STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Regional Office • 3190 160th Avenue SE • Bellevue, Washington 98008-5452 • (425) 649-7000

March 10, 2006

CERTIFIED MAIL
7005 2570 0001 0182 2817

Mr. Jim Sumner
Manager, Group Environmental Programs
General Electric Aircraft Engine
One Neumann Way MD T165
Cincinnati, OH 45215

Dear Mr. Sumner:

Re: Ecology Response Letter: Evaluation for the Potential for Subsurface Vapor Intrusion, Former GE South Dawson Street-Facility, Seattle, Washington-dated February 6, 2006

Ecology has received the report, *Evaluation for the Potential for Subsurface Vapor Intrusion, Former GE South Dawson Street-Facility, Seattle, Washington, dated February 6, 2006*. Ecology received this report on February 7, 2006.

Thank you for submitting the report per the schedule in the Ecology-approved Evaluation of Subsurface Vapor Intrusion Assessment work plan[1]. The report contains a good accounting of the December 2005 sampling event. However, Ecology does not agree with the General Electric Company's (GE's) conclusions that the sampling results indicate that subsurface vapor migration is not a pathway of concern at the former GE facility. Listed below are Ecology's comments on the report and required actions to be undertaken by GE in the timelines listed below:

General Comments:

1. Sample Area 1, the northeast corner of the Puget Sound Pipe Company warehouse had a corrected trichloroethylene (TCE) indoor air concentration[2] of 0.085 ug/m^3. This value is below the MTCA Method C indoor air cleanup level of 0.22 ug/m^3. However, the sub-slab vapor TCE concentration was found to be 1600 ug/m^3 (duplicate also 1600 ug/m^3), 7270 times the MTCA Method C TCE indoor air

[1] Ecology certified (7005 1160 0000 0644 2806) approval letter dated November 16, 2006
[2] GE subtracted an average TCE ambient air concentration of 0.195 ug/m3 from each indoor air sample measured

cleanup level. Therefore, even though indoor air concentration of TCE in this area was acceptable on the day of sampling, this high concentration of TCE in the sub-slab vapor will continue to serve as a source of future potentially unacceptable vapor intrusion into Sample Area 1. To ensure that indoor air quality remains minimally impacted by vapor intrusion, Ecology requires that GE monitor sub-slab vapors and indoor air to verify that risks remain below MTCA thresholds. Specifically, GE should routinely (semi-annually) sample indoor air, ambient air, and sub-slab vapor associated with Sample Area 1 to verify that unacceptable vapor intrusion impacts into Sample Area 1 are not occurring. Sampling should occur during the heating season and during the non-heating season, close to the times when groundwater in the vicinity is sampled. Indoor air and sub-slab vapor monitoring should continue until the potential for unacceptable vapor intrusion into Sample Area 1 clearly no longer exists (as indicated, primarily, by sub-slab vapor and nearby groundwater TCE concentrations). As an alternative to this routine monitoring, GE may elect to propose and implement vapor intrusion mitigation for the area.

2. Sample Area 2, the northern portion of the Mason Supply warehouse, had corrected TCE[2] indoor air concentrations at 0.075 ug/m^3 and 0.085 ug/m^3 (duplicate), both below the MTCA Method C indoor air cleanup level of 0.22 ug/m^3. The sub-slab TCE vapor concentrations from V-2 showed 44 ug/m^3 TCE. Although there is the potential for future vapor intrusion in this area resulting in TCE indoor air concentrations above the MTCA Method C indoor air cleanup levels (if the α were to exceed 0.005), Ecology is satisfied that based on current conditions alone, Sample Area 2 will not require further indoor air or sub-slab vapor monitoring. Groundwater concentrations of TCE in the vicinity will continue to be monitored and any increases in groundwater TCE below or near Sample Area 2 will require additional vapor intrusion assessments.

3. Sample Area 3, the Mason Supply office/retail area, had a corrected TCE indoor air concentration[2] of 0.145 ug/m^3. This value is also below the MTCA Method C indoor air cleanup level of 0.22 ug/m^3. However, the sub-slab vapor TCE concentration was found to be 240 ug/m^3. This concentration is 1090 times the MTCA Method C indoor air cleanup level. Similarly to Sample Area 1, such a high concentration of TCE in the sub-slab vapor will continue to serve as a source of TCE indoor air contamination and Ecology is concerned that future potentially unacceptable vapor intrusion could occur into Sample Area 3. Ecology therefore requires that GE institute routine monitoring to ensure that vapor impacts remain negligible. Specifically, GE should conduct semi-annual indoor air, ambient air, and sub-slab vapor sampling in Sample Area 3. Sampling should occur during the heating season and during the non-heating season, concurrent (as much as possible) with nearby groundwater monitoring, until the potential for unacceptable vapor intrusion into Sample Area 3 clearly no longer exists. As an alternative, GE may elect to propose and implement vapor intrusion mitigation, in lieu of routine monitoring.

4. Sample Area 4, the Hudson Bay Insulation warehouse had a corrected TCE indoor air concentration[2] of 0.355 ug/m^3, above the MTCA Method C indoor air cleanup level of 0.22 ug/m^3.

Assuming that all of the employees of the Hudson Bay Insulation company work at the facility only 40 hours per week, 50 weeks per year, Ecology estimates that the current additional individual lifetime carcinogenic risk due to TCE vapor intrusion alone to be 2.5E-06[3]. Since most, if not all, of the carcinogenic inhalation risk due to vapor intrusion is from TCE, the current inhalation risk to Sample Area 4 workers from subsurface vapor intrusion appears to be below a total excess individual lifetime carcinogenic exposure risk of 1.0 E-05.

Adjusting the exposure frequency and duration in this manner is a way to calculate a remediation level, not a cleanup level (see WAC 173-340-708(10)). Under MTCA, the default exposure timeframes and frequencies must be used in the calculation of indoor air cleanup levels. Since the corrected TCE indoor air concentrations for Sample Area 4 represent an exceedance of the MTCA Method C indoor air cleanup level (0.22 ug/m^3), GE will be required to address vapor intrusion in Sample Area 4 within the Feasibility Study and final site cleanup action plan.

Sub-slab vapor TCE concentrations were found to be 350 ug/m^3, or approximately 1590 times the MTCA Method C indoor air cleanup level. This elevated concentration of TCE in the sub-slab vapor is a potential source of TCE indoor air contamination, and the future vapor intrusion could lead to indoor air TCE levels which even exceed the remediation level of 1.15 ug/m^3 proposed by GE based on a "realistic" worker scenario. Therefore, Ecology requires that GE institute routine monitoring in Sample Area 4 to verify that indoor air levels of TCE – due to vapor intrusion – do not exceed the proposed remediation levels. Specifically, this monitoring should include semi-annual indoor air, ambient air, and sub-slab vapor sampling. This sampling should occur during the heating season and during the non-heating season, concurrent (as much as possible) with groundwater sampling near the building, until the potential for unacceptable vapor intrusion into Sample Area 4 clearly no longer exists. As an alternative, GE may elect to propose and implement vapor intrusion mitigation in this part of the building.

GE may also elect to prepare and implement a plan for identifying indoor sources of TCE in Sample Area 4 that are responsible for the elevated indoor air measurements.

In any case, since GE apparently has no current administrative or institutional controls to prevent workers in Sample Area 4 from being exposed to indoor air more than 40 hours per week, 50 weeks per year (basis of the TCE indoor air remediation level), GE should submit information obtained from the tenant that demonstrates that the assumptions used by GE in Section 5.6 of the Report are conservative.

5. Sample Area 5, inside the Puget Sound Piping Office, had a corrected TCE indoor air concentration[2] of 0.515 ug/m^3, above the MTCA Method C indoor air cleanup level of 0.22 ug/m^3.

---

[3] [(0.355 ug/m^3)x(0.4 mg/kg-d)$^{-1}$)x 20 m^3/day x (20 yrs exposure/75 yrs lifetime) x .23 (exposure frequency)]/(70 kg x 1,000 ug/mg)

Similar to the discussion for Sample Area 4, assuming that the employees of the Puget Sound Pipe Office work only 8-hour shifts over the course of a 40-hour work week, 50 weeks per year, and that the "corrected" concentration includes all TCE from vapor intrusion, Ecology estimates that the current individual lifetime additional carcinogenic inhalation risk from vapor intrusion to be 3.6 E-06[4]. As noted for Sample Area 4, adjusting the exposure duration and frequency as proposed by GE (Section 5.6) to account for less than continuous exposure (exposure factor = 1.0) results in a remediation level, not a cleanup level calculation. Adjusting the "MTCA indoor air cleanup level" from 0.22 to approximately 1 ug/m3 constitutes a *remediation level*, not a cleanup level. Since the corrected TCE indoor air concentrations for Sample Area 5 represent an exceedance of the MTCA Method C indoor air cleanup level (0.22 ug/m^3), GE will be required to address vapor intrusion in this part of the building within the Feasibility Study and final site cleanup action plan.

The sub-slab vapor concentration of TCE beneath this area was found to be 3700 ug/m^3, or approximately 16800 times the MTCA Method C indoor air cleanup level. This very high concentration of TCE in the sub-slab vapor will continue to serve as a source of future TCE indoor air contamination. In fact, in the future, vapor intrusion could lead to indoor air TCE levels high enough to exceed the GE proposed remediation levels. Therefore, Ecology requires that GE institute routine monitoring in Sample Area 5 to verify that indoor air levels of TCE – due to vapor intrusion – do not exceed GE's proposed remediation levels. Specifically, this monitoring should include semi-annual indoor air, ambient air, and sub-slab vapor sampling. Sampling should occur during the heating season and during the non-heating season, concurrent (as much as possible) with groundwater sampling near the building, until the potential for unacceptable vapor intrusion into Sample Area 5 clearly no longer exists. As an alternative, GE may propose and implement vapor intrusion mitigation in this part of the building[5].

GE also may elect to prepare and implement a plan for identifying indoor sources of TCE in Sample Area 5 that are responsible for the elevated indoor air measurements.

Since GE apparently has no current administrative or institutional controls to prevent workers in Sample Area 5 from being exposed to indoor air more than 8 hours per day and 40 hours per week (which the proposed TCE Remediation Level is based on), GE should submit information obtained from the tenant that demonstrates that the assumptions used by GE in Section 5.6 of the Report are conservative.

Specific Comments: GE shall provide revised sections of the report to include all of the Ecology comments below within 30-calendar days of your receipt of this certified letter.

---

[4] [(515 ug/m3) x (0.4 mg/kg-d)$^{-1}$)x 20 m^3/day x (20 yrs exposure/75 yrs lifetime) x 23 (exposure frequency)]/(70 kg x 1,000 ug/mg)

[5] GE claims that the part of the corrected indoor measurement that is above the MTCA Method C indoor air CUL (0.29 ug/m^3) has been contributed by indoor air sources, not vapor intrusion. However, this is not a conservative conclusion, especially with soil gas levels as high as 3700 ug/m3 and Area 5 COC alphas indicating that all the TCE found indoors could be due to VI. Nor has GE identified any indoor TCE sources to support such a hypothesis.

6. Page 2-7, Section 2.4, paragraph 2 and Page 4-3, Section 4.5: Please submit the tabulated raw cross-slab pressure measurement data. Also include a schematic and photograph of the Dwyer Magnehelic pressure/vacuum gauge and ancillary apparatus as installed within the former GE building Sample Areas #2 and #5.

7. Page 3-2, Section 3.4, bullet #5: TCE also remains in soils beneath the Puget Sound Pipe building, below V-5 and IA-5.

8. Page 4-1, Section 4.0: Ecology stated[6] that it wasn't going to strictly apply the 100 times attenuation factor to sub-slab vapor concentrations since we were willing to allow faster sampling times and due to IA samples being collected.

9. Page 5-1, Section 5.1: GE makes the assumption that the highest sub-slab vapor TCE and TCA concentrations should result in the highest indoor air TCE and TCA concentrations. It is likely that different areas of the floor slab within the old former GE building could be "tighter" than other areas, thus resulting in different cross-slab attenuation factors. Differing air exchange rates in each Sample Area can also lead to different Sample Area attenuation factors. For example, Sample Area #1 is near a large bay door that is often open to facilitate the loading and unloading of delivery trucks. One would expect this to facilitate a larger exchange of indoor air with outdoor air and thus result in higher attenuation (lower α). Refer to Figure 5-1 and Table 4-1.

   Ecology interprets Figure 5-1 as showing that the Sample Area-specific attenuation factors and measured sub-slab vapor TCE and TCA concentrations both have an influence on each Sample Area indoor air TCE and TCA concentration.

10. Page 5-1, Section 5.2: GE makes the assumption that one can calculate average attenuation factors, sub-slab vapor concentrations and indoor air concentrations on a building-wide basis and compare these average trends to each of the five (5) area specific data. For reasons described above (comment #9), Ecology believes it is inappropriate to assume this.

11. Page 5-2, Section 5.3: GE again makes the assumption here that attenuation factors should be consistent across all Sample Areas within the former GE building. Ecology does not believe that this assumption is valid, as noted above.

    With respect to Figure 5-2, the plot does not use the same attenuation factor scale on the dependent and independent variable axis, which can lead to some inadvertent skew to the data in the dependent variable direction. The scale magnitude relative to the uncertainties of the measurements leads to apparent observed scatter of data around the $\alpha_{TCE} = \alpha_{TCA}$ line. However, if one looks at each of the five Sample Areas separately, and compares the sub-slab vapor and indoor air data on an area-by-area basis, one sees that the TCE and TCA attenuation factors fall within an order of

[6] Ecology Certified Letter (7004 2510 0006 4925 8177) dated October 17, 2005

magnitude of one another within each of the respective Sample Areas 1, 3, 4, and 5 (Table 4-1).

This all suggests a strong line of evidence indicating vapor intrusion of TCE and TCA in Sample Areas 1, 3, 4, and 5. This is a reasonable assessment of the comparability of the attenuation factors for TCE and TCA given the measurement[7], analytical, spacial and temporal uncertainty of the Sample Area specific sub-slab vapor and indoor air data. Sample Area 2 has already been excluded by Ecology from further vapor intrusion assessment or mitigation.

12. Page 5-2, Section 5.4: This section seemingly contradicts previous statements in Section 4.5 that the cross-slab pressure differential measurements are not distinguishable from zero, and could actually be positive (downward gradient) based on the accuracy of the instrument.

    In addition, while Ecology understands that the pressure measurements were primarily made to help explain the December 2005 indoor air results, and the likelihood of vapor intrusion impacting indoor air quality on the day of sampling, the Department has also previously stated that we felt the data had limited applicability. These short-term cross-slab pressure differential tests do not yield sufficient data to demonstrate that the vapor intrusion pathway at a building is incomplete. To make such a claim, pressure would need to be measured/monitored sufficiently to estimate pressure gradient conditions across the entire warehouse floor slab, the Puget Sound Pipe Company office, and the Mason Supply office/retail area, 24-hours a day and 365-days a year[8].

13. Page 5-4, Section 5.6: Refer to Comments # 4 and #5 above. In addition, please provide the equation used to calculate the proposed remediation indoor air concentration and include information from the Hudson Bay Insulation Company and Puget Sound Pipe Company that shows the GE exposure assumptions in Section 5.6 are conservative.

In accordance with the RCRA Corrective Action Agreed Order No. DE02HWTRNR-4686 and the Ecology approved Interim Action Work Plan, dated October 28, 2002, GE shall submit a draft monitoring plan (QAPP, SOPs and SAPs inclusive) for routine indoor air, ambient air, sub-slab vapor, and groundwater monitoring at the former GE facility in Sample Areas 1, 3, 4, and 5. The draft work plan shall be submitted for Ecology review, comment and approval within 30 calendar days of your receipt of this certified letter. Sampling frequency should begin at two events per year, with provisions in the plan for less frequent sampling if results after several events indicate little variability in indoor TCE concentrations. GE may at their option choose to mitigate any or all of the specified areas in lieu of semi-annual monitoring. Mitigation, depending on the technique chosen, may be a more cost effective manner for GE to address vapor intrusion into the four Sample Areas. If this option is selected, GE shall submit a draft

[7] This is particularly true for measurements of very low indoor air concentrations. In many instances TCA was not quantified above the reporting limit.

[8] Ecology Certified Letter (7004 2510 0006 4925 8177) dated October 17, 2005.

mitigation work plan within 30 calendar days of your receipt of this letter. The plan shall contain GE's mitigation proposals, identifying the specific Sample Areas proposed for mitigation and a conceptual design of each mitigation approach. The plan shall also contain a proposed schedule for: (1) submitting any future work plans with detailed design/implementation proposals, and (2) completing the proposed mitigation activities. Under this option, Ecology may require a brief amendment to the current Agreed Order to incorporate the mitigation.

Please feel free to call me at (425) 649-7264 if you have any questions regarding this letter. Ecology is willing to discuss its comments and required work in a teleconference call, before the workplan(s) are due for submittal to Ecology.

Sincerely,

Dean Yasuda

Dean Yasuda, P.E.
Environmental Engineer
Hazardous Waste and Toxics Reduction Program

DY:sd

cc: Julie Sellick, HWTR/NWRO
Ed Jones, Ecology HWTR/NWRO
Jim Schwartz, Ecology AAG
Tong Li, Ground Water Solutions
Marcia Bailey, EPA Region 10
Stephen R. Black, Black & Yund
Alex Cordas, Keymac, LCC
Bill Joyce, Salter, Joyce, Ziker, PLLC
WAD009278706 HZW 6.2

General Electric
WAD009278706
HZW 67.1

RECEIVED
FEB 07 2006
DEPT. OF ECOLOGY

RECEIVED
FEB 07 2006
DEPT. OF ECOLOGY

GE
Aviation

James W. Sumner, Manager
Group Environmental Programs

One Neumann Way, M/D T165
Cincinnati, OH 45215

T 513-672-3986, DC 8*892-3986
F 513 552-8918, DC 8*892-8918
jim.sumner@ge.com

February 6, 2006

Mr. Dean Yasuda
Washington Department of Ecology
Northwest Regional Office
3190 – 160th Avenue S.E.
Bellevue, Washington 98008-5452

Dear Mr. Yasuda:

Attached please find the Evaluation of the Potential for Sub-Surface Vapor Intrusion for the former GE site on South Dawson Street, Seattle.

Should you have any questions or concerns about the information presented in this report, please do not hesitate to call me at (513) 672-3986 or Jill Lantz at (206) 624-9349.

Sincerely,

Original Signed By

James W. Sumner

Attachment – Evaluation of the Potential for Sub-Surface Vapor Intrusion

cc: Tong Li – Groundwater Solutions
Alex Cordas – KeyMac
Bill Joyce – Ogden Murphy Wallace
Linda Baker, Jill Lantz, Jamie Stevens – RETEC

General Electric
WAD009278706
HZW C.7.1

RECEIVED
FEB 17 2006
DEPT. OF ECOLOGY

GE
Aviation

James W. Sumner, Manager
Group Environmental Programs

One Neumann Way, M/D T165
Cincinnati, OH 45215

T 513-672-3986, DC 8*892-3986
F 513 552-8918, DC 8*892-8918
jim.sumner@ge.com

February 6, 2006

Mr. Dean Yasuda
Washington Department of Ecology
Northwest Regional Office
3190 – 160th Avenue S.E.
Bellevue, Washington 98008-5452

Dear Mr. Yasuda:

Attached please find the Evaluation of the Potential for Sub-Surface Vapor Intrusion for the former GE site on South Dawson Street, Seattle.

Should you have any questions or concerns about the information presented in this report, please do not hesitate to call me at (513) 672-3986 or Jill Lantz at (206) 624-9349.

Sincerely,

James W. Sumner

Attachment – Evaluation of the Potential for Sub-Surface Vapor Intrusion

cc: Tong Li – Groundwater Solutions
Alex Cordas – KeyMac
Bill Joyce – Ogden Murphy Wallace
Linda Baker, Jill Lantz, Jamie Stevens – RETEC

From: Origin ID: (206)624-9349
Jill Lantz
The RETEC Group
1011 Southwest Klickitat Way #207

Seattle, WA 98134

FedEx Express

CLS012205/14/18

Ship Date: 06FEB06
ActWgt: 3 LB
System#: 1859212/INET2400
Account#: S *********

REF: GE001-19314-750

Delivery Address Bar Code

RECEIVED
FEB 07 2006
DEPT. OF ECOLOGY

SHIP TO: (425)649-7264 **BILL SENDER**

Dean Yasuda
Dept.Of Ecology
3190 160th Ave.S.E.

Bellevue, WA 98008

STANDARD OVERNIGHT **TUE**

Deliver By:
07FEB06

TRK# 7908 0464 2486 FORM 0201

SEA A2

98008 -WA-US

85 BVUA

Shipping Label: Your shipment is complete

1. Use the 'Print' feature from your browser to send this page to your laser or inkjet printer
2. Fold the printed page along the horizontal line
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is $500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide Written claims must be filed within strict time limits, see current FedEx Service Guide

Central Files Copy

General Electric
WA0000978706
H2W 6.7.1

RETEC

Evaluation of the Potential for Subsurface Vapor Intrusion

Former GE South Dawson Street Facility
Seattle, Washington

RECEIVED
FEB 07 2006
DEPT. OF ECOLOGY

Prepared by:

The RETEC Group, Inc.
1011 SW Klickitat Way, Suite 207
Seattle, Washington 98134

RETEC Project Number: GE001-19314

Prepared for:

GE Aviation
One Neumann Way, Mail Drop T165
Cincinnati, Ohio 45215

February 6, 2006

Evaluation of the Potential for Subsurface Vapor Intrusion

Former GE South Dawson Street Facility
Seattle, Washington

Prepared by:

The RETEC Group, Inc.
1011 SW Klickitat Way, Suite 207
Seattle, Washington 98134

RETEC Project Number: GE001-19314

Prepared for:

GE Aviation
One Neumann Way, Mail Drop T165
Cincinnati, Ohio 45215

Prepared by:

Jill N. Lantz, P.E. – Project Manager

Reviewed by:

John T. Finn, P.E. – Senior Engineer

February 6, 2006

Executive Summary

General Electric (GE) Company's Aviation division is conducting this evaluation of the potential for subsurface vapor intrusion, as part of the overall environmental investigation at and downgradient of its former facility, 220 South Dawson Street in Seattle, Washington.

The scope of the work described in this report includes collection of air samples from indoor, outdoor and sub-slab sampling locations, as well as subsurface permeability testing and measurement of pressure differential across the building slab. Groundwater sampling was also conducted in wells in the vicinity of the former GE building, to provide a complete assessment of the potential for vapor migration in the building.

The evaluation shows, consistent with buildings with high rates of ventilation and negligible pressure differential across the sub-slab, that sub-slab to indoor air attenuation factors are near the low end of the typical range. Analytical results derived from the investigation further show that none of the measured or corrected indoor air concentrations exceed levels that would be appropriate for a worker exposure scenario.

A thorough evaluation of all of the lines of evidence supports the conclusion that subsurface vapor migration is not a pathway of concern at the former GE facility.

Table of Contents

List of Tables

List of Figures

List of Appendices

1 Introduction

General Electric Company's Aviation division (GE) is currently evaluating environmental impacts to soil and groundwater at and downgradient of its former facility, 220 South Dawson Street in Seattle, Washington. GE and the Washington Department of Ecology (Ecology) entered into an Agreed Order (#DE02HWTRNR-4686) in 2002, under which GE will complete the investigation phase of the project so that a final remedy can be implemented. The work to be completed under the Agreed Order is detailed in the *Interim Action Work Plan* (IAWP; RETEC, 2002).

This report presents an evaluation of the potential for subsurface vapor intrusion to indoor air in accordance with the *Work Plan for Evaluation of Subsurface Vapor Intrusion, Revision 2*, dated November 1, 2005 (Work Plan; RETEC, 2005). This Work Plan was approved by the Department of Ecology with conditions in a letter dated November 16, 2005 (Attached in Appendix A). The scope of the Work Plan included collection of air samples from indoor, outdoor and sub-slab sampling locations, as well as subsurface permeability testing and measurement of pressure differential across the building slab. Groundwater sampling was also conducted in wells in the vicinity of the former GE building, to provide a complete assessment of the potential for vapor migration in the building.

Ecology provided approval of Sections 1.3 to 7.0 of the Work Plan in a letter dated November 16, 2005, and work commenced on December 2, 2005.

1.1 Report Organization

The remainder of this document is organized as follows:

- Section 2 describes the field sampling activities, including collection of ambient air, indoor air and sub-slab vapor samples, as well as measurement of the pressure differential.
- Section 3 describes overall data quality.
- Section 4 presents the analytical data from the field sampling activities.
- Section 5 presents a discussion of the potential for vapor intrusion at the former GE facility, and presents conclusions and findings.
- Section 6 lists reference documents cited in this report.

2 Field Methods

This section describes the activities undertaken to collect data and information for the purposes of the indoor air quality screening evaluation. The methods and rationale are described for the pre-sampling site visit, indoor, ambient and sub-slab sampling, pneumatic testing, and measurement of pressure differential. The sampling results are presented in Section 4 of this report.

2.1 Pre-Sampling Site Visit

On December 2, 2005, representatives from GE, Ecology, the building tenants, and RETEC participated in a site walk-through. The purpose of this visit was to observe and mitigate potential sources of volatile organic compounds (VOC) contamination in indoor air, to mark the locations of the samples, and to obtain agreement from Ecology on the specific sampling locations. The information obtained during the building inspection is summarized below, and field logs and photographs from the site visit are included in Appendix B.

The December 2, 2005 inspection included a walk-through of all three businesses located within the building – Masons Supply, Puget Sound Pipe, and Hudson Bay Insulation. Approximate locations for ambient air, indoor air, and sub-slab vapor sampling were determined with reference to the building activities, site history, and locations of the historic soil removal areas, shown on Figure 2-1. Sub-slab soil and indoor air sampling locations were selected proximate to each other to facilitate comparison of the results. At two paired locations (IA/V-5 and IA/V-3), the sub-slab samples were marked for collection immediately outside of the office spaces where the indoor air samples were marked, in an effort to minimize the damage to finished flooring and accommodate business traffic.

During the site inspection, a number of potential indoor air sources were identified which might affect the indoor air results, primarily in the vicinity of the IA-2 sampling location, in the warehouse associated with the Masons Supply business. These potential sources included: open and closed containers of flooring sealant and tile paint top coats; industrial glass cleaner; WD-40 cans; spray paint without spray nozzles; and a number of assorted masonry products, such as adhesives and grouts. Obvious potential sources of indoor air contamination were identified and placed in sealed plastic bags for the duration of the sampling events (photos presented in Appendix B). During the site inspection, business owners were asked to reduce the amount of car traffic and indoor smoking during the field event. It should be noted that all of the businesses use fork lifts and load trucks inside the warehouses, and that light trucks are often driven inside the warehouses. Those activities were observed during the December sampling event as well.

During the building inspection, the Masons Supply company was conducting a demonstration of a floor surfacing technique, which included the use of liquid compounds that had a very strong odor. The Material Safety Data Sheets (MSDS) for the products used in this application are included in Appendix C of this report. An inventory log of all products stored in the warehouse (mostly in closed, sealed containers) is also included in Appendix C.

Five ambient air locations were selected around the outside of the building. During the December 2, 2005 inspection, the locations of AA-1 and AA-3 were moved farther away from the building than were originally proposed, to better represent the wind flow. Two additional ambient air sample locations were added, AA-4 and AA-5, to insure that the entire outside perimeter of the building was included in the study and to represent potential wind patterns. Final sample locations are shown on Figure 2-1.

A site utility clearance was conducted on December 2, 2005. No underground utilities were identified that interfered with sample locations.

2.2 Groundwater Sampling

The regular November quarterly sampling event was conducted between November 14 and November 17, 2005. GE consulted with Ecology prior to the sampling event, and Ecology agreed that the field sampling timing was acceptable. In addition to the regularly scheduled sampling of monitoring wells, samples were also collected from wells MW-1, MW-4, MW-6, MW-7 and MW-8 to provide additional lines of evidence for the air pathway study. All samples were collected using low-flow techniques, using dedicated QED Well Wizard sampling pumps, and dedicated sampling tubing, as described in the site Sampling and Analysis Plan, included in the IAWP.

2.3 Air Sampling Program

Field work for the air sampling was conducted on Monday, December 5 through Wednesday, December 8, 2005. A total of 18 air and sub-slab vapor samples were collected for this evaluation. These consisted of 5 ambient air samples, 6 indoor air samples, 5 sub-slab vapor samples, and 2 quality assurance/quality control samples. The sample locations are shown in Figure 2-1.

In order to minimize the potential for introducing interference, all sampling personnel ensured appropriate hygiene and behaviors during the sampling events. For instance, sampling personnel did not handle hazardous substances such as gasoline or permanent marking pens, or smoke cigarettes during the sampling episodes. All sampling was also conducted to the extent practicable in accordance with the standard operating procedures discussed in the Work Plan.

All sampling canisters were individually certified (in the case of SIM-prepared canisters) or 10% process certified (in all non-SIM-prepared canisters) clean by GC/MS analysis before being used in the field. Certification of cleaning and evacuation was noted prior to collection of samples. A vacuum gauge was used to check both the initial and final vacuum in the canisters; the initial vacuum was checked to ensure mechanical integrity of the canisters and was approximately 30 inches mercury (inches Hg). The final vacuum after sample collection read from approximately 1 to 10 inches Hg, and was verified upon receipt by the laboratory to ensure sample integrity during return shipment (Table 2-1). Two different pressure gauges were used to record vacuum readings on the canisters – a glycerin-filled gauge provided by the laboratory, and the built-in gauge on each flow controller. Table 2-1 presents the vacuum readings for each sample. Some of the initial readings from the glycerin-filled gauge from the indoor and ambient samples are suspect due to the cold weather and the inordinately long time it took for the gauge to equilibrate. The gauges on the flow controllers consistently read at or near 30 inches of vacuum prior to sample collection. The laboratory was satisfied that all vacuum readings indicated that appropriate sample volumes were collected (see Section 3 for data quality review).

The sample ID, sample date, sample time and canister number were recorded on the sampling forms and in the field notes. Once samples were collected, they were stored according to the method protocol and shipped to the analytical laboratory on the next business day under Chain of Custody procedures. Copies of all field forms are included in Appendix D, a photographic record of the sampling events is provided in Appendix D.

2.3.1 Ambient Air Sampling Event

One round of ambient air sampling was performed on Monday December 5, 2005. The ambient air samples were set up and collected in accordance with the Work Plan. Six-liter Summa canisters with 8-hour flow controllers were used to collect each ambient air sample during the field event. The canisters and controllers were SIM-certified at the laboratory. The canisters were placed approximately five to seven feet above the ground, the higher sample locations were selected to minimize exposure to vehicle exhaust. Starting and ending vacuum readings were recorded for each canister, and recorded on the sample labels and the Chain of Custody for laboratory quality control purposes.

Table 2-1 lists the full sample numbers, locations, sampling times, and vacuum readings for each sample.

2.3.2 Indoor Air Sampling Event

The indoor air sampling event was conducted concurrent with the ambient air sampling, on December 5, 2005. This event occurred after a 2-day weekend

and during dry weather. The indoor air samples were collected prior to the sub-slab vapor survey inside of the building to ensure that the indoor air quality was not impacted by the sub-slab vapor sampling. The samples were collected over an eight-hour time period to capture a normal worker's exposure. This event was conducted during the normal operating hours for all of the businesses in the former GE building.

The indoor samples were set up and collected in accordance with the Work Plan. Six-liter Summa canisters with 8-hour flow controllers were used to collect each indoor air sample during the field event. The canisters and controllers were SIM-certified at the laboratory. The canisters were placed approximately four to five feet above the ground (at approximate breathing zone height).

All isolation measures put in place on Friday were observed to still be in place with one exception. Contrary to the agreement reached with Masons Supply, an employee was conducting a trial floor sealing. The activity was quickly discontinued and the laboratory was consulted to determine if sampling could proceed. The laboratory indicated that they could still produce reliable results and would make every effort to achieve the required detection limits of the target compounds. One additional indoor air sample location (IA-6) was added to evaluate if the xylene-based flooring product in use in Masons Supply demonstration area would affect the indoor air quality in the western portion of the building. This decision was made in the field in response to the fact that the Masons Supply company had recently applied decorative floor treatments in their demonstration area.

A field duplicate sample was collected at the IA-2 location. Two canisters were set up on a ladder at the same location. A photograph of the setup is shown in Appendix D. The field duplicate was used in data validation for quality control/quality assurance purposes.

Sample IDs, sample dates, sample times and canister numbers were recorded for each sample. Signs were also posted on each unit stating the purpose of the sampler and asking that no smoking occur. In addition, starting and ending vacuum readings were recorded for each canister, and recorded on the sample labels and the Chain of Custody for laboratory quality control purposes. Canisters for indoor and outdoor samples were individually certified along with their flow controllers, as required for SIM analyses.

Table 2-1 lists the full sample numbers, locations, sampling times, and vacuum readings for each sample.

2.3.3 Sub-Slab Soil Vapor Sampling Event

The sub-slab soil vapor sampling within the building was conducted from December 6 through December 7, 2005. Sub-slab soil vapor samples were collected over a period of approximately 30-minutes at each location.

The approximate sub-slab soil vapor sampling locations were established during the December 2, 2005 building inspection. These locations were determined with reference to the building floor plans and the utility clearance results so as to avoid underground utilities and subsurface obstructions such as concrete footings, and all locations were cleared by Ecology before the sampling event occurred.

Six sub-slab vapor samples were collected from five locations beneath the building slab. One location (V-1) was sampled twice – at the beginning and end of the sub-slab sampling event, to assess temporal variation of sub-slab vapor conditions.

Equipment checkout and calibration activities occurred prior to each sampling event and were documented in field notes (Appendix D).

Sub-slab sampling locations were installed in accordance with the Work Plan. Photographs of the sampling process are included in Appendix D, and illustrate the sampling equipment, as well as the procedures used for installation of the probes and collection of the sub-slab samples.

As described in the Work Plan, a hammer drill was used to penetrate the concrete slab at each sample location. A ¼-inch (nominal) brass NPT pipe and fittings were installed and sealed with quick-setting hydrating cement. All sample train tubing was Nyla-Flow™ tubing. To confirm the integrity of the seal between the sub-slab vapor sampling probe and the floor, a plastic shroud was placed over the sampling apparatus, and helium was introduced into the shroud. Helium concentrations were monitored during purging activities (before and after sample collection) using a portable helium meter, the MGD-2002 Helium Detector, which was pre-calibrated by the rental company according to the manufacturer's instructions. The purpose of the helium was to act as a highly mobile tracer gas that would indicate the extent of leakage through the cement seal (i.e., the amount of ambient air being drawn from the surface to the subsurface during sub-slab vapor sampling). The concentration of helium in the shroud was monitored and recorded during purging. A sample was then collected in a Tedlar bag, and the helium concentration in the Tedlar bag was measured with the helium detector. If the helium concentration in the Tedlar bag was greater than 5% of the shroud concentration, then the seal was deemed inadequate and was repaired or replaced prior to continuing with sampling. The original holes were completely sealed prior to collection of the samples from the new holes.

At the initial two sampling locations, V-1 and V-5, the field measurements of flow, pressure and helium indicated that the sample probes were not properly sealed. In addition, high vacuum was required to pull the samples from the subsurface, indicating that the ½-inch probe holes were not sufficient for the sample collection, and/or that the probes may have encountered a secondary slab or low permeability material.

Corrective actions were taken to obtain proper seals and effective probe holes. New probe holes were drilled using the 1-inch drill bit, which confirmed the slab had been completely penetrated. These methods were used at all five of sub-slab sampling locations. From drilling each hole, the slab thickness was estimated by observing when a "breakthrough" was felt during drilling, and by running a thin metal rod along the inside of the hole to feel for the presence of concrete. Based on these measurements, the slab thickness ranged from 9.5 to 12 inches thick. This agrees with the 10-inch estimate derived from drilling logs for MW-7.

Field measurements of helium at each location indicated that the probes were sealed to within acceptable leakage limits (samples contained less than 5% of the helium concentration in the shroud). Flow and vacuum measurements demonstrated that the sub-slab region had a relatively high permeability, as would be expected for gravel materials that are normally used for bedding materials, with the exception of location V-2. At location V-2, the sub-slab region was less permeable and indicative of siltier materials.

Each sample location was purged at a flow rate of approximately 0.2 liters per minute using a GAST DOA-AA vacuum pump. During purging, the purged air was collected in a new and dedicated Tedlar bag and screened with portable instruments for concentrations of methane, carbon dioxide, oxygen, helium and total volatile organic compounds. Screening readings were recorded for 3 successive samples to demonstrate stability in the readings prior to collection of a sample for laboratory analysis

Following purging, 6-liter Summa canisters with 30-minute flow controllers were used to collect each sub-slab vapor sample. Helium concentrations in the shroud covering the top of the probe were monitored during the sample collection period. After sampling, the sample probes and tubing were pulled from the sample locations and all holes were backfilled with cement to match the grade of the floor. Copies of field logs summarizing the purging and monitoring are included in Appendix D.

All instrumentation was operated in accordance with manufacturer's instructions, unless otherwise specified in the Work Plan. The photo-ionization detectors (PID) used was a RAE systems miniRAE, calibrated using isobutylene span gas and ambient air as zero gas. A Landtech GEM 2000 Landfill Gas Meter (CO_2, O_2 & CH_4) was used to record methane, oxygen and carbon dioxide during purging. A Combustible Gas Indicator (CGI) was used to record the concentrations of methane in the indoor air before sampling activities to check for natural gas leaks. In addition to being explosive, natural gas contains trace concentrations of benzene and may therefore be a confounding source of volatile organic compounds. The CGI measurements were also used to monitor concentrations of oxygen and carbon dioxide.

A summary of the sample numbers, locations, and sampling times is provided in Table 2-1. Field logs completed during sampling are included in Appendix D.

2.4 Method for Pressure Differential Measurement

A Dwyer Magnehelic™ pressure/vacuum gauge with a range of 0.005 to 0.25 inches water (inches H_2O) was used to measure the pressure difference prior to sample collection at each sample point. The measured pressure difference was 0 inches H_2O at each point. The gauge was leveled and zeroed immediately prior to all measurements.

At two locations, V-2 and V-5, outside of the Puget Sound Piping office and inside the Masons Supply warehouse, the pressure differential between subsurface and the interior of the building was monitored over a 24-hour period. The pressure differential was measured following completion of the sub-slab sampling, starting in the afternoon of December 6 at V-2 and V-5. The following day, when the data loggers were retrieved, it showed that the data logger at V-2 had not functioned correctly and had not recorded the measurements. Consequently, the V-2 data logger was reset and run from December 7 to 8, 2005, to obtain a full 24-hour period of pressure readings.

The Model 8705 DP-Calc Micromanometer was attached to the sample probe and then allowed to record the sub-slab to indoor air pressure differential over a period of twenty-four hours at each location. The instrument was allowed to thermally equilibrate for a minimum of two hours to the interior temperature of the building before calibration and zeroing. The instrument was set up to automatically record pressure readings integrated over a 10-second interval, every two minutes for the twenty-four hour testing period. The Work Plan called for a sample recording time of a ten-second interval every minute; however, the DP-Calc™ memory was insufficient to hold this many data points. Concurrent with the pressure differential measurements, a Barnstead Pressure/Temperature Recorder (PRTEMP101) unit was used to record barometric pressure and temperature inside the building, logging at one-minute intervals over the test period.

3 Data Quality

3.1 Methods of Laboratory Analysis

Sub-slab soil gas samples were analyzed for target chlorinated VOCs using EPA Method TO-15 with a standard reporting limit of 0.5 parts per billion by volume (ppbv), at Air Toxics Laboratory of Folsom, California. Table 2-1 shows a summary of sample IDs and sample methods. In addition to the target analytes, the samples were also analyzed for the presence of helium, using Modified ASTM D-1945, with a reporting limit of 0.010 %.

Indoor and outdoor air samples were analyzed for target chlorinated VOCs using EPA Method TO-15 with Selective Ion Monitoring (SIM), to provide a standard reporting limit of 0.01 to 0.02 ppbv, at Air Toxics Laboratory of Folsom, California. SIM analysis is required for the indoor and ambient samples, due to the low target concentration for trichloroethylene (TCE). Table 2-1 shows a summary of sample IDs and sample methods.

The laboratory was informed of the potential for sample contamination from the flooring products being used at the Masons Supply warehouse. The laboratory representative assured GE that there were methods that could be used if other VOCs were causing interference for the target compounds, however, these methods were not necessary, and required detection limits were achieved using standard methods.

3.2 Data Quality Review

In order to ensure that the indoor air and sub-slab vapor sampling conducted at the building were accurate, assurance/quality control (QA/QC) procedures described in the Work Plan were implemented during the work. Both field and laboratory QA/QC procedures were implemented to ensure that the data were of acceptable quality and reproducibility.

The laboratory reviewed the sampling canisters and the beginning and ending canister vacuum readings. No problems were identified with the sample integrity. Final laboratory vacuum readings are included on the Chains of Custody (Appendix E) and on Table 2-1.

Data validation was performed using method and project specific requirements outlined in the Work Plan. The data validation report identified no quality control issues with the laboratory analysis, and no qualifiers were added to the laboratory data. The field duplicate sample (IA-20) was within acceptable limits from the primary sample, indicating good reproducibility of sample results. The laboratory data and data validation reports are included in Appendix E.

3.3 Leak Testing Results

Helium concentrations were measured to evaluate the potential for leakage between the subsurface and the interior of the building during sampling. Helium concentrations in the shroud during sample collection were maintained in the range of 25 to 85%. Only very low concentrations of helium (up to 0.47%) were detected in the sub-slab vapor samples, indicating that the leakage through the seal was insignificant. The results of this QA/QC procedure are presented on Table 3-1.

3.4 Representativeness

The sample locations were chosen to be representative of site conditions. As described in the Work Plan, the locations were selected to represent distinct areas of subsurface conditions corresponding to soil removal activities and areas of elevated VOCs in groundwater. Indoor air samples were co-located with sub-slab samples and were also selected to be representative of the different work areas in the building. Ambient sample locations were selected to be representative of outdoor air conditions on all sides of the building, to ensure that good data were available for upwind locations based on the wind direction observed on the sampling day. The rationale behind selection of specific sampling locations is summarized below:

- V-1 and IA-1 were located in the northeast corner of the Puget Sound Pipe warehouse, where historic excavations have occurred and where a small area of soil exceeding applicable cleanup levels remained following excavation activities 10 years ago.

- V-2 and IA-2 were located in the north end of the Masons Supply warehouse. This location was selected to provide spatial coverage across the warehouse, focusing on the northern half of the building, where historic soil and groundwater impacts have been observed.

- V-3 was located directly outside of the new Masons Supply retail space and IA-3 was located inside the retail space. This location was selected because the retail area is isolated from the warehouse and has its own HVAC system.

- V-4 and IA-4 were located south of the main wall dividing the north and south halves of the warehouse building area. This location was selected to provide for coverage in the Hudson Bay Insulation warehouse.

- V-5 was located directly outside of the Puget Sound Pipe office, and IA-5 was located inside the office space. This location was selected to specifically investigate sub-slab vapor beneath a distinct office space located inside the warehouse, completely separated by walls and having its own HVAC system.

- IA-6 was collected outside of the scope of the Work Plan, simply to document conditions in the area where the floor products were actively being used, and where open containers of products were observed.

Sample collection procedures were also designed to provide representative samples. Leak detection/tracer testing, described above, ensured that sub-slab samples are representative of sub-slab vapor conditions and were not affected by indoor air quality. Indoor and ambient samples were collected over an eight-hour interval to be representative of worker conditions. Further, the indoor air was sampled on a Monday, after the building was generally closed over the weekend, providing a conservative approach to sampling

The Work Plan was developed in cooperation with Ecology, to ensure that sample locations were selected to be representative of the sub-slab soil vapor, indoor air and ambient air at the site. GE and Ecology agreed on the sampling program and considered representativeness during the design of this program.

4 Results

VOCs in samples collected at the former GE facility are compared to relevant screening levels, and are presented in Table 4-1. For indoor air, the relevant screening level is the MTCA Method C formula value. For sub-slab vapor, Ecology has assumed a 100-fold default attenuation between the sub-slab and indoor air, resulting in a screening level equal to 100 times the MTCA Method C formula value. These screening values are included in Table 4-2. The laboratory data and data validation reports are included in Appendix E.

4.1 Ambient Air

Both tetrachloroethylene (PCE) and trichloroethylene (TCE) were detected at low concentrations in ambient air at the site. PCE concentrations ranged from 0.34 to 0.46 $\mu g/m^3$ in the ambient air samples. These values are approximately 10 times lower than the MTCA Method C value of 4.2 $\mu g/m^3$. TCE was detected in four of the five ambient air samples at concentrations ranging from 0.18 to 0.2 $\mu g/m^3$, and was not detected above a detection limit of 0.17 $\mu g/m^3$ in one sample (AA-4).

The wind during the day on December 5 was generally from a southerly direction, based on field observations. Wind speed and direction data were obtained from Boeing Field and from the Puget Sound Clean Air Agency (PSCAA) station located at 4752 East Marginal Way South, less than one-half mile from the former GE facility. Wind roses showing the wind speed and direction recorded at the two locations throughout the day on December 5, 2005, are shown in Figure 4-1. These measurements confirm that wind was generally from a southerly direction, with the majority of the measurements from the SSE direction.

Based on the wind data for the test period, samples AA-1 and AA-5 are representative of upwind conditions at the former GE facility. It should be noted that the upwind sample results are not significantly different from the downwind or crosswind samples at the site, suggesting these are typical ambient concentrations in the area.

4.2 Indoor Air

Raw indoor air VOC concentrations are presented at the top of Table 4-1. These data show detections of 1,1,1-trichloroethane (TCA), PCE and TCE only. The remaining compounds were not detected above the detection limits, which were well below applicable screening values. Only TCE was detected above the MTCA Method C value of 0.22 $\mu g/m^3$, with a maximum concentration of 0.71 $\mu g/m^3$ at IA-5, located in the Puget Sound Pipe office.

Indoor air quality was very similar to outdoor air quality. Ambient air contributions will add to any contributions from interior or subsurface sources. The average concentrations of VOCs in outdoor air samples AA-1

and AA-5 were subtracted from the indoor air concentrations, to provide concentrations that may be attributable the sum of interior and subsurface sources (i.e., "corrected" indoor air concentrations). Table 4-1 presents the indoor, ambient and "corrected" indoor air concentrations. Non-detects in ambient samples were assumed to have a zero value in calculating the average outdoor air concentration, as a conservative estimate of the contribution of ambient air to indoor air.

TCA was only detected in two indoor air samples, at concentrations of 0.18 and 0.38 $\mu g/m^3$ in IA-1 and IA-5, respectively. TCA was not detected in ambient samples. TCA is a propellant used in aerosols, so it may have been from interior sources, but TCA was also detected in subsurface samples, so the potential for vapor intrusion cannot be ruled out. Nevertheless, the indoor concentrations of TCA are nearly 4 orders of magnitude lower than the MTCA Method C value of 2,205 $\mu g/m^3$, so TCA poses no unacceptable risk.

PCE was detected in all indoor samples, in concentrations ranging from 0.38 to 0.46 $\mu g/m^3$. Ambient air samples AA-1 and AA-5 contained PCE at concentrations of 0.46 and 0.40 $\mu g/m^3$, respectively. It is clear that PCE in indoor air is largely attributable to background/ambient conditions. Further, the detected concentrations are approximately 10 times lower than the MTCA Method C level of 4.2 $\mu g/m^3$, so PCE poses no unacceptable risk.

After correcting for ambient air contribution to indoor air, the "corrected" TCE concentrations in indoor air range from 0.075 to 0.515 $\mu g/m^3$. Three samples contained corrected TCE concentrations greater than the MTCA Method C level of 0.22 $\mu g/m^3$:

- **IA-6 (0.245 µg/m3)** – located in the room where the Masons Supply company had been demonstrating application of special floor coatings
- **IA-4 (0.355 µg/m3)** – located in the warehouse area of the Hudson Bay Insulation company
- **IA-5 (0.515 µg/m^3)** – located in the office of the Puget Sound Piping Company.

Figure 4-2 presents the sub-slab vapor and corrected indoor air results for TCA and TCE, which were the most commonly detected compounds in this study. Further discussion of the TCE and TCA results are presented in Section 5.

4.3 Sub-slab Vapor

1,1-Dichloroethylene (1,1-DCE) and vinyl chloride were not detected in any sub-slab samples. PCE, chloroform, cis-1,2-dichloroehtylene (cis-DCE) and 1,1-dichloroethane (1,1-DCA) were detected in a few samples, at concentrations 1 to 3 orders of magnitude lower than the screening levels of

100 times the MTCA Method C values. Therefore, none of these compounds poses a risk via subsurface vapor intrusion.

Both TCA and TCE were consistently detected in sub-slab samples. TCA concentrations ranged from 15 to 6,900 $\mu g/m^3$, but were well below the screening level of 220,500 $\mu g/m^3$. TCE concentrations ranged from 44 to 3,700 $\mu g/m^3$, which all exceed the screening level of 22 $\mu g/m^3$.

The relationship between sub-slab vapor and indoor air concentrations will be discussed further in Chapter 5 of this report.

4.4 Groundwater

Groundwater samples collected from MW-1, MW-4, MW-6, MW-7 and MW-8 show low levels of VOCs in groundwater, similar to those observed in previous groundwater sampling events. In general, MW-4 contains the highest concentrations of VOCs, with a TCE concentration of 40 µg/L, and a TCA concentration of 12 µg/L. Groundwater cleanup levels at the site are based on protection of surface water (1.5 µg/L for TCE). Groundwater concentrations in these wells were below the MTCA Method B surface water cleanup levels for all compounds except TCE. TCE was detected in all wells, in concentrations ranging from 2 to 40 µg/L (Figure 4-2 and Table 4-1).

4.5 Pressure Differential

Pressure differential, barometric pressure and temperature were measured for 24-hour time periods at sample locations V-2 and V-5. The data are presented in Figures 4-3 to 4-5. The data loggers were originally set to run after the sample collection at the location was complete. One data logger (V-2) however, failed to log the pressure data, so was reset to run the following day. At each location, the pressure differential measurements recorded were near the instrument minimum detection limit and are therefore not considered to be indicative of any significant pressure gradient. At V-2, the average reading was -0.007 inches H_2O, with values ranging from -0.002 to -0.012 inches H_2O. At V-5, the average was -0.005 in H_2O, with values ranging from -0.001 to -0.007 in H_2O. The accuracy of the micromanometer is ± 0.005 in H_2O, therefore the readings are indistinguishable from zero.

Figures 4-3 to 4-5 show that the sub-slab to indoor air pressure gradient did not correspond to atmospheric pressure changes. The barometric pressure changed on each day by approximately 2 inches H_2O (0.15 inches Hg), going down from December 6 to December 7, and up from December 7 to December 8. The slight changes in barometric pressure did not affect the pressure differential across the slab. Note that the barometric pressure is plotted on Figures 4-3 and 4-4 as the *change in* pressure from the initial measurement. This was done to facilitate graphing both the barometric pressure and the pressure differential using one y-axis. The initial and final barometric pressure readings are noted on the graphs.

5 Discussion and Conclusions

Generally, only TCA and TCE were detected consistently in both sub-slab vapor and indoor air samples. TCE was also consistently detected in outdoor air samples; therefore, the relative contribution from the subsurface requires some analysis and interpretation, using the lines of evidence presented below. The portion of indoor air vapors that are reasonably attributable to subsurface vapor intrusion can then be compared to screening levels to evaluate whether or not subsurface vapor migration is an issue at the former GE facility.

5.1 Relationship Between Indoor and Sub-Slab Results

The relationship between vapor concentrations in co-located indoor air and sub-slab vapor samples for TCE and TCA is shown on Figure 5-1. The average upwind outdoor concentration was subtracted to "correct" the indoor air concentrations to show just the contribution from the sum of subsurface and interior sources, and non-detect values were plotted as one-half their reporting limit. While the location where the highest indoor air concentration of TCE was observed (0.515 $\mu g/m^3$ at IA-5) corresponded to highest sub-slab vapor concentration of TCE (3,700 $\mu g/m^3$ at V-5), the relationship does not hold for the other sample locations. Similarly, the highest concentrations of TCA from sub-slab vapor (6,900 $\mu g/m^3$ at V-1) do not correspond to the highest concentrations in indoor air (0.38 $\mu g/m^3$ at IA-5).

The scatter in the correlation on Figure 5-1 indicates that VOCs in indoor air are not primarily from subsurface vapor migration.

5.2 Comparison of Compound Ratios

The average sub-slab TCA concentration was higher than the average sub-slab TCE concentration, yet the converse was true for the corrected indoor air data, with TCE concentrations being higher than TCA concentrations. There is no physical reason why TCA would intrude any more or less effectively than TCE, because their physical and chemical properties are very similar. The increase in TCE relative to TCA in corrected indoor concentrations indicates a potential additional contribution of TCE from a source or sources within the building.

The contribution of TCE to indoor air from the subsurface can be calculated by multiplying the sub-slab TCE concentrations by the TCA attenuation factor. Omitting duplicates, dividing the average corrected indoor air concentration of TCA by the average sub-slab concentration yields a building average attenuation factor of 1.1×10^{-4}. Multiplying this by the average sub-slab TCE concentration yields an indoor air concentration for TCE of 0.13 $\mu g/m^3$. This is below the regulatory target concentration of 0.22 $\mu g/m^3$.

5.3 Comparison of Alpha Factors

This section evaluates the consistency of the ratio of indoor air concentrations to sub-slab vapor concentrations, commonly known as the attenuation coefficient or "alpha factor".

The primary mechanism for attenuation from sub-slab vapor to indoor air is dilution attributable to the building ventilation. Johnson (2005) recommends that most sub-slab attenuation factors are in the range of 0.01 to 0.0001, based on all available data. The building is generally well ventilated, so the expected alpha factor would be expected to be closer to the 0.0003 end of the range. Lines corresponding to alpha factor values of 0.01, 0.001 and 0.0001 are shown on Figure 5-1 for comparison purposes.

Site-specific alpha factors are shown in Table 4-1. Alpha factors were only calculated in cases where compounds were detected in sub-slab samples. One-half the detection limit was used for non-detects in indoor air samples. For TCA and TCE, the two compounds consistently detected in both sub-slab and indoor air samples, the alpha factors range from 0.00001 to 0.006. Alpha factors are not consistent across the building, nor are they consistent at a given sample location for the various VOCs.

Figure 5-2 plots the alpha factor for TCE vs. the alpha factor for TCA. If there was a direct vapor intrusion relationship, the alpha factors from the two compounds would be roughly the same, and would fall along a line with a slope of 1 (shown on Figure 5-2 for reference).

5.4 Pressure Differential

As described in Section 4, pressure differential data from the test period showed a neutral gradient between the building and the subsurface. A negative or neutral gradient between the building and the subsurface would retard or prevent subsurface vapor migration into the overlying indoor air, resulting in a low sub-slab attenuation factor, which is exactly what was observed.

The pneumatic testing demonstrated that the sub-slab materials have a high gas permeability (with the exception of V-2), and the concrete slab was about 10 inches thick on average, therefore, the path of least resistance for vapor transport beneath the building is probably laterally to the edge of the slab, rather than upwards across it.

5.5 Relationship Between Indoor Air and Subsurface Conditions

5.5.1 IA-1/V-1

In sample IA-1, corrected indoor air concentrations of both TCA and TCE were below the MTCA Method C levels, indicating no concerns with subsurface vapor migration in this area.

5.5.2 IA-2/V-2

In samples IA-2 and IA-20, corrected indoor air concentrations of both TCA and TCE were below the MTCA Method C levels, indicating no concerns with subsurface vapor migration in this area.

5.5.3 IA-3/V-3

In sample IA-3, corrected indoor air concentrations of both TCA and TCE were below the MTCA Method C levels, indicating no concerns with subsurface vapor migration in this area.

5.5.4 IA-4/V-4

Sample location 4 is in the Hudson Bay Insulation warehouse. TCE was detected in indoor air (0.355 $\mu g/m^3$, corrected) above the MTCA Method C level of 0.22 $\mu g/m^3$. The sub-slab vapor sample (V-4) contained TCE at 350 $\mu g/m^3$.

TCA was detected in sub-slab sample V-4 at a concentration of 270 $\mu g/m^3$, but not detected in indoor air at a detection limit of 0.18 $\mu g/m^3$, which can only be used to put an upper bound on the attenuation factor of 6.7×10^{-4}, (or less). Multiplying this attenuation factor by the sub-slab TCE concentration yields a calculated indoor air concentration of 0.23 (or less), which is essentially equal to the MTCA Method C level, which is very conservative.

5.5.5 IA-5/V-5

Samples IA-5 and V-5 were collected as representative of the Puget Sound Pipe office. Following excavation over 10 years ago, very low TCE concentrations (0.12 mg/kg in SP-40 and 0.21 mg/kg in S-7-35) remained in soil below this area. In addition, groundwater impacts are largely located to the north of the office space, as evidenced by the decrease in TCE concentrations between MW-1 (north of the office) and MW-2 (on the southern edge and upgradient of the office). Nevertheless, this location had the highest concentrations of TCE in indoor air and sub-slab vapor, with a corrected indoor air concentration of 0.515 $\mu g/m^3$ and a sub-slab vapor concentration of 3,700 $\mu g/m^3$.

5.5.6 IA-6

This sample was collected outside of the scope of the Work Plan, simply to document conditions in the area where the floor products were actively being used, and where open containers of products were observed. Although the corrected indoor air concentration (0.245 $\mu g/m^3$) was slightly higher than the MTCA Method C value, the values are very close, and the screening level is very conservative, so this is not considered to pose an unacceptable risk.

5.6 Target Concentrations

The default exposure scenario for a commercial/industrial worker under MTCA's Equation 750-2 includes continuous exposure for a 30-year duration. This assumes 24 hours a day, 7 days a week during this exposure period. A more realistic exposure scenario would account for the actual time that a worker would expected to be exposed during a typical work week, including the following adjustments:

- Adjust the equation to account for a 250-day/year exposure instead of 365 day/year (see http://www.epa.gov/reg3hwmd/risk/human/info/tech.htm)
- Adjust the equation to account for an 8-hour/day exposure instead of 24 hours/day (more reasonable since workers are not exposed to air in this building for a full 24-hour day).

These adjustments are incorporated into the exposure frequency term in Equation 750-2. The resulting value is 1.15 $\mu g/m^3$, which would provide for an acceptable risk of 10^{-5} under a realistic worker scenario. No concentrations were observed above this level in indoor air samples at the facility, even before correcting for outdoor air contributions.

Although not relevant as action levels, the OSHA permissible exposure limit (PEL) is a time-weighted average (TWA) of 100 ppm. ATSDR (http://www.atsdr.cdc.gov/HEC/CSEM/tce/tce.pdf) further reports that The National Institute for Occupational Safety and Health recommends an exposure limit of 25 ppm as a 10-hour TWA. According to the American Conference of Industrial Hygienists (ACGIH), an 8-hour TWA of 50 ppm is recommended. The most conservative of these values (25 ppm) is equivalent to 134 mg/m^3, or 134,000 $\mu g/m^3$. This value is over 10,000 times the adjusted level of 1.15 $\mu g/m^3$ presented above.

5.7 Summary

The sub-slab to indoor air attenuation factors are near the low end of the typical range, which is consistent with the high rates of ventilation and the negligible pressure differential. None of the measured or corrected indoor air concentrations exceed levels that would be appropriate for a worker exposure scenario. All of the lines of evidence support the conclusion that subsurface vapor migration is not a pathway of concern at the former GE facility.

6 References

Jeffrey E. Banikowski, Swiatoslav Kaczmar, John Hunt and Russell Pellegrino, 2005. *Field Validation of Helium as a Tracer Gas During Soil Vapor Sample Collection.* Presentation to be given at the 21st Annual International Conference on Soils, Sediments and Water. University of Massachusetts – Amherst. October 17-20, 2005.

DiGiulio, D., R. Cody, R. Mosley, R. Willey, A. Lee, C. Paul, S. Clifford, K. Christensen, and P. Kahn. 2005. Assessment of Vapor Intrusion Using Sub-Slab Air Samples 1. Guidelines for Installation and Sampling of Sub-Slab Vapor Probes. Draft.

EPA, 2002. *EPA OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance).* Web Address: http://www.epa.gov/correctiveaction/eis/vapor/complete.pdf

Johnson and Ettinger (1991) *Model for Subsurface Vapor Intrusion into buildings.* Web Address: http://www.epa.gov/oswer/riskassessment/airmodel/johnson_ettinger.htm

Johnson, Paul C., et al, 2001. *Helium Tracer Tests for Assessing Air Recovery and Air Distribution During In-Situ Air Sparging.* Battelle Memorial Institute, Columbus Ohio. Report A353604. December 1, 2001.

Johnson, Paul C., 2005. *Identification of application-specific critical inputs for the 1991 Johnson and Ettinger vapor intrusion algorithm.* Ground Water Monitoring & Remediation. Volume 25 Page 63 - February. Web Address: http://www.blackwell-synergy.com/doi/abs/10.1111 /j.1745-6592.2005.0002.x

McAlary, Todd and Ettinger, Robert 2005. *Reference Handbook for Site-Specific Assessment of Subsurface Vapor Intrusion to Indoor Air*, March 2005 (EPRI Report #1008492) by Todd McAlary and Robert Ettinger of GeoSyntec Consultants, Inc. with Peer Review by Dr. Paul Johnson of Arizona State University.

New York State Department of Health, 2005. Guidance for Evaluating Soil Vapor Intrusion in the State of New York. Public Comment Draft. (http://www.health.state.ny.us/nysdoh/gas/svi_guidance/docs/ svi_main.pdf)

RETEC, 2002. *Interim Action Work Plan (Revision 4).* October 28.

RETEC, 2005. *Work Plan for Evaluation of Sub-Surface Vapor Intrusion. Revision 2.* November 1.

Wisconsin Department of Health and Family Services, 2000. TRICHLOROETHYLENE Fact Sheet. (http://www.dhfs.state.wi.us/eh/ChemFS/fs/TCE.htm)

Tables

Table 2.1 Summary of Sample Collection Information

Location ID	Canister ID	Initial Vacuum Readings		Final Vacuum Readings		Final Vacuum Reading at Laboratory	Start Time	End Time	Duration (hours)	Analysis
		Glycerin Gauge	Flow Controller	Glycerin Gauge	Flow Controller					
IA-1	12087	-23	-30	-2	-7	-4.5	8:05	16:05	8:00	TO-15 SIM & Helium
IA-2	34752	-24	-30	-4.5	-9.5	-6.5	8:17	16:17	8:00	TO-15 SIM & Helium
IA-3	34369	-23.5	-30	-2.5	-6	-6.0	8:08	16:14	8:06	TO-15 SIM & Helium
IA-4	34343	-24	-30	-2.5	7	-5.0	7:58	16:02	8:04	TO-15 SIM & Helium
IA-5	33896	-24	-28	-3	-5	-6.5	8:04	16:02	7:58	TO-15 SIM & Helium
IA-6	31440	-23.5	-30	-2.5	-8.5	-5.0	8:20	16:21	8:01	TO-15 SIM & Helium
IA-20	33888	-23.5	-30	-2	-7	-5.0	8:17	16:17	8:00	TO-15 SIM & Helium
AA-1	3783	-24	-30	-2.5	-10	-6.0	8:41	13:42	5:01	TO-15 SIM & Helium
AA-2	34479	-23.5	-30	-2	-5.5	-4.5	8:36	16:37	8:01	TO-15 SIM & Helium
AA-3	11882	-23.5	-29.5	-1	-5	-4.5	8:52	16:53	8:01	TO-15 SIM & Helium
AA-4	33971	-18	-30	-1.75	-6	-4.5	8:54	16:59	8:05	TO-15 SIM & Helium
AA-5	22508	-23.5	-30	-1.5	-6	-4.5	8:44	16:48	8:04	TO-15 SIM & Helium
V-1	30933	-26.5	NR	-1.2	-1.2	-3.0	15:02	15:27	0:25	TO-15 & Helium
V-10	34310	-27.5	NR	-1.75	-1.5	-2.0	11:42	12:10	0:28	TO-15 & Helium
V-2	4157	-26.5	NR	-4.2	-4.2	-6.5	16:10	16:40	0:30	TO-15 & Helium
V-3	24219	-27.5	NR	-2.5	-2.5	-2.5	8:34	9:02	0:28	TO-15 & Helium
V-4	12026	-27.5	NR	-1.75	-1.75	-2.0	10:15	10:41	0:26	TO-15 & Helium
V-5	34406	-26.25	NR	0	-2.5	-1.0	13:47	14:17	0:30	TO-15 & Helium

Notes:
NR - not recorded
Some samples were ended a few minutes early to prevent the final pressure gauge reading 0.0
TO-15 Analysis included: 1,1,1-Trichloroethane (1,1,1-TCA), 1,1-Dichloroethane (1,1-DCA), 1,1-Dichloroethylene (1,1-DCE), Chloroform, cis 1,2-Dichloroethylene (1,2-DCE), Tetrachloroethylene (PCE), Trichloroethylene (TCE), and Vinyl Chloride
All vacuum readings in units of punds per square inch (psi)
Initial Vacum Readings of -30psi were greater than -30psi, the gaugue only recorded to -30psi.

Table 3-1 Helium Tracer Results

		Analytical Method	ASTM D-1945	Field Screening	
		Unit	%	%	
Location ID	Sample Date	Sample ID		Min	Max
Sub-slab Vapor Samples					
V-1	12/6/2005	V-1-1205	0.025	25	83
V-1 (resample)	12/7/2005	V-10-1205	0.15	43.4	72.1
V-2	12/6/2005	V-2-1205	0.47	58	67
V-3	12/7/2005	V-3-1205	0.03	54	84
V-4	12/7/2005	V-4-1205	< 0.014	40.5	83.1
V-5	12/6/2005	V-5-1205	0.12	30	40

Table 4-1 December 2005 Vapor Intrusion Study Results

		Chemical Name	1 1 1-TCA	1 1-DCA	1 1-DCE	Chloroform	cis-1 2-DCE	PCE	TCE	Vinyl Chloride
Location ID	Sample Date	Sample ID								
Indoor Air Samples (µg/m³)										
IA-1	12/5/2005	IA-1-1205	0.18	< 0.13	< 0.063	< 0.15	< 0.12	0.38	0.28	< 0.04
IA-2	12/5/2005	IA-2-1205	< 0.19	< 0.14	< 0.068	< 0.17	< 0.14	0.38	0.27	< 0.044
IA-2 (duplicate)	12/5/2005	IA-20-1205	< 0.18	< 0.13	< 0.064	< 0.16	< 0.13	0.38	0.28	< 0.041
IA-3	12/5/2005	IA-3-1205	< 0.18	< 0.14	< 0.067	< 0.16	< 0.13	0.43	0.34	< 0.043
IA-4	12/5/2005	IA-4-1205	< 0.18	< 0.13	< 0.064	< 0.16	< 0.13	0.42	0.55	< 0.041
IA-5	12/5/2005	IA-5-1205	0.38	< 0.14	< 0.068	< 0.17	< 0.14	0.45	0.71	< 0.044
IA-6	12/5/2005	IA-6-1205	< 0.18	< 0.13	< 0.064	< 0.16	< 0.13	0.46	0.44	< 0.041
Upwind Ambient Samples (µg/m³)										
AA-1	12/5/2005	AA-1-1205	< 0.18	< 0.14	< 0.067	< 0.16	< 0.13	0.46	0.2	< 0.043
AA-5	12/5/2005	AA-5-1205	< 0.17	< 0.13	< 0.063	< 0.15	< 0.12	0.4	0.19	< 0.04
Average Upwind for Indoor Air Correction			*0*	*0*	*0*	*0*	*0*	*0.43*	*0.195*	*0*
Down/Crosswind Ambient Samples (µg/m³)										
AA-2	12/5/2005	AA-2-1205	< 0.17	< 0.13	< 0.063	< 0.15	< 0.12	0.38	0.18	< 0.04
AA-3	12/5/2005	AA-3-1205	< 0.17	< 0.13	< 0.063	< 0.15	< 0.12	0.37	0.18	< 0.04
AA-4	12/5/2005	AA-4-1205	< 0.17	< 0.13	< 0.063	< 0.15	< 0.12	0.34	< 0.17	< 0.04
Corrected Indoor Air Results (Indoor Air minus Ambient) (µg/m³)										
IA-1	12/5/2005	IA-1-1205	0.18	< 0.13	< 0.063	< 0.15	< 0.12	-0.05	0.085	< 0.04
IA-2	12/5/2005	IA-2-1205	< 0.19	< 0.14	< 0.068	< 0.17	< 0.14	-0.05	0.075	< 0.044
IA-2 (duplicate)	12/5/2005	IA-20-1205	< 0.18	< 0.13	< 0.064	< 0.16	< 0.13	-0.05	0.085	< 0.041
IA-3	12/5/2005	IA-3-1205	< 0.18	< 0.14	< 0.067	< 0.16	< 0.13	0	0.145	< 0.043
IA-4	12/5/2005	IA-4-1205	< 0.18	< 0.13	< 0.064	< 0.16	< 0.13	-0.01	0.355	< 0.041
IA-5	12/5/2005	IA-5-1205	0.38	< 0.14	< 0.068	< 0.17	< 0.14	0.02	0.515	< 0.044
IA-6	12/5/2005	IA-6-1205	< 0.18	< 0.13	< 0.064	< 0.16	< 0.13	0.03	0.245	< 0.041
Indoor Air Screening Level			*2,205*	*350*	*200*	*1.1*	*35*	*4.2*	*0.22*	*2.82*
Sub-slab Vapor Samples (µg/m³)										
V-1	12/6/2005	V-1-1205	6,900	23	< 15	< 18	< 15	< 25	1,600	< 9.5
V-1 (resample)	12/7/2005	V-10-1205	6,900	24	< 14	< 18	< 14	< 24	1,600	< 9.2
V-2	12/6/2005	V-2-1205	1,600	< 3.5	< 3.4	< 4.2	< 3.4	< 5.8	44	< 2.2
V-3	12/7/2005	V-3-1205	15	< 3	< 2.9	< 3.6	< 2.9	< 5	240	< 1.9
V-4	12/7/2005	V-4-1205	270	< 2.9	< 2.8	< 3.5	< 2.8	19	350	< 1.8
V-5	12/6/2005	V-5-1205	700	250	< 11	19	480	< 19	3,700	< 7.1
Sub-slab Screening Level			*220,500*	*35,000*	*20,000*	*110*	*3,500*	*420*	*22*	*282*
Alpha Factor (Indoor/Sub-slab)										
IA-1/V-1			*0.00003*	*0.00283*	*NA*	*NA*	*NA*	*NA*	*0.00005*	*NA*
IA-1/V-1 (resample)			*0.00003*	*0.00271*	*NA*	*NA*	*NA*	*NA*	*0.00005*	*NA*
IA-2/V-2			*0.00006*	*NA*	*NA*	*NA*	*NA*	*NA*	*0.00170*	*NA*
IA-2 (dup)/V-2			*0.00006*	*NA*	*NA*	*NA*	*NA*	*NA*	*0.00193*	*NA*
IA-3/V-3			*0.00600*	*NA*	*NA*	*NA*	*NA*	*NA*	*0.00060*	*NA*
IA-4/V-4			*0.00033*	*NA*	*NA*	*NA*	*NA*	*-0.00053*	*0.00101*	*NA*
IA-5/V-5			*0.00054*	*0.00028*	*NA*	*0.00447*	*0.00015*	*NA*	*0.00014*	*NA*
Groundwater Samples (µg/L)										
MW-1	11/17/2005	MW-1-1105	11	< 0.6	0.12	< 0.6	< 0.6	1.8	24	< 0.02
MW-4	11/14/2005	MW-4-1105	12	7.2	3.4	< 0.6	< 0.6	2.3	40	0.032
MW-6	11/17/2005	MW-6-1105	< 0.2	0.4	0.12	< 0.2	< 0.2	0.026	2.1	< 0.02
MW-6 (dup)	11/17/2005	MW-6A-1105 (dup)	< 0.2	0.5	0.13	< 0.2	< 0.2	0.025	2.0	< 0.02
MW-7	11/17/2005	MW-7-1105	< 0.2	0.4	0.3	< 0.2	0.5	< 0.020	3.8	< 0.02
MW-8	11/14/2005	MW-8S-1105	< 0.2	2.0	0.7	< 0.2	12	< 0.020	12	0.04

Notes: Sub-slab vapor samples analyzed by Method TO-15 SIM
Indoor and ambient air samples analyzed by Method TO-15
Groundwater samples analyzed by Method 8260 and Method 8260 SIM
Shading indicates an exceedance of air/vapor screening levels.
Alpha factors calculated using 1/2 detection limit for non-detects in indoor air

Table 4-2 VOC Screening Values

Analyte	Indoor Air	Sub-slab Vapor
	MTCA Method C ($\mu g/m^3$)	100x MTCA Method C ($\mu g/m^3$)
1,1,1-Trichloroethane (1,1,1-TCA)	2,205	220,500
1,1-Dichloroethane (1,1-DCA)	350	35,000
1,1-Dichloroethylene (1,1-DCE)	200	20,000
Chloroform	1.1	110
cis 1,2-Dichloroethylene (1,2-DCE)	35	3,500
Tetrachloroethylene (PCE)	4.2	420
Trichloroethylene (TCE)	0.22	22
Vinyl Chloride	2.82	282

Table 2.1 Summary of Sample Collection Information

Location ID	Canister ID	Initial Vacuum Readings		Final Vacuum Readings		Final Vacuum Reading at Laboratory	Start Time	End Time	Duration (hours)	Analysis
		Glycerin Gauge	Flow Controller	Glycerin Gauge	Flow Controller					
IA-1	12087	-23	-30	-2	-7	-4.5	8:05	16:05	8:00	TO-15 SIM & Helium
IA-2	34752	-24	-30	-4.5	-9.5	-6.5	8:17	16:17	8:00	TO-15 SIM & Helium
IA-3	34369	-23.5	-30	-2.5	-6	-6.0	8:08	16:14	8:06	TO-15 SIM & Helium
IA-4	34343	-24	-30	-2.5	7	-5.0	7:58	16:02	8:04	TO-15 SIM & Helium
IA-5	33896	-24	-28	-3	-5	-6.5	8:04	16:02	7:58	TO-15 SIM & Helium
IA-6	31440	-23.5	-30	-2.5	-8.5	-5.0	8:20	16:21	8:01	TO-15 SIM & Helium
IA-20	33888	-23.5	-30	-2	-7	-5.0	8:17	16:17	8:00	TO-15 SIM & Helium
AA-1	3783	-24	-30	-2.5	-10	-6.0	8:41	13:42	5:01	TO-15 SIM & Helium
AA-2	34479	-23.5	-30	-2	-5.5	-4.5	8:36	16:37	8:01	TO-15 SIM & Helium
AA-3	11882	-23.5	-29.5	-1	-5	-4.5	8:52	16:53	8:01	TO-15 SIM & Helium
AA-4	33971	-18	-30	-1.75	-6	-4.5	8:54	16:59	8:05	TO-15 SIM & Helium
AA-5	22508	-23.5	-30	-1.5	-6	-4.5	8:44	16:48	8:04	TO-15 SIM & Helium
V-1	30933	-26.5	NR	-1.2	-1.2	-3.0	15:02	15:27	0:25	TO-15 & Helium
V-10	34310	-27.5	NR	-1.75	-1.5	-2.0	11:42	12:10	0:28	TO-15 & Helium
V-2	4157	-26.5	NR	-4.2	-4.2	-6.5	16:10	16:40	0:30	TO-15 & Helium
V-3	24219	-27.5	NR	-2.5	-2.5	-2.5	8:34	9:02	0:28	TO-15 & Helium
V-4	12026	-27.5	NR	-1.75	-1.75	-2.0	10:15	10:41	0:26	TO-15 & Helium
V-5	34406	-26.25	NR	0	-2.5	-1.0	13:47	14:17	0:30	TO-15 & Helium

Notes:

NR - not recorded

Some samples were ended a few minutes early to prevent the final pressure gauge reading 0.0

TO-15 Analysis included: 1,1,1-Trichloroethane (1,1,1-TCA), 1,1-Dichloroethane (1,1-DCA), 1,1-Dichloroethylene (1,1-DCE), Chloroform, cis 1,2-Dichloroethylene (1,2-DCE), Tetrachloroethylene (PCE), Trichloroethylene (TCE), and Vinyl Chloride

All vacuum readings in units of punds per square inch (psi)

Initial Vacum Readings of -30psi were greater than -30psi, the gaugue only recorded to -30psi.

Table 3-1 Helium Tracer Results

		Analytical Method	ASTM D-1945	Field Screening	
		Unit	%	%	
Location ID	Sample Date	Sample ID		Min	Max
Sub-slab Vapor Samples					
V-1	12/6/2005	V-1-1205	0.025	25	83
V-1 (resample)	12/7/2005	V-10-1205	0.15	43.4	72.1
V-2	12/6/2005	V-2-1205	0.47	58	67
V-3	12/7/2005	V-3-1205	0.03	54	84
V-4	12/7/2005	V-4-1205	< 0.014	40.5	83.1
V-5	12/6/2005	V-5-1205	0.12	30	40

Table 4-1 December 2005 Vapor Intrusion Study Results

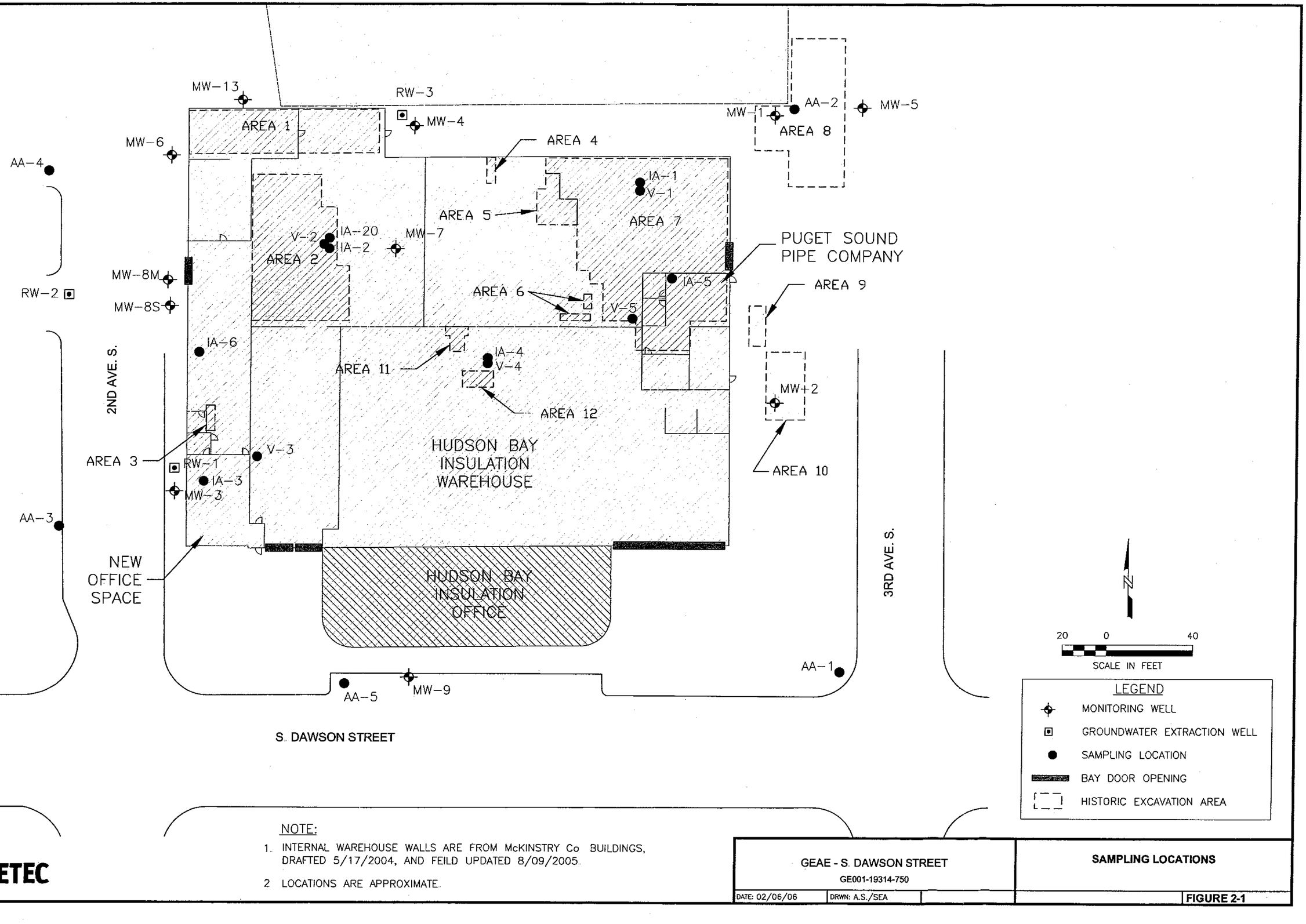
		Chemical Name	1 1 1-TCA	1 1-DCA	1 1-DCE	Chloroform	cis-1 2-DCE	PCE	TCE	Vinyl Chloride
Location ID	Sample Date	Sample ID								
Indoor Air Samples (µg/m³)										
IA-1	12/5/2005	IA-1-1205	0.18	< 0.13	< 0.063	< 0.15	< 0.12	0.38	0.28	< 0.04
IA-2	12/5/2005	IA-2-1205	< 0.19	< 0.14	< 0.068	< 0.17	< 0.14	0.38	0.27	< 0.044
IA-2 (duplicate)	12/5/2005	IA-20-1205	< 0.18	< 0.13	< 0.064	< 0.16	< 0.13	0.38	0.28	< 0.041
IA-3	12/5/2005	IA-3-1205	< 0.18	< 0.14	< 0.067	< 0.16	< 0.13	0.43	0.34	< 0.043
IA-4	12/5/2005	IA-4-1205	< 0.18	< 0.13	< 0.064	< 0.16	< 0.13	0.42	0.55	< 0.041
IA-5	12/5/2005	IA-5-1205	0.38	< 0.14	< 0.068	< 0.17	< 0.14	0.45	0.71	< 0.044
IA-6	12/5/2005	IA-6-1205	< 0.18	< 0.13	< 0.064	< 0.16	< 0.13	0.46	0.44	< 0.041
Upwind Ambient Samples (µg/m³)										
AA-1	12/5/2005	AA-1-1205	< 0.18	< 0.14	< 0.067	< 0.16	< 0.13	0.46	0.2	< 0.043
AA-5	12/5/2005	AA-5-1205	< 0.17	< 0.13	< 0.063	< 0.15	< 0.12	0.4	0.19	< 0.04
Average Upwind for Indoor Air Correction			*0*	*0*	*0*	*0*	*0*	*0.43*	*0.195*	*0*
Down/Crosswind Ambient Samples (µg/m³)										
AA-2	12/5/2005	AA-2-1205	< 0.17	< 0.13	< 0.063	< 0.15	< 0.12	0.38	0.18	< 0.04
AA-3	12/5/2005	AA-3-1205	< 0.17	< 0.13	< 0.063	< 0.15	< 0.12	0.37	0.18	< 0.04
AA-4	12/5/2005	AA-4-1205	< 0.17	< 0.13	< 0.063	< 0.15	< 0.12	0.34	< 0.17	< 0.04
Corrected Indoor Air Results (Indoor Air minus Ambient) (µg/m³)										
IA-1	12/5/2005	IA-1-1205	0.18	< 0.13	< 0.063	< 0.15	< 0.12	-0.05	0.085	< 0.04
IA-2	12/5/2005	IA-2-1205	< 0.19	< 0.14	< 0.068	< 0.17	< 0.14	-0.05	0.075	< 0.044
IA-2 (duplicate)	12/5/2005	IA-20-1205	< 0.18	< 0.13	< 0.064	< 0.16	< 0.13	-0.05	0.085	< 0.041
IA-3	12/5/2005	IA-3-1205	< 0.18	< 0.14	< 0.067	< 0.16	< 0.13	0	0.145	< 0.043
IA-4	12/5/2005	IA-4-1205	< 0.18	< 0.13	< 0.064	< 0.16	< 0.13	-0.01	0.355	< 0.041
IA-5	12/5/2005	IA-5-1205	0.38	< 0.14	< 0.068	< 0.17	< 0.14	0.02	0.515	< 0.044
IA-6	12/5/2005	IA-6-1205	< 0.18	< 0.13	< 0.064	< 0.16	< 0.13	0.03	0.245	< 0.041
Indoor Air Screening Level			*2,205*	*350*	*200*	*1.1*	*35*	*4.2*	*0.22*	*2.82*
Sub-slab Vapor Samples (µg/m³)										
V-1	12/6/2005	V-1-1205	6,900	23	< 15	< 18	< 15	< 25	1,600	< 9.5
V-1 (resample)	12/7/2005	V-10-1205	6,900	24	< 14	< 18	< 14	< 24	1,600	< 9.2
V-2	12/6/2005	V-2-1205	1,600	< 3.5	< 3.4	< 4.2	< 3.4	< 5.8	44	< 2.2
V-3	12/7/2005	V-3-1205	15	< 3	< 2.9	< 3.6	< 2.9	< 5	240	< 1.9
V-4	12/7/2005	V-4-1205	270	< 2.9	< 2.8	< 3.5	< 2.8	19	350	< 1.8
V-5	12/6/2005	V-5-1205	700	250	< 11	19	480	< 19	3,700	< 7.1
Sub-slab Screening Level			*220,500*	*35,000*	*20,000*	*110*	*3,500*	*420*	*22*	*282*
Alpha Factor (Indoor/Sub-slab)										
IA-1/V-1			*0.00003*	*0.00283*	*NA*	*NA*	*NA*	*NA*	*0.00005*	*NA*
IA-1/V-1 (resample)			*0.00003*	*0.00271*	*NA*	*NA*	*NA*	*NA*	*0.00005*	*NA*
IA-2/V-2			*0.00006*	*NA*	*NA*	*NA*	*NA*	*NA*	*0.00170*	*NA*
IA-2 (dup)/V-2			*0.00006*	*NA*	*NA*	*NA*	*NA*	*NA*	*0.00193*	*NA*
IA-3/V-3			*0.00600*	*NA*	*NA*	*NA*	*NA*	*NA*	*0.00060*	*NA*
IA-4/V-4			*0.00033*	*NA*	*NA*	*NA*	*NA*	*-0.00053*	*0.00101*	*NA*
IA-5/V-5			*0.00054*	*0.00028*	*NA*	*0.00447*	*0.00015*	*NA*	*0.00014*	*NA*
Groundwater Samples (µg/L)										
MW-1	11/17/2005	MW-1-1105	11	< 0.6	0.12	< 0.6	< 0.6	1.8	24	< 0.02
MW-4	11/14/2005	MW-4-1105	12	7.2	3.4	< 0.6	< 0.6	2.3	40	0.032
MW-6	11/17/2005	MW-6-1105	< 0.2	0.4	0.12	< 0.2	< 0.2	0.026	2.1	< 0.02
MW-6 (dup)	11/17/2005	MW-6A-1105 (dup)	< 0.2	0.5	0.13	< 0.2	< 0.2	0.025	2.0	< 0.02
MW-7	11/17/2005	MW-7-1105	< 0.2	0.4	0.3	< 0.2	0.5	< 0.020	3.8	< 0.02
MW-8	11/14/2005	MW-8S-1105	< 0.2	2.0	0.7	< 0.2	12	< 0.020	12	0.04

Notes: Sub-slab vapor samples analyzed by Method TO-15 SIM
Indoor and ambient air samples analyzed by Method TO-15
Groundwater samples analyzed by Method 8260 and Method 8260 SIM
Shading indicates an exceedance of air/vapor screening levels
Alpha factors calculated using 1/2 detection limit for non-detects in indoor air

Table 4-2 VOC Screening Values

Analyte	Indoor Air	Sub-slab Vapor
	MTCA Method C ($\mu g/m^3$)	100x MTCA Method C ($\mu g/m^3$)
1,1,1-Trichloroethane (1,1,1-TCA)	2,205	220,500
1,1-Dichloroethane (1,1-DCA)	350	35,000
1,1-Dichloroethylene (1,1-DCE)	200	20,000
Chloroform	1.1	110
cis 1,2-Dichloroethylene (1,2-DCE)	35	3,500
Tetrachloroethylene (PCE)	4.2	420
Trichloroethylene (TCE)	0.22	22
Vinyl Chloride	2.82	282

Figures



NOTE:

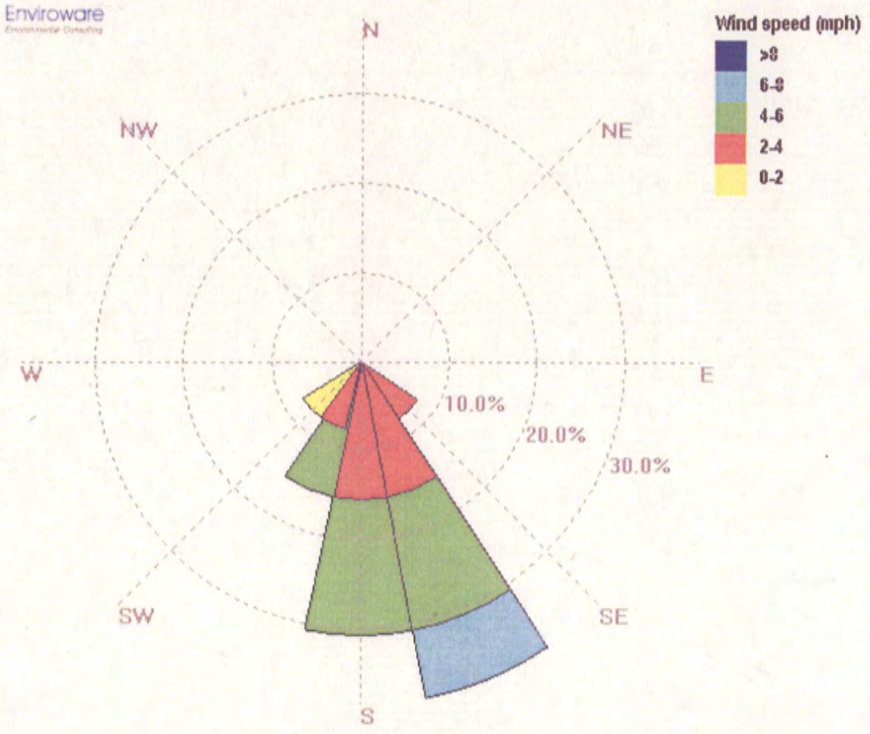
1. INTERNAL WAREHOUSE WALLS ARE FROM McKINSTRY Co BUILDINGS, DRAFTED 5/17/2004, AND FEILD UPDATED 8/09/2005.
2. LOCATIONS ARE APPROXIMATE.

RETEC

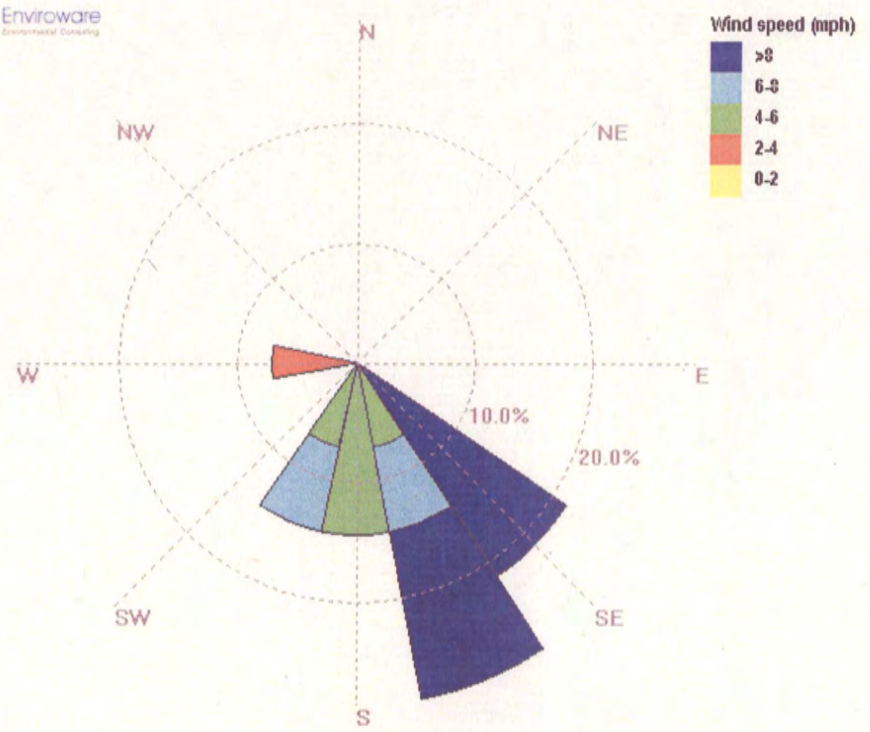
GEAE - S. DAWSON STREET GE001-19314-750		SAMPLING LOCATIONS
DATE: 02/06/06	DRWN: A.S./SEA	FIGURE 2-1

File: H:\19314\193145001.dwg Layout: FIGURE 2-i User: astenberg Plotted: Feb 06, 2006 - 2:23pm Xref's: 186008001

December 5, 2005: 7AM to 7PM – PSCAA Duwamish Station

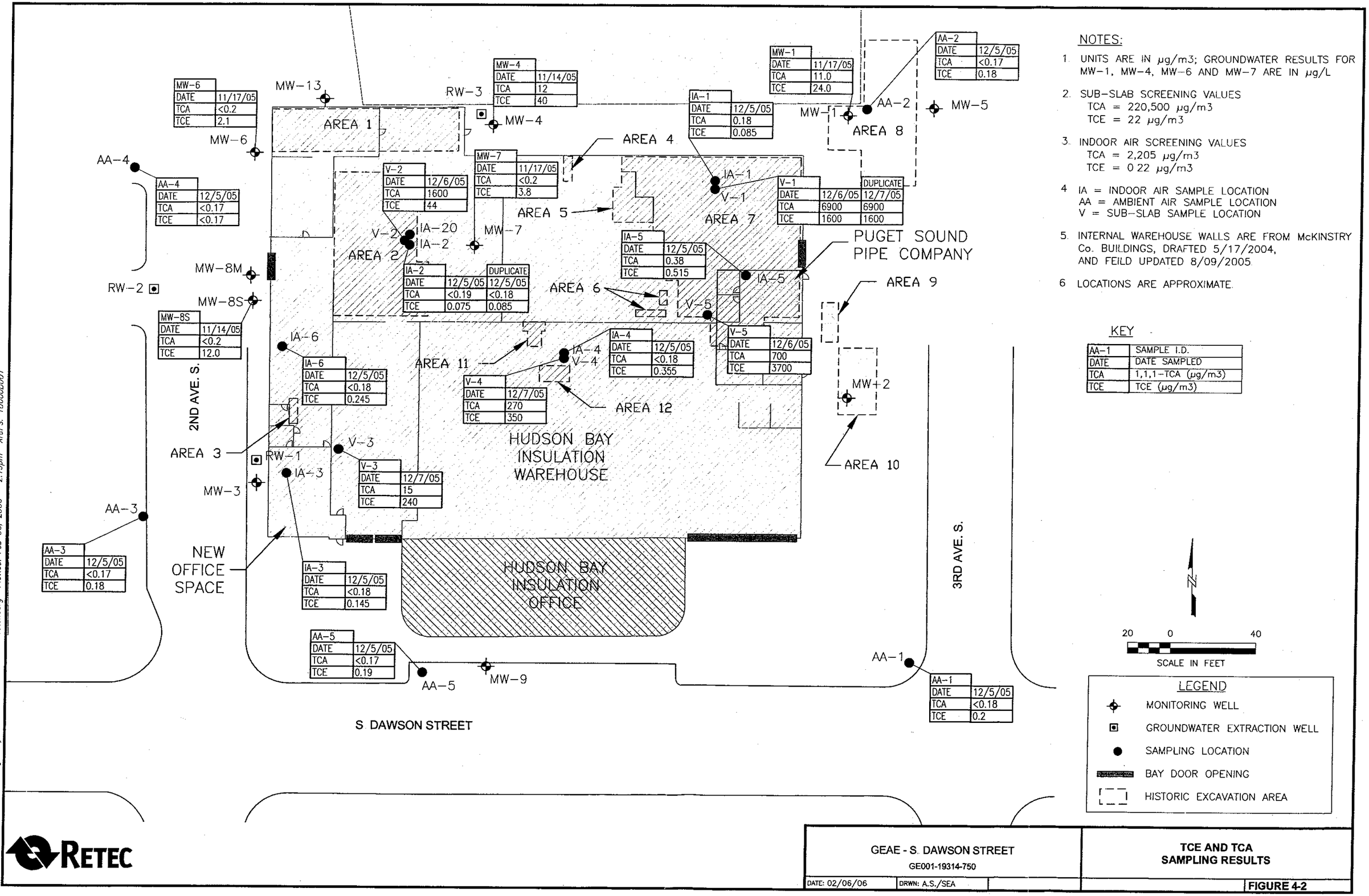


December 5, 2005: 7AM to 7PM – Boeing Field



RETEC

GE South Dawson Street Facility GE Aviation		Wind Roses
Date:02-06-06	File: P/DOCS/9314	FIGURE 4-1



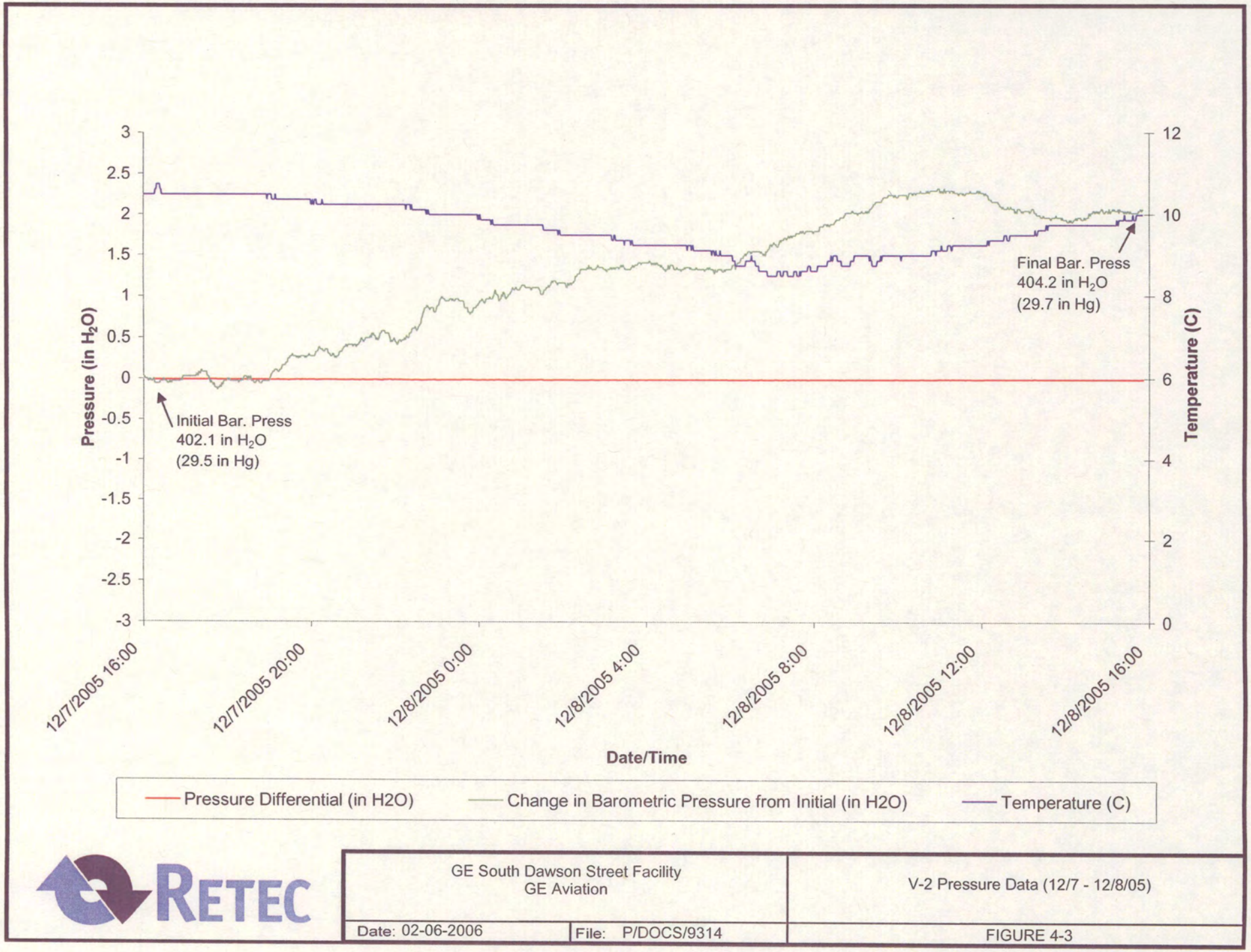
RETEC

GEAE - S. DAWSON STREET
GE001-19314-750
DATE: 02/06/06 | DRWN: A.S./SEA

TCE AND TCA SAMPLING RESULTS

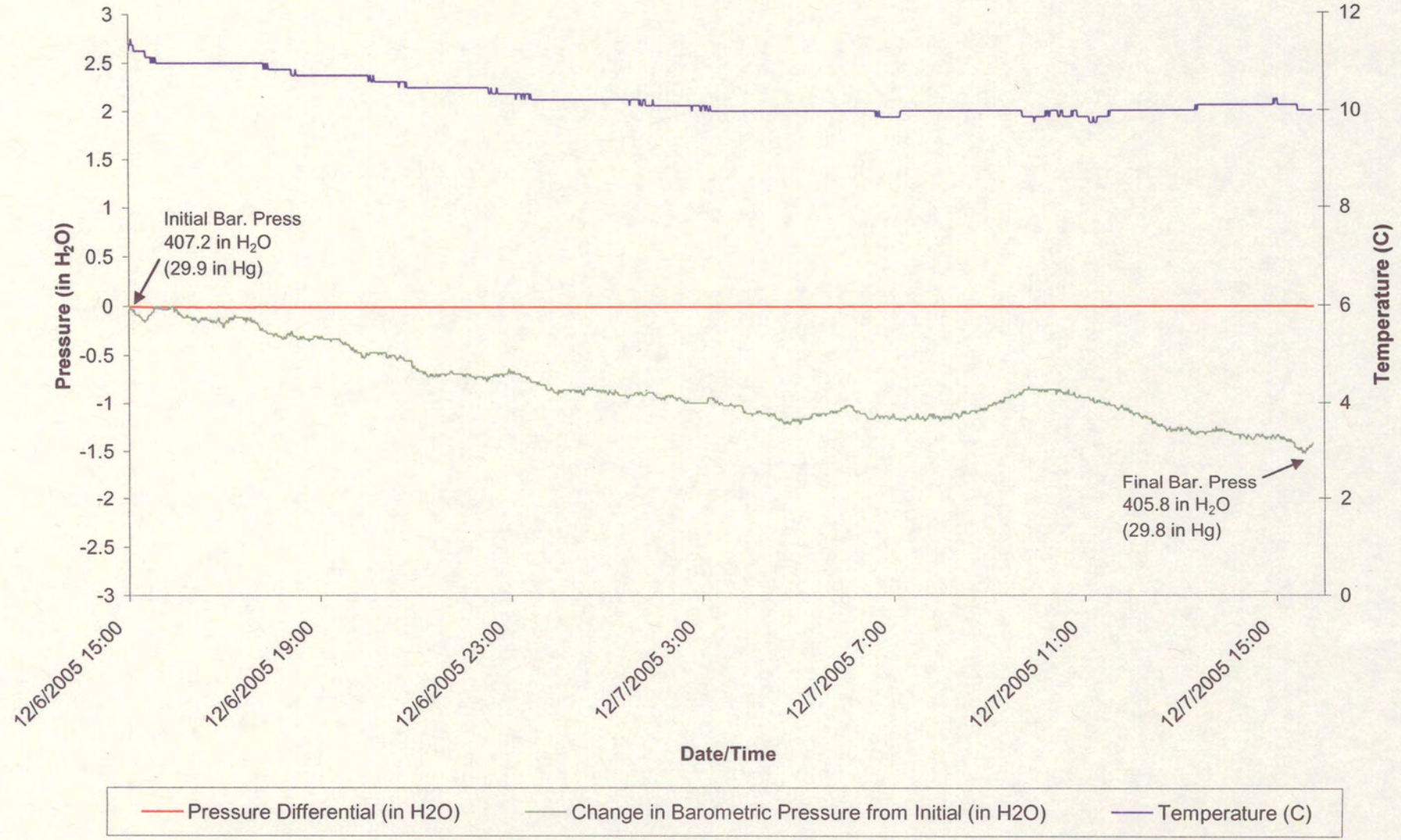
FIGURE 4-2

File: H:\19314\19314S002.dwg Layout: FIGURE 4-2 User: astenberg Plotted: Feb 06, 2006 - 2:19pm Xref's: 186008001



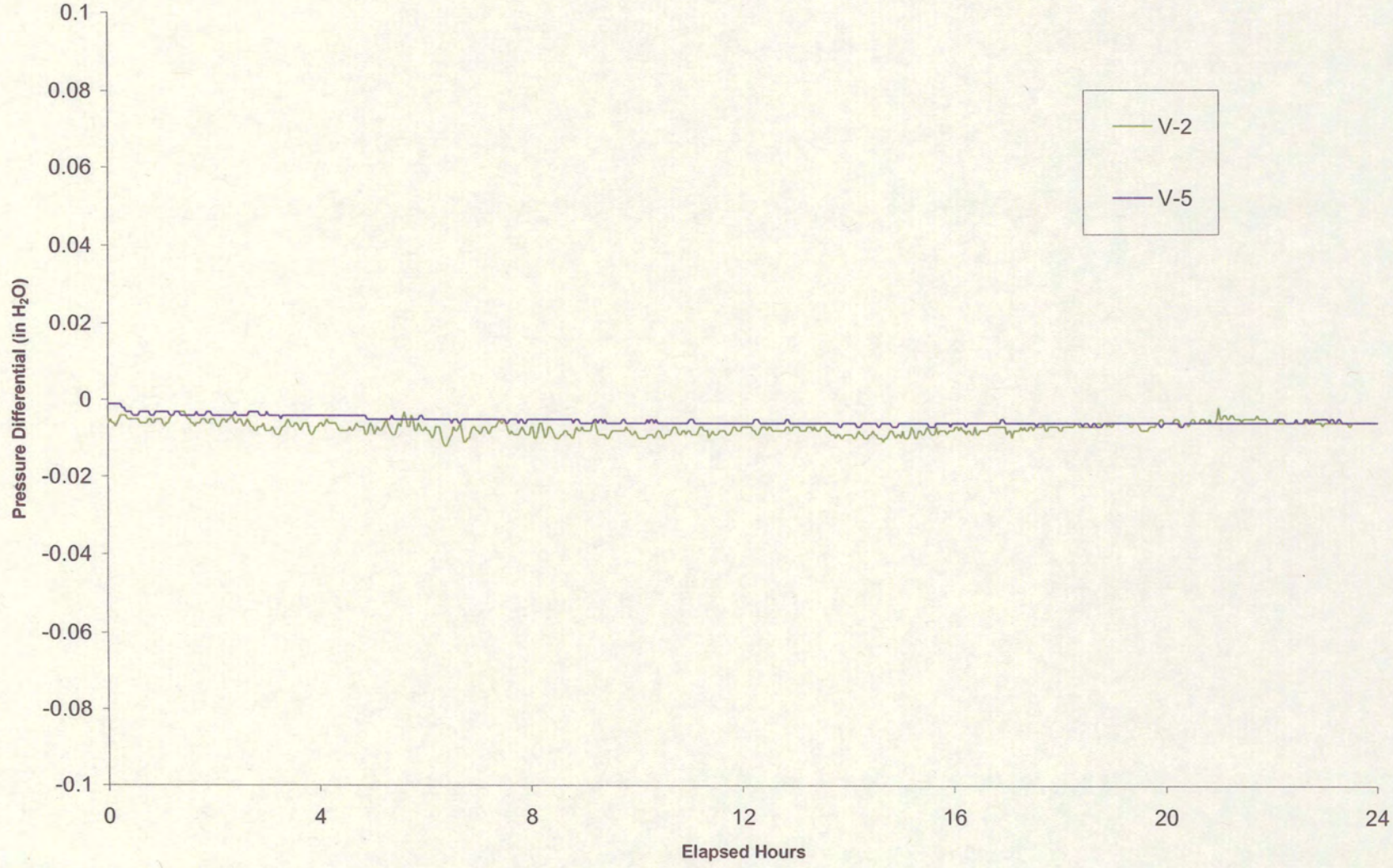
RETEC

GE South Dawson Street Facility GE Aviation	V-2 Pressure Data (12/7 - 12/8/05)
Date: 02-06-2006 File: P/DOCS/9314	FIGURE 4-3



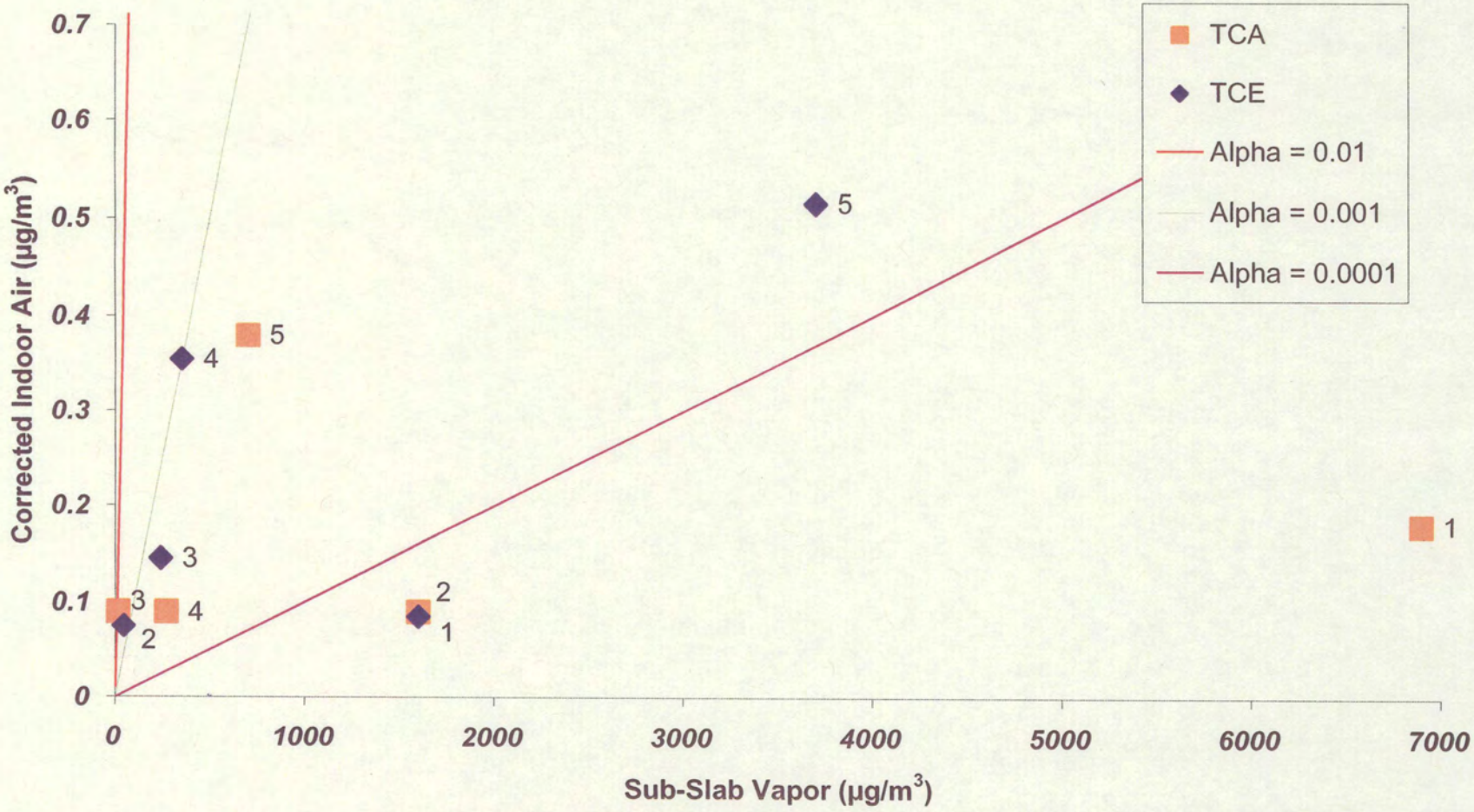
RETEC

GE South Dawson Street Facility GE Aviation	V-5 Pressure Data (12/6-12/7/05)
Date: 02-06-2006 File: P/DOCS/9314	FIGURE 4-4



RETEC

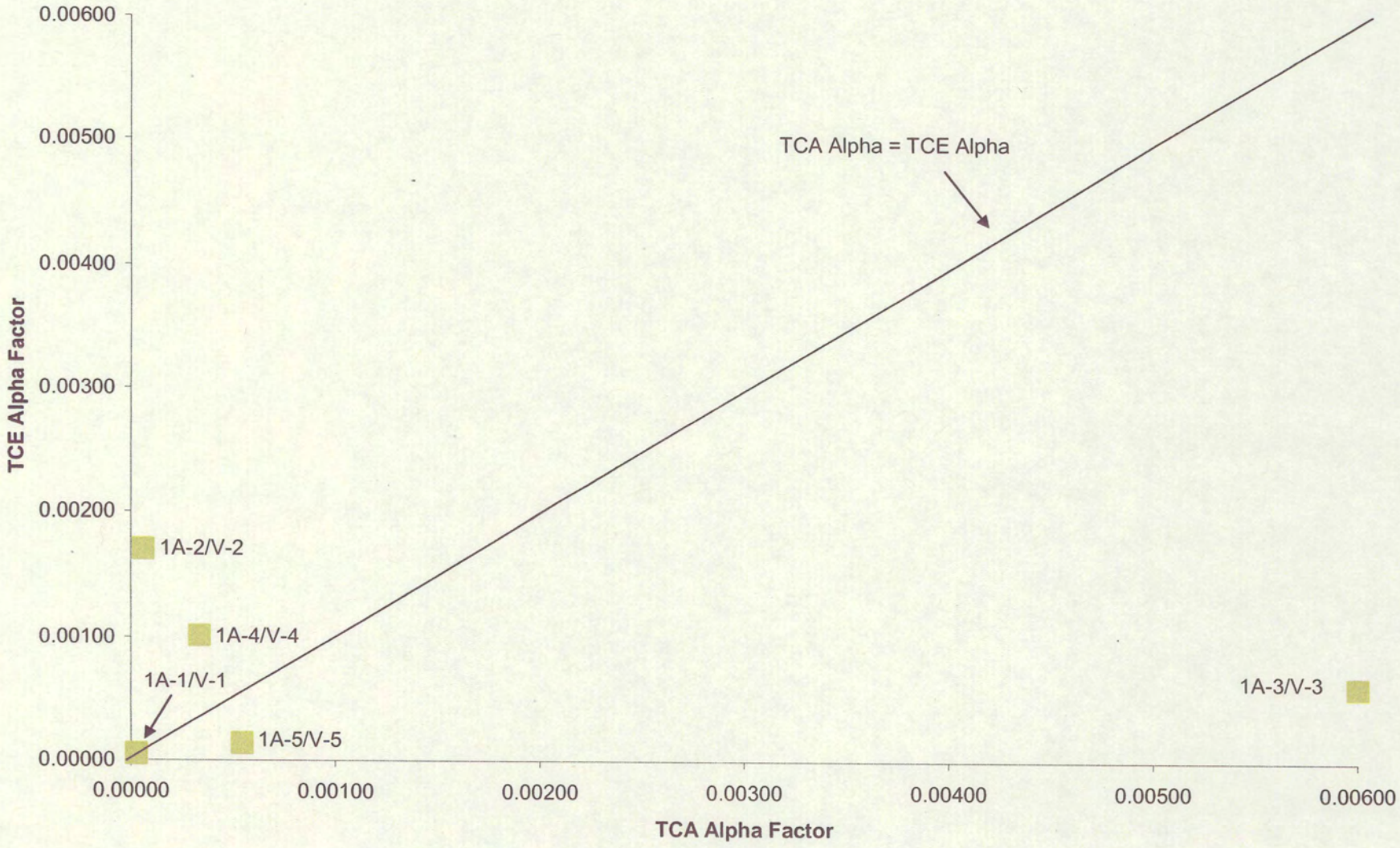
GE South Dawson Street Facility GE Aviation		Pressure Differential Over Time
Date: 02-06-2006	File: P/DOCS/9314	FIGURE 4-5



Notes:
ND plotted as ½ detection limit
Numeric labels indicate sample location number

RETEC

GE South Dawson Street Facility GE Aviation		Vapor Concentration vs. Indoor Air Concentration
Date: 02-06-2006	File: P/DOCS/9314	FIGURE 5-1



RETEC

GE South Dawson Street Facility GE Aviation		TCE vs. TCA Alpha Factors
Date: 02-06-2006	File: P/DOCS/9314	FIGURE 5-2

Appendix A

Ecology Approval of Work Plan

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

Northwest Regional Office • 3190 160th Avenue SE • Bellevue, Washington 98008-5452 • (425) 649-7000

November 16, 2005

Mr. Jim Sumner
Manager, Group Environmental Programs
General Electric Aircraft Engine
One Neumann Way MD T165
Cincinnati, OH 45215

CERTIFIED MAIL
7005 1160 0000 0644 2806

Dear Mr. Sumner:

Re: GE Work Plan for Evaluation of Sub-Surface Vapor Intrusion, dated November 1, 2005

This letter supersedes the previous November 9, 2005 letter (Certified #7005 1160 0000 0644 2769) and is intended to clarify Ecology's approval of the *Work Plan for Evaluation of Sub-surface Vapor Intrusion*, dated November 1, 2005. Subject to the *Conditions* #1 thru #13 of the October 17, 2005 Ecology comment letter to you (Certified Letter: #7004 2510 0006 4925 8177), Ecology approves only Sections 1.3 thru Section 7.0 of this work plan. As mentioned in the previous October 17, 2005 Ecology letter to you, Ecology does not concur with a number of the statements in Section 1.1 and 1.2 of the Work Plan and does *not approve* Sections 1.1 or 1.2 as written. The language will simply continue to stand as GE's point of view, with which Ecology does not agree. Sampling and sampling preparation under the approved work plan at the former GE facility are planned for December 2, 5, and 6, 2005.

Today's letter and the November 1, 2005 Work Plan constitute the approved work plan which is incorporated by reference into the Ecology-approved Interim Action Work Plan and Agreed Order, DE02HWTRNR-4686.

Please feel free to call me at (425) 649-7264 if you have any questions regarding this letter.

Sincerely,

Dean Yasuda

Dean Yasuda, P.E.
Environmental Engineer
Hazardous Waste and Toxics Reduction Program

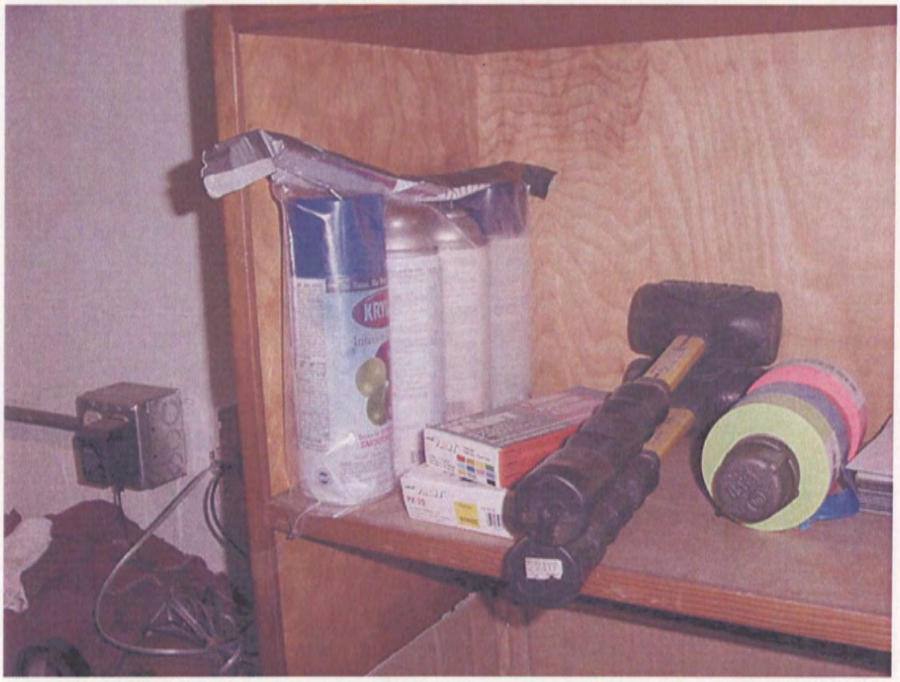
cc: Julie Sellick, HWTR/NWRO
Ed Jones, Ecology HWTR/NWRO
Jim Schwartz, Ecology AAG
Tong Li, Ground Water Solutions
Marcia Bailey, EPA Region 10
Stephen R. Black, Black & Yund
Alex Cordas, Keymac, LCC
Bill Joyce, Salter, Joyce, Ziker, PLLC
WAD009278706 HZW 6.2

Appendix B

Pre-Sampling Site Visit Photographs and Field Notes

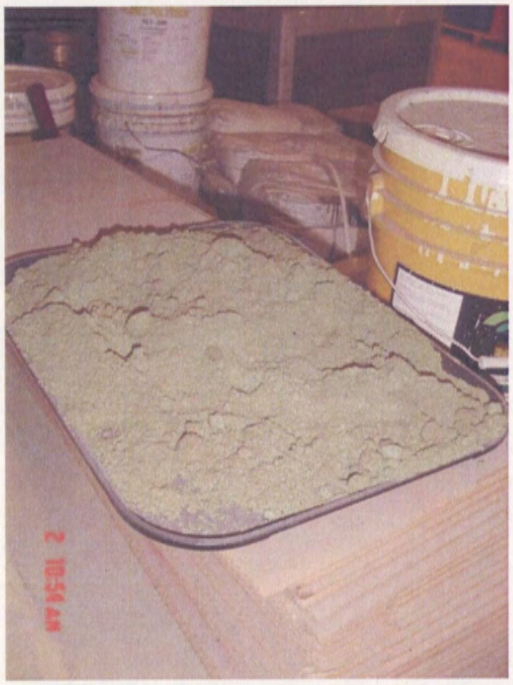
Photo Log – Building Inspection
December 2, 2006

Photo of Shelves in Puget Sound Pipe Company (notice uncapped spray-paint cans).



Sealed Spray Paint Cans in Puget Pipe Supply

Photo Log – Building Inspection
December 2, 2006



Unknown Products in Masons Supply Company

Photos of V-4 Sample Location – large number of boxes located around the sampling location

Photo Log – Building Inspection
December 2, 2006

Unknown Products at Masons Supply Company

Photo of Floor activity in Masons Supply Company

Photo Log – Building Inspection
December 2, 2006

Photo of open paint products/floor sealants at Masons Supply Company

Photo of sealed open containers and open buckets at Masons Supply Company

FIELD ACTIVITY LOG

RETEC

PROJECT GEAE — COMPLETED BY JS

JOB NO. GE001-18600-750 — APPROVED BY _____

DAY & DATE Friday 12/02/05 — SHEET 1 OF 2

FIELD ACTIVITY SUBJECT:
DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

TIME	
0925	Arrive on site
0925	Mtg with APS- go over Site Safety
	show locations
0930	Dean Y. Jims, Jill L on site Ed Jones
0938	JS starts marking locations
0940	Marked V-1 IA-1 · used duck tap and pink flag
0950	V-5 IA-5 - " , IA-5 inside used yellow flag
1000	Marked V-4 IA-4 duck tap/pink flag
1009	Marked V-3 IA-3 IA-3 inside used yellow flag moved away from wall
1012	Marked V-2 IA-2 - on ladder
	Marked 2 possible locations
	Manson company applying an apoxy in the "lunch room"
	alaphatun aniens
	Brent Straight - floor tech
	· May not disipate over the weekend
	· 4 chloro benzo - chlorinated solvent
	· acetate
	Ed Jones- could effect the detection limits
	· cold weather will make it delay
	V-4 and IA-4
	Will put IA-4 will be on ladder

VISITORS ON SITE:
Dean Y
Jim S

CHANGES FROM PLANS OR IMPORTANT DECISIONS

WEATHER CONDITIONS:

IMPORTANT TELEPHONE CALLS:
Hertz rental- 8' ladders instead of 6', will deliver earlier

PERSONNEL ON SITE:
Jill L. & Jamie Stevens

FIELD ACTIVITY LOG

RETEC

PROJECT GEAE — COMPLETED BY J. Stevens

JOB NO. GE001-18600-750 — APPROVED BY _____

DAY & DATE Friday 12/02/05 — SHEET 2 OF 2

FIELD ACTIVITY SUBJECT:
DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

TIME	
	~~7:30~~ JCS
	Randy w/ Hudson Bay
	asked about equipment inside the building
	truck trafic - will not have any truck traffic
	Dean - will call Jim Cells phone
	Ed ~~Wallace~~ - on Monday and Tuesday
	Dean 7:30 09:00
1200	Dean and Ed leave site
1212	JS, Jim, JL walk the outside air locations
	Confirm the few cans that need to be sealed
1230	Jim leaves site
1245	Jill Lantz and JS leave Site
1300 - 1400	JS goes to home depot and safe way for supplies
1420	Return to site
1425	Seal up can at puget supply (1 set in the warehouse 1 glass cleaners in office)
1448	Seal up paint can and 1 gallon jug in warehouse of manson
1505	Sealed up boxes/paint jars/and misc waste at manson. additional waste produced by Manson
1600	JS leaves site

VISITORS ON SITE: — **CHANGES FROM PLANS OR IMPORTANT DECISIONS**

WEATHER CONDITIONS: — **IMPORTANT TELEPHONE CALLS:**

see page 1

PERSONNEL ON SITE:

Appendix C

MSDS for Floric Polytech Products and Inventory Log of Products in Masons Supply Warehouse

Material Safety Data Sheet

Section 1: Product Information

Manufacturer's Name / Address:

Floric Polytech
10280 Indiana Court
Rancho Cucamonga, CA 91730

Info. Phone:
909-483-1870

Emergency Phone:
909-560-4778

Trade Name: Epamine HS Clearseal 'A' Comp

Chemical Family: Epoxide

Intended Use: Concrete Sealer

D.O.T. Proper Shipping Name: Resin Solution

Initial Issue Date: 12/21/00 **Revision Date:** 05/18/05 **Prepared By:** B. Strait

Section 2: Hazardous Ingredients

Hazardous Component	OSHA PEL	ACGIH TLV	Other Limits	% (Optional)
Bisphenol A-Epichlorohydrin Epoxy (25068-38-6)	ND	ND	ND	<80
Oxirane, mono[{C8-10-alkyioxy}methyl] dervis (68609-96-1)	ND	ND	ND	>20

VOC of Component: 2g/L **VOC As Applied:** 1g/L

Section 3: Physical Data

Boiling Point (°C):	>200	**Specific Gravity:**	1.16
Vapor Pressure:	NE	**Melting Point:**	NE
Vapor Density: (Air = 1)	>1	**Evaporation Rate:** (Butyl Acetate = 1)	>1
Solubility in Water:	Immiscible	**pH:**	NE
Freezing Point	NE		
Coefficient of Oil/Water Distribution:		NE	
Appearance and Odor:		Clear liquid w/ slight phenolic odor	
Odor Threshold:		NE	

Section 4: Fire and Explosion Hazard

Flash Point (°C):	254
Conditions of Flammability:	NA
Flammable Limits:	**LEL:** NE **UEL:** NE
Autoignition Temperature (°C):	NE
Hazardous Combustion Products:	Carbon Dioxide, Carbon Monoxide, Oxides of Nitrogen
Sensitivity to Impact:	None
Sensitivity to Static Discharge:	None
Extinguishing Media:	Chemical foam, dry chemical, carbon dioxide, and water spray for large fires
Special Firefighting Procedures:	Full emergency equipment with self-contained breathing apparatus is required.
Unusual Fire and Explosion Hazards:	Heated tanks may rupture.

Section 5: Health Hazard Data

Primary Routes of Entry: ☒ Eye ☒ Inhalation ☒ Skin Contact ☐ Ingestion
Overexposure Effects: Skin irritation, eye irritation, respiratory irritation
Conditions Aggravated by Exposure: Upper respiratory disorders, skin disorders

Health Hazards (Acute and Chronic Exposures):

Eyes

Acute:
May cause irritation, redness, and swelling.
Chronic:
ND

Skin Contact

Acute:
Contact may cause skin sensitization Irritation, redness, and swelling
Chronic:
Prolonged and repeated contacts may cause allergic reactions and sensitization.

Skin Absorption

Acute:
ND
Chronic:
ND

Inhalation

Acute:
May cause irritation to the nose, throat, and respiratory tract
Chronic:
ND

Ingestion

Acute:
ND
Chronic:
ND

Emergency and First Aid Procedures:

General:
If unconcious, provide artificial respiration. Seek medical assistance as necessary. Treat symptomatically
Eyes:
Flush with clean water for at least 15 minutes while holding the eyelids open. Obtain medical attention.
Skin:
Remove contaminated clothing immediately. Wash effected areas with soap and water for at least 15 minutes. Seek medical attention if symptoms persist
Inhalation:
Move effected person from risk of further exposure. Administer oxygen or artificial respiration as necessary. Obtain medical attention.
Ingestion:
Do not induce vomiting. Give 250ml od milk or water to drink. DO NOT GIVE LIQUIDS TO AN UNCONCIOUS PERSON. Consult physician.

Carcinogenic Data:
NTP: No
OSHA: No
IARC: No

Toxicological Data:
(025085-99-8) LD50 (Skin/Rabbit) 20,000mg/kg; Oral LD50 (Ingestion/Rats) >5000mg/kg

Section 6: Reactivity Data

Chemical Stability: ☒ Stable ☐ Unstable
Conditions to Avoid: Strong Oxidizers.
Incompatibility (Materials to Avoid) : Strong Oxidizers, mineral acids, aliphatic amines
Hazardous Decomposition Products: Carbon dioxide, carbon monoxide, oxides of nitrogen
Hazardous Polymerization (Reactivity) : ☐ May Occur ☒ Will Not Occur

Section 7: Spill and Leak Procedures:

Steps to be Taken in Case of Material Release or Spillage: Evacuate non-essential personel. Equip cleaning crew with protective clothing inclusive of rubber boots and gloves, long sleeve shirts and pants. Contain spill. Cover with absorbant material. Collect material in open containers.

Waste Disposal Methods: Dispose at a licensed, permitted, waste disposal facility in accordance with federal, state, and local regulations. Incineration is preffered

Ecological Information: No specific data on product.

Ecotoxicity: Product contains materials known to be moderately toxic to marine organisms. No further test data is available.

Section 8: Special Protection Information

Engineering Controls: Local exhaust and general ventilation is recommended
Respiratory Protection: NIOSH approved respirator must be worn.
Protective Gloves: Gloves of butyl, nitrile, or neoprene rubber must be worn.
Eye Protection: Chemical goggles or full face shield must be worn.
Other protective Equipment: Long sleeve shirts and pants must be worn.

Section 9: Handling and Storage

General: Store away from excessive heat and cold. Avoid open sources of ignition and strong oxidizers. Store in well ventilated areas.

Section 10: Supplemental Information

Health: 2 **Flammability:** 1 **Reactivity:** 0

DOT Proper Shipping Name: Resin Solution
Hazard Class : Hot Regulated
UN Number: NA
Packing Group: NA
IMO Shipping Data: NA
ICAO/IATA Shipping Data : NA
NMFC Shipping Class: 55

TSCA (Toxic Substance Control Act) :
All materials contained in this product are listed within the TSCA inventory
CERCLA (Comprehensive Response Compensation and Liability Act):
None
SARA Title III:
311/312 Immediate Health Hazard

California Proposition 65 : Below is a list of compounds known to the State of California to cause cancer, birth defects, or other reproductive harm:
None

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, express or implied, is made with respect to the accuracy of the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects, which may be caused by exposure to our products. Customers and users of this product must comply with all applicable health and safety laws, regulations and orders.

(NA = Not Applicable) (NE = Not Established) (ND = No Data)
(NR = Not Required)

Material Safety Data Sheet

Section 1: Product Information

Manufacturer's Name / Address:

Floric Polytech
10280 Indiana Ct
Rancho Cucamonga, CA 91730

Info. Phone:
909-483-1870

Emergency Phone:
909-560-4778

Trade Name: Epamine "HS" "B" Comp

Chemical Family: Cycloaiphatic Amine

Intended Use: Concrete Sealer

D.O.T. Proper Shipping Name: Isophoronediamine

Initial Issue Date: 12/21/00 **Revision Date:** 5/18/05 **Prepared By:** B. Strait

Section 2: Hazardous Ingredients

Hazardous Component	OSHA PEL	ACGIH TLV	Other Limits	% (Optional)
Isophoronediamine (2855-13-2)	ND	ND	ND	<10
Benzyl Alcohol (100-51-6)	ND	ND	ND	<40
Cycloaliphatic amine	NE	NE	ND	<15

VOC of Component: 0g/L **VOC As Applied:** 1g/L

Section 3: Physical Data

Boiling Point (°C):	205	**Specific Gravity:**	1.045
Vapor Pressure:	< 10.34 mmHg at 21°C	**Melting Point:**	ND
Vapor Density:	64.301 lb/ft3 at 21°C	**Evaporation Rate:**	>1
(Air = 1)		**(Butyl Acetate = 1)**	
Solubility in Water:	Immiscible	**pH:**	9
Freezing Point	NE		
Coefficient of Oil/Water Distribution:		NE	
Appearance and Odor:		Colorless, Ammoniacal	
Odor Threshold:		NE	

Section 4: Fire and Explosion Hazard

Flash Point (°C):	96
Conditions of Flammability:	NA
Flammable Limits:	**LEL:** NE **UEL:** NE
Autoignition Temperature (°C):	NE
Hazardous Combustion Products:	Carbon Dioxide, Carbon Monoxide, Oxides of Nitrogen
Sensitivity to Impact:	None
Sensitivity to Static Discharge:	None
Extinguishing Media:	Chemical foam, dry chemical, carbon dioxide, and water spray for large fires.
Special Firefighting Procedures:	Full emergency equipment with self-contained breathing apparatus is required.
Unusual Fire and Explosion Hazards:	Heated tanks may rupture

Section 5: Health Hazard Data

Primary Routes of Entry: ☒ Eye ☒ Inhalation ☒ Skin Contact ☐ Ingestion
Overexposure Effects: Skin irritation, eye irritation, respiratory irritation.
Conditions Aggravated by Exposure: Upper respiratory disorders, skin disorders

Health Hazards (Acute and Chronic Exposures):

Eyes

Acute:
Lacrimation, conjunctivitis, and corneal damage when absorbed into eye tissue Burns to eye.
Chronic:
ND

Skin Contact

Acute:
Dryness, itching, rash, burns, necrosis, and permanent injury.
Chronic:
Skin sensitization and allergy.

Skin Absorption

Acute:
Nausea, headache, and general discomfort.
Chronic:
ND

Inhalation

Acute:
Inhalation of mists are severely damaging contacted tissue, causing scarring
Chronic:
ND

Ingestion

Acute:
ND
Chronic:
ND

Emergency and First Aid Procedures:

General:
If unconcious, provide artificial respiration. Seek medical assistance as necessary Treat symptomatically
Eyes:
Flush with clean water for at least 15 minutes while holding the eyelids open Obtain medical attention
Skin:
Remove contaminated clothing immediately. Wash effected areas with soap and water for at least 15 minutes. Seek medical attention if symptoms persist.
Inhalation:
Move effected person from risk of further exposure Administer oxygen or artificial respiration as necessary. Obtain medical attention
Ingestion:
Do not induce vomiting. Give 250ml od milk or water to drink DO NOT GIVE LIQUIDS TO AN UNCONCIOUS PERSON. Consult physician

Carcinogenic Data:
NTP: No
OSHA: No
IARC: No

Toxicological Data:
LD50 (Oral/Rat) 1750 mg/KG , LD-50 (Dermal/Rabbit) >2000mg/kg

Section 6: Reactivity Data

Chemical Stability: ☒ Stable ☐ Unstable
Conditions to Avoid: NA
Incompatibility (Materials to Avoid) : Strong oxidizers, mineral acids, reactive metals, and organic acids.
Hazardous Decomposition Products: Carbon dioxide, carbon monoxide, oxides of nitrogen, ammonia, nitric acid.
Hazardous Polymerization (Reactivity) : ☐ May Occur ☒ Will Not Occur

Section 7: Spill and Leak Procedures:

Steps to be Taken in Case of Material Release or Spillage: Evacuate non-essential personel. Equip cleaning crew with protective clothing inclusive of rubber boots and gloves, long sleeve shirts, pants, and self-contained breathin apparatus. Contain spill. Cover with absorbant material. Collect material in open containers.

Waste Disposal Methods: Dispose at a licensed, permitted, waste disposal facility in accordance with federal, state, and local regulations.

Ecological Information: No specific data on product.

Ecotoxicity: Product contains materials known to be moderately toxic to marine organisms. No further test data is available.

Section 8: Special Protection Information

Engineering Controls: Local exhaust and general ventilation is recommended
Respiratory Protection: NIOSH approved respirator must be worn.
Protective Gloves: Gloves of butyl, nitrile, or neoprene rubber must be worn
Eye Protection: Chemical goggles or full face shield must be worn
Other protective Equipment: Long sleeve shirts and pants must be worn.

Section 9: Handling and Storage

General: Store away from excessive heat and cold. Avoid open sources of ignition and strong oxidizers. Store in well ventilated areas

Section 10: Supplemental Information

Health: 3 **Flammability**: 1 **Reactivity**: 0

DOT Proper Shipping Name: Isophoronediamine
Hazard Class : 8
UN Number: 2289
Packing Group: III
IMO Shipping Data: Refer to bill of lading
ICAO/IATA Shipping Data : Isophoronediamine Mixture, 8, UN2289, PG III
NMFC Shipping Class: 70

TSCA (Toxic Substance Control Act) :
All materials contained in this product are listed within the TSCA inventory.
CERCLA (Comprehensive Response Compensation and Liability Act):
None
SARA Title III:
312 Immediate health hazard. Delayed Health Hazard.

California Proposition 65 : Below is a list of compounds known to the State of California to cause cancer, birth defects, or other reproductive harm:
None

The information and recommendations contained herein are based upon data believed to be correct However, no guarantee or warranty of any kind, express or implied, is made with respect to the accuracy of the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects, which may be caused by exposure to our products Customers and users of this product must comply with all applicable health and safety laws, regulations and orders.

Material Safety Data Sheet

Section 1: Product Information

Manufacturer's Name / Address:
Floric Polytech
10280 Indiana Ct
Rancho Cucamonga, CA 91730
Info. Phone:
909-483-1870
Emergency Phone:
909-560-4778

Trade Name: Moisture Block "A" Comp
Chemical Family: Epoxy Resin

Intended Use: Epoxy Primer

D.O.T. Proper Shipping Name: Resin Solution

Initial Issue Date: 2/1/1 **Revision Date:** 5/18/05 **Prepared By:** B. Strait

Preparers Signature (not valid w/o) _____

Section 2: Hazardous Ingredients

Hazardous Component	OSHA PEL	ACGIH TLV	Other Limits	% (Optional)
Bisphenol A-Epichlorohydrin Epoxy (25085-99-8)	ND	ND	ND	<80
Alkyl C12-C14 Glycidyl Ether(68609-97-2)	NE	NE	ND	5-15

VOC of Component: 0g/L **VOC As Applied:**0g/L

Section 3: Physical Data

Boiling Point (°C): >35
Vapor Pressure: NE
Vapor Density: >1
(Air = 1)
Solubility in Water: Immiscible
Freezing Point NE
Coefficient of Oil/Water Distribution:
Appearance and Odor:
Odor Threshold:

Specific Gravity: 1.13
Melting Point: NE
Evaporation Rate: >1
(Butyl Acetate = 1)
pH: NE

NE
Clear liquid w/ slight phenolic odor
NE

Section 4: Fire and Explosion Hazard

Flash Point (°C): >150
Conditions of Flammability: NA
Flammable Limits: **LEL:** NE **UEL:** NE
Autoignition Temperature (°C): NE
Hazardous Combustion Products: Carbon Dioxide, Carbon Monoxide, Oxides of Nitrogen
Sensitivity to Impact: None
Sensitivity to Static Discharge: None
Extinguishing Media: Chemical foam, dry chemical, carbon dioxide, and water spray for large fires
Special Firefighting Procedures: Full emergency equipment with self-contained breathing apparatus is required
Unusual Fire and Explosion Hazards: Heated tanks may rupture

(NA = Not Applicable) (NE = Not Established) (ND = No Data)
(NR = Not Required)

Section 5: Health Hazard Data

Primary Routes of Entry: ☒ Eye ☒ Inhalation ☒ Skin Contact ☐ Ingestion
Overexposure Effects: Skin irritation, eye irritation, respiratory irritation.
Conditions Aggravated by Exposure: Upper respiratory disorders, skin disorders.

Health Hazards (Acute and Chronic Exposures):

Eyes

Acute:
May cause irritation, redness, and swelling
Chronic:
ND

Skin Contact

Acute:
Contact may cause skin sensitization. Irritation, redness, and swelling.
Chronic:
Prolonged and repeated contacts may cause allergic reactions and sensitization

Skin Absorption

Acute:
ND
Chronic:
ND

Inhalation

Acute:
May cause irritation to the nose, throat, and respiratory tract.
Chronic:
ND

Ingestion

Acute:
ND
Chronic:
ND

Emergency and First Aid Procedures:

General:
If unconcious, provide artificial respiration. Seek medical assistance as necessary. Treat symptomatically
Eyes:
Flush with clean water for at least 15 minutes while holding the eyelids open. Obtain medical attention.
Skin:
Remove contaminated clothing immediately. Wash effected areas with soap and water for at least 15 minutes. Seek medical attention if symptoms persist
Inhalation:
Move effected person from risk of further exposure. Administer oxygen or artificial respiration as necessary. Obtain medical attention
Ingestion:
Do not induce vomiting. Give 250ml od milk or water to drink. DO NOT GIVE LIQUIDS TO AN UNCONCIOUS PERSON. Consult physician

Carcinogenic Data:
NTP: No
OSHA: No
IARC: No

Toxicological Data:
(025085-99-8) LD50 (Skin/Rabbit) 20,000mg/kg; Oral LD50 (Ingestion/Rats) >5000mg/kg

Section 6: Reactivity Data

Chemical Stability: ☒ Stable ☐ Unstable
Conditions to Avoid: Strong Oxidizers.
Incompatibility (Materials to Avoid) : Strong Oxidizers, mineral acids, aliphatic amines
Hazardous Decomposition Products: Carbon dioxide, carbon monoxide, oxides of nitrogen
Hazardous Polymerization (Reactivity) : ☐ May Occur ☒ Will Not Occur

Section 7: Spill and Leak Procedures:

Steps to be Taken in Case of Material Release or Spillage: Evacuate non-essential personel. Equip cleaning crew with protective clothing inclusive of rubber boots and gloves, long sleeve shirts and pants. Contain spill. Cover with absorbant material. Collect material in open containers.

Waste Disposal Methods: Dispose at a licensed, permitted, waste disposal facility in accordance with federal, state, and local regulations. Incineration is preffered

Ecological Information: No specific data on product

Ecotoxicity: Product contains materials known to be moderately toxic to marine organisms. No further test data is available.

Section 8: Special Protection Information

Engineering Controls: Local exhaust and general ventilation is recommended
Respiratory Protection: NIOSH approved respirator must be worn.
Protective Gloves: Gloves of butyl, nitrile, or neoprene rubber must be worn
Eye Protection: Chemical goggles or full face shield must be worn
Other protective Equipment: Long sleeve shirts and pants must be worn

Section 9: Handling and Storage

General: Store away from excessive heat and cold. Avoid open sources of ignition and strong oxidizers. Store in well ventilated areas.

Section 10: Supplemental Information

Health: 2 **Flammability**: 1 **Reactivity**: 0

DOT Proper Shipping Name: Resin Solution
Hazard Class : NA
UN Number: NA
Packing Group: NA
IMO Shipping Data: NA
ICAO/IATA Shipping Data : NA
NMFC Shipping Class: 55

TSCA (Toxic Substance Control Act) :
All materials contained in this product are listed within the TSCA inventory.
CERCLA (Comprehensive Response Compensation and Liability Act):
None
SARA Title III:
311/312 Immediate HealthHazard. Delayed Health Hazard

California Proposition 65 : Below is a list of compounds known to the State of California to cause cancer, birth defects, or other reproductive harm:
None

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, express or implied, is made with respect to the accuracy of the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects, which may be caused by exposure to our products. Customers and users of this product must comply with all applicable health and safety laws, regulations and orders.

(NA = Not Applicable) (NE = Not Established) (ND = No Data)
(NR = Not Required)

Material Safety Data Sheet

Section 1: Product Information

Manufacturer's Name / Address:
Floric Polytech
10280 Indiana Ct
Rancho Cucamonga, CA 91730
Info. Phone:
909-483-1870
Emergency Phone:
909-560-4778

Trade Name: Moisture Block "B" Comp
Chemical Family: Modified Polyaminoamide

Intended Use: Epoxy Primer

D.O.T. Proper Shipping Name: Amines, liquid, corrosive,n.o.s ,Isophorone-diamine

Initial Issue Date: 2/1/1 **Revision Date:** 5/18/05 **Prepared By:** B. Strait

Preparers Signature (not valid w/o) _____

Section 2: Hazardous Ingredients

Hazardous Component	OSHA PEL	ACGIH TLV	Other Limits	% (Optional)
Benzyl Alcohol (100-51-6)	NE	NE	ND	>20
Di ethylenetriamine (111-40-0)	ND	NE	ND	>17
Dimethylaminopropylamine (109-55-7)	NE	NE	NE	>15
m-Xylylenediamine (1477-55-0)	NE	NE	NE	>18
Cashew, nuitshell liquid (8007-24-7)	NE	NE	NE	>7

VOC of Component: 0g/L **VOC As Applied:**0g/L

Section 3: Physical Data

Boiling Point (°C): >175.0
Vapor Pressure: NE
Vapor Density: >1
(Air = 1)
Solubility in Water: Immiscible
Freezing Point NE
Coefficient of Oil/Water Distribution:
Appearance and Odor:
Odor Threshold:

Specific Gravity: 1.01
Melting Point: NE
Evaporation Rate: >1
(Butyl Acetate = 1)
pH: Alkaline

NE
Amber liquid with ammoniacal odor.
NE

Section 4: Fire and Explosion Hazard

Flash Point (°C): 117.0
Conditions of Flammability: NA
Flammable Limits: **LEL:** NE **UEL:** NE

Autoignition Temperature (°C): NE
Hazardous Combustion Products: Carbon Dioxide, Carbon Monoxide, Oxides of Nitrogen
Sensitivity to Impact: None
Sensitivity to Static Discharge: None
Extinguishing Media: Chemical foam, dry chemical, carbon dioxide, and water spray for large fires
Special Firefighting Procedures: Full emergency equipment with self-contained breathing apparatus is required.
Unusual Fire and Explosion Hazards: Heated tanks may rupture

(NA = Not Applicable) (NE = Not Established) (ND = No Data)
(NR = Not Required)

Section 5: Health Hazard Data

Primary Routes of Entry: ☒ Eye ☒ Inhalation ☒ Skin Contact ☐ Ingestion
Overexposure Effects: Skin irritation, eye irritation, respiratory irritation.
Conditions Aggravated by Exposure: Upper respiratory disorders, skin disorders.

Health Hazards (Acute and Chronic Exposures):

Eyes

Acute:
May cause irritation, redness, and swelling. Conjunctivitus, corneal damage
Chronic:
Permanent eye damage may occur with repeated or prolonged exposure.

Skin Contact

Acute:
Contact may cause skin sensitization. Irritation, redness, and swelling.
Chronic:
Prolonged and repeated contacts may cause allergic reactions and sensitization.

Skin Absorption

Acute:
ND
Chronic:
ND

Inhalation

Acute:
May cause irritation to the nose, throat, and respiratory tract
Chronic:
ND

Ingestion

Acute:
ND
Chronic:
ND

Emergency and First Aid Procedures:

General:
If unconcious, provide artificial respiration. Seek medical assistance as necessary. Treat symptomatically.
Eyes:
Flush with clean water for at least 15 minutes while holding the eyelids open. Obtain medical attention
Skin:
Remove contaminated clothing immediately. Wash effected areas with soap and water for at least 15 minutes. Seek medical attention if symptoms persist
Inhalation:
Move effected person from risk of further exposure. Administer oxygen or artificial respiration as necessary. Obtain medical attention.
Ingestion:
Do not induce vomiting. Give 250ml od milk or water to drink. DO NOT GIVE LIQUIDS TO AN UNCONCIOUS PERSON. Consult physician

Carcinogenic Data:
NTP: No
OSHA: No
IARC: No

Toxicological Data:
Acute Oral Toxicity (LD50, Rat) 2020 mg/kg

Section 6: Reactivity Data

Chemical Stability: ☒ Stable ☐ Unstable
Conditions to Avoid: Strong Oxidizers.
Incompatibility (Materials to Avoid) : Strong Oxidizers, mineral acids, aliphatic amines
Hazardous Decomposition Products: Carbon dioxide, carbon monoxide, oxides of nitrogen
Hazardous Polymerization (Reactivity) : ☐ May Occur ☒ Will Not Occur

Section 7: Spill and Leak Procedures:

Steps to be Taken in Case of Material Release or Spillage: Evacuate non-essential personel. Equip cleaning crew with protective clothing inclusive of rubber boots and gloves, long sleeve shirts and pants. Contain spill. Cover with absorbant material. Collect material in open containers.

Waste Disposal Methods: Dispose at a licensed, permitted, waste disposal facility in accordance with federal, state, and local regulations. Incineration is preffered

Ecological Information: No specific data on product

Ecotoxicity: Product contains materials known to be moderately toxic to marine organisms. No further test data is available

Section 8: Special Protection Information

Engineering Controls: Local exhaust and general ventilation is recommended
Respiratory Protection: NIOSH approved respirator must be worn.
Protective Gloves: Gloves of butyl, nitrile, or neoprene rubber must be worn.
Eye Protection: Chemical goggles or full face shield must be worn.
Other protective Equipment: Long sleeve shirts and pants must be worn.

Section 9: Handling and Storage

General: Store away from excessive heat and cold. Avoid open sources of ignition and strong oxidizers. Store in well ventilated areas.

Section 10: Supplemental Information

Health: 3 **Flammability**: 1 **Reactivity**: 0

DOT Proper Shipping Name: Amines, liquid, corrosive, n.o.s. Isophoronediamine
Hazard Class : 8
UN Number: 2735
Packing Group: III
IMO Shipping Data: NA
ICAO/IATA Shipping Data : NA
NMFC Shipping Class: 70

TSCA (Toxic Substance Control Act) :
All materials contained in this product are listed within the TSCA inventory.
CERCLA (Comprehensive Response Compensation and Liability Act):
None
SARA Title III:
311/312 Immediate HealthHazard. Delayed Health Hazard

California Proposition 65 : Below is a list of compounds known to the State of California to cause cancer, birth defects, or other reproductive harm:
None

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, express or implied, is made with respect to the accuracy of the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects, which may be caused by exposure to our products Customers and users of this product must comply with all applicable health and safety laws, regulations and orders

(NA = Not Applicable) (NE = Not Established) (ND = No Data)
(NR = Not Required)

Material Safety Data Sheet

Section 1: Product Information

Manufacturer's Name / Address:

Floric Polytech
10280 Indiana Court
Rancho Cucamonga, CA 91730

Info. Phone:
909-483-1870

Emergency Phone:
909-560-4778

Trade Name: MT-200 Microtopping Liquid

Chemical Family: Latex Emulsion

Intended Use: Concrete Topping

D.O.T. Proper Shipping Name Liquid Latex

Initial Issue Date: 12/21/00 **Revision Date:** 5/17/05 **Prepared By:** B. Strait

Section 2: Hazardous Ingredients

Hazardous Component	OSHA PEL	ACGIH TLV	Other Limits	% (Optional)
Ethylene Vinyl Acetate Copolymer (24937-78-8)	NE	NE	NE	NR

VOC of Component: 0g/L **VOC As Applied:**0g/L

Section 3: Physical Data

Boiling Point (°C):	100	**Specific Gravity:**	1.04
Vapor Pressure:	NE	**Melting Point:**	NA
Vapor Density: (Air = 1)	>1	**Evaporation Rate:** (Butyl Acetate = 1)	>1
Solubility in Water:	Miscible	**pH:**	6.7
Freezing Point	0-10C		
Coefficient of Oil/Water Distribution:		ND	
Appearance and Odor:		Milky white with acetic odor	
Odor Threshold:		NE	

Section 4: Fire and Explosion Hazard

Flash Point (°C):	>100
Conditions of Flammability:	NA
Flammable Limits:	**LEL:** ND **UEL:** ND
Autoignition Temperature (°C):	ND
Hazardous Combustion Products:	Carbon mooxide, carbon dioxide
Sensitivity to Impact:	None
Sensitivity to Static Discharge:	None
Extinguishing Media:	Water spray, dry chemical, carbon dioxide
Special Firefighting Procedures:	If exposed to vapors wear self-contained breathing apparatus
Unusual Fire and Explosion Hazards:	None known

(NA = Not Applicable) (NE = Not Established) (ND = No Data)
(NR = Not Required)

Section 5: Health Hazard Data

Primary Routes of Entry: ☒ Eye ☒ Inhalation ☒ Skin Contact ☐ Ingestion
Overexposure Effects: Irritation of eyes, skin, and pulmonary tract
Conditions Aggravated by Exposure: Pulmonary and skin disorders

Health Hazards (Acute and Chronic Exposures):

Eyes

Acute:
Irritation, redness, and tearing.
Chronic:
None known.

Skin Contact

Acute:
May cause skin irritation and rash upon prolonged or repeated exposure.
Chronic:
None known

Skin Absorption

Acute:
Does not absorb through skin as supplied
Chronic:
ND

Inhalation

Acute:
Exposure to vapors or spray mists may cause irritation of the nose, throat, and pulmonary tract. May cause labored breathing.
Chronic:
ND

Ingestion

Acute:
ND
Chronic:
ND

Emergency and First Aid Procedures:

General:
If unconcious, provide artificial respiration. Seek medical assistance as necessary. Treat symptomatically

Eyes:
Flush with clean water for at least 15 minutes while holding the eyelids open. Obtain medical attention.

Skin:
Remove contaminated clothing immediately. Wash effected areas with soap and water for at least 15 minutes. Seek medical attention if symptoms persist.

Inhalation:
Move effected person from risk of further exposure. Administer oxygen or artificial respiration as necessary. Obtain medical attention.

Ingestion:
Do not induce vomiting. Give 250ml od milk or water to drink. DO NOT GIVE LIQUIDS TO AN UNCONCIOUS PERSON. Consult physician

Carcinogenic Data:
NTP: No
OSHA: No
IARC: No

Toxicological Data:
ND

Section 6: Reactivity Data

Chemical Stability: ☒ Stable ☐ Unstable
Conditions to Avoid: Excessive cold.
Incompatibility (Materials to Avoid) : NA
Hazardous Decomposition Products: Under severe thermal degradation low molecular weight organic compounds may form.
Hazardous Polymerization (Reactivity) : ☐ May Occur ☒ Will Not Occur

Section 7: Spill and Leak Procedures:

Steps to be Taken in Case of Material Release or Spillage: Evacuate non-essential personel. Equip cleaning crew with protective clothing inclusive of rubber boots and gloves, long sleeve shirts and pants. Contain spill. Cover with absorbant material. Collect material in open containers

Waste Disposal Methods: Dispose at a licensed, permitted, waste disposal facility in accordance with federal, state, and local regulations

Ecological Information: ND

Ecotoxicity: ND

Section 8: Special Protection Information

Engineering Controls: Local exhaust and general ventilation is recommended
Respiratory Protection: NIOSH approved respirator must be worn.
Protective Gloves: Gloves of butyl, nitrile, or neoprene rubber must be worn.
Eye Protection: Chemical goggles or full face shield must be worn.
Other protective Equipment: Long sleeve shirts and pants must be worn. Eye wash station and/or shower should be easily accessible

Section 9: Handling and Storage

General: Store away from excessive cold. Keep from freezing.

Section 10: Supplemental Information

Health: 1 **Flammability**: 0 **Reactivity**: 0

DOT Proper Shipping Name: Liquid Latex
Hazard Class : NA
UN Number: NA
Packing Group: NA
IMO Shipping Data: NA
ICAO/IATA Shipping Data : NA
NMFC Shipping Class: 60

TSCA (Toxic Substance Control Act) :
All materials contained in this prduct are listed in the TSCA inventory.
CERCLA (Comprehensive Response Compensation and Liability Act):
None
SARA Title III:
Not subject to SARA reporting requirements

California Proposition 65 : Below is a list of compounds known to the State of California to cause cancer, birth defects, or other reproductive harm:
None

The information and recommendations contained herein are based upon data believed to be correct However, no guarantee or warranty of any kind, express or implied, is made with respect to the accuracy of the information contained herein We accept no responsibility and disclaim all liability for any harmful effects, which may be caused by exposure to our products Customers and users of this product must comply with all applicable health and safety laws, regulations and orders

(NA = Not Applicable) (NE = Not Established) (ND = No Data)
(NR = Not Required)

Material Safety Data Sheet

Section 1: Product Information

Manufacturer's Name / Address:

Floric Polytech
10280 Indiana Court
Rancho Cucamonga, CA 91730

Info. Phone:
909-483-1870

Emergency Phone:
909-560-4778

Trade Name: Stamp Overlay Liquid Polymer

Chemical Family: Latex Emulsion

Intended Use: Concrete Topping

D.O.T. Proper Shipping Name Liquid Latex

Initial Issue Date: 12/21/00 **Revision Date:** 5/17/05 **Prepared By:** B Strait

Section 2: Hazardous Ingredients

Hazardous Component	OSHA PEL	ACGIH TLV	Other Limits	% (Optional)
Ethylene Vinyl Acetate Copolymer (24937-78-8)	NE	NE	NE	NR

VOC of Component: 0g/L **VOC As Applied:**0g/L

Section 3: Physical Data

Boiling Point (°C):	100	**Specific Gravity:**	1.04
Vapor Pressure:	NE	**Melting Point:**	NA
Vapor Density:	>1	**Evaporation Rate:**	>1
(Air = 1)		**(Butyl Acetate = 1)**	
Solubility in Water:	Miscible	**pH:**	6.7
Freezing Point	0-10C		
Coefficient of Oil/Water Distribution:		ND	
Appearance and Odor:		Milky white with acetic odor.	
Odor Threshold:		NE	

Section 4: Fire and Explosion Hazard

Flash Point (°C):	>100
Conditions of Flammability:	NA
Flammable Limits:	**LEL:** ND **UEL:** ND
Autoignition Temperature (°C):	ND
Hazardous Combustion Products:	Carbon mooxide, carbon dioxide
Sensitivity to Impact:	None
Sensitivity to Static Discharge:	None
Extinguishing Media:	Water spray, dry chemical, carbon dioxide.
Special Firefighting Procedures:	If exposed to vapors wear self-contained breathing apparatus.
Unusual Fire and Explosion Hazards:	None known.

(NA = Not Applicable) (NE = Not Established) (ND = No Data)
(NR = Not Required)

Section 5: Health Hazard Data

Primary Routes of Entry: ☒ Eye ☒ Inhalation ☒ Skin Contact ☐ Ingestion
Overexposure Effects: Irritation of eyes, skin, and pulmonary tract
Conditions Aggravated by Exposure: Pulmonary and skin disorders

Health Hazards (Acute and Chronic Exposures):

Eyes

Acute:
Irritation, redness, and tearing
Chronic:
None known

Skin Contact

Acute:
May cause skin irritation and rash upon prolonged or repeated exposure.
Chronic:
None known

Skin Absorption

Acute:
Does not absorb through skin as supplied.
Chronic:
ND

Inhalation

Acute:
Exposure to vapors or spray mists may cause irritation of the nose, throat, and pulmonary tract. May cause labored breathing.
Chronic:
ND

Ingestion

Acute:
ND
Chronic:
ND

Emergency and First Aid Procedures:

General:
If unconcious, provide artificial respiration. Seek medical assistance as necessary. Treat symptomatically
Eyes:
Flush with clean water for at least 15 minutes while holding the eyelids open. Obtain medical attention
Skin:
Remove contaminated clothing immediately. Wash effected areas with soap and water for at least 15 minutes. Seek medical attention if symptoms persist
Inhalation:
Move effected person from risk of further exposure. Administer oxygen or artificial respiration as necessary. Obtain medical attention.
Ingestion:
Do not induce vomiting. Give 250ml od milk or water to drink. DO NOT GIVE LIQUIDS TO AN UNCONCIOUS PERSON. Consult physician.

Carcinogenic Data:
NTP: No
OSHA: No
IARC: No

Toxicological Data:
ND

Section 6: Reactivity Data

Chemical Stability: ☒ Stable ☐ Unstable
Conditions to Avoid: Excessive cold.
Incompatibility (Materials to Avoid) : NA
Hazardous Decomposition Products: Under severe thermal degradation low molecular weight organic compounds may form
Hazardous Polymerization (Reactivity) : ☐ May Occur ☒ Will Not Occur

Section 7: Spill and Leak Procedures:

Steps to be Taken in Case of Material Release or Spillage: Evacuate non-essential personel. Equip cleaning crew with protective clothing inclusive of rubber boots and gloves, long sleeve shirts and pants. Contain spill. Cover with absorbant material. Collect material in open containers.

Waste Disposal Methods: Dispose at a licensed, permitted, waste disposal facility in accordance with federal, state, and local regulations.

Ecological Information: ND

Ecotoxicity: ND

Section 8: Special Protection Information

Engineering Controls: Local exhaust and general ventilation is recommended
Respiratory Protection: NIOSH approved respirator must be worn.
Protective Gloves: Gloves of butyl, nitrile, or neoprene rubber must be worn
Eye Protection: Chemical goggles or full face shield must be worn.
Other protective Equipment: Long sleeve shirts and pants must be worn. Eye wash station and/or shower should be easily accessible.

Section 9: Handling and Storage

General: Store away from excessive cold. Keep from freezing.

Section 10: Supplemental Information

Health: 1 **Flammability:** 0 **Reactivity:** 0

DOT Proper Shipping Name: Liquid Latex
Hazard Class : NA
UN Number: NA
Packing Group: NA
IMO Shipping Data: NA
ICAO/IATA Shipping Data : NA
NMFC Shipping Class: 60

TSCA (Toxic Substance Control Act) :
All materials contained in this prduct are listed in the TSCA inventory
CERCLA (Comprehensive Response Compensation and Liability Act):
None
SARA Title III:
Not subject to SARA reporting requirements.

California Proposition 65 : Below is a list of compounds known to the State of California to cause cancer, birth defects, or other reproductive harm:
None

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, express or implied, is made with respect to the accuracy of the information contained herein We accept no responsibility and disclaim all liability for any harmful effects, which may be caused by exposure to our products Customers and users of this product must comply with all applicable health and safety laws, regulations and orders.

Material Safety Data Sheet

Section 1: Product Information

Manufacturer's Name / Address:

Floric Polytech
10280 Indiana Court
Rancho Cucamonga, CA 91730

Info. Phone:
909-483-1870

Emergency Phone:
909-560-4778

Trade Name: MT-200 Micro topping Regular Powder

Chemical Family: Cementitous Mortar

Intended Use: Concrete Topping

D.O.T. Proper Shipping Name Dry Mortar Mix

Initial Issue Date: 12/21/00 **Revision Date:** April 2005 **Prepared By:** B. Strait

Section 2: Hazardous Ingredients

Hazardous Component	OSHA PEL	ACGIH TLV	Other Limits	% (Optional)
Portland Cements (65977-15-1)	ND	ND	ND	10-25%
Silica Sand (7631-86-9)	ND	0.1 mg/M3		<50%
Calcium Carbonate (1317-65-3)	ND	ND	ND	>20%

VOC of Component: 0g/L **VOC As Applied:**0g/L

Section 3: Physical Data

Boiling Point (°C):	NA	**Specific Gravity:**	2.9
Vapor Pressure:	NA	**Melting Point:**	NE
Vapor Density: (Air = 1)	NA	**Evaporation Rate:** (Butyl Acetate = 1)	NA
Solubility in Water:	Slight	**pH:**	Alkaline when wet
Freezing Point	NA		
Coefficient of Oil/Water Distribution:		ND	
Appearance and Odor:		White powder w/ no odor	
Odor Threshold:		NE	

Section 4: Fire and Explosion Hazard

Flash Point (°C):	NA
Conditions of Flammability:	NA
Flammable Limits:	**LEL:** NA **UEL:** NA
Autoignition Temperature (°C):	NA
Hazardous Combustion Products:	None known
Sensitivity to Impact:	None
Sensitivity to Static Discharge:	None
Extinguishing Media:	NA
Special Firefighting Procedures:	NA
Unusual Fire and Explosion Hazards:	None

(NA = Not Applicable) (NE = Not Established) (ND = No Data)
(NR = Not Required)

Section 5: Health Hazard Data

Primary Routes of Entry: ☒ Eye ☒ Inhalation ☒ Skin Contact ☐ Ingestion
Overexposure Effects: Respiratory. skin, and eye irritation
Conditions Aggravated by Exposure: Asthma, pre-existing skin disorders.

Health Hazards (Acute and Chronic Exposures):

Eyes

Acute:
Drying, irritation, and redness
Chronic:
ND

Skin Contact

Acute:
Drying, irritation, redness Prolonged and repeated exposure to wet material may cause painful rash.
Chronic:
Allergic dermatitis may in hypersensitive individuals.

Skin Absorption

Acute:
Not absorbed through skin.
Chronic:
NA

Inhalation

Acute:
Irritation, labored breathing, drying of the nose and throat.
Chronic:
Excessive inhalation may result in respiratory disease, including silicois, pneamoconioisis, and pulmonary fibrosis Symptoms are progressive with continued exposure and increasing age.

Ingestion

Acute:
Alkali burns of the mouth, throat, and gastrointestinal tract.
Chronic:
ND

Emergency and First Aid Procedures:

General:
If unconscious, provide artificial respiration. Seek medical assistance as necessary.. Treat symptomatically.

Eyes:
Flush with clean water for at least 15 minutes while holding the eyelids open. Obtain medical attention

Skin:
Remove contaminated clothing immediately. Wash effected areas with soap and water for at least 15 minutes Seek medical attention if symptoms persist

Inhalation:
Move effected person from risk of further exposure Administer oxygen or artificial respiration as necessary. Obtain medical attention.

Ingestion:
Do not induce vomiting. Give 250ml od milk or water to drink DO NOT GIVE LIQUIDS TO AN UNCONCIOUS PERSON Consult physician

Carcinogenic Data:
NTP: ND
OSHA:ND
IARC: YES

Toxicological Data:
ND

Section 6: Reactivity Data

Chemical Stability: ☒ Stable ☐ Unstable
Conditions to Avoid: High humidity.
Incompatibility (Materials to Avoid) : Fluorine, acids, water.
Hazardous Decomposition Products: Calcium Oxide.
Hazardous Polymerization (Reactivity) : ☐ May Occur ☒ Will Not Occur

Section 7: Spill and Leak Procedures:

Steps to be Taken in Case of Material Release or Spillage: Evacuate non-essential personel. Equip cleaning crew with protective clothing inclusive of rubber boots and gloves, long sleeve shirts and pants. Contain spill. Cover with absorbant material Collect material in open containers

Waste Disposal Methods: Dispose at a licensed, permitted, waste disposal facility in accordance with federal, state, and local regulations.

Ecological Information: ND

Ecotoxicity: ND

Section 8: Special Protection Information

Engineering Controls: Local exhaust and general ventilation is recommended
Respiratory Protection: NIOSH approved respirator must be worn.
Protective Gloves: Gloves of butyl, nitrile, or neoprene rubber must be worn.
Eye Protection: Chemical goggles or full face shield must be worn.
Other protective Equipment: Long sleeve shirts and pants must be worn. Eye wash station or shower should be locally accessible

Section 9: Handling and Storage

General: Store away from moisture.

Section 10: Supplemental Information

Health: 2 **Flammability:** 0 **Reactivity:** 0

DOT Proper Shipping Name: Dry Mortar Mix
Hazard Class : NA
UN Number: NA
Packing Group: NA
IMO Shipping Data: NA
ICAO/IATA Shipping Data :NA
NMFC Shipping Class: 50

ISCA (Toxic Substance Control Act) :
Al substance contained in this product are listed in the ISCA inventory.
CERCLA (Comprehensive Response Compensation and Liability Act):
None.
SARA Title III:
ND

California Proposition 65 : Below is a list of compounds known to the State of California to cause cancer, birth defects, or other reproductive harm:
Silicon Dioxide

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, express or implied, is made with respect to the accuracy of the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects, which may be caused by exposure to our products. Customers and users of this product must comply with all applicable health and safety laws, regulations and orders.

(NA = Not Applicable) (NE = Not Established) (ND = No Data)
(NR = Not Required)

Material Safety Data Sheet

Section 1: Product Information

Manufacturer's Name / Address:

Floric Polytech
10280 Indiana Court
Rancho Cucamonga, CA 91730

Info. Phone:
909-483-1870

Emergency Phone:
909-560-4778

Trade Name: MT-200 Micro topping Regular Powder

Chemical Family: Cementitous Mortar

Intended Use: Concrete Topping

D.O.T. Proper Shipping Name Dry Mortar Mix

Initial Issue Date: 12/21/00 **Revision Date:** April 2005 **Prepared By:** B. Strait

Section 2: Hazardous Ingredients

Hazardous Component	OSHA PEL	ACGIH TLV	Other Limits	% (Optional)
Portland Cements (65977-15-1)	ND	ND	ND	10-25%
Calcium Carbonate (1317-65-3)	ND	ND	ND	<50%

VOC of Component: 0g/L **VOC As Applied:** 0g/L

Section 3: Physical Data

Boiling Point (°C):	NA	**Specific Gravity:**	2.9
Vapor Pressure:	NA	**Melting Point:**	NE
Vapor Density: (Air = 1)	NA	**Evaporation Rate:** (Butyl Acetate = 1)	NA
Solubility in Water:	Slight	**pH:**	Alkaline when wet
Freezing Point	NA		
Coefficient of Oil/Water Distribution:		ND	
Appearance and Odor:		White powder w/ no odor	
Odor Threshold:		NE	

Section 4: Fire and Explosion Hazard

Flash Point (°C):	NA
Conditions of Flammability:	NA
Flammable Limits:	**LEL:** NA **UEL:** NA
Autoignition Temperature (°C):	NA
Hazardous Combustion Products:	None known
Sensitivity to Impact:	None
Sensitivity to Static Discharge:	None
Extinguishing Media:	NA
Special Firefighting Procedures:	NA
Unusual Fire and Explosion Hazards:	None

(NA = Not Applicable) (NE = Not Established) (ND = No Data)
(NR = Not Required)

Section 5: Health Hazard Data

Primary Routes of Entry: ☒ Eye ☒ Inhalation ☒ Skin Contact ☐ Ingestion
Overexposure Effects: Respiratory, skin, and eye irritation
Conditions Aggravated by Exposure: Asthma, pre-existing skin disorders.

Health Hazards (Acute and Chronic Exposures):

Eyes

Acute:
Drying, irritation, and redness
Chronic:
ND

Skin Contact

Acute:
Drying, irritation, redness Prolonged and repeated exposure to wet material may cause painful rash.
Chronic:
Allergic dermatitis may in hypersensitive individuals.

Skin Absorption

Acute:
Not absorbed through skin.
Chronic:
NA

Inhalation

Acute:
Irritation, labored breathing, drying of the nose and throat.
Chronic:
Excessive inhalation may result in respiratory disease, including silicois, pneamoconioisis, and pulmonary fibrosis. Symptoms are progressive with continued exposure and increasing age

Ingestion

Acute:
Alkali burns of the mouth, throat, and gastrointestinal tract.
Chronic:
ND

Emergency and First Aid Procedures:

General:
If unconscious, provide artificial respiration. Seek medical assistance as necessary Treat symptomatically
Eyes:
Flush with clean water for at least 15 minutes while holding the eyelids open. Obtain medical attention.
Skin:
Remove contaminated clothing immediately Wash effected areas with soap and water for at least 15 minutes. Seek medical attention if symptoms persist
Inhalation:
Move effected person from risk of further exposure Administer oxygen or artificial respiration as necessary. Obtain medical attention.
Ingestion:
Do not induce vomiting. Give 250ml od milk or water to drink DO NOT GIVE LIQUIDS IO AN UNCONCIOUS PERSON. Consult physician.

Carcinogenic Data:
NTP: ND
OSHA:ND
IARC: YES

Toxicological Data:
ND

Section 6: Reactivity Data

Chemical Stability: ☒ Stable ☐ Unstable
Conditions to Avoid: High humidity.
Incompatibility (Materials to Avoid) : Fluorine, acids, water
Hazardous Decomposition Products: Calcium Oxide
Hazardous Polymerization (Reactivity) : ☐ May Occur ☒ Will Not Occur

Section 7: Spill and Leak Procedures:

Steps to be Taken in Case of Material Release or Spillage: Evacuate non-essential personel. Equip cleaning crew with protective clothing inclusive of rubber boots and gloves, long sleeve shirts and pants. Contain spill. Cover with absorbant material. Collect material in open containers.

Waste Disposal Methods: Dispose at a licensed, permitted, waste disposal facility in accordance with federal, state, and local regulations.

Ecological Information: ND

Ecotoxicity: ND

Section 8: Special Protection Information

Engineering Controls: Local exhaust and general ventilation is recommended
Respiratory Protection: NIOSH approved respirator must be worn.
Protective Gloves: Gloves of butyl, nitrile, or neoprene rubber must be worn.
Eye Protection: Chemical goggles or full face shield must be worn
Other protective Equipment: Long sleeve shirts and pants must be worn Eye wash station or shower should be locally accessible

Section 9: Handling and Storage

General: Store away from moisture.

Section 10: Supplemental Information

Health: 2 **Flammability**: 0 **Reactivity**: 0

DOT Proper Shipping Name: Dry Mortar Mix
Hazard Class : NA
UN Number: NA
Packing Group: NA
IMO Shipping Data: NA
ICAO/IATA Shipping Data :NA
NMFC Shipping Class: 50

TSCA (Toxic Substance Control Act) :
Al substance contained in this product are listed in the TSCA inventory
CERCLA (Comprehensive Response Compensation and Liability Act):
None
SARA Title III:
ND

California Proposition 65 : Below is a list of compounds known to the State of California to cause cancer, birth defects, or other reproductive harm:
Silicon Dioxide

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, express or implied, is made with respect to the accuracy of the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects, which may be caused by exposure to our products. Customers and users of this product must comply with all applicable health and safety laws, regulations and orders.

(NA = Not Applicable) (NE = Not Established) (ND = No Data)
(NR = Not Required)

Material Safety Data Sheet

Section 1: Product Information

Manufacturer's Name / Address:

Floric Polytech
10280 Indiana Court
Rancho Cucamonga, CA 91730
Info. Phone:
909-483-1870
Emergency Phone:
909-560-4778

Trade Name: MT-200 Smooth Powder

Chemical Family: Cementitous Mortar

Intended Use: Concrete Topping

D.O.T. Proper Shipping Name Dry Mortar Mix

Initial Issue Date: 12/21/00 **Revision Date:** April 2005 **Prepared By:** B. Strait

Section 2: Hazardous Ingredients

Hazardous Component	OSHA PEL	ACGIH TLV	Other Limits	% (Optional)
Portland Cements (65977-15-1)	ND	ND	ND	10-25%
Calcium Carbonate (1317-65-3)	ND	ND	ND	<50%

VOC of Component: 0g/L **VOC As Applied:**0g/L

Section 3: Physical Data

Boiling Point (°C):	NA	**Specific Gravity:**	2.9
Vapor Pressure:	NA	**Melting Point:**	NE
Vapor Density:	NA	**Evaporation Rate:**	NA
(Air = 1)		**(Butyl Acetate = 1)**	
Solubility in Water:	Slight	**pH:**	Alkaline when wet
Freezing Point	NA		
Coefficient of Oil/Water Distribution:		ND	
Appearance and Odor:		White powder w/ no odor	
Odor Threshold:		NE	

Section 4: Fire and Explosion Hazard

Flash Point (°C):	NA
Conditions of Flammability:	NA
Flammable Limits:	**LEL:** NA **UEL:** NA
Autoignition Temperature (°C):	NA
Hazardous Combustion Products:	None known.
Sensitivity to Impact:	None
Sensitivity to Static Discharge:	None
Extinguishing Media:	NA
Special Firefighting Procedures:	NA
Unusual Fire and Explosion Hazards:	None

(NA = Not Applicable) (NE = Not Established) (ND = No Data)
(NR = Not Required)

Section 5: Health Hazard Data

Primary Routes of Entry: ☒ Eye ☒ Inhalation ☒ Skin Contact ☐ Ingestion
Overexposure Effects: Respiratory, skin. and eye irritation.
Conditions Aggravated by Exposure: Asthma, pre-existing skin disorders.

Health Hazards (Acute and Chronic Exposures):

Eyes

Acute:
Drying, irritation, and redness
Chronic:
ND

Skin Contact

Acute:
Drying, irritation, redness Prolonged and repeated exposure to wet material may cause painful rash.
Chronic:
Allergic dermatitis may in hypersensitive individuals.

Skin Absorption

Acute:
Not absorbed through skin
Chronic:
NA

Inhalation

Acute:
Irritation, labored breathing, drying of the nose and throat
Chronic:
Excessive inhalation may result in respiratory disease, including silicois, pneamoconioisis, and pulmonary fibrosis Symptoms are progressive with continued exposure and increasing age.

Ingestion

Acute:
Alkali burns of the mouth, throat, and gastrointestinal tract.
Chronic:
ND

Emergency and First Aid Procedures:

General:
If unconscious, provide artificial respiration. Seek medical assistance as necessary. Treat symptomatically.
Eyes:
Flush with clean water for at least 15 minutes while holding the eyelids open. Obtain medical attention.
Skin:
Remove contaminated clothing immediately. Wash effected areas with soap and water for at least 15 minutes. Seek medical attention if symptoms persist.
Inhalation:
Move effected person from risk of further exposure. Administer oxygen or artificial respiration as necessary Obtain medical attention.
Ingestion:
Do not induce vomiting. Give 250ml od milk or water to drink DO NOT GIVE LIQUIDS TO AN UNCONCIOUS PERSON Consult physician

Carcinogenic Data:
NTP: ND
OSHA:ND
IARC: YES

Toxicological Data:
ND

Section 6: Reactivity Data

Chemical Stability: ☒ Stable ☐ Unstable
Conditions to Avoid: High humidity.
Incompatibility (Materials to Avoid) : Fluorine, acids, water
Hazardous Decomposition Products: Calcium Oxide.
Hazardous Polymerization (Reactivity) : ☐ May Occur ☒ Will Not Occur

Section 7: Spill and Leak Procedures:

Steps to be Taken in Case of Material Release or Spillage: Evacuate non-essential personel. Equip cleaning crew with protective clothing inclusive of rubber boots and gloves, long sleeve shirts and pants. Contain spill. Cover with absorbant material. Collect material in open containers.

Waste Disposal Methods: Dispose at a licensed, permitted, waste disposal facility in accordance with federal, state, and local regulations.

Ecological Information: ND

Ecotoxicity: ND

Section 8: Special Protection Information

Engineering Controls: Local exhaust and general ventilation is recommended
Respiratory Protection: NIOSH approved respirator must be worn
Protective Gloves: Gloves of butyl, nitrile, or neoprene rubber must be worn.
Eye Protection: Chemical goggles or full face shield must be worn
Other protective Equipment: Long sleeve shirts and pants must be worn. Eye wash station or shower should be locally accessible.

Section 9: Handling and Storage

General: Store away from moisture

Section 10: Supplemental Information

Health: 2 **Flammability**: 0 **Reactivity**: 0

DOT Proper Shipping Name: Dry Mortar Mix
Hazard Class : NA
UN Number: NA
Packing Group: NA
IMO Shipping Data:
ICAO/IATA Shipping Data :
NMFC Shipping Class: 50

TSCA (Toxic Substance Control Act) :
Al substance contained in this product are listed in the TSCA inventory
CERCLA (Comprehensive Response Compensation and Liability Act):
None
SARA Title III:
ND

California Proposition 65 : Below is a list of compounds known to the State of California to cause cancer, birth defects, or other reproductive harm:
Silicon Dioxide

The information and recommendations contained herein are based upon data believed to be correct However, no guarantee or warranty of any kind, express or implied, is made with respect to the accuracy of the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects, which may be caused by exposure to our products Customers and users of this product must comply with all applicable health and safety laws, regulations and orders

Appendix C Inventory of Products in Warehouses

Product ID	Manufacturer	Product ID	Manufacturer
4 Chlorobenzo Triflouride (or Oxall 100)	—	Masco Seal Acrylic Sealer	Masco
Acetone	—	Mascoseal Acrylic Sealer	Masco
Action Kote	Masco	Mascote Premium	Masco
Armaflex 520 Adhesive	Armaflex	Mascote VOC	Masco
Armor All	—	Master Painter - Interior Latex Paint	Rodda (?)
Camie 363 High Strength Fast Tack	Camie	Med-Cure	WR Meadows
Caulk	—	MEK	—
Chromastain	Floric Polytech	Meta Caulk 1000	Symons
Citri Clean	—	Moisture Block A+B	Floric Polytech
Clear Seal WB / 50	Tamms	MT 200 Liquid Polymer	Floric Polytech
CS 101 Clear Seal	Floric Polytech	MT-200 Liquid Polymer	Floric Polytech
Cure and Hard	Symons	Perma Weld Adhesive	Johns Manville
Day-Chem Rez Cure	Dayton Superior	Pro Patina	—
Eco-Adhesive	MEI	Profilm Concentrate	Unitex
Eco-Hanger Grip Adhesive	MEI	Raeco R-2000	Raeco
Eco-Mastic	MEI	Raeco R-25 Latex Admixture	Raeco
Eco-Perm Coating	MEI	Raeco R-50 Latex Admixture	Raeco
Eco-Vapor Cote Coating 55-10	MEI	Rector Seal	Rector Seal
Epamine HB Primer	Floric Polytech	Resi Chem Clear	Symons
Flexolith LV	Tamms	Rodda Latex Paint	Rodda
Glass Cleaner	—	Safe Cure and Seal J-18	Dayton Superior
Hey'di Powder X	Tamms	Slow Dry 5	—
HLM 5000	Sonneborn	Speed Crete Blue Line	Tamms
Horncure WB 30-C	Tamms	Speed Crete Red Line	Tamms
Hornolith	Tamms	ST-200 Stamp-Overlay	Floric Polytech
Hub Stick	—	Strata Seal Waterproofing	Cetco
Instant Grout	—	Super Flow Rock	Lyons Man.
Leaktite Adhesive	IMCOA	T Pulse	—
Lubriplate	Fiske Brothers	Tamms Cement Wash	Tamms
Luster Seal 300	Tamms	Thoroc Plug	Tho-Roc
Magic Kote	Symons	Tite Fit 30-35	Foster
Marking Paint	—	Toluene	—
Masco Cure ARC	Masco	Volclay WB Adhesive	Cetco
Masco Cure Biocure	Masco	WB/Finish	Armaflex
Masco Cure Cure and Seal 25%	Masco	Weld Crete	Larsen
Masco Cure, Cure and Seal 25% FDUV	Masco	Welding Adhesive	Proto (?)
Masco Kote	Masco	Xylene	—
Masco Kote Biokote	Masco		

Appendix D

Air Sampling Photographs and Field Notes

December 2005 Ambient Air Photos: Sub-slab Investigation Field Work Photo Log

Ambient Air Location AA-2, facing south-east

Ambient Air Location AA-1, facing east

December 2005 Ambient Air Photos: Sub-slab Investigation Field Work Photo Log

Ambient Air Location AA-3, facing south-west

Ambient Air Location AA-3, facing east

December 2005 Ambient Air Photos: Sub-slab Investigation Field Work Photo Log

Ambient Air Location AA-4, facing east

Ambient Air Location AA-5, facing north-east

December 2005 Sub-slab Investigation Field Work Photo Log

Indoor Air Location IA-1 Sampling

Indoor Air Location IA-2 Sampling

Indoor Location Air IA-3 Setup

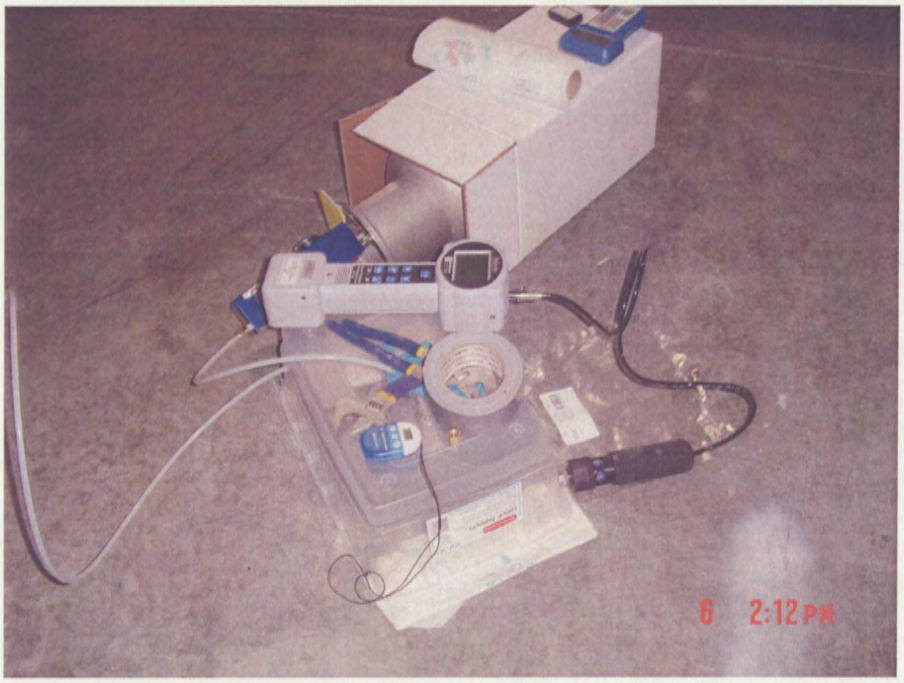
Indoor Air Location IA-4 Sampling

Indoor Air Location IA-5 Setup (canisters staged on the floor in the foreground and on the right side of the desk)

Indoor Air Location IA-6 (additional location)

Sub-slab Sample Probe and Gauges

Sub-slab Sampling Probe (after removed from a sample location)



Sub-slab Sampling Equipment Setup

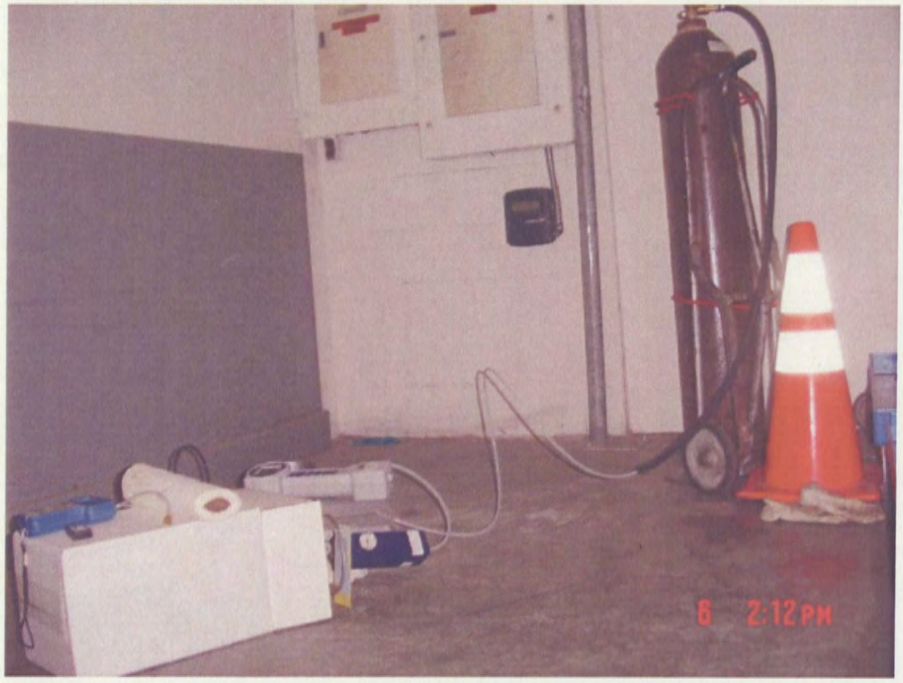
Sub-slab Sample Location V-1 – Drilling Sample Probe Location

Sub-slab Sample Location V-2 – Sampling Set up

Sub-slab Sample Location V-3 – Sampling Setup

December 2005 Sub-slab Investigation Field Work Photo Log

Sub-slab sample location V-4 – Sub-slab Sample Purging setup



Sub-slab Sample Location V-5 – Sub-slab Sample Collection Setup

FIELD ACTIVITY LOG

RETEC

PROJECT GE- indoor/outdoor Air COMPLETED BY J. Waite

JOB NO. GE001-18600 750 APPROVED BY

DAY & DATE 12/5/05 SHEET 1 OF 1

FIELD ACTIVITY SUBJECT:
DESCRIPTION OF DAILY ACTIVITIES AND EVENTS: Indoor and Ambient Air Sampling

Indoor / Outdoor Air Summa Canister Set up

TIME		canister (Summa) #	initial vacuum (in Hg)	time	final vacuum	time
	Indoor					
	IA-1	12037	-23/30"	5:05	2/-7	
	IA-2	34742	-24/30"	5:17	4.5/-7.5	
	IA-3	34369	-23.5/30"	5:02	2.5/-6	16:14
	IA-4	34343	-24/30"	7:55	2.5/-7	16:02
	IA-5	33896	-24/28	8:04	3/-5	
	IA-6	31447	-23.5/30"	8:20	2.5/-8.5	
	IA-20*	33339	-23.5/30"	8:13	2/-7	
	Outdoor					
	AA-1	3783	-24/30"	8:41	2.5/10	16:42
	AA-2	34479	-23.5/30	8:36	5.5/	16:37
	AA-3	11982	-23.5/29.5	8:52	1/5	
	AA-4	33971	-18/30"	8:54	1.5/6	16:59
	AA-5	22508	-23.5/30"	8:44	1.5/6	16:48

* did not zero

final vacuum should be less than 5 but greater than 1.0 in Hg

* Duplicate Sample

VISITORS ON SITE: Dean Yasuda, Ed Jones, Erdogy Am
Dave Dantin - geosyntec on site at 1614

CHANGES FROM PLANS OR IMPORTANT DECISIONS

WEATHER CONDITIONS: cold. Cloudy, wind SE/SSE

IMPORTANT TELEPHONE CALLS:

PERSONNEL ON SITE:

FIELD ACTIVITY LOG

RETEC

PROJECT GEAE — COMPLETED BY J. Stevens

JOB NO. GE001-18600-750 — APPROVED BY _____

DAY & DATE Monday — SHEET 1 OF 3

FIELD ACTIVITY SUBJECT:
DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

TIME	
0600	Arrive at office pack van
	· Summa Cans / ladders / concs
0650	leave office for GE
0700	Arrive at site
0708	John Finn on site / Jim Summa on site
0712	Site Safety Meeting. Led by Jill
	· lifting / putting regulators on a cutting hands
0718	Jill / John / Jim start checking pressure in cans
	Janie - continues to set ladders up at indoor/outdoor
	air samplers
0758	Start putting out can
	see page 2 for sample start times
0755	Dean Yamada arrives on site Ed Wallace arrive aprox 0815
0940	Dean / Ed leave site
	John Finn - leaves site aprox 0820
	Jill / Jim continue to collect photos
	JS puts umbrellas up at all sample outdoor
	locations
0958	Jill / Jim leave site
1020	JS leaves site
1210	Jill and Jim check pressure at site - all ok
1400	JS arrive on site

VISITORS ON SITE: CHANGES FROM PLANS OR IMPORTANT DECISIONS

Ed Jones / Dean Y - Ecology

WEATHER CONDITIONS: IMPORTANT TELEPHONE CALLS:

40's - dry

PERSONNEL ON SITE:

Jill Lantz, James Stevens, John Flinn

FIELD ACTIVITY LOG

RETEC

PROJECT GEAE | COMPLETED BY JStevens

JOB NO. GE001-18620-750 | APPROVED BY _____

DAY & DATE 12/5/05 | SHEET 2 OF 3

FIELD ACTIVITY SUBJECT:
DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

TIME	
1402	JS check Pressure
1412	Husdan Bay Insulation – 3 packed vehicals inside (1 Box Van, 1 truck-pickup, 1 VAN) and 1 additonal Box Van backed in while I was inside building
1418	Manson Supply- heavy forklift traffic. Pallets (at least 5) had been moved to 1A-2 & 1A-20 sample locations
1428	All pressures ok
1429	Photo of closed hudson bay door
1432	2 photos inside hudson bay (2 Box trucks looking East truck & Van looking West)
1434	Photo of Manson Supply storage area - looking N 1A-2 & 1A-20
	Photo of demonstration area (w/ bags of trash in photo)
	Forklift – Mitsubishi F.21 25
1437	1A-3. metal crow bar infront
1445	collect photos of AA-1 to demonstrate traffic flow
1450	Noticed people smoking as they walk towards the entrance door of Mckinstry Services - as they walk by AA-2
1452	Start on COC and paperwork
1500	Flag direction blowing N/W - wind from SE (Flag over ~~hudson~~ Mckinstry bldg-East Side)

VISITORS ON SITE: yes **CHANGES FROM PLANS OR IMPORTANT DECISIONS**

see pg 1

WEATHER CONDITIONS:

see pg 1

IMPORTANT TELEPHONE CALLS:

PERSONNEL ON SITE:

see pg 1

FIELD ACTIVITY LOG

RETEC

PROJECT GEAE — COMPLETED BY J. Stevens

JOB NO. GE001-18600-750 — APPROVED BY _____

DAY & DATE Monday — SHEET 3 OF 3

FIELD ACTIVITY SUBJECT:
DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

TIME	
1508	Check Pressure
1511	Photo of IA-2 & IA-20, photo of AA-4
1521	All ok.
1522	Idling truck by AA-3, asked driver to turn off engine
1556	Jill Lantz/Jim Sumner on site
1558	start taking canisters down
1602	IA-5 - END -5
1605	IA-~~1~~ - End -7
1605	
1614	IA-3 End -6
1617	IA-2 END -9.5 IA-20 -8.0
1621	IA-6 END -8.5
1636	~~AA~~-2 END- 5.5
1642	~~AA~~-1 END -10.0
1653	AA3 END -5.0
1659	AA4 END -6.0
1710	Everyone leaves site
1720	unload equipment at office
1730	Pack up samples and prepare COC
1845	leave office
	end 12/05/05

VISITORS ON SITE:

See pg 1

CHANGES FROM PLANS OR IMPORTANT DECISIONS

WEATHER CONDITIONS:

See pg 1

IMPORTANT TELEPHONE CALLS:

PERSONNEL ON SITE:

See pg 1

FIELD ACTIVITY LOG

RETEC

PROJECT GCAE — COMPLETED BY JS

JOB NO. GCAE-18600-750 — APPROVED BY _____

DAY & DATE Tuesday 12/6/05 — SHEET 1 OF 3

FIELD ACTIVITY SUBJECT:
DESCRIPTION OF DAILY ACTIVITIES AND EVENTS: Sub slab sampling

TIME	
06:15	JS at office - load up van with equipment
06:45	Jill Lantz at office
0700	Jill Lantz / J. Stevens on site
	Dave already on site
0705	load equipment into building
0715	went over HSS plan - John Finn on site
0722	site specific JHA/tailgate meeting - John Finn lead
	• vehicals inside building
	• trip / slip / fall
	• drilling safety - dust / electrical / hearing protect
	• cement
	• clinder - on cart (should not need to move it)
0727	Start drilling at V-1
	concrete slab aprox 10" thick
0731	Evaluated - EHS checklist
	.2 .04
	.1 .02
0802	Start helium leak methods
0855	seal not setting - leave site to go to home depot to collect another kind of cement
0928	Back on site - reset V-1 probe
0939	Dan Yourd in from Ecology on site

VISITORS ON SITE: Dan Yourd - Ecology Ed Jones Ecology Jim Sumner, JohnFinn, Dave Bertaud

CHANGES FROM PLANS OR IMPORTANT DECISIONS

WEATHER CONDITIONS:

IMPORTANT TELEPHONE CALLS:

PERSONNEL ON SITE:
see above

FIELD ACTIVITY LOG

RETEC

PROJECT GENE
JOB NO. GE001-18.02 750
DAY & DATE Tuesday 12/6/05

COMPLETED BY J. Steven
APPROVED BY
SHEET 2 OF 3

FIELD ACTIVITY SUBJECT:
DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

TIME	
0955	Seal set at V-1, start initial testing
	.1 30 inch H_2S 3min
	41.2 Helium percent ranges
	64.6
1019	4.4 Test #1
	40.4 38
	66.9 67.1
	2106 ppm - limited air flow, adjust to collect the next sample
1041	V-5
	VACUUM - NOT measurable
	36.1) SO2
	79.7)
1116	Round 2 81.0 32.1) SO2
	1130
	Round 3 31.2 81.2 SO2
	Moved 16' to the North
	VP-5 ~~33962~~ ~~2625~~
	1347 34406 initial -~~24.0~~ in Hg
	30933
1400	Moved back to VP-1, moved hole 20" to North

VISITORS ON SITE:
see pg 1

CHANGES FROM PLANS OR IMPORTANT DECISIONS
Moved VP-5 18" to the North
Moved VP-1 20' to the North

WEATHER CONDITIONS:
see pg 1

IMPORTANT TELEPHONE CALLS:

PERSONNEL ON SITE:
see pg 1

FIELD ACTIVITY LOG

RETEC

PROJECT GEAE
JOB NO. GEAA-18600760
DAY & DATE Tuesday 12/05/05

COMPLETED BY J. Stevens
APPROVED BY
SHEET 3 OF 3

FIELD ACTIVITY SUBJECT:
DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

TIME	
1408	VP-5
	Pressure maintained around 35 40 Z
	checked pressure on canister
	final pressure 0.0
	Flow controller read 2.5 at end
	did notice that it dropped
	VP1 - 30123 -26.5
	initial pressure start time
1502	25 MIN - start time
1521	set up at VP-2 RUN off electrical
1526	Final pressure VP- 1.0
1538	4157 - V-2 Initial pressure -26.5
	~~2675~~ CS
1610	Start time V-2
1640	final pressur -4.2
1642	Remove equipment. Left helium inside, ~~canister~~ manometer supply
1710	JS/Jim Sumner/John Flinn/Dave leave site
1730	JS back at office
	· complete COC
	· pack samples for fedex
1600	JS leaves site/office

VISITORS ON SITE:
See Pg 1

CHANGES FROM PLANS OR IMPORTANT DECISIONS

WEATHER CONDITIONS:
See Pg 1

IMPORTANT TELEPHONE CALLS:

PERSONNEL ON SITE:
See Pg 1

FIELD ACTIVITY LOG

RETEC

PROJECT GEAE — COMPLETED BY J. Stevens

JOB NO. GE001-18600.750 — APPROVED BY _____

DAY & DATE 12/7/05 Wednesday — SHEET 1 OF 1

FIELD ACTIVITY SUBJECT:
DESCRIPTION OF DAILY ACTIVITIES AND EVENTS: subslab sampling

TIME	
0700	JS/DF/DB/JL on site
	Site safety meeting
	· slow down · heavy lifting · compressed gas cylinder
	· watch for traffic · pinch points · use correct tool
0710	Move equipment to V-3 – will redrill hole
0720	JS calibrates equipment
	MINI RAE 2000 #
	calibrated 12/7/05 J. Stevens
0803	V-3 Canister 24219 initial pressure = 27.5
	9.5 thickness
0813	leak detections pass
0834	Sample time V-3
0926	final pressure - 2.5 - rec 28 min
0929	Moved to V-4 set up at Hudson Bay Insulation
	check pressure
	27.5 #12.026
0938	John Finn leaves site
0957	leak test pass
	~~54.7~~ 90.1 49.1
1010	L Baker off site
1015	Start V-4 ran for 26 min Final vac = 1.75
1055	Move to ~~MW~~ V-1 to collect duplicate sample

VISITORS ON SITE:

Dave Bertand - Geosyntech

CHANGES FROM PLANS OR IMPORTANT DECISIONS

WEATHER CONDITIONS:

dry - 40's

IMPORTANT TELEPHONE CALLS:

PERSONNEL ON SITE:

L. Baker / J. Lantz / John Finn / J. Stevens

FIELD ACTIVITY LOG

RETEC

PROJECT GE AE — COMPLETED BY JSteers

JOB NO. GE001-18600-750 — APPROVED BY _____

DAY & DATE 12/7/05 Wednesday — SHEET 2 OF 2

FIELD ACTIVITY SUBJECT:
DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

TIME	
1059	Jill Lantz leaves site
1204 VP-10	initial 27.5 #34310
	first leak test pass
1142	Start V-10 sample
	final -1.5
1230	Start taking down equipment
	subslab pressure measurement remain
	Jill Lantz / Dave will remove at 15:45.
1255	JS/Dave leave site
1310	Back at office - pack up samples and equipment
	end
	12/07/05

VISITORS ON SITE: — CHANGES FROM PLANS OR IMPORTANT DECISIONS

see pg 1

WEATHER CONDITIONS: — IMPORTANT TELEPHONE CALLS:

see pg 1

PERSONNEL ON SITE:

see pg 1

FIELD ACTIVITY LOG

RETEC

PROJECT GEAE
COMPLETED BY J. Stevens
JOB NO. GE001-18600-750
APPROVED BY
DAY & DATE Thursday 12/08/05
SHEET 1 OF 1

FIELD ACTIVITY SUBJECT:
DESCRIPTION OF DAILY ACTIVITIES AND EVENTS: Pull pressure logger at V-3

TIME	
1438	Leave Retec for site
	Gather data from Tuesday and Wed
1650	Arrive on site - let Manson Supply know we are onsite
	Remove Pressure logger
	Patch with leak stopper
1710	leave site -
1728	Pack sample for fedex
	end 12/08/05

VISITORS ON SITE:
none

CHANGES FROM PLANS OR IMPORTANT DECISIONS

WEATHER CONDITIONS:
Clear - 40's

IMPORTANT TELEPHONE CALLS:

PERSONNEL ON SITE:
Jill Lartz and Jamie Stevens

SOIL GAS PROBE MEASUREMENTS

GeoSyntec Consultants
130 Research Lane, Suite 2
Guelph, Ontario, Canada N1G 5G3
(519)822-2230 Fax (519)822-3151

Project Name: GE Seattle
Project Number: TR0217
Phase Number: 02
Date: Dec 6, 05 Weather:
Field Personnel: D. Bertrand
Recorded By: D. Bertrand
Tracer Gas: Helium

Probe No V-1 (2nd Attempt) ☒ Sub-slab probe ☐ Soil gas probe
PID Model Number: Mini Rae 2000 Lamp: 10.6 / 11.7 eV
PID Serial Number: —
Landtech GEM 2000 Landfill Gas Meter Serial Number: —
Helium detector (model and serial number) —
Air Temperature — (°C/°F) Atmospheric Pressure — (in. Hg)

Field tubing blank reading (ppm_v)	0.0	Time	1355	Initial Pressure/ Vacuum (Prior to Pumping)	0.0	Time	1357

Surface Type: ☐ Asphalt ☒ Concrete ☐ Grass ☐ Other
Surface Thickness 10-15" (inches/centimeters) ☐ Unknown
(ie. asphalt or concrete surface)
Drilled down about 18"

Casing Volume
☒ Sub-slab <0.1 L
Soil gas probe (L)

Start of Pneumatic Testing:

Elapsed Time (min.)	Pump Flow Rate (LPM)	Well Head Vacuum inches H_2O
	3.0	
	1.0	
1.5	0.4	0.095
1.0	0.2	0.01

Start Time	End Time	Elapsed Time (min.)	Bag Volume (L)	Purge Rate (LPM)	Cumulative Volume (L)	Well Head Vacuum (inches H_2O)	CH_4 (%)	CO_2 (%)	O_2 (%)	Tracer Gas (%) Shroud Min	Tracer Gas (%) Shroud Max	Tracer Gas (%) Sample	VOC_s by PID (ppm_v)
1430	1434	4	0.8	0.2	0.8	0.03	0.0	0.9	17.9	36	70.7	800ppm	0.0
1438	1442.30	4.5	0.9	0.2	1.7	0.03	0.0	1.8	17.5	34	80.1	600ppm	0.0
1446	1450	4.0	1.7	0.2	2.5	0.04	0.0	2.3	17.3	22	73	200ppm	0.0
1502	~~1532~~ 1527	~~35~~	3mm 6L	0.2	8.5	—	—	—	—	25	83	—	—

Time	Location	Sample ID	Summa Canister ID	Initial Vacuum (in Hg)	Final Vacuum (in. Hg)
15:02	V-1	V-1	30933	-26.5	-1.2

Comments:

SOIL GAS PROBE MEASUREMENTS

GeoSyntec Consultants
130 Research Lane, Suite 2
Guelph, Ontario, Canada N1G 5G3
(519)822-2230 Fax (519)822-3151

Project Name: GE Seattle
Project Number: TR0217.02
Site Location: Seattle
Date: Dec. 7 05 Weather:
Field Personnel: D. Bertrand
Recorded By: D. Bertrand
Tracer Gas: Helium

Probe No VAP V-10 (Resample of V-1)
PID Model Number: Mini Rae 2000 Lamp: (10.6) / 11.7 eV
PID Serial Number: Purge Time /Volume:
Pump Model & Serial Number: Gast Pump

Initial Pressure 0.0 "H_2O @ 11:05

Field tubing blank reading (ppmv)	0.0	Time	11:00

Surface: ☐ Asphalt ☒ Concrete ☐ Grass ☐ Other
Thickness _____ inches/centimeters ☐ Unknown

1 Casing Volume	Air Temp (°C)
40.1L (L)	—

Start Time	End Time	Elapsed Time (min.)	Purge Rate (LPM)	Bag Volume (L)	Cumulative Volume (L)	Well Head Vacuum (inches H_2O)	CH_4 (%)	CO_2 (%)	O_2 (%)	Tracer Gas (%)		VOCs by PID (ppmv)
										Shroud	Sample	
11:15	11:19	4	0.2	0.8	0.8	003	0.0	2.2	17.2	54.1-80.5	0.0ppm	0.0
1124	1128	4	0.2	0.8	1.6	0.03	0.0	2.8	16.7	54.5-79.8	0.0ppm	0.0
1132	1136	4	0.2	0.8	2.4	0.03	0.0	2.8	16.9	541-85.7	20ppm	0.0
11:42	12:10	28	0.2	Summa 6L	8.4	—	—	—	—	43.4-72.1	—	—

Time	Location	Sample ID	Summa Canister ID	Initial Vacuum (in Hg)	Final Vacuum (in Hg)
1142	V-1	V-10	34310	-27.5	-1.5

Comments:

Pneumatic Test 0.2 L/min ⇒ 0.01 "H_2O
@ 11:08am 0.1 L/min 0.005 "H_2O

SOIL GAS PROBE MEASUREMENTS

GeoSyntec Consultants
130 Research Lane, Suite 2
Guelph, Ontario, Canada N1G 5G3
(519)822-2230 Fax (519)822-3151

Project Name: GE Seattle
Project Number: TR0217
Phase Number: 02
Date: Dec 6, 05 Weather:
Field Personnel: D. Bertrand
Recorded By: D. Bertrand
Tracer Gas: Helium

Probe No: V-2 ☒ Sub-slab probe ☐ Soil gas probe
PID Model Number: Mini Rae 2000 Lamp: (10.6) / 11.7 eV
PID Serial Number: —
Landtech GEM 2000 Landfill Gas Meter Serial Number: —
Helium detector (model and serial number): —
Air Temperature: — (°C/°F) Atmospheric Pressure: — (in. Hg)

Field tubing blank reading (ppm$_V$)	Time	Initial Pressure/ Vacuum (Prior to Pumping)	Time
0.6	1525	0.0	15:15

Surface Type: ☐ Asphalt ☐ Concrete ☐ Grass ☐ Other ______

Surface Thickness: ~10–18" (inches)/centimeters ☐ Unknown
(ie. asphalt or concrete surface)

1 Casing Volume: ☒ Sub-slab <0.1 L; Soil gas probe ______ (L)

Start of Pneumatic Testing: 1520

Elapsed Time (min.)	Pump Flow Rate (LPM)	Well Head Vacuum inches H_2O
—	3.0	—
—	1.0	—
1.0	0.2	20
2.0	0.1	8.0

Start Time	End Time	Elapsed Time (min.)	Bag Volume (L)	Purge Rate (LPM)	Cumulative Volume (L)	Well Head Vacuum (inches H_2O)	CH_4 (%)	CO_2 (%)	O_2 (%)	Tracer Gas (%) Shroud Min	Tracer Gas (%) Shroud Max	Tracer Gas (%) Sample	VOCs by PID (ppm$_V$)
1544	1548	4	<0.8	<0.2	<0.8	60	0.0	0.5	18.5	75	92	2675 ppm	0.0
1554	1558	4	<0.8	<0.2	<1.6	70	0.0	0.4	18.4	90	97	8050 ppm	0.0
16:02	16:06	4	<0.8	<0.2	<2.4	70	0.0	0.5	18.5	95	98	11250 ppm	0.0
16:10	1640	30	~6L	~0.2	8.4	—	—	—	—	58	67	—	—

Time	Location	Sample ID	Summa Canister ID	Initial Vacuum (in Hg)	Final Vacuum (in. Hg)
	V-2	V-2	4157	-26.5	-4.2

Comments:

SOIL GAS PROBE MEASUREMENTS

GeoSyntec Consultants
130 Research Lane, Suite 2
Guelph, Ontario, Canada N1G 5G3
(519)822-2230 Fax (519)822-3151

Project Name: GE Seattle
Project Number: TR0217
Phase Number: 02
Date: Dec 7 05 Weather:
Field Personnel: D. Bertrand
Recorded By: D. Bertrand
Tracer Gas: Helium

Probe No V-3 ☒ Sub-slab probe ☐ Soil gas probe
PID Model Number: MiniRae 3000 Lamp (10.6) / 11.7 eV
PID Serial Number: —
Landtech GEM 2000 Landfill Gas Meter Serial Number: —
Helium detector (model and serial number) —
Air Temperature — (°C/°F) Atmospheric Pressure — (in. Hg)

Field tubing blank reading (ppm_v)	0.0	Time	745	Initial Pressure/ Vacuum (Prior to Pumping)	0 C	Time	752

Surface Type: ☐ Asphalt ☒ Concrete ☐ Grass ☐ Other
Surface Thickness ~10.5 (inches)/centimeters ☐ Unknown
(ie. asphalt or concrete surface)

Casing Volume
☒ Sub-slab <0.1 L
Soil gas probe (L)

Start of Pneumatic Testing: 753

Elapsed Time (min.)	Pump Flow Rate (LPM)	Well Head Vacuum inches H_2O
	3.0	
	1.0	
0.5	0.2	0.02
1.0	0.1	0.005

Start Time	End Time	Elapsed Time (min.)	Bag Volume (L)	Purge Rate (LPM)	Cumulative Volume (L)	Well Head Vacuum (inches H_2O)	CH_4 (%)	CO_2 (%)	O_2 (%)	Tracer Gas (%) Shroud Min	Tracer Gas (%) Shroud Max	Tracer Gas (%) Sample	VOCs by PID (ppm_v)
8:07	8:11	4	0.8	~0.2	0.8	0.045	0.0	1.8	16.3	53.1	89	0.0ppm	0.7
8:16	8:20	4	0.8	~0.2	1.6	0.045	0.0	2.5	16.1	55.0	80	0.0ppm	0.6
8:24	8:28	4	0.8	~0.2	2.4	0.045	0.0	2.8	16.0	53.2	81.7	0.0ppm	0.3
8:34	9:02	28	Summa 6L	~0.2	8.4	—	—	—	—	54	84	—	—

Time	Location	Sample ID	Summa Canister ID	Initial Vacuum (in Hg)	Final Vacuum (in. Hg)
8:34	V-3	V-3	24219	-27.5	-2.5

Comments:

SOIL GAS PROBE MEASUREMENTS

GeoSyntec Consultants
130 Research Lane, Suite 2
Guelph, Ontario, Canada N1G 5G3
(519)822-2230 Fax (519)822-3151

Project Name: GE Seattle
Project Number: TR0217
Phase Number: 02
Date: Dec 05 Weather:
Field Personnel: D. Bertrand
Recorded By: D. Bertrand
Tracer Gas: Helium

Probe No V-4 ☒ Sub-slab probe ☐ Soil gas probe
PID Model Number: MiniRae 2000 Lamp (10.6) / 11.7 eV
PID Serial Number:
Landtech GEM 2000 Landfill Gas Meter Serial Number:
Helium detector (model and serial number)
Air Temperature (°C/°F) Atmospheric Pressure (in. Hg)

Field tubing blank reading (ppm_v)	0.0	Time	935	Initial Pressure/ Vacuum (Prior to Pumping)	0.0	Time	930

Surface Type: ☐ Asphalt ☒ Concrete ☐ Grass ☐ Other
Surface Thickness 11.5 (inches)/centimeters ☐ Unknown
(ie. asphalt or concrete surface)

Casing Volume
☒ Sub-slab <0.1 L
Soil gas probe (L)

Start of Pneumatic Testing: 933

Elapsed Time (min.)	Pump Flow Rate (LPM)	Well Head Vacuum inches H_2O
—	3.0	—
—	1.0	—
0.25	0.2	0.07
0.5	0.1	0.01

Start Time	End Time	Elapsed Time (min.)	Bag Volume (L)	Purge Rate (LPM)	Cumulative Volume (L)	Well Head Vacuum (inches H_2O)	CH_4 (%)	CO_2 (%)	O_2 (%)	Tracer Gas (%) Shroud Min	Tracer Gas (%) Shroud Max	Tracer Gas (%) Sample	VOCs by PID (ppm_v)
947	951	4	0.8	0.2	0.8	0.05	0.0	4.0	14.6	46.4	63.0	0 ppm	0.0
958	1002	4	0.8	0.2	1.6	0.05	0.0	5.1	14.1	50	84.3	0 ppm	0.0
1006	1010	4	0.8	0.2	2.4	0.05	0.0	5.5	14.4	49.1	90.1	0 ppm	0.0
1015	1041	26	6L Summa	~0.2	8.4	—	—	—	—	42.5	83.1	—	—

Time	Location	Sample ID	Summa Canister ID	Initial Vacuum (in Hg)	Final Vacuum (in. Hg)
1015	V-4	V-4	12026	-27.5	-1.75

Comments:

SOIL GAS PROBE MEASUREMENTS

GeoSyntec Consultants
130 Research Lane, Suite 2
Guelph, Ontario, Canada N1G 5G3
(519)822-2230 Fax (519)822-3151

Project Name: GE Seattle
Project Number: TR0217
Phase Number: 02
Date: Dec 6, 05 Weather: —
Field Personnel: D. Bertrand
Recorded By: D. Bertrand
Tracer Gas: Helium

Probe No V-5 (2nd attempt) ☒ Sub-slab probe ☐ Soil gas probe
PID Model Number: Mini Rae 2000 Lamp (10.6) / 11.7 eV
PID Serial Number: —
Landtech GEM 2000 Landfill Gas Meter Serial Number: —
Helium detector (model and serial number) —
Air Temperature — (°C/°F) Atmospheric Pressure — (in. Hg)

Field tubing blank reading (ppm_v)		Time		Initial Pressure/ Vacuum (Prior to Pumping)	0.0	Time	1300

Surface Type: ☐ Asphalt ☐ Concrete ☐ Grass ☐ Other —
Surface Thickness — inches/centimeters ☐ Unknown
(ie. asphalt or concrete surface)

Casing Volume	
☒ Sub-slab	<0.1 L
Soil gas probe	— (L)

Start of Pneumatic Testing: —

Elapsed Time (min.)	Pump Flow Rate (LPM)	Well Head Vacuum inches H_2O
—	3.0	—
0.5	1.0	0.02
1.0	0.5	0.01
~~0~~ 2.0	0.2	<0.01

Start Time	End Time	Elapsed Time (min.)	Bag Volume (L)	Purge Rate (LPM)	Cumulative Volume (L)	Well Head Vacuum (inches H_2O)	CH_4 (%)	CO_2 (%)	O_2 (%)	Tracer Gas (%) Shroud Min	Shroud Max	Sample	VOCs by PID (ppm_v)
1310	1313	3	0.6	0.2	0.6	0.01	—	—	—	0.0	0.0	0.0	—
1316	1320	4	0.8	0.2	1.8	0.01	0.0	1.0	17.5	41	84	600ppm	1.0
1326	1330	4	0.8	0.2	2.6	0.01	0.0	1.0	17.4	47	87	1225ppm	1.0
1334	1338	4	0.8	0.2	3.4	0.01	0.0	1.5	17.3	43	88	900ppm	0.8
1347	1417	30	Summa 6L	0.2	9.4	—	—	—	—	30	40	—	—

Time	Location	Sample ID	Summa Canister ID	Initial Vacuum (in Hg)	Final Vacuum (in. Hg)
1347	V-5	V-5	34406	~~28.5~~ ~~24~~ ~~25.5~~	0.0

Comments:

Appendix E

Laboratory Data Reports and Data Validation Reports

Organic and Inorganic Data Verification Report

GE South Dawson Street
Indoor Air Risk Pathway Evaluation
4th Quarter 2005

Prepared for:

Jill Lantz
Project Manager
The RETEC Group, Inc.
1011 SW Klickitat Way, Suite 207
Seattle, WA 98134-1162

Prepared by:

Leslie Hill
Environmental Scientist
The RETEC Group, Inc.
2409 Research Blvd., Suite 106
Fort Collins, CO 80526

RETEC Project No.: GE00119314-750

Overview

The samples analyzed for the GE South Dawson Street Indoor Air Risk Pathway Evaluation event in December 2005 are listed in the Table of Samples Analyzed (page 2). Data verification was performed on 18 air samples.

The samples were analyzed by Air Toxics Ltd. of Folsom, CA. The validated analyses were Toxic Organic Compounds by Modified EPA Method TO-15 GC/MS SIM and Helium Natural Gas Analysis by Modified ASTM D-1945.

The RETEC Analytical Data Verification Checklist is presented as pages 3-6. Data were evaluated based on verification criteria set forth in the *USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Superfund Organic Methods Data Review*, document number USEPA-540-R-04-009, January 2005 and *USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Inorganic Data Review*, document number EPA 540-R-01-008 of July 2002, as they applied to the reported methodology. Field duplicate RPD control limits were taken from the USEPA Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses, February 1988, upheld in DRAFT 1993.

The following data components were reviewed during the data verification procedure:

Submitted Deliverables
Case Narratives
Chain-of-Custody form(s) and sample integrity
Sample results, reporting limits, dilution factors
Holding times
Method blank results
LCS/LCSD (blank spike) results
Laboratory duplicate results
Organic surrogate recoveries
Field duplicate results
Electronic data deliverables (EDDs)

Data Verification Qualifiers Assigned During this Review

There were no data verification qualifiers assigned during this review.

Overall Data Assessment

Precision, accuracy, method compliance, and completeness of the data set have been determined to be acceptable, based on the data submitted. The data are suitable for their intended use without qualification.

Table of Samples Analyzed
GE South Dawson Street
Indoor Air Risk Pathway Evaluation
Air Toxics Ltd., Folsom, CA
Reports 0512185, 0512237A, 0512237B, 0512246A, and 0512246B
December 2005

Matrix	Sample ID	Sample Date and Time		SDG	COC
Air	IA-1-1205	12/05/2005	8:05 AM	0512185	NA
Air	IA-2-1205	12/05/2005	8:17 AM	0512185	NA
Air	IA-20-1205	12/05/2005	8:17 AM	0512185	NA
Air	IA-3-1205	12/05/2005	8:08 AM	0512185	NA
Air	IA-4-1205	12/05/2005	7:58 AM	0512185	NA
Air	IA-5-1205	12/05/2005	8:04 AM	0512185	NA
Air	IA-6-1205	12/05/2005	8:20 AM	0512185	NA
Air	AA-1-1205	12/05/2005	8:41 AM	0512185	NA
Air	AA-2-1205	12/05/2005	8:36 AM	0512185	NA
Air	AA-3-1205	12/05/2005	8:08 AM	0512185	NA
Air	AA-4-1205	12/05/2005	8:54 AM	0512185	NA
Air	AA-5-1205	12/05/2005	8:44 AM	0512185	NA
Air	V-10-1205	12/07/2005	11:42 AM	0512237A/0512237B	101195
Air	V-4-1205	12/07/2005	10:15 AM	0512237A/0512237B	101195
Air	V-3-1205	12/07/2005	8:34 AM	0512237A/0512237B	101195
Air	V-2-1205	12/06/2006	4:10 PM	0512246A/0512246B	101307
Air	V-1-1205	12/06/2006	3:02 PM	0512246A/0512246B	101307
Air	V-5-1205	12/06/2006	1:47 PM	0512246A/0512246B	101307

ANALYTICAL DATA VERIFICATION CHECKLIST

Project Name: GE South Dawson Street	Laboratory: Air Toxics Ltd., Folsom, CA
Project Reference: Indoor Air Risk Pathway Evaluation	Sample Matrix: Air Samples
RETEC Project: GE001-19314-750	Sample Start Date: 12/05/2005
Validated By: Leslie Hill	Sample End Date: 12/07/2005
Samples Analyzed: Refer to the Table of Samples Analyzed (page 2).	
Parameters Verified: Toxic Organic Compounds by Modified EPA Method TO-15 GC/MS SIM and Helium Natural Gas Analysis by Modified ASTM D-1945	
Laboratory Project IDs: 0512185, 0512237A, 0512237B, 0512246A, and 0512246B	

PRECISION, ACCURACY, METHOD COMPLIANCE, AND COMPLETENESS ASSESSMENT

Precision:	X	Acceptable		Unacceptable	LH	Initials

Comments: Precision is the measure of variability of individual sample measurements. Field precision was determined by comparison of field duplicate sample results. Laboratory precision was determined by examination of laboratory duplicate results. Evaluation of both field and laboratory duplicates for precision was done using the Relative Percent Difference (RPD). The RPD is defined as the difference between two duplicate samples divided by the mean and expressed as a percent. Field duplicate RPD QC limits were set at 0-30% for air samples. Laboratory RPD limits referenced EPA published QC limits. No data require qualification based on field and laboratory duplicate RPDs, and overall field and laboratory precision is acceptable. Precision measurements are reviewed in items 17, 20, and 21.

Accuracy:	X	Acceptable		Unacceptable	LH	Initials

Comments: Field accuracy, a measure of the sampling bias, could not be determined as no trip blank or field blank samples were collected. Laboratory accuracy is a measure of the system bias, and was measured by evaluating laboratory control sample/laboratory control sample duplicate (LCS/LCSD) and organic system monitoring compounds (surrogate) percent recoveries (%Rs). LCS/LCSD %Rs, which demonstrated the overall performance of the analysis, were compared to EPA published QC limits. System monitoring compound or surrogate recoveries, which measured system performance and efficiency during organic analysis, were compared to EPA published QC limits. No data require qualification based on field and laboratory accuracy measurements, and overall field and laboratory accuracy is acceptable. Accuracy measurements are reviewed in items 12, 14, 15, and 16.

Method Compliance:	X	Acceptable		Unacceptable	LH	Initials

Comments: Method compliance was determined by evaluating sample integrity, holding time, and laboratory blanks against method specified requirements, while applying EPA data validation guidelines. No data require qualification based on method compliance issues, and overall method compliance is acceptable based on the supplied data. Method compliance measurements are reviewed in items 4, 8, 11, 13, 18, 19, 20, and 22.

Completeness:	X	Acceptable		Unacceptable	LH	Initials

Comments: Completeness is the overall ratio of the number of samples planned versus the number of samples with valid analyses. Completeness goals are set at 90-100%. Determination of completeness included a review of chain of custody records, laboratory analytical methods and detection limits, laboratory case narratives, and project requirements. Completeness also included 100% review of the laboratory sample data results, QC summary reports, and electronic data deliverables (EDDs). All of the data received from the laboratory are useable without qualification. Completeness of the data is calculated to be 100% and is acceptable.

ANALYTICAL DATA VERIFICATION CHECKLIST

VERIFICATION CRITERIA CHECK						
There were no data verification flags used in this review.						
1. Did the laboratory identify any non-conformances related to the analytical results?		Yes	X	No	LH	Initials
Explanation by laboratory: There were no analytical discrepancies.						
2. Were sample Chain-of-Custody forms complete?	X	Yes		No	LH	Initials
Comments: COC records from field to laboratory were complete, and custody was maintained as evidenced by field and laboratory personnel signatures, dates, and times of receipt.						
3. Were all the analyses requested for the samples on the COCs completed by the laboratory?	X	Yes		No	LH	Initials
Comments: All requested analyses were completed.						
4. Were samples received in good condition and at the appropriate temperature?	X	Yes		No	LH	Initials
Comments: No discrepancies or problems were identified on the chains of custody or in the case narratives.						
5. Were the requested analytical methods in compliance with WP/QAPP, permit, or COC?	X	Yes		No	LH	Initials
Comments: Reported methods and target analyte lists were in compliance with COC records.						
6. Were detection limits in accordance with WP/QAPP, permit, or method?	X	Yes		No	LH	Initials
Comments: Reported detection limits are achievable by the quoted methods. Some samples required dilution due to high concentrations of target analytes or interference. The reporting limits for diluted results were raised appropriately.						
7. Do the laboratory reports include only those constituents requested to be reported for a specific analytical method?	X	Yes		No	LH	Initials
Comments: Only the requested target analytes were reported.						
8. Were sample holding times met?	X	Yes		No	LH	Initials
Comments: Analytical holding times were met for all samples and analyses.						
9. Were correct concentration units reported?	X	Yes		No	LH	Initials
Comments: Correct concentration units were reported.						
10. Were the reporting requirements for flagged data met?	X	Yes		No	LH	Initials
Comments: Data verification qualifiers override any assigned laboratory flags.						
11. Were laboratory blank samples free of target analyte contamination?	X	Yes		No	LH	Initials
Comments: All laboratory blanks were free of target analyte contamination.						
12. Were trip blank, field blank, and/or equipment rinse blank samples free of target analyte contamination?	NA	Yes	NA	No	LH	Initials
Comments: There were no trip blank or field blank samples associated with this sample set. Field accuracy could not be evaluated						

ANALYTICAL DATA VERIFICATION CHECKLIST

13. Were instrument calibrations within method or data verification control limits?	NA	Yes	NA	No	LH	Initials
Comments: Instrument calibration information is not required for this level of data verification						
14. Were surrogate recoveries within control limits?	X	Yes		No	LH	Initials
Comments: Surrogate percent recoveries (%Rs) for organic analyses were within laboratory QC criteria for all samples.						
15. Were laboratory control sample recoveries within control limits?	X	Yes		No	LH	Initials
Comments: LCS and LCSD (blank spike) recoveries were within laboratory QC limits for all target analytes.						
16. Were matrix spike recoveries within control limits?	NA	Yes	NA	No	LH	Initials
Comments: Matrix spike samples are not required for air samples.						
17. Were duplicate RPDs and/or serial dilution %Ds within control limits?	X	Yes		No	LH	Initials
Comments: Laboratory RPDs for target analytes in LCS/LCSD samples were within data verification control limits. No analyses requiring the use of serial dilutions were requested for this sample set.						
18. Were organic system performance criteria met?	NA	Yes	NA	No	LH	Initials
Comments: System performance checks were not required for this level of data verification.						
19. Were internal standards within method criteria for GC/MS sample analyses?	NA	Yes	NA	No	LH	Initials
Comments: Internal standard information was not required for this level of data verification.						
20. Were inorganic system performance criteria met?	NA	Yes	NA	No	LH	Initials
Comments: System performance checks were not required for this level of data verification.						
21. Were blind field duplicates collected? If so, discuss the precision (RPD) of the results.	X	Yes		No	LH	Initials
Duplicate Sample No. IA-20-1205		Primary Sample No. IA-2-1205				

Comments: The RPDs for the duplicates were within the 0-30% data verification QC limits for air samples, or RPDs were not applicable due to results that were ± the detection limit, or were undetected in both samples.

Method	Analyte	IA-20-1205	IA-2-1205	RPD	Qualifier	Duplicate RL	Sample RL	Units
TO15	Tetrachloroethene	0.38	0.38	0		0.22	0.23	ug/m3
TO15	Trichloroethene	0.28	0.27	4		0.17	0.18	ug/m3

Field duplicate and native sample concentrations that were both undetected are not reflected in the table above since RPDs are not applicable.

22. Were qualitative criteria for organic target analyte identification met?	X	Yes		No	LH	Initials
Comments: Trained laboratory personnel reviewed retention times and chromatography in accordance with the laboratory's internal QA/QC program. Laboratory personnel did not note any data outliers.						

ANALYTICAL DATA VERIFICATION CHECKLIST

23 Were 100% of the EDD concentrations and reporting limits compared to the hardcopy data reports?	X	Yes		No	LH	Initials
Comments: There were no discrepancies between the EDD concentrations and reporting limits and the hardcopy data reports.						
24. General Comments: Data were evaluated based on verification criteria set forth in the *USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Superfund Organic Methods Data Review*, document number USEPA-540-R-04-009, January 2005 and *USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Inorganic Data Review*, document number EPA 540-R-01-008 of July 2002, as they applied to the reported methodology. Field duplicate RPD control limits were taken from the USEPA Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses, February 1988, upheld in DRAFT 1993.						

@ AIR TOXICS LTD.
AN ENVIRONMENTAL ANALYTICAL LABORATORY

Air Toxics Ltd. Introduces the Electronic Report

Thank you for choosing Air Toxics Ltd. To better serve our customers, we are providing your report by e-mail. This document is provided in Portable Document Format which can be viewed with Acrobat Reader by Adobe.

This electronic report includes the following:

- Work order Summary;
- Laboratory Narrative;
- Results; and
- Chain of Custody (copy).

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630

(916) 985-1000 FAX (916) 985-1020
Hours 8:00 A.M to 6:00 P.M. Pacific

@ AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0512246B

Work Order Summary

CLIENT:	Ms. Jill Lantz The RETEC Group, Inc. 1011 SW Klickitat Way Suite 207 Seattle, WA 98134	**BILL TO:**	Ms. Jill Lantz The RETEC Group, Inc. 1011 SW Klickitat Way Suite 207 Seattle, WA 98134
PHONE:		**P.O. #**	
FAX:		**PROJECT #**	GE001-18600.750 GEAE
DATE RECEIVED:	12/09/2005	**CONTACT:**	Nicole Danbacher
DATE COMPLETED:	12/22/2005		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.
01A	V-2-1205	Modified ASTM D-1945	6.5 "Hg
02A	V-1-1205	Modified ASTM D-1945	3.0 "Hg
03A	V-5-1205	Modified ASTM D-1945	1.0 "Hg
04A	Lab Blank	Modified ASTM D-1945	NA
05A	LCS	Modified ASTM D-1945	NA

CERTIFIED BY: Linda J. Fruman DATE: 12/22/05

Laboratory Director

Certfication numbers: AR DEQ - 03-084-0, CA NELAP - 02110CA, LA NELAP/LELAP- AI 30763, NJ NELAP - CA004
NY NELAP - 11291, UT NELAP - 9166389892
Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
Accreditation number: E87680, Effective date: 07/01/05, Expiration date: 06/30/06
Air Toxics Ltd certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
Modified ASTM D-1945
The RETEC Group, Inc.
Workorder# 0512246B

Three 6 Liter Summa Canister samples were received on December 09, 2005. The laboratory performed analysis via modified ASTM Method D-1945 for Helium in natural gas using GC/TCD. The method involves direct injection of 1.0 mL of sample. See the data sheets for the reporting limits for each compound.

Method modifications taken to run these samples include:

Requirement	*ASTM D-1945*	*ATL Modifications*
Normalization	Sum of original values should not differ from 100.0% by more than 1.0%.	Sum of original values may range between 75-125%. Normalization of data not performed.
Sample analysis	Equilibrate samples to 20-50° F. above source temperature at field sampling	No heating of samples is performed.
Sample calculation	Response factor is calculated using peak height for C5 and lighter compounds.	Peak areas are used for all target analytes to quantitate concentrations.
Reference Standard	Concentration should not be < half of nor differ by more than 2 X the concentration of the sample. Run 2 consecutive checks; must agree within 1%.	A minimum 3-point linear calibration is performed. The acceptance criterion is %RSD </= 25%. All target analytes must be within the linear range of calibration (with the exception of O2, N2, and C6+ Hydrocarbons).
Sample Injection Volume	0.50 mL to achieve Methane linearity.	1.0 mL.

Receiving Notes

The Chain of Custody (COC) information for sample V-2-1205 did not match the entry on the sample tag with regard to sample identification. The discrepancy was noted in the Sample Receipt Confirmation email/fax and the information on the COC was used to process and report the sample.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

Six qualifiers may have been used on the data analysis sheets and indicate as follows:

J - Estimated value.
E - Exceeds instrument calibration range.
S - Saturated peak.

Q - Exceeds quality control limits.
U - Compound analyzed for but not detected above the detection limit.
M - Reported value may be biased due to apparent matrix interferences.

File extensions may have been used on the data analysis sheets and indicates as follows:
a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

AIR TOXICS LTD.

Summary of Detected Compounds
NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1945

Client Sample ID: V-2-1205

Lab ID#: 0512246B-01A

Compound	Rpt. Limit (%)	Amount (%)
Helium	0 017	0.47

Client Sample ID: V-1-1205

Lab ID#: 0512246B-02A

Compound	Rpt. Limit (%)	Amount (%)
Helium	0.015	0.025

Client Sample ID: V-5-1205

Lab ID#: 0512246B-03A

Compound	Rpt. Limit (%)	Amount (%)
Helium	0.014	0.12

AIR TOXICS LTD.

Client Sample ID: V-2-1205

Lab ID#: 0512246B-01A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1945

File Name:	9122110b	Date of Collection:	12/6/05
Dil. Factor:	1.71	Date of Analysis:	12/21/05 10:58 AM

Compound	Rpt. Limit (%)	Amount (%)
Helium	0.017	0.47

Container Type: 6 Liter Summa Canister

AIR TOXICS LTD.

Client Sample ID: V-1-1205

Lab ID#: 0512246B-02A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1945

File Name:	9122111b	Date of Collection:	12/6/05
Dil. Factor:	1.49	Date of Analysis:	12/21/05 11:21 AM

Compound	Rpt. Limit (%)	Amount (%)
Helium	0.015	0.025

Container Type: 6 Liter Summa Canister

AIR TOXICS LTD.

Client Sample ID: V-5-1205

Lab ID#: 0512246B-03A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1945

File Name:	9122112b	Date of Collection:	12/6/05
Dil. Factor:	1.39	Date of Analysis:	12/21/05 11:43 AM

Compound	Rpt. Limit (%)	Amount (%)
Helium	0.014	0.12

Container Type: 6 Liter Summa Canister

AIR TOXICS LTD.

Client Sample ID: Lab Blank

Lab ID#: 0512246B-04A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1945

File Name:	9122109b	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	12/21/05 10:36 AM

Compound	Rpt. Limit (%)	Amount (%)
Helium	0.010	Not Detected

Container Type: NA - Not Applicable

AIR TOXICS LTD.

Client Sample ID: LCS

Lab ID#: 0512246B-05A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1945

File Name:	9122104b	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	12/21/05 08:17 AM

Compound	%Recovery
Helium	105

Container Type: NA - Not Applicable

Chain of Custody Record

№ 101307

0512246

The RETEC Group, Inc.
*0:1 S.W. Kicklat Way, Suite 207 • Seattle, WA 98134-1162
(206) 624-9349 Phone • (206) 624-2839 Fax
www.retec.com

RETEC

Project Name: GEAE
Project Number: GE001-18600-750
Send Report To: Jill Lantz
Sampler (Print Name): J. Stevens
Address: 1011 SW Klickitat Way
Shipment Method: Fedex
Suite 207
Airbill Number:
Seattle WA
Phone: 206-624-9349
Laboratory Receiving: Air Toxics LTD
Fax

Page 1 of 1

Purchase Order #: 62 12/15/05

Analysis Requested: 1,1,1 - TCA; 1,1,2 - DCA; 1,1 - DCE; Chloroform; 1,2 DCE; PCE; TCE; Vinyl Chloride; Halium

Field Sample ID	CAN #	Sample Date	Sample Time	Sample Matrix	Number of Containers	Comments, Special Instructions, etc.	Lab Sample ID (to be completed by lab)
SAMPLE ID		12/6/05				Initial / Final	Initial / Final
V-2-120S	4157		1610	AIR	1	-26.5 / -4.2	6.5"Hg / 5.0psi
V-1-120S	30933		1502	AIR	1	-26.5 / 1.2	3.0"Hg / ↓
V-5-120S	34406	↓	1347	AIR	1	-26.25 / 0.0 (*)	1.0"Hg / ↓

01A
02A
03A

*Returning CAN # 33962 EMPTY - initial pressure = 0.0

CUSTODY SEAL INTACT?
Y N NONE TEMP

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
12/6/05 1800		12/9/05	0930
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

Sample Custodian Remarks (Completed By Laboratory):

QA/QC Level: Level I ☐ Level II ☐ Level III ☐ Other ☐

Turnaround: Routine ☐ 24 Hour ☐ 1 Week ☐ Other ____

Sample Receipt:
- Total # Containers Received?
- COC Seals Present?
- COC Seals Intact?
- Received Containers Intact?
- Temperature?

White: Lab Copy; Yellow: PM Copy; Pink: Field Copy; Gold: PM/QA/QC Copy

7002 4523 5752

AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Air Toxics Ltd. Introduces the Electronic Report

Thank you for choosing Air Toxics Ltd. To better serve our customers, we are providing your report by e-mail. This document is provided in Portable Document Format which can be viewed with Acrobat Reader by Adobe.

This electronic report includes the following:

- Work order Summary;
- Laboratory Narrative;
- Results; and
- Chain of Custody (copy).

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630

(916) 985-1000 FAX (916) 985-1020
Hours 8:00 A.M to 6:00 P.M. Pacific

@ AIR TOXICS LTD.
AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0512237B

Work Order Summary

CLIENT:	Ms. Jill Lantz The RETEC Group, Inc 1011 SW Klickitat Way Suite 207 Seattle, WA 98134	**BILL TO:**	Ms Jill Lantz The RETEC Group, Inc 1011 SW Klickitat Way Suite 207 Seattle, WA 98134
PHONE:		**P.O. #**	
FAX:		**PROJECT #**	GE001-18600 750 GEAE
DATE RECEIVED:	12/09/2005	**CONTACT:**	Nicole Danbacher
DATE COMPLETED:	12/23/2005		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.
01A	V-10-1205	Modified ASTM D-1945	2.0 "Hg
01AA	V-10-1205 Duplicate	Modified ASTM D-1945	2.0 "Hg
02A	V-4-1205	Modified ASTM D-1945	2.0 "Hg
03A	V-3-1205	Modified ASTM D-1945	2.5 "Hg
04A	Lab Blank	Modified ASTM D-1945	NA
05A	LCS	Modified ASTM D-1945	NA

CERTIFIED BY: Linda J. Fruman DATE: 12/23/05

Laboratory Director

Certfication numbers: AR DEQ - 03-084-0, CA NELAP - 02110CA, LA NELAP/LELAP- AI 30763, NJ NELAP - CA004
NY NELAP - 11291, UT NELAP - 9166389892
Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
Accreditation number: E87680, Effective date: 07/01/05, Expiration date: 06/30/06
Air Toxics Ltd certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
Modified ASTM D-1945
The RETEC Group, Inc.
Workorder# 0512237B

Three 6 Liter Summa Canister samples were received on December 09, 2005. The laboratory performed analysis via modified ASTM Method D-1945 for Helium in natural gas using GC/TCD. The method involves direct injection of 1.0 mL of sample. See the data sheets for the reporting limits for each compound.

Method modifications taken to run these samples include:

Requirement	*ASTM D-1945*	*ATL Modifications*
Normalization	Sum of original values should not differ from 100.0% by more than 1.0%.	Sum of original values may range between 75-125%. Normalization of data not performed.
Sample analysis	Equilibrate samples to 20-50° F above source temperature at field sampling	No heating of samples is performed.
Sample calculation	Response factor is calculated using peak height for C5 and lighter compounds.	Peak areas are used for all target analytes to quantitate concentrations.
Reference Standard	Concentration should not be < half of nor differ by more than 2 X the concentration of the sample Run 2 consecutive checks; must agree within 1%.	A minimum 3-point linear calibration is performed. The acceptance criterion is %RSD </= 25%. All target analytes must be within the linear range of calibration (with the exception of O2, N2, and C6+ Hydrocarbons).
Sample Injection Volume	0.50 mL to achieve Methane linearity.	1.0 mL.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

Six qualifiers may have been used on the data analysis sheets and indicate as follows:

J - Estimated value.
E - Exceeds instrument calibration range.
S - Saturated peak.
Q - Exceeds quality control limits.
U - Compound analyzed for but not detected above the detection limit.
M - Reported value may be biased due to apparent matrix interferences.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

AIR TOXICS LTD.

Summary of Detected Compounds

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1945

Client Sample ID: V-10-1205

Lab ID#: 0512237B-01A

Compound	Rpt. Limit (%)	Amount (%)
Helium	0.014	0.15

Client Sample ID: V-10-1205 Duplicate

Lab ID#: 0512237B-01AA

Compound	Rpt. Limit (%)	Amount (%)
Helium	0.014	0.15

Client Sample ID: V-4-1205

Lab ID#: 0512237B-02A

No Detections Were Found.

Client Sample ID: V-3-1205

Lab ID#: 0512237B-03A

Compound	Rpt. Limit (%)	Amount (%)
Helium	0.015	0.030

AIR TOXICS LTD.

Client Sample ID: V-10-1205

Lab ID#: 0512237B-01A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1945

File Name:	9122113b	Date of Collection:	12/7/05
Dil. Factor:	1.44	Date of Analysis:	12/21/05 12:05 PM

Compound	Rpt. Limit (%)	Amount (%)
Helium	0.014	0.15

Container Type: 6 Liter Summa Canister

AIR TOXICS LTD.

Client Sample ID: V-10-1205 Duplicate

Lab ID#: 0512237B-01AA

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1945

File Name:	91221145	Date of Collection:	12/7/05
Dil Factor:	1.44	Date of Analysis:	12/21/05 12:36 PM

Compound	Rpt. Limit (%)	Amount (%)
Helium	0.014	0.15

Container Type: 6 Liter Summa Canister

AIR TOXICS LTD.

Client Sample ID: V-4-1205

Lab ID#: 0512237B-02A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1945

File Name:	9122115b	Date of Collection:	12/7/05
Dil. Factor:	1.44	Date of Analysis:	12/21/05 12:59 PM

Compound	Rpt. Limit (%)	Amount (%)
Helium	0.014	Not Detected

Container Type: 6 Liter Summa Canister

AIR TOXICS LTD.

Client Sample ID: V-3-1205

Lab ID#: 0512237B-03A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1945

File Name:	122116b	Date of Collection:	12/7/05
Dil. Factor:	1.46	Date of Analysis:	12/21/05 01:21 PM

Compound	Rpt. Limit (%)	Amount (%)
Helium	0.015	0.030

Container Type: 6 Liter Summa Canister

AIR TOXICS LTD.

Client Sample ID: Lab Blank

Lab ID#: 0512237B-04A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1945

File Name:	9122109b	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	12/21/05 10:36 AM

Compound	Rpt. Limit (%)	Amount (%)
Helium	0.010	Not Detected

Container Type: NA - Not Applicable

AIR TOXICS LTD.

Client Sample ID: LCS

Lab ID#: 0512237B-05A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1945

File Name:	9122104b	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	12/21/05 08:17 AM

Compound	%Recovery
Helium	105

Container Type: NA - Not Applicable

Chain of Custody Record

№ 101195

0512237

The RETEC Group, Inc.
1011 S.W. Klickitat Way, Suite 207 • Seattle, WA 98134-1162
(206) 624-9349 Phone • (206) 624-2839 Fax
www.retec.com

RETEC

Project Name: GEAE	Project Number: G6001-18600.750
Send Report To: Jill Lantz	Sampler (Print Name): Geosyntech
Address: 1011 SW Klickitat	Sampler (Print Name): J. Stevens
	Shipment Method: FedEx
	Airbill Number:
Phone: 206-624-9349	Laboratory Receiving: Air Toxics LTD
Fax:	

Page 1 of 1

Purchase Order #: B3 12/15/05

Analysis Requested: 1,1,1-TCA; 1,1-DCA; 1,1-DCE; Chloroform; 1,2-DCE; PCE; TCE; Vinyl Chloride; Helium

	Field Sample ID	CAN #	Sample Date	Sample Time	Sample Matrix	Number of Containers	Comments: Special Instructions, etc	Lab Sample ID (to be completed by lab)
	SAMPLE ID	CAN #	---	----	----	---	Initial / Final	Initial / Final
01A	V-10-1205	34310	12/7/05	1142	AIR	1 X	-27.5 / -1.5	2.0 / 5.0 psi
02A	V-4-1205	12026	12/7/05	1015	AIR	1 ↓	-27.5 / 7.75	2.0 /
03A	V-3-1205	24219	12/7/05	0834	AIR	1 ↓	-27.5 / -2.5	2.5 / ↓

CUSTODY SEAL INTACT? Y N NONE ITEM ✓

Relinquished by: (Signature) 12/07/05 0945	Received by: (Signature) Judy See air	Date: 12/7/05	Time: 0930
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

Sample Custodian Remarks (Completed by Laboratory):

QA/QC Level		Turnaround	
Level I	☐	Routine	☐
Level II	☐	24 Hour	☐
Level III	☐	1 Week	☐
Other	☐	Other ___	

Sample Receipt	
Total # Containers Received?	
COC Seals Present?	
COC Seals Intact?	
Received Containers Intact?	
Temperature?	

White: Lab Copy Yellow: PM Copy Pink: Field Copy Gold: PM/QA/QC Copy

TAT: 10 WD

@ AIR TOXICS LTD.
AN ENVIRONMENTAL ANALYTICAL LABORATORY

Air Toxics Ltd. Introduces the Electronic Report

Thank you for choosing Air Toxics Ltd. To better serve our customers, we are providing your report by e-mail. This document is provided in Portable Document Format which can be viewed with Acrobat Reader by Adobe.

This electronic report includes the following:

- Work order Summary;
- Laboratory Narrative;
- Results; and
- Chain of Custody (copy).

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630

(916) 985-1000 FAX (916) 985-1020
Hours 8:00 A.M to 6:00 P.M. Pacific

@ AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0512246A

Work Order Summary

CLIENT:	Ms Jill Lantz The RETEC Group, Inc 1011 SW Klickitat Way Suite 207 Seattle, WA 98134	**BILL TO:**	Ms Jill Lantz The RETEC Group, Inc. 1011 SW Klickitat Way Suite 207 Seattle, WA 98134
PHONE:		**P.O. #**	
FAX:		**PROJECT #**	GE001-18600 750 GEAE
DATE RECEIVED:	12/09/2005	**CONTACT:**	Nicole Danbacher
DATE COMPLETED:	12/22/2005		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.
01A	V-2-1205	Modified TO-15	6.5 "Hg
02A	V-1-1205	Modified TO-15	3.0 "Hg
03A	V-5-1205	Modified TO-15	1.0 "Hg
04A	Lab Blank	Modified TO-15	NA
05A	CCV	Modified TO-15	NA
06A	LCS	Modified TO-15	NA
06AA	LCSD	Modified TO-15	NA

CERTIFIED BY: Linda D. Truman DATE: 12/22/05

Laboratory Director

Certfication numbers: AR DEQ - 03-084-0, CA NELAP - 02110CA, LA NELAP/LELAP- AI 30763, NJ NELAP - CA004
NY NELAP - 11291, UT NELAP - 9166389892
Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
Accreditation number: E87680, Effective date: 07/01/05, Expiration date: 06/30/06
Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 (800) 985-5955 FAX (916) 985-1020

LABORATORY NARRATIVE
Modified TO-15
The RETEC Group, Inc.
Workorder# 0512246A

Three 6 Liter Summa Canister samples were received on December 09, 2005. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the full scan mode. The method involves concentrating up to 0.2 liters of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis.

Method modifications taken to run these samples are summarized in the below table. Specific project requirements may over-ride the ATL modifications.

Requirement	*TO-15*	*ATL Modifications*
Daily CCV	+- 30% Difference	</= 30% Difference with two allowed out up to </=40%.; flag and narrate outliers
Sample collection media	Summa canister	ATL recommends use of summa canisters to insure data defensibility, but will report results from Tedlar bags at client request
Method Detection Limit	Follow 40CFR Pt.136 App. B	The MDL met all relevant requirements in Method TO-15 (statistical MDL less than the LOQ). The concentration of the spiked replicate may have exceeded 10X the calculated MDL in some cases

Receiving Notes

The Chain of Custody (COC) information for sample V-2-1205 did not match the entry on the sample tag with regard to sample identification. The discrepancy was noted in the Sample Receipt Confirmation email/fax and the information on the COC was used to process and report the sample.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

AIR TOXICS LTD.

Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: V-2-1205

Lab ID#: 0512246A-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,1-Trichloroethane	0.86	300	4.7	1600
Trichloroethene	0.86	8.3	4.6	44

Client Sample ID: V-1-1205

Lab ID#: 0512246A-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1-Dichloroethane	3.7	5.7	15	23
1,1,1-Trichloroethane	3.7	1300	20	6900
Trichloroethene	3.7	310	20	1600

Client Sample ID: V-5-1205

Lab ID#: 0512246A-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1-Dichloroethane	2.8	62	11	250
cis-1,2-Dichloroethene	2.8	120	11	480
Chloroform	2.8	4.0	14	19
1,1,1-Trichloroethane	2.8	130	15	700
Trichloroethene	2.8	680	15	3700

AIR TOXICS LTD.

Client Sample ID: V-2-1205

Lab ID#: 0512246A-01A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	f121918	Date of Collection:	12/6/05
Dil. Factor:	1.71	Date of Analysis:	12/19/05 11:54 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Vinyl Chloride	0.86	Not Detected	2.2	Not Detected
1,1-Dichloroethene	0.86	Not Detected	3.4	Not Detected
1,1-Dichloroethane	0.86	Not Detected	3.5	Not Detected
cis-1,2-Dichloroethene	0.86	Not Detected	3.4	Not Detected
Chloroform	0.86	Not Detected	4.2	Not Detected
1,1,1-Trichloroethane	0.86	300	4.7	1600
Trichloroethene	0.86	8.3	4.6	44
Tetrachloroethene	0.86	Not Detected	5.8	Not Detected

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	96	70-130
4-Bromofluorobenzene	100	70-130

AIR TOXICS LTD.

Client Sample ID: V-1-1205

Lab ID#: 0512246A-02A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	f121919	Date of Collection:	12/6/05
Dil. Factor:	7.45	Date of Analysis:	12/20/05 12:50 AM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Vinyl Chloride	3.7	Not Detected	9.5	Not Detected
1,1-Dichloroethene	3.7	Not Detected	15	Not Detected
1,1-Dichloroethane	3.7	5.7	15	23
cis-1,2-Dichloroethene	3.7	Not Detected	15	Not Detected
Chloroform	3.7	Not Detected	18	Not Detected
1,1,1-Trichloroethane	3.7	1300	20	6900
Trichloroethene	3.7	310	20	1600
Tetrachloroethene	3.7	Not Detected	25	Not Detected

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	104	70-130
4-Bromofluorobenzene	94	70-130

AIR TOXICS LTD.

Client Sample ID: V-5-1205

Lab ID#: 0512246A-03A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Vinyl Chloride	2.8	Not Detected	7.1	Not Detected
1,1-Dichloroethene	2.8	Not Detected	11	Not Detected
1,1-Dichloroethane	2.8	62	11	250
cis-1,2-Dichloroethene	2.8	120	11	480
Chloroform	2.8	4.0	14	19
1,1,1-Trichloroethane	2.8	130	15	700
Trichloroethene	2.8	680	15	3700
Tetrachloroethene	2.8	Not Detected	19	Not Detected

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	106	70-130
4-Bromofluorobenzene	94	70-130

AIR TOXICS LTD.

Client Sample ID: Lab Blank

Lab ID#: 0512246A-04A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	121908	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 12/19/05 02:52 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	92	70-130
4-Bromofluorobenzene	104	70-130

AIR TOXICS LTD.

Client Sample ID: CCV

Lab ID#: 0512246A-05A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	f121902	Date of Collection: NA	
Dil. Factor:	1.00	Date of Analysis: 12/19/05 09:56 AM	

Compound	%Recovery
Vinyl Chloride	91
1,1-Dichloroethene	95
1,1-Dichloroethane	93
cis-1,2-Dichloroethene	94
Chloroform	95
1,1,1-Trichloroethane	99
Trichloroethene	100
Tetrachloroethene	92

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	106	70-130
4-Bromofluorobenzene	100	70-130

AIR TOXICS LTD.

Client Sample ID: LCS

Lab ID#: 0512246A-06A

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	f121903	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 12/19/05 10:39 AM

Compound	%Recovery
Vinyl Chloride	74
1,1-Dichloroethene	83
1,1-Dichloroethane	83
cis-1,2-Dichloroethene	87
Chloroform	84
1,1,1-Trichloroethane	82
Trichloroethene	86
Tetrachloroethene	85

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	106	70-130
4-Bromofluorobenzene	100	70-130

AIR TOXICS LTD.

Client Sample ID: LCSD

Lab ID#: 0512246A-06AA

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	112904	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	12/19/05 11:24 AM

Compound	%Recovery
Vinyl Chloride	75
1,1-Dichloroethene	84
1,1-Dichloroethane	83
cis-1,2-Dichloroethene	88
Chloroform	85
1,1,1-Trichloroethane	82
Trichloroethene	86
Tetrachloroethene	86

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	106	70-130
4-Bromofluorobenzene	101	70-130

Chain of Custody Record

№ 101307

0512246

The RETEC Group, Inc.
*0 1 6 W. Kitsap Way, Suite 207 • Seattle, WA 98134-1132
(206) 324-9349 Phone • (206) 624-2839 Fax
www.retec.com

RETEC

Project Name: GEAE	Project Number: GE001-18600-750
Send Report To: Jill Lantz	Sampler (Print Name):
Address: 1011 SW Klickitat Way	Sampler (Print Name): J. Stevens
Suite 207	Shipment Method: Fedex
Seattle WA	Airbill Number:
Phone: 206-624-9349	Laboratory Receiving: Air Toxics LTD
Fax:	

Page 1 of 1

Purchase Order #: 69 12/15/05

Item	Field Sample ID	CAN #	Sample Date	Sample Time	Sample Matrix	Number of Containers	Analysis Requested: 1,1,1-TCA	1,1,2-TCA	1,1-DCE	Chloroform	1,2-DCE	PCE	TCE	Vinyl Chloride	Halium	Comments, Special Instructions, etc. Initial	Final	Lab Sample ID (to be completed by lab) Initial	Final
01A	V-2-120S	4157	12/6/05	1610	AIR	1	X	X	X	X	X	X	X	X	X	-26.5	-4.2	6.5"Hg	5.0psi
02A	V-1-120S	30933	↓	1502	AIR	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	-26.5	1.2	3.0"Hg	↓
03A	V-5-120S	34406	↓	1347	AIR	1	↓	↓	↓	↓	↓	↓	↓	↓	↓	-26.25	0.0	(*) 1.0"Hg	↓

*Returning CAN # 33982 EMPTY - initial pressure = 0.0

CUSTODY SEAL INTACT?
Y N NONE TEMP

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
J C Stevens 1800 12/6/05	Andy See ATL	12/9/05	0930
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

Sample Custodian Remarks (Completed By Laboratory):

QA/QC Level		Turnaround		Sample Receipt	
Level I	☐	Routine	☐	Total # Containers Received?	
Level II	☐	24 Hour	☐	COC Seals Present?	
Level III	☐	1 Week	☐	COC Seals Intact?	
Other	☐	Other ____		Received Containers Intact?	
				Temperature?	

White: Lab Copy Yellow: PM Copy Pink: Field Copy Gold: PM/QA/QC Copy

7902 4523 5752

@ AIR TOXICS LTD.
AN ENVIRONMENTAL ANALYTICAL LABORATORY

CHAIN-OF-CUSTODY RECORD

Sample Transportation Notice
Relinquishing signature on this document indicates that sample is being shipped in compliance with all applicable local, State, Federal, national, and international laws, regulations and ordinances of any kind. Air Toxics Limited assumes no liability with respect to the collection, handling or shipping of these samples. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Air Toxics Limited against any claim, demand, or action, of any kind, related to the collection, handling, or shipping of samples. D.O.T. Hotline (800) 467-4922.

180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX (916) 985-1020

Contact Person: Jill Lantz
Company: The RETEC Group Email: jlantz@retec.com
Address: 1011 SW Klickitat Way, Suite 207 City: Seattle State: WA Zip: 98134
Phone: 206-624-9349 Fax:
Collected by: (Signature) J. Stevens

Project Info:
P.O. #:
Project #: 96001-18600-750
Project Name: GEAE-Dawson St

Turn Around Time:
☑ Normal
☐ Rush
specify

Lab Use Only
Pressurized by: JC
Date: 12/10/05
Pressurization Gas: (N2) He

Lab I.D.	Field Sample I.D. (Location)	Can#	Date	Start Time	Analyses Requested	Canister Pressure/Vacuum Initial	Final	Receipt	Final (psig)
11A	AA-4-1205	3397	12/05/05	0854	TO-15 SIM	-18	-4.5	6	4.5	5.0
12A	AA-5-1205	2508	12/05/05	0844	TO-15 SIM	-25	-3.0	1.5	6	4.5	4

Relinquished by: (signature) JC Stevens Date/Time 12/06/05 0610
Received by: (signature) [illegible] Date/Time 12/8/05 1020

Notes: * Pressure measured on gauge of flow controller
Initial pressure measured with gauge attached to flow controller. may be suspect

Relinquished by: (signature) Date/Time
Received by: (signature) Date/Time

Relinquished by: (signature) Date/Time
Received by: (signature) Date/Time

Lab Use Only	Shipper Name	Air Bill #	Temp (°C)	Condition	Customer Seals Intact?	Work Order #
	Fedex	7912 9454 1603	-	ok	Yes No None	0512185

Form 1283.rev.13

@ AIR TOXICS LTD.
AN ENVIRONMENTAL ANALYTICAL LABORATORY

180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX (916) 985-1020

CHAIN-OF-CUSTODY RECORD

Sample Transportation Notice
Relinquishing signature on this document indicates that sample is being shipped in compliance with all applicable local, State, Federal, national, and international laws, regulations and ordinances of any kind. Air Toxics Limited assumes no liability with respect to the collection, handling or shipping of these samples. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Air Toxics Limited against any claim, demand, or action, of any kind, related to the collection, handling, or shipping of samples. D.O.T. Hotline (800) 467-4922.

Page 1 of 1

Contact Person: Jill Lantz
Company: The RETEC Group Email: jlantz@retec.com
Address: 1011 SW Klickitat Way Suite 207 City: Seattle State: WA Zip: 98134
Phone: 206-624-9349 Fax:
Collected by: (Signature) [signature]

Project Info:
P.O. #:
Project #: GEC01-18000-750
Project Name: GEAE - Dunson St

Turn Around Time:
[X] Normal
[ ] Rush
specify

Lab Use Only
Pressurized by: OF
Date: 12/16/05
Pressurization Gas: (N2) He

Lab I.D.	Field Sample I.D. (Location)	Can#	Date	Start Time	Analyses Requested	Canister Pressure/Vacuum Initial	Final	Receipt	Final (psi)
01A	1A-1-1205	12087	12/5/05	0805	TO-15 SIM	23/30"	2/7	4.5%	5.0%
02A	1A-2-1205	34752	12/9/05	0817	TO-15 SIM	24/30"	4.5/9.5	6.5%	
03A	1A-20-1205	33888		0817	TO-15 SIM	23/30"	2/7	5.0%	
04A	1A-3-1205	34369		0808	TO-15 SIM	23.5/30"	2.5/6	6.0%	
05A	1A-4-1205	34343		0758	TO-15 SIM	24/30"	2.5/7	5.0%	
06A	1A-5-1205	33896		0804	TO-15 SIM	24/28	3/5	6.5%	
07A	1A-6-1205	31440		0820	TO-15 SIM	23.5/30	2.5/8.5	5.0%	
08A	AA-1-1205	3783		0841	TO-15 SIM	24/30	2.5/10	6.0%	
09A	AA-2-1205	34479		0836	TO-15 SIM	23.5/30	2/5.5	4.5%	
10A	AA-3-1205	11892		0808	TO-15 SIM	23.5/28.5	1.5	4.5%	

Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time
[signature]	12/06/05 0611	[signature]	12/8/05 1020
Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time
Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time

Notes: * Pressure measured on gauge / controller
Initial measurements on gauge attached to controller so may be suspect.

Lab Use Only	Shipper Name	Air Bill #	Temp (°C)	Condition	Customer Seals Intact?	Work Order #
	Fedex	7912 9454 4403	-	good	Yes / No / (None)	0512185

Form 1293 rev.10

AIR TOXICS LTD.

Client Sample ID: LCSD

Lab ID#: 0512185-15AA

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	g121404sim	Date of Collection: NA	
Dil. Factor:	1.00	Date of Analysis: 12/14/05 09:04 AM	

Compound	%Recovery
Vinyl Chloride	90
cis-1,2-Dichloroethene	90
Trichloroethene	89
1,1-Dichloroethene	86
Chloroform	100
1,1,1-Trichloroethane	96
Tetrachloroethene	95
1,1-Dichloroethane	99

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	107	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	101	70-130

AIR TOXICS LTD.

Client Sample ID: LCS

Lab ID#: 0512185-15A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	g121403sim	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	12/14/05 08:38 AM

Compound	%Recovery
Vinyl Chloride	89
cis-1,2-Dichloroethene	86
Trichloroethene	89
1,1-Dichloroethene	86
Chloroform	99
1,1,1-Trichloroethane	95
Tetrachloroethene	98
1,1-Dichloroethane	98

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	105	70-130
Toluene-d8	106	70-130
4-Bromofluorobenzene	102	70-130

AIR TOXICS LTD.

Client Sample ID: CCV

Lab ID#: 0512185-14A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name	g121402sim	Date of Collection: NA	
Dil. Factor	1.00	Date of Analysis: 12/14/05 08:12 AM	

Compound	%Recovery
Vinyl Chloride	112
cis-1,2-Dichloroethene	104
Trichloroethene	110
1,1-Dichloroethene	105
Chloroform	110
1,1,1-Trichloroethane	112
Tetrachloroethene	111
1,1-Dichloroethane	110

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	111	70-130
4-Bromofluorobenzene	104	70-130

AIR TOXICS LTD.

Client Sample ID: Lab Blank

Lab ID#: 0512185-13A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	g121406sim	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	12/14/05 10:15 AM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Vinyl Chloride	0.010	Not Detected	0.026	Not Detected
cis-1,2-Dichloroethene	0.020	Not Detected	0.079	Not Detected
Trichloroethene	0.020	Not Detected	0.11	Not Detected
1,1-Dichloroethene	0.010	Not Detected	0.040	Not Detected
Chloroform	0.020	Not Detected	0.098	Not Detected
1,1,1-Trichloroethane	0.020	Not Detected	0.11	Not Detected
Tetrachloroethene	0.020	Not Detected	0.14	Not Detected
1,1-Dichloroethane	0.020	Not Detected	0.081	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	92	70-130

AIR TOXICS LTD.

Client Sample ID: AA-5-1205

Lab ID#: 0512185-12A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	g121412sim	Date of Collection:	12/5/05
Dil. Factor:	1.58	Date of Analysis:	12/14/05 01:39 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Vinyl Chloride	0.016	Not Detected	0.040	Not Detected
cis-1,2-Dichloroethene	0.032	Not Detected	0.12	Not Detected
Trichloroethene	0.032	0.035	0.17	0.19
1,1-Dichloroethene	0.016	Not Detected	0.063	Not Detected
Chloroform	0.032	Not Detected	0.15	Not Detected
1,1,1-Trichloroethane	0.032	Not Detected	0.17	Not Detected
Tetrachloroethene	0.032	0.059	0.21	0.40
1,1-Dichloroethane	0.032	Not Detected	0.13	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	106	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	93	70-130

AIR TOXICS LTD.

Client Sample ID: AA-4-1205

Lab ID#: 0512185-11A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	g121410sim	Date of Collection:	12/5/05
Dil. Factor:	1.58	Date of Analysis:	12/14/05 12:37 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Vinyl Chloride	0.016	Not Detected	0.040	Not Detected
cis-1,2-Dichloroethene	0.032	Not Detected	0.12	Not Detected
Trichloroethene	0.032	Not Detected	0.17	Not Detected
1,1-Dichloroethene	0.016	Not Detected	0.063	Not Detected
Chloroform	0.032	Not Detected	0.15	Not Detected
1,1,1-Trichloroethane	0.032	Not Detected	0.17	Not Detected
Tetrachloroethene	0.032	0.050	0.21	0.34
1,1-Dichloroethane	0.032	Not Detected	0.13	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	93	70-130

AIR TOXICS LTD.

Client Sample ID: AA-3-1205

Lab ID#: 0512185-10A

MODIFIED EPA METHOD TO-15 GC/MS SIM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Vinyl Chloride	0.016	Not Detected	0.040	Not Detected
cis-1,2-Dichloroethene	0.032	Not Detected	0.12	Not Detected
Trichloroethene	0.032	0.034	0.17	0.18
1,1-Dichloroethene	0.016	Not Detected	0.063	Not Detected
Chloroform	0.032	Not Detected	0.15	Not Detected
1,1,1-Trichloroethane	0.032	Not Detected	0.17	Not Detected
Tetrachloroethene	0.032	0.054	0.21	0.37
1,1-Dichloroethane	0.032	Not Detected	0.13	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	105	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	93	70-130

AIR TOXICS LTD.

Client Sample ID: AA-2-1205

Lab ID#: 0512185-09A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	g121413sim	Date of Collection:	12/5/05
Dil. Factor:	1.58	Date of Analysis:	12/14/05 02:09 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Vinyl Chloride	0.016	Not Detected	0.040	Not Detected
cis-1,2-Dichloroethene	0.032	Not Detected	0.12	Not Detected
Trichloroethene	0.032	0.033	0.17	0.18
1,1-Dichloroethene	0.016	Not Detected	0.063	Not Detected
Chloroform	0.032	Not Detected	0.15	Not Detected
1,1,1-Trichloroethane	0.032	Not Detected	0.17	Not Detected
Tetrachloroethene	0.032	0.056	0.21	0.38
1,1-Dichloroethane	0.032	Not Detected	0.13	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	106	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	94	70-130

AIR TOXICS LTD.

Client Sample ID: AA-1-1205

Lab ID#: 0512185-08A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	g121411sim	Date of Collection:	12/5/05
Dil. Factor:	1.68	Date of Analysis:	12/14/05 01:08 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Vinyl Chloride	0.017	Not Detected	0.043	Not Detected
cis-1,2-Dichloroethene	0.034	Not Detected	0.13	Not Detected
Trichloroethene	0.034	0.036	0.18	0.20
1,1-Dichloroethene	0.017	Not Detected	0.067	Not Detected
Chloroform	0.034	Not Detected	0.16	Not Detected
1,1,1-Trichloroethane	0.034	Not Detected	0.18	Not Detected
Tetrachloroethene	0.034	0.068	0.23	0.46
1,1-Dichloroethane	0.034	Not Detected	0.14	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	93	70-130

AIR TOXICS LTD.

Client Sample ID: IA-6-1205 Duplicate

Lab ID#: 0512185-07AA

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	g121420sim	Date of Collection: 12/5/05
Dil. Factor:	1.61	Date of Analysis: 12/14/05 06:36 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Vinyl Chloride	0.016	Not Detected	0.041	Not Detected
cis-1,2-Dichloroethene	0.032	Not Detected	0.13	Not Detected
Trichloroethene	0.032	0.075	0.17	0.40
1,1-Dichloroethene	0.016	Not Detected	0.064	Not Detected
Chloroform	0.032	Not Detected	0.16	Not Detected
1,1,1-Trichloroethane	0.032	Not Detected	0.18	Not Detected
Tetrachloroethene	0.032	0.067	0.22	0.45
1,1-Dichloroethane	0.032	Not Detected	0.13	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	108	70-130
4-Bromofluorobenzene	106	70-130

AIR TOXICS LTD.

Client Sample ID: IA-6-1205

Lab ID#: 0512185-07A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	g121419sim	Date of Collection: 12/5/05
Dil. Factor:	1.61	Date of Analysis: 12/14/05 05:58 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Vinyl Chloride	0.016	Not Detected	0.041	Not Detected
cis-1,2-Dichloroethene	0.032	Not Detected	0.13	Not Detected
Trichloroethene	0.032	0.082	0.17	0.44
1,1-Dichloroethene	0.016	Not Detected	0.064	Not Detected
Chloroform	0.032	Not Detected	0.16	Not Detected
1,1,1-Trichloroethane	0.032	Not Detected	0.18	Not Detected
Tetrachloroethene	0.032	0.068	0.22	0.46
1,1-Dichloroethane	0.032	Not Detected	0.13	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	113	70-130
4-Bromofluorobenzene	110	70-130

AIR TOXICS LTD.

Client Sample ID: IA-5-1205

Lab ID#: 0512185-06A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	g121408sim	Date of Collection:	12/5/05
Dil. Factor:	1.71	Date of Analysis:	12/14/05 11:29 AM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Vinyl Chloride	0.017	Not Detected	0.044	Not Detected
cis-1,2-Dichloroethene	0.034	Not Detected	0.14	Not Detected
Trichloroethene	0.034	0.13	0.18	0.71
1,1-Dichloroethene	0.017	Not Detected	0.068	Not Detected
Chloroform	0.034	Not Detected	0.17	Not Detected
1,1,1-Trichloroethane	0.034	0.070	0.19	0.38
Tetrachloroethene	0.034	0.066	0.23	0.45
1,1-Dichloroethane	0.034	Not Detected	0.14	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	103	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	102	70-130

AIR TOXICS LTD.

Client Sample ID: IA-4-1205

Lab ID#: 0512185-05A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	g121407sim	Date of Collection:	12/5/05
Dil. Factor:	1.61	Date of Analysis:	12/14/05 10:55 AM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Vinyl Chloride	0.016	Not Detected	0.041	Not Detected
cis-1,2-Dichloroethene	0.032	Not Detected	0.13	Not Detected
Trichloroethene	0.032	0.10	0.17	0.55
1,1-Dichloroethene	0.016	Not Detected	0.064	Not Detected
Chloroform	0.032	Not Detected	0.16	Not Detected
1,1,1-Trichloroethane	0.032	Not Detected	0.18	Not Detected
Tetrachloroethene	0.032	0.062	0.22	0.42
1,1-Dichloroethane	0.032	Not Detected	0.13	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	98	70-130

AIR TOXICS LTD.

Client Sample ID: IA-3-1205

Lab ID#: 0512185-04A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	g121417sim	Date of Collection:	12/5/05
Dil. Factor:	1.68	Date of Analysis:	12/14/05 04:28 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Vinyl Chloride	0.017	Not Detected	0.043	Not Detected
cis-1,2-Dichloroethene	0.034	Not Detected	0.13	Not Detected
Trichloroethene	0.034	0.064	0.18	0.34
1,1-Dichloroethene	0.017	Not Detected	0.067	Not Detected
Chloroform	0.034	Not Detected	0.16	Not Detected
1,1,1-Trichloroethane	0.034	Not Detected	0.18	Not Detected
Tetrachloroethene	0.034	0.063	0.23	0.43
1,1-Dichloroethane	0.034	Not Detected	0.14	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	105	70-130
4-Bromofluorobenzene	109	70-130

AIR TOXICS LTD.

Client Sample ID: IA-20-1205

Lab ID#: 0512185-03A

MODIFIED EPA METHOD TO-15 GC/MS SIM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Vinyl Chloride	0.016	Not Detected	0.041	Not Detected
cis-1,2-Dichloroethene	0.032	Not Detected	0.13	Not Detected
Trichloroethene	0.032	0.052	0.17	0.28
1,1-Dichloroethene	0.016	Not Detected	0.064	Not Detected
Chloroform	0.032	Not Detected	0.16	Not Detected
1,1,1-Trichloroethane	0.032	Not Detected	0.18	Not Detected
Tetrachloroethene	0.032	0.057	0.22	0.38
1,1-Dichloroethane	0.032	Not Detected	0.13	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	106	70-130
Toluene-d8	107	70-130
4-Bromofluorobenzene	108	70-130

AIR TOXICS LTD.

Client Sample ID: IA-2-1205

Lab ID#: 0512185-02A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	g121418sim	Date of Collection:	12/5/05
Dil. Factor:	1.71	Date of Analysis:	12/14/05 05:21 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Vinyl Chloride	0.017	Not Detected	0.044	Not Detected
cis-1,2-Dichloroethene	0.034	Not Detected	0.14	Not Detected
Trichloroethene	0.034	0.051	0.18	0.27
1,1-Dichloroethene	0.017	Not Detected	0.068	Not Detected
Chloroform	0.034	Not Detected	0.17	Not Detected
1,1,1-Trichloroethane	0.034	Not Detected	0.19	Not Detected
Tetrachloroethene	0.034	0.056	0.23	0.38
1,1-Dichloroethane	0.034	Not Detected	0.14	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	109	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	105	70-130

AIR TOXICS LTD.

Client Sample ID: IA-1-1205

Lab ID#: 0512185-01A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	g121416sim	Date of Collection:	12/5/05
Dil. Factor:	1.58	Date of Analysis:	12/14/05 03:43 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Vinyl Chloride	0.016	Not Detected	0.040	Not Detected
cis-1,2-Dichloroethene	0.032	Not Detected	0.12	Not Detected
Trichloroethene	0.032	0.052	0.17	0.28
1,1-Dichloroethene	0.016	Not Detected	0.063	Not Detected
Chloroform	0.032	Not Detected	0.15	Not Detected
1,1,1-Trichloroethane	0.032	0.033	0.17	0.18
Tetrachloroethene	0.032	0.056	0.21	0.38
1,1-Dichloroethane	0.032	Not Detected	0.13	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	105	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	100	70-130

Client Sample ID: AA-5-1205

Lab ID#: 0512185-12A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Trichloroethene	0.032	0.035	0.17	0.19
Tetrachloroethene	0.032	0.059	0.21	0.40

Client Sample ID: IA-5-1205

Lab ID#: 0512185-06A

1,1,1-Trichloroethane	0.034	0.070	0.19	0.38
Tetrachloroethene	0.034	0.066	0.23	0.45

Client Sample ID: IA-6-1205

Lab ID#: 0512185-07A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Trichloroethene	0.032	0.082	0.17	0.44
Tetrachloroethene	0.032	0.068	0.22	0.46

Client Sample ID: IA-6-1205 Duplicate

Lab ID#: 0512185-07AA

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Trichloroethene	0.032	0.075	0.17	0.40
Tetrachloroethene	0.032	0.067	0.22	0.45

Client Sample ID: AA-1-1205

Lab ID#: 0512185-08A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Trichloroethene	0.034	0.036	0.18	0.20
Tetrachloroethene	0.034	0.068	0.23	0.46

Client Sample ID: AA-2-1205

Lab ID#: 0512185-09A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Trichloroethene	0.032	0.033	0.17	0.18
Tetrachloroethene	0.032	0.056	0.21	0.38

Client Sample ID: AA-3-1205

Lab ID#: 0512185-10A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Trichloroethene	0.032	0.034	0.17	0.18
Tetrachloroethene	0.032	0.054	0.21	0.37

Client Sample ID: AA-4-1205

Lab ID#: 0512185-11A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Tetrachloroethene	0.032	0.050	0.21	0.34

AIR TOXICS LTD.

Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS SIM

Client Sample ID: IA-1-1205

Lab ID#: 0512185-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Trichloroethene	0.032	0.052	0.17	0.28
1,1,1-Trichloroethane	0.032	0.033	0.17	0.18
Tetrachloroethene	0.032	0.056	0.21	0.38

Client Sample ID: IA-2-1205

Lab ID#: 0512185-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Trichloroethene	0.034	0.051	0.18	0.27
Tetrachloroethene	0.034	0.056	0.23	0.38

Client Sample ID: IA-20-1205

Lab ID#: 0512185-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Trichloroethene	0.032	0.052	0.17	0.28
Tetrachloroethene	0.032	0.057	0.22	0.38

Client Sample ID: IA-3-1205

Lab ID#: 0512185-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Trichloroethene	0.034	0.064	0.18	0.34
Tetrachloroethene	0.034	0.063	0.23	0.43

Client Sample ID: IA-4-1205

Lab ID#: 0512185-05A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Trichloroethene	0.032	0.10	0.17	0.55
Tetrachloroethene	0.032	0.062	0.22	0.42

Client Sample ID: IA-5-1205

Lab ID#: 0512185-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Trichloroethene	0.034	0.13	0.18	0.71

as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

LABORATORY NARRATIVE
Modified TO-15 SIM
The RETEC Group, Inc.
Workorder# 0512185

Twelve 6 Liter Summa Canister (SIM Certified) samples were received on December 08, 2005. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the SIM acquisition mode. The method involves concentrating up to 0.5 liters of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis.

Method modifications taken to run these samples are summarized in the below table. Specific project requirements may over-ride the ATL modifications.

Requirement	*TO-15*	*ATL Modifications*
ICAL %RSD acceptance criteria	</=30% RSD with 2 compounds allowed out to < 40% RSD	Project specific; default criteria is </=30% RSD with 10% of compounds allowed out to < 40% RSD
Daily Calibration	+- 30% Difference	Project specific; default criteria is </= 30% Difference with 10% of compounds allowed out up to </=40%.; flag and narrate outliers
Blank and standards	Zero air	Nitrogen
Method Detection Limit	Follow 40CFR Pt.136 App. B	The MDL met all relevant requirements in Method TO-15 (statistical MDL less than the LOQ). The concentration of the spiked replicate may have exceeded 10X the calculated MDL in some cases

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates

AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0512185

Work Order Summary

CLIENT:	Ms. Jill Lantz The RETEC Group, Inc. 1011 SW Klickitat Way Suite 207 Seattle, WA 98134	**BILL TO:**	Ms. Jill Lantz The RETEC Group, Inc. 1011 SW Klickitat Way Suite 207 Seattle, WA 98134
PHONE:		**P.O. #**	
FAX:		**PROJECT #**	GE001-18600-750 GEAE Dawson St
DATE RECEIVED:	12/08/2005	**CONTACT:**	Nicole Danbacher
DATE COMPLETED:	12/21/2005		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.
01A	IA-1-1205	Modified TO-15 SIM	4.5 "Hg
02A	IA-2-1205	Modified TO-15 SIM	6.5 "Hg
03A	IA-20-1205	Modified TO-15 SIM	5.0 "Hg
04A	IA-3-1205	Modified TO-15 SIM	6.0 "Hg
05A	IA-4-1205	Modified TO-15 SIM	5.0 "Hg
06A	IA-5-1205	Modified TO-15 SIM	6.5 "Hg
07A	IA-6-1205	Modified TO-15 SIM	5.0 "Hg
07AA	IA-6-1205 Duplicate	Modified TO-15 SIM	5.0 "Hg
08A	AA-1-1205	Modified TO-15 SIM	6.0 "Hg
09A	AA-2-1205	Modified TO-15 SIM	4.5 "Hg
10A	AA-3-1205	Modified TO-15 SIM	4.5 "Hg
11A	AA-4-1205	Modified TO-15 SIM	4.5 "Hg
12A	AA-5-1205	Modified TO-15 SIM	4.5 "Hg
13A	Lab Blank	Modified TO-15 SIM	NA
14A	CCV	Modified TO-15 SIM	NA
15A	LCS	Modified TO-15 SIM	NA
15AA	LCSD	Modified TO-15 SIM	NA

CERTIFIED BY: Linda D. Turner DATE: 12/21/05

Laboratory Director

Certfication numbers: AR DEQ - 03-084-0, CA NELAP - 02110CA, LA NELAP/LELAP- AI 30763, NJ NELAP - CA004
NY NELAP - 11291, UT NELAP - 9166389892
Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
Accreditation number: E87680, Effective date: 07/01/05, Expiration date: 06/30/06
Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 (800) 985-5955 FAX (916) 985-1020

AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Air Toxics Ltd. Introduces the Electronic Report

Thank you for choosing Air Toxics Ltd. To better serve our customers, we are providing your report by e-mail. This document is provided in Portable Document Format which can be viewed with Acrobat Reader by Adobe.

This electronic report includes the following:

- Work order Summary;
- Laboratory Narrative;
- Results; and
- Chain of Custody (copy).

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630

(916) 985-1000 .FAX (916) 985-1020
Hours 8:00 A.M to 6:00 P.M. Pacific