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2014 TIER 3 VAPOR INTRUSION ASSESSMENT REPORT

5815 4th AVENUE SOUTH—NORTH BUILDING SEATTLE, WASHINGTON

AGREED ORDER NO. DE 5348

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For:
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ACRONYMS AND ABBREVIATIONS

Agreed Order	Agreed Order No. DE 5348 entered into by Capital Industries, Inc. and the Washington State Department of Ecology on January 24, 2008
Building	North Building at 5815 4th Avenue South in Seattle, Washington
Capital	Capital Industries, Inc.
CCEF	cancer cumulative exceedance factor
COPCs	constituents of potential concern
Ecology	Washington State Department of Ecology
Farallon	Farallon Consulting, L.L.C.
HVOCs	halogenated volatile organic compounds
IPIMALs	Inhalation Pathway Interim Measures Action Levels
IPIM	Inhalation Pathway Interim Measures
NCCEF	non-cancer cumulative exceedance factor
PCE	tetrachloroethene
PSC	Philip Services Corporation
RI	*Revised Draft Remedial Investigation Report, 5901 4th Avenue South, Seattle, Washington* dated October 2012 prepared by Farallon
SAP	*Revised Tier 3 Vapor Intrusion Sampling and Analysis Plan, 5815 4th Avenue South – North Building, Seattle, Washington* dated December 23, 2011 prepared by Farallon
SAP Addendum	*2013 Tier 3 Vapor Intrusion Assessment Sampling and Analysis Plan Addendum, Capital Industries, Inc. 5801 Third Avenue South, Seattle, Washington* dated February 27, 2013 prepared by Farallon
SOP	Standard Operating Procedures
TCE	trichloroethene
Tier 3 VI Assessment Report	*Tier 3 Vapor Intrusion Assessment Report, 5814 4th Avenue South—North Building, Seattle, Washington* dated August 20, 2014, prepared by Farallon (this report)
VI	vapor intrusion
VI Assessment	Vapor Intrusion Assessment

1.0 INTRODUCTION

Farallon Consulting, L.L.C. (Farallon) has prepared this 2014 Tier 3 Vapor Intrusion Assessment Report (Tier 3 VI Assessment Report) on behalf of Capital Industries, Inc. (Capital) to present the results of the Tier 3 Vapor Intrusion Assessment (VI Assessment) conducted at the Pacific Food Systems North Building at 5815 4th Avenue South in Seattle, Washington (herein referred to as the Building) (Figure 1). The Tier 3 VI Assessment Report presents the results of the VI Assessment work completed between April 2011 and May 2014.

The Tier 3 VI Assessment Report has been prepared in accordance with Exhibits B and D of Agreed Order No. DE 5348, which was entered into by Capital and the Washington State Department of Ecology (Ecology) on January 24, 2008 (Agreed Order). The VI Assessment was conducted in accordance with the *Tier 3 Vapor Intrusion Sampling and Analysis Plan, 5815 4th Avenue South, Seattle, Washington* dated December 23, 2011 (SAP) prepared by Farallon (2011b), and the *2013 Tier 3 Vapor Intrusion Assessment Sampling and Analysis Plan Addendum, Capital Industries, Inc. 5801 Third Avenue South, Seattle, Washington* dated February 27, 2013 prepared by Farallon (2013) (SAP Addendum), which included Standard Operating Procedures (SOPs) for collection of air samples . The SOPs are provided in Appendix A. The VI Assessment also was completed in general accordance with the Revised Inhalation Pathway Interim Measures (IPIM) Work Plan prepared by Philip Services Corporation (PSC) (2002); the Draft Interim Vapor Intrusion Plan prepared by Arrow Environmental et al. (2007), which is Exhibit D of the Agreed Order; and the *Updated Air and Groundwater IPIMALs/VIRLs for Residential and Commercial Scenarios for the Georgetown Site* prepared by Pioneer Technologies Corporation (2012).

1.1 PURPOSE

The purpose of the VI Assessment was to evaluate the potential for migration of constituents of potential concern (COPCs), including the halogenated volatile organic compounds (HVOCs) tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene, trans-1,2-dichloroethene, 1,1-dichloroethene, and vinyl chloride to occur from soil or groundwater to indoor air in the Building. The results of the VI Assessment were used to determine whether Tier 4 mitigation measures are necessary to protect human health.

1.2 REPORT ORGANIZATION

This Tier 3 VI Assessment Report has been organized into the following sections:

- Section 1 presents the purpose of the VI Assessment;
- Section 2 provides a site description and a summary of the IPIM approach for VI Assessment;
- Section 3 presents the results of the Building inspection and discusses the procedures for collecting subslab soil gas and indoor and outdoor air samples;
- Section 4 includes a discussion of the VI Assessment results;

- Section 5 presents Farallon's conclusions with respect to the VI Assessment results; and
- Section 6 lists the documents used in preparation of this report.

2.0 SITE DESCRIPTION AND IPIM APPROACH

The following sections provide a description of the Capital Area of Investigation, which the Building is located within, and a summary of the VI Assessment approach.

2.1 SITE DESCRIPTION

Capital is defined as the property at 5801 3rd Avenue South between South Mead Street on the north and South Fidalgo Street on the south, and between 4th Avenue South on the east and 1st Avenue South on the west in Section 39, Township 24 South, Range 4 East in Seattle, King County, Washington (Figure 1) and is a source of HVOCs in the subsurface with the potential to result in a vapor intrusion condition at Capital and buildings within the Capital Area of Investigation. The Capital Area of Investigation was initially defined in the *Remedial Investigation Work Plan, Capital Industries, Inc., 5801 Third Avenue South, Seattle, Washington* dated September 16, 2008, prepared by Farallon (2008a); and revised in the *Revised Draft Remedial Investigation Report, 5901 4th Avenue South, Seattle, Washington* dated October 2012 prepared by Farallon (2012b) (RI) as the area where concentrations of HVOCs associated with confirmed or suspected source areas at Capital exceed the screening levels (Figure 1). The Capital Area of Investigation is within the Seattle city limits in King County, Washington (2007) and is zoned as industrial light manufacturing. Properties within the Capital Area of Investigation include a mixture of light industrial, commercial, and residential properties.

The Building is located within the Capital Area of Investigation, east of Capital Plant 4 (Figure 1), and currently is used by Pacific Food Systems for warehouse storage and equipment maintenance. A description of the Building is provided in Section 3.1, Building Inspection and Evaluation.

2.2 IPIM APPROACH FOR VAPOR ASSESSMENT

The *Vapor Intrusion Assessment Work Plan, Capital Industries, Inc., 5801 Third Avenue South, Seattle Washington* dated September 16, 2008 prepared by Farallon (2008b) presents a scope of work for groundwater VI Assessment at buildings within the Capital Area of Investigation that is consistent with the IPIM approach defined by PSC and adopted by Capital. The IPIM approach includes a four-tiered IPIM process that is summarized below:

- **Tiers 1 and 2:** Analytical results of groundwater samples are compared to groundwater Inhalation Pathway Interim Measures Action Levels (IPIMALs) to determine whether there is a potential vapor intrusion (VI) concern in nearby residential (Tier 1) or commercial (Tier 2) buildings. The groundwater data are used to calculate a cancer cumulative exceedance factor (CCEF) and a non-cancer cumulative exceedance factor (NCCEF). If either the CCEF or the NCCEF exceeds a factor of 10 (which represents a carcinogenic risk greater than 1E-05 or a hazard index greater than 1, respectively), the building is further evaluated under Tier 3, or may proceed directly to Tier 4.
- **Tier 3:** Building-specific sampling is conducted, potentially including indoor air, ambient air, additional groundwater, and soil gas and/or subslab soil gas sampling. If

either the CCEF or NCCEF exceeds a factor of 10 (which represents a carcinogenic risk greater than 1E-05 or a hazard index greater than 1, respectively), the building is further evaluated, or may proceed directly to Tier 4.

- **Tier 4:** A VI mitigation system is installed and operated as an interim measure to mitigate the VI exposure pathway.

The groundwater data historically collected at monitoring well MW-8, located up-gradient and north of the Building (Figure 1) did not contain concentrations of HVOCs did not indicate the need for VI assessment for the Building based on the IPIM process approved by Ecology. However, monitoring well MW-6, located down-gradient and to the southwest within Plant 4 of Capital included concentrations of PCE and TCE that warranted a need for VI Assessment. Additionally, PCE and TCE were detected in soil at borings proximate to the Building, with the highest concentration of PCE of 0.038 milligrams per kilogram detected at boring location EC38 (Table 1; Figure 2). Additional information on concentrations of COPCs in soil and groundwater is summarized in the *Remedial Investigation Field Program First Phase Report, Capital Industries, Inc., 5801 3rd Avenue South, Seattle, Washington* dated September 18, 2009, prepared by Farallon (2009), and the RI. A VI Assessment was performed at the Building between 2011 and 2014 to evaluate whether a vapor intrusion condition exists that warrants Tier 4 mitigation measures.

3.0 VAPOR INTRUSION ASSESSMENT PROCEDURES

This section summarizes the Building inspections and the subslab soil gas, indoor, and outdoor ambient air sampling conducted at the Building between January 2011 and May 2014.

3.1 BUILDING INSPECTIONS

Building inspections were conducted in January 2011, March 2013, and April 2014. The purpose of the inspections of the Building was to obtain a better understanding of the architecture, layout, and ventilation features of the Building and to identify structural features that may provide a preferential pathway for soil gas to enter the Building. The inspections were conducted to also identify products stored or used that may contain concentrations of volatile organic compounds that could affect the interpretation of indoor air sampling data.

The Building is approximately 1,176 square feet in area and currently is occupied by Pacific Food Systems, who operates the warehouse portion during normal business hours. The Building was constructed in 1978 and consists of a poured concrete slab-on-grade foundation and corrugated steel walls that are unfinished on the interior and lined with insulation between the studs. No crawl space is present beneath the Building. . The ceiling height in the warehouse portion is greater than 20 feet.

The warehouse portion of the Building is heated using a natural gas forced-air circulation system. The heating system was operating normally during the 2012 and 2013 sampling events, and was not operating during the 2014 sampling events. Ceiling fans are present in the Building and are used for cooling during warm conditions. These fans were not operating at the time of the 2012, 2013, or 2014 sampling events. The Building includes large roll-up doors that occasionally are opened to ventilate the Building. The roll-up doors remained closed during the sampling events in 2012, 2013, and 2014.

Two offices are present in the southern portion of the Building. The offices appear to be used for storage of paperwork and are also periodically used by personnel performing equipment maintenance. The Building has one bathroom with what appeared to be single-sheet vinyl-type floor covering. A floor drain in the bathroom likely is connected to the sanitary sewer for the Building, although the floor drain construction and connections were not confirmed as part of the inspection.

The warehouse portion includes shop facilities, where various chemicals were observed on work benches and in chemical cabinets. Although a full inventory of the chemicals stored and used was not completed for the initial investigation in April 2011, numerous aerosol cans, solvents, lubricants, and degreasers were observed prior to collection of the subslab soil gas samples. These chemicals were not removed at the time of the 2011 or 2012 sampling events because the products were sealed; no open containers were present during these sampling events.

The Building inspection in March 2013 identified the addition of a parts cleaner in the southwest corner of the warehouse that uses Safety Kleen 105, a product that consists primarily of petroleum distillates with trace amounts of PCE. The parts cleaner was present in the Building at the time of the 2013 and April 2014 sampling events, but was not in use. During the May 2014 sampling event, the parts cleaner was removed to evaluate whether it is a potential source of HVOCs. The warehouse also included a drill press and a saw that uses water-soluble cutting oils. The oil containers were sealed at the time of the sampling events.

Ambient air was monitored using a photoionization detector at the time of the 2013 Building inspection and prior to collecting the indoor air samples. The results did not indicate the presence of measurable concentrations of volatile organic compounds in ambient air. Ambient air was not screened during the 2014 sampling events.

3.2 SUBSLAB SOIL GAS SAMPLING

Subslab soil gas sampling was conducted for the 2011 sampling event only, and took place on April 13, 2011 in accordance with the SAP. Subslab soil gas conditions are not anticipated to change significantly; therefore, subslab samples to evaluate the VI pathway were not collected in 2013 or 2014.

The weather forecast was monitored for pending falling barometric pressure prior to and during the 2011 subslab soil gas sampling. The sampling was initiated during a period of falling barometric pressure, considered optimal for assessment of VI conditions.

Barometric pressure on April 12, 2011 was approximately 1,026 millibars, and continuously decreased to approximately 1,012 millibars just prior to initiation of subslab soil gas sampling. Barometric pressure rose to approximately 1,014 millibars by the conclusion of the sampling period. Weather conditions (i.e., temperature, wind speed, wind direction, barometric pressure) were derived from National Oceanic and Atmospheric Administration weather station 9447130 in downtown Seattle before, during, and at the conclusion of the sampling event, and are documented in Appendix B.

Two subslab soil gas samples were collected using evacuated 6-liter Summa canisters that individually were certified clean. Initial Summa canister vacuums were measured at 29.5 inches of mercury. Manifold components and tubing were purged of several volumes of air before sampling was initiated to ensure that the sample collected consisted of soil gas from beneath the Building slab. Sampling duration ranged from 1 hour 55 minutes to 2 hours. Sampling was discontinued when the Summa canister vacuum reached 6.0 inches of mercury, in accordance with the recommendation by the canister suppler, Eurofins/Air Toxics, Ltd. of Folsom, California, that final canister vacuums be not less than 5.0 inches of mercury.

Upon completion of collection of the subslab soil gas samples, the Summa canisters were labeled, sealed, and packed into their original shipping containers and returned to the Eurofins/Air Toxics Ltd. laboratory in Folsom, California for analysis for HVOCs using U.S. Environmental Protection Agency Method TO-15. Farallon also analyzed the subslab soil gas samples for helium by Modified ASTM Method D-1946 to confirm the results obtained from leak testing performed prior to collection of the sample. The Chain of Custody form for the subslab soil gas samples is included with the laboratory analytical reports provided in Appendix C.

3.3 INDOOR AND OUTDOOR AIR SAMPLING

Indoor and outdoor ambient air sampling was performed in February 2012, March 2013, and April and May 2014 to evaluate whether HVOCs in soil gas are entering the Building at concentrations exceeding the IPIMALs, CCEF and/or NCCEF, triggering a need for Tier 4 mitigation measures. Weather conditions (i.e., temperature, wind speed, wind direction, barometric pressure) for all four events were derived from National Oceanic and Atmospheric Administration weather station 9447130 in downtown Seattle before, during, and at the conclusion of each sampling event, and are documented in Appendix B. The Chain of Custody forms for the indoor and outdoor air sampling events are included with the laboratory analytical reports provided in Appendix C. The details of the sampling events are presented below.

3.3.1 February 2012 Indoor and Outdoor Ambient Air Sampling

Indoor and outdoor ambient air sampling was conducted on February 21, 2012 in accordance with the SAP and SOPs (Appendix A) prepared by Farallon (2011b). Sampling included collection of two indoor air samples in Building office and warehouse spaces, and one outdoor air sample along the fence at the southwest corner of the adjacent Pacific Food Systems—South Building (Figure 2). The prevailing wind direction was southwest at approximately 9 knots when sampling was initiated between 8:46 and 9:00 a.m. The wind reached a speed of 12 knots and dropped to approximately 6 knots by the conclusion of the sampling between 3:40 and 6:34 p.m. The location of the outdoor ambient air sample was appropriate for the prevailing wind direction during sampling. Barometric pressure on February 21, 2012 fluctuated between 1016.3 and approximately 1018.4 millibars throughout the sampling period.

The indoor and outdoor ambient air samples were collected using 6-liter Summa canisters. The indoor air sample canisters were placed at locations approximately 3.5 to 5 feet above the Building floor, and the outdoor air sample canister was attached to a fence at a height of approximately 6 feet above ground surface. The initial Summa canister vacuum pressures were measured at 30 inches of mercury for the indoor and outdoor air sample canisters (Table 2). Final vacuum readings at the conclusion of sampling were between 7 and 7.5 inches of mercury for the indoor air sample canisters, and 5 inches of mercury for the outdoor air sample canister. The sampling duration was approximately 8 hours.

Upon completion of the indoor and outdoor ambient air sampling, the Summa canisters were labeled, sealed, and packed into their original shipping containers and sent to the Eurofins/Air Toxics Ltd. laboratory in Folsom, California for analysis for HVOCs using U.S. Environmental Protection Agency Method TO-15/SIM.

During the final inspection of the Building following sample collection, two 3-inch-diameter open core holes were observed in the warehouse floor beneath material storage pallets (Figure 2). Discussions with Pacific Food Systems personnel indicated that the coring had been completed several years earlier and left unsealed. These cores may provide a pathway for soil vapor migration from the subsurface, biasing the sampling results. The two core holes subsequently were filled with concrete, and finished to the existing warehouse floor grade.

3.3.2 March 2013 Indoor and Outdoor Ambient Air Sampling

Indoor and outdoor ambient air sampling was conducted on March 20, 2013 in accordance with the SAP Addendum and SOPs (Appendix A) prepared by Farallon (2013). The sampling was performed to evaluate whether sealing of the core holes in the floor slab in 2012 affected indoor air quality.

The sampling included collection of two indoor air samples in Building office and warehouse spaces, and one outdoor air sample along the fence at the southwest corner of the adjacent Pacific Food Systems—South Building (Figure 2). The prevailing wind direction was southeast at approximately 8 knots when sampling was initiated between 8:30 and 9:00 a.m. The wind reached a speed of 14 knots, and the prevailing wind direction changed to southwest by the conclusion of the sampling between 4:30 and 5:00 p.m. The location of the outdoor ambient air sample was appropriate for the prevailing wind direction during sampling. Barometric pressure on March 20, 2013 fluctuated between 1,000.7 and approximately 995.80 millibars throughout the sampling period.

The indoor and outdoor ambient air samples were collected using 6-liter Summa canisters. The indoor air sample canisters were placed at locations approximately 3.5 to 5 feet above the Building floor. The outdoor air sample canister was attached to a fence at a height of approximately 6 feet above ground surface. The initial Summa canister vacuum pressures were measured at 28.5 to 30 inches of mercury for the indoor and outdoor air sample canisters (Table 2). Final vacuum readings at the conclusion of sampling were between 6.5 and 7.5 inches of mercury for the indoor air sample canisters, and 7.5 inches of mercury for the outdoor air sample canister. The sampling duration was approximately 8 hours.

Upon completion of the 2013 indoor and outdoor ambient air sampling, the Summa canisters were labeled, sealed, and packed into their original shipping containers and sent to the Eurofins/Air Toxics Ltd. laboratory in Folsom, California for analysis for HVOCs using U.S. Environmental Protection Agency Method TO-15/SIM.

3.3.3 April 2014 Indoor and Outdoor Ambient Air Sampling

Indoor and outdoor ambient air sampling was conducted on April 24, 2014 in accordance with the SAP Addendum and SOPs (Appendix A) prepared by Farallon (2013). The sampling was performed to evaluate whether the parts cleaner is a contributing source of PCE and TCE to indoor ambient air sampling results. Sampling was performed at the parts cleaner location with the unit open and residual solvent in the basin.

The April 2014 sampling included collection of one indoor air sample in the Building warehouse space, and one outdoor air sample on the telephone pole at the corner of South Fidalgo Street and 4^{th} Avenue South (Figure 2). The prevailing wind direction was south at approximately 12 knots when sampling was initiated between 8:00 and 8:30 a.m. The wind reached a speed of 13 knots, and the prevailing wind direction changed to southwest by the conclusion of the sampling between 4:00 and 4:30 p.m. The location of the outdoor ambient air sample was appropriate for the prevailing wind direction during sampling. Barometric pressure on April 24, 2014 fluctuated between 1,012.0 and approximately 1,006.8 millibars throughout the sampling period.

The indoor and outdoor ambient air samples were collected using 6-liter Summa canisters. The indoor air sample canister was placed at approximately 3.5 to 5 feet above the Building floor in the southwest corner of the Building at the parts cleaner location. The outdoor air sample canister was attached to a telephone pole at the corner of South Fidalgo Street and 4th Avenue South at a height of approximately 5 feet above the ground surface (Figure 2). The initial Summa canister vacuum pressures were measured at 30 inches of mercury for the indoor and outdoor air sample canisters (Table 2). The final vacuum reading for both indoor and outdoor air sample canisters at the conclusion of sampling was 6.0 inches. The sampling duration was approximately 8 hours.

Upon completion of the 2014 indoor and outdoor ambient air sampling, the Summa canisters were labeled, sealed, and packed into their original shipping containers and sent to the Eurofins/Air Toxics Ltd. laboratory in Folsom, California for analysis for HVOCs using U.S. Environmental Protection Agency Method TO-15/SIM.

3.3.4 May 2014 Indoor Ambient Air Sampling

Indoor ambient air sampling was conducted on May 5, 2014 in accordance with the SAP Addendum and SOPs (Appendix A) prepared by Farallon (2013). The sampling included collection of one indoor air sample in Building warehouse (Figure 2). An outdoor air sample was not collected for this sampling event. Prior to the sampling event, the parts cleaner and solvent were removed from the Building. The Building was ventilated on April 25 and 26, 2014 by Pacific Food Systems. Ventilation reportedly included opening the roll-up doors and operating the ceiling fans and HVAC system throughout both work days. The Building then resumed normal operations during the time of the sampling event. Barometric pressure on May 5, 2014 fluctuated between 1,016.5 and approximately 1,012.9 millibars throughout the sampling period.

The indoor ambient air sample was collected using a 6-liter Summa canister. The indoor air sample canister was placed in the southwest corner of the Building approximately 3.5 to 5 feet above the floor, near the area where the parts cleaner was located prior to its removal (Figure 2). The initial Summa canister vacuum pressure for the indoor air sample canister was measured at 30 inches of mercury (Table 2). The final vacuum reading at the conclusion of sampling was 6.0 inches of mercury. The sampling duration was approximately 8 hours.

Upon completion of the May 2014 indoor ambient air sampling, the Summa canister was labeled, sealed, and packed into its original shipping container and sent to the Eurofins/Air Toxics Ltd. laboratory in Folsom, California for analysis for HVOCs using U.S. Environmental Protection Agency Method TO-15/SIM.

4.0 RESULTS

The Tier 3 VI Assessment included collection and analysis of two subslab soil gas samples during the 2012 sampling event. Indoor and outdoor ambient air samples were collected during the 2012, 2013, and 2014 sampling events. The results of these sampling events are presented below.

4.1 SUBSLAB SOIL GAS RESULTS

Concentrations of PCE, TCE, and cis-1,2-dichloroethene were detected in the subslab soil gas sample collected in 2012 from location SS-2 (Table 3). PCE, TCE, and cis-1,2-dichloroethene were detected in this sample at concentrations of 840, 1,400, and 74 micrograms per cubic meter, respectively. The other target HVOCs were not detected at concentrations at or exceeding laboratory reporting limits. Helium was detected in this soil gas sample at a concentration of 0.44 percent, which indicates that leakage of ambient air occurred during sampling. The sampling shroud concentration was maintained at approximately 22.5 percent. Therefore, the helium concentration in the sample was approximately 2 percent of the helium concentration in the shroud. The leakage indicated by the helium analysis is less than the recommended leak rate threshold of 10 percent, which indicates that the sample results are within an acceptable range of tolerance for data quality.

Concentrations of PCE and TCE were detected in the subslab soil gas sample collected from location SS-3 at concentrations of 4,200 and 28,000 micrograms per cubic meter, respectively (Table 3). The other target HVOCs were not detected at concentrations at or exceeding laboratory reporting limits. Helium was not detected in this soil gas sample at a level at or exceeding the laboratory reporting limit. The absence of helium in the sample indicates that no apparent leakage of ambient air occurred during sampling.

The concentrations of PCE detected in both subslab soil gas samples exceeded the IPIMAL for PCE of 220 micrograms per cubic meter for commercial buildings (Table 4). The concentrations of TCE detected in both subslab soil gas samples exceeded the IPIMAL for TCE of 15 micrograms per cubic meter for commercial buildings (Table 4). No IPIMAL has been established by Ecology for cis-1,2-dichloroethene.

The calculated CCEF value for the subslab soil gas sample collected from location SS-2 is 97, and the NCCEF value is 370, which are based on the cumulative risk of HVOCs present in the samples (Table 4). Both the CCEF and the NCCEF values exceeded the target value of 10 for soil gas.

The calculated CCEF value for the subslab soil gas sample from location SS-3 is 1,888, and the NCCEF value is 7,236, which are based on the cumulative risk of HVOCs present in the samples (Table 4). Both the CCEF and the NCCEF values exceeded the target value of 10 for soil gas.

4.2 INDOOR AND OUTDOOR AMBIENT AIR RESULTS

The results for the indoor and outdoor ambient air sampling events conducted between 2012 and 2014 are presented below.

4.2.1 2012 Indoor and Outdoor Ambient Air Results

PCE, TCE, and cis-1,2-dichloroethene were detected at concentrations exceeding the laboratory reporting limits in the two indoor air samples collected on February 21, 2012 (Table 3). PCE was detected at concentrations of 1.5 and 0.60 micrograms per cubic meter in the samples collected from locations IA-3 and IA-4, respectively. TCE was detected at concentrations of 4.4 and 1.9 micrograms per cubic meter in the samples collected from locations IA-3 and IA-4, respectively. cis-1,2-dichloroethene was detected at concentrations of 0.98 and 0.32 micrograms per cubic meter in the samples collected from locations IA-3 and IA-4, respectively. The remaining target HVOCs were not detected at concentrations at or exceeding laboratory reporting limits.

The target HVOCs were not detected at concentrations at or exceeding laboratory reporting limits in outdoor air sample OA-1 collected on February 21, 2012. This result indicates that concentrations of HVOCs in ambient air will not bias indoor air sampling data.

The concentration of PCE detected in both indoor air samples collected on February 21, 2012 did not exceed the IPIMAL for PCE of 22 micrograms per cubic meter for commercial buildings (Table 5). The concentrations of TCE detected in both indoor samples exceeded the IPIMAL for TCE of 1.5 micrograms per cubic meter for commercial buildings. No IPIMAL for cis-1,2-dichloroethene has been established by Ecology.

The calculated CCEF values for the indoor air samples ranged from 1.2 to 2.9, which are less than the target value of 10. The NCCEF values ranged from 4.7 to 11.3. The NCCEF value for sample IA-3, collected in the warehouse portion of the Building, exceeds the target value of 10.

4.2.2 2013 Indoor and Outdoor Ambient Air Results

PCE, TCE, and cis-1,2-dichloroethene were detected at concentrations exceeding the laboratory reporting limits in the two indoor air samples collected on March 20, 2013 (Table 3). PCE was detected at concentrations of 1.6 and 0.66 micrograms per cubic meter in the samples collected from locations IA-3 and IA-4, respectively. TCE was detected at concentrations of 7.0 and 2.4 micrograms per cubic meter in the samples collected from locations IA-3 and IA-4, respectively. cis-1,2-dichloroethene was detected at concentrations of 1.6 and 0.43 micrograms per cubic meter in the samples collected from locations IA-3 and IA-4, respectively. The remaining target HVOCs were not detected at concentrations at or exceeding laboratory reporting limits.

The target HVOCs were not detected at concentrations at or exceeding laboratory reporting limits in outdoor air sample OA-1 collected on March 20, 2013. This result indicates that concentrations of HVOCs in ambient air will not bias indoor air sampling data.

The concentration of PCE detected in both indoor air samples collected on March 20, 2013 did not exceed the IPIMAL for PCE of 22 micrograms per cubic meter for commercial buildings (Table 5). The concentrations of TCE detected in both indoor samples exceeded the IPIMAL for TCE of 1.5 micrograms per cubic meter for commercial buildings. No IPIMAL for cis-1,2-dichloroethene has been established by Ecology.

The calculated CCEF values for the indoor air samples ranged from 1.6 to 4.8, which are less than the target value of 10. NCCEF values ranged from 6.0 to 17.9. . The NCCEF value for sample IA-3, collected in the warehouse portion of the Building, exceeded the target value of 10.

4.2.3 2014 Indoor and Outdoor Ambient Air Results

PCE, TCE, and cis-1,2-dichloroethene were detected at concentrations exceeding the laboratory reporting limits in the two indoor air samples collected on April 24 and May 5, 2014 (Table 3). PCE was detected at concentrations of 1.1 and 0.95 micrograms per cubic meter in the samples collected from locations IA-5 and IA-6, respectively. TCE was detected at concentrations of 3.4 and 3.6 micrograms per cubic meter in the samples collected from locations IA-5 and IA-6, respectively. Cis-1,2-dichloroethene was detected at concentrations of 0.49 and 0.34 micrograms per cubic meter in the samples collected from locations IA-5 and IA-6, respectively. The remaining target HVOCs were not detected at concentrations at or exceeding laboratory reporting limits in either indoor air sample collected in 2014.

TCE was detected at a concentration of 0.27 micrograms per cubic meter in outdoor air sample OA-2 collected on April 24, 2014, exceeding the laboratory reporting limit (Table 2). No other target HVOC was detected at a concentration at or exceeding laboratory reporting limits in outdoor air sample OA-2. These results indicate that concentrations of HVOCs in ambient air will be factored into the interpretation of the CCEF and NCCEF for the indoor air sampling data.

The concentrations of PCE detected in the indoor air samples collected on April 24 and May 5, 214 did not exceed the IPIMAL for PCE of 22 micrograms per cubic meter for commercial buildings (Table 5). The concentrations of TCE detected in the indoor samples exceeded the IPIMAL for TCE of 1.5 micrograms per cubic meter for commercial buildings. No IPIMAL for cis-1,2-dichloroethene has been established by Ecology.

The calculated CCEF values for indoor air samples IA-5 and IA-6 were 2.1 and 2.3 respectively, less than the target value of 10. Similarly, the calculated NCCEF values for indoor air samples IA-5 and IA-6 were 8.2 and 8.7 respectively, less than the target value of 10.

5.0 CONCLUSIONS

PCE, TCE, and/or cis-1,2-dichloroethene were detected at concentrations exceeding the IPIMALs for commercial buildings and the CCEF and NCCEF values of 10 for cumulative compound risk in two subslab soil gas samples collected at the Building in April 2011. These results indicate the potential for VI into the Building, and warranted indoor air analysis to further evaluate whether a VI risk exists.

The results of the Tier 3 VI Assessments of indoor and outdoor ambient air conducted between 2012 and 2014 indicate that a source of HVOCs in the subsurface is resulting in a vapor intrusion condition for the Building. Results of the indoor air sampling events have remained relatively consistent despite sealing the core holes in the floor slab, and eliminating the potential contribution of HVOCs from the parts cleaner.

Concentrations of TCE detected in indoor air samples have consistently exceeded the IPIMAL of 1.5 micrograms per cubic meter for a carcinogenic compound. Due to the source of TCE being associated with a release of HVOCs beneath or proximate to the Building with no apparent contributing operational source within the building, Tier 4 mitigation measures must be implemented.

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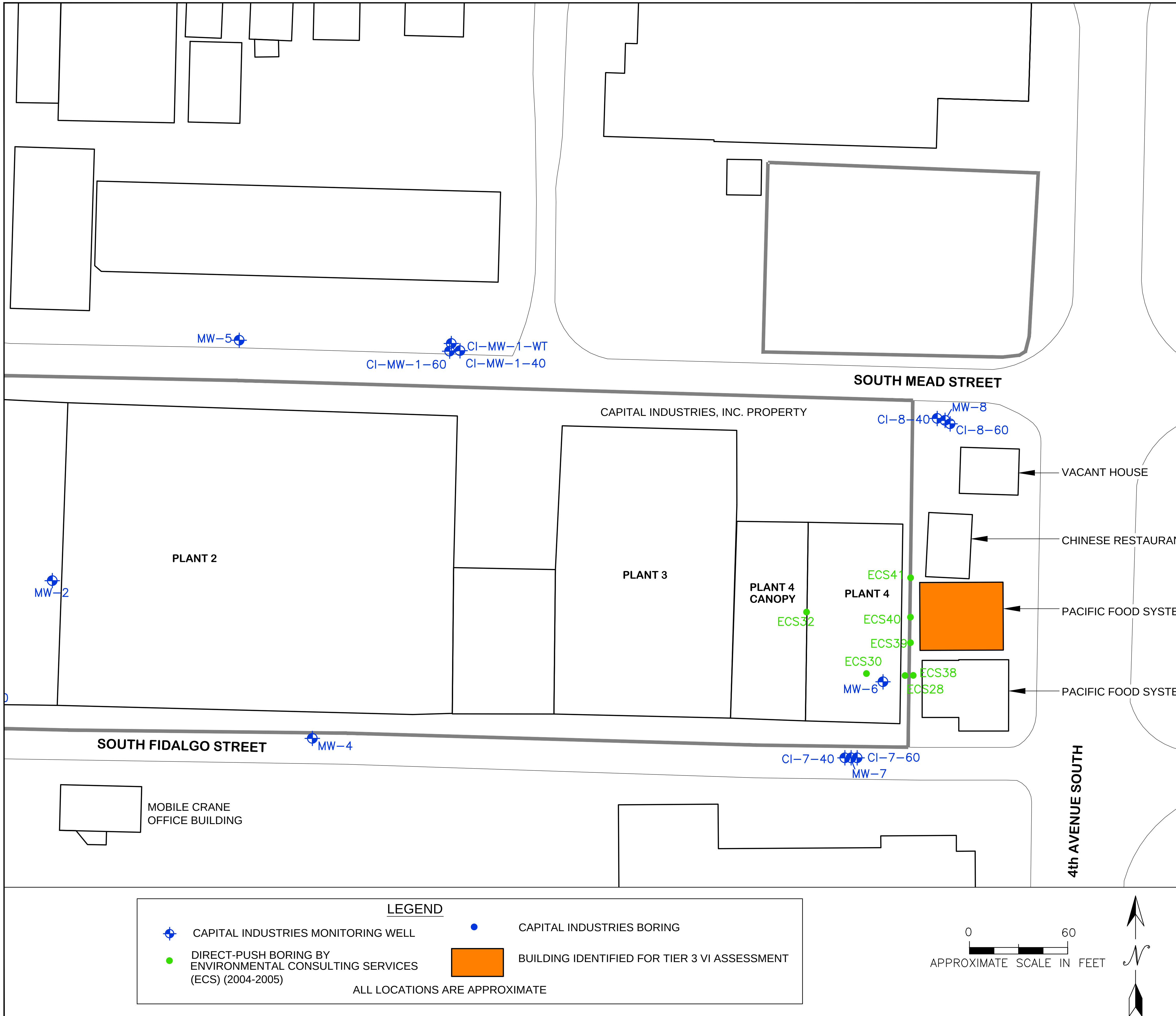
FIGURES

TIER 3 VAPOR INTRUSION
ASSESSMENT REPORT
5815 4th Avenue South—North Building
Seattle, Washington

Farallon PN: 457-007



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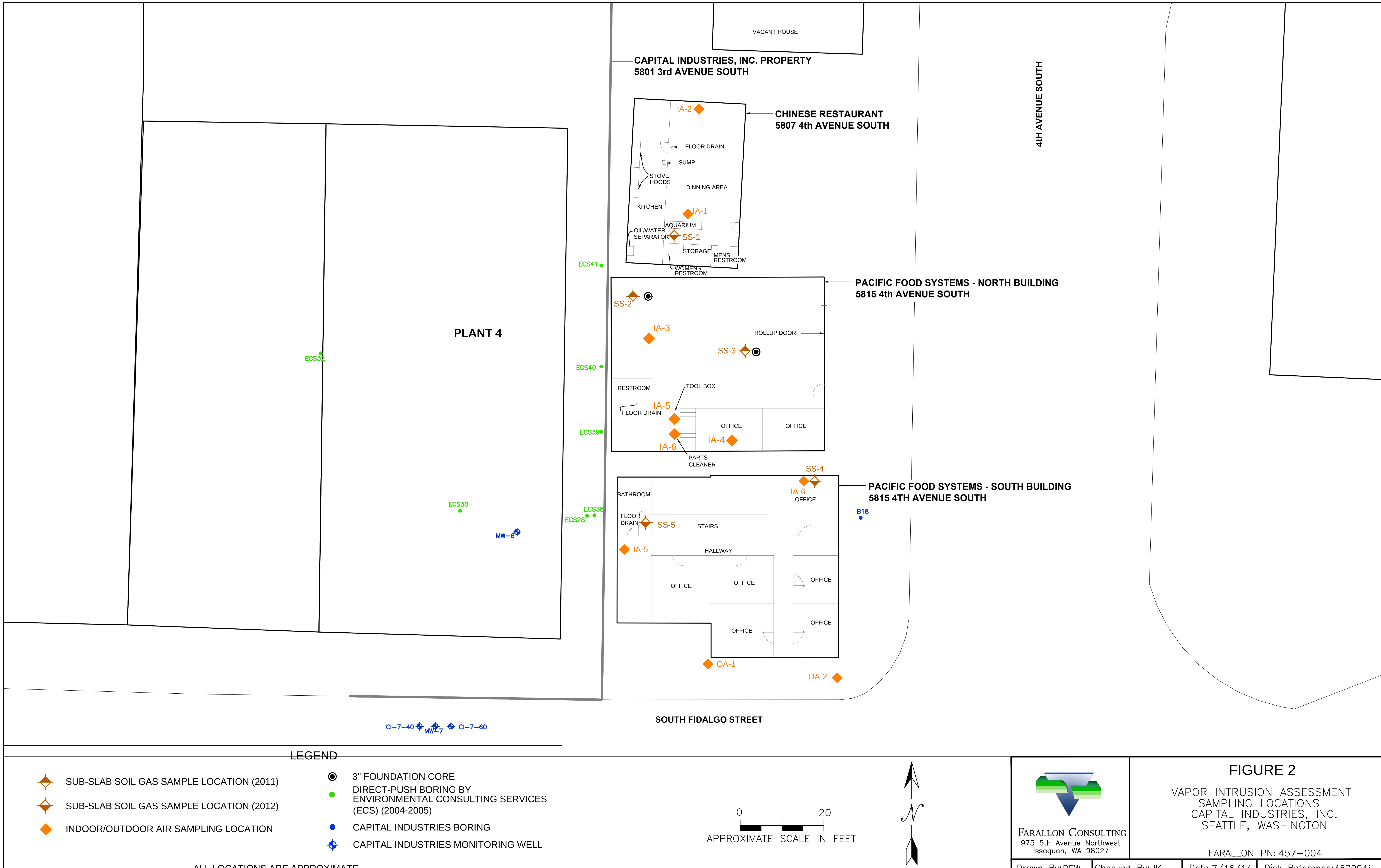
Issaquah, WA 98027

FIGURE 1

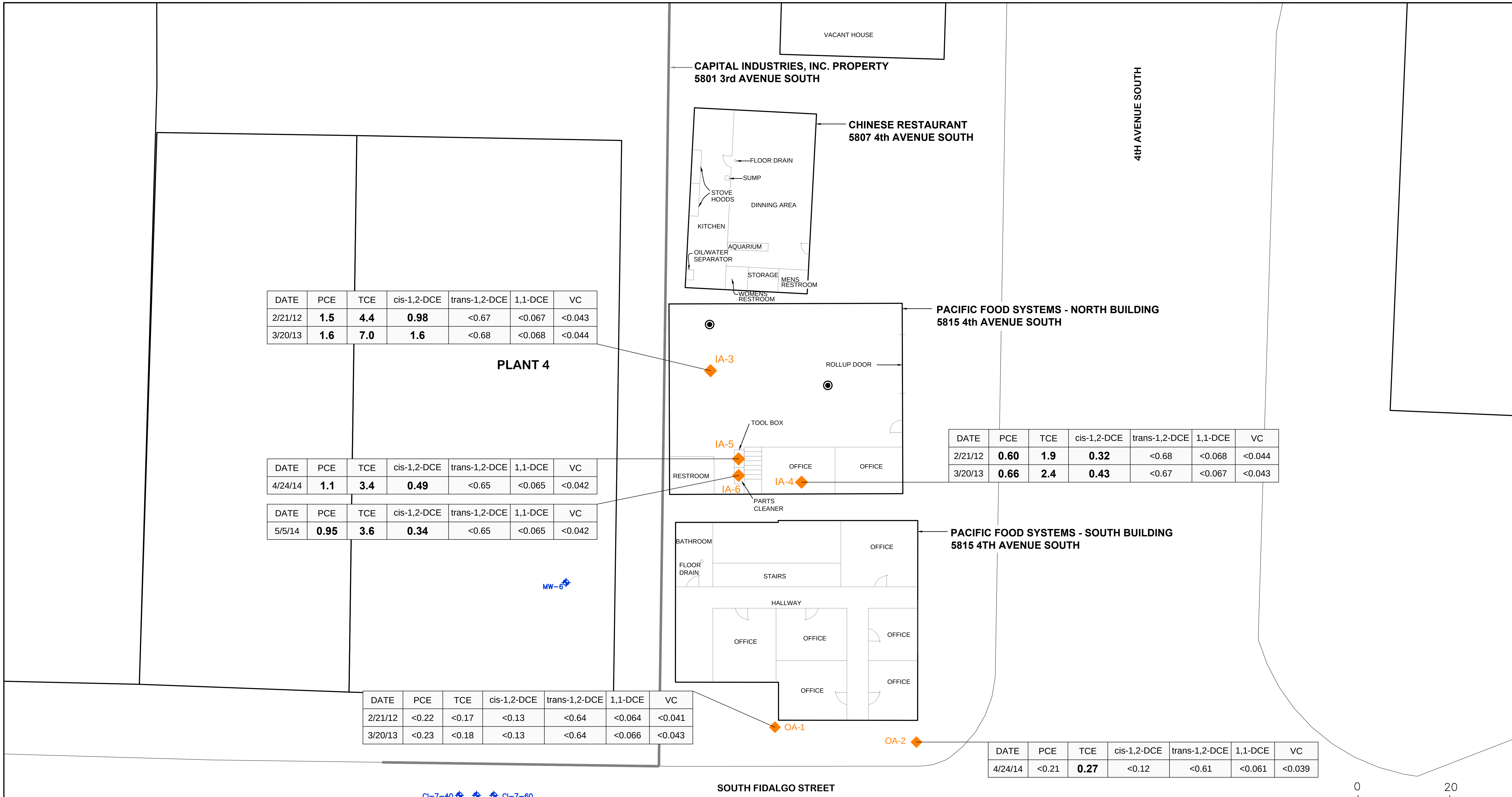
SITE PLAN SHOWING MONITORING WELL AND SOIL SAMPLE LOCATIONS
CAPITAL INDUSTRIES, INC.
SEATTLE, WASHINGTON

FARALLON PN: 457−004

Drawn By:DEW | Checked By:DC | Date:7/16/14 | Disk Reference:457004j



VACANT HOUSE
CAPITAL INDUSTRIES, INC. PROPERTY
5801 3rd AVENUE SOUTH
CHINESE RESTAURANT
5807 4th AVENUE SOUTH
4tH AVENUE SOUTH
IA-2
FLOOR DRAIN
SUMP
STOVE HOODS
DINNING AREA
KITCHEN
IA-1
AQUARIUM
OIL/WATER SEPARATOR
SS-1
STORAGE
MENS RESTROOM
WOMENS RESTROOM
PACIFIC FOOD SYSTEMS - NORTH BUILDING
5815 4th AVENUE SOUTH
ECS41
SS-2
IA-3
ROLLUP DOOR
SS-3
PLANT 4
ECS32
ECS40
RESTROOM
TOOL BOX
IA-5
FLOOR DRAIN
ECS39
OFFICE
OFFICE
IA-4
IA-6
PARTS CLEANER
SS-4
PACIFIC FOOD SYSTEMS - SOUTH BUILDING
5815 4TH AVENUE SOUTH
BATHROOM
IA-6
OFFICE
B18
ECS30
ECS38
ECS28
FLOOR DRAIN
SS-5
STAIRS
MW-6
IA-5
HALLWAY
OFFICE
OFFICE
OFFICE
OFFICE
OFFICE
OFFICE
OA-1
OA-2
SOUTH FIDALGO STREET
CI-7-40
MW-7
CI-7-60
LEGEND
SUB-SLAB SOIL GAS SAMPLE LOCATION (2011)
SUB-SLAB SOIL GAS SAMPLE LOCATION (2012)
INDOOR/OUTDOOR AIR SAMPLING LOCATION
3" FOUNDATION CORE
DIRECT-PUSH BORING BY ENVIRONMENTAL CONSULTING SERVICES (ECS) (2004-2005)
CAPITAL INDUSTRIES BORING
CAPITAL INDUSTRIES MONITORING WELL
ALL LOCATIONS ARE APPROXIMATE
0
20
APPROXIMATE SCALE IN FEET
N
FARALLON CONSULTING
975 5th Avenue Northwest
Issaquah, WA 98027
FIGURE 2
VAPOR INTRUSION ASSESSMENT
SAMPLING LOCATIONS
CAPITAL INDUSTRIES, INC.
SEATTLE, WASHINGTON
FARALLON PN: 457-004
Drawn By:DEW
Checked By:JK
Date:7/16/14
Disk Reference:457004j



IA-3

DATE	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	1,1-DCE	VC
2/21/12	**1.5**	**4.4**	**0.98**	<0.67	<0.067	<0.043
3/20/13	**1.6**	**7.0**	**1.6**	<0.68	<0.068	<0.044

IA-5

DATE	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	1,1-DCE	VC
4/24/14	**1.1**	**3.4**	**0.49**	<0.65	<0.065	<0.042

IA-6

DATE	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	1,1-DCE	VC
5/5/14	**0.95**	**3.6**	**0.34**	<0.65	<0.065	<0.042

IA-4

DATE	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	1,1-DCE	VC
2/21/12	**0.60**	**1.9**	**0.32**	<0.68	<0.068	<0.044
3/20/13	**0.66**	**2.4**	**0.43**	<0.67	<0.067	<0.043

OA-1

DATE	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	1,1-DCE	VC
2/21/12	<0.22	<0.17	<0.13	<0.64	<0.064	<0.041
3/20/13	<0.23	<0.18	<0.13	<0.64	<0.066	<0.043

OA-2

DATE	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	1,1-DCE	VC
4/24/14	<0.21	**0.27**	<0.12	<0.61	<0.061	<0.039

LEGEND

◆ INDOOR/OUTDOOR AIR SAMPLING LOCATION

ALL LOCATIONS ARE APPROXIMATE

◉ 3" FOUNDATION CORE

⊕ CAPITAL INDUSTRIES MONITORING WELL

ANALYTICAL RESULTS (MICROGRAMS PER CUBIC METER)
PCE = TETRACHLOROETHENE
TCE = TRICHLOROETHENE
cis-1,2-DCE = cis-1,2-DICHLOROETHENE
trans-1,2-DCE = trans-1,2-DICHLOROETHENE
1,1-DCE = 1,1-DICHLOROETHENE
VC = VINYL CHLORIDE
RESULTS IN **BOLD** DENOTE CONCENTRATIONS ABOVE LABORATORY METHOD REPORTING LIMITS.
< DENOTES ANALYTE NOT DETECTED AT OR ABOVE THE REPORTING LIMIT LISTED

FARALLON CONSULTING
975 5th Avenue Northwest
Issaquah, WA 98027

FIGURE 3

VAPOR INTRUSION ASSESSMENT
AIR SAMPLING ANALYTICAL RESULTS
CAPITAL INDUSTRIES, INC.
SEATTLE, WASHINGTON

FARALLON PN: 457-007

Drawn By: DEW | Checked By: JK | Date: 7/16/14 | Disk Reference: 457007c

TABLES

TIER 3 VAPOR INTRUSION
ASSESSMENT REPORT
5815 4th Avenue South—North Building
Seattle, Washington

Farallon PN: 457-007

Table 1
Summary of COPC Analytical Results for Soil and Soil Gas
5815 4th Avenue South - North Building Vicinity
Capital Industries, Inc.
Seattle, Washington
Farallon PN 457-007

Sample Location	Sample Identification	Sample Depth[1]	Sample Date	Analytical Results				
				PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl Chloride
Soil (milligrams per kilogram) [2]								
ECS28	ECS28	2.6	May-05	0.034	0.027	0.0037	<0.005	<0.005
ECS28	ECS28	6.0	May-05	0.037	0.013	0.005	<0.005	<0.005
ECS30	ECS30	2.9	May-05	0.016	0.14	0.006	<0.005	<0.005
ECS30	ECS30	6.5	May-05	0.017	0.046	0.017	<0.005	<0.005
ECS32	ECS32	2.1	May-05	<0.005	0.037	0.0046	<0.005	<0.005
ECS32	ECS32	4.5	May-05	<0.005	0.045	0.0048	<0.005	<0.005
ECS38	ECS38	4.2	May-05	0.014	0.006	0.0029	<0.005	<0.005
ECS38	ECS38	6.4	May-05	0.038	0.0041	0.0022	<0.005	<0.005
ECS39	ECS39	0.7	May-05	0.006	0.015	0.017	<0.005	<0.005
ECS39	ECS39	2.2	May-05	0.009	0.013	0.038	<0.005	<0.005
ECS39	ECS39	6.7	May-05	0.0024	0.0024	0.0263	<0.005	<0.005
ECS39	ECS39	9.5	May-05	<0.005	<0.005	0.0037	<0.005	<0.005
ECS40	ECS40	0.6	May-05	0.0015	0.0044	<0.005	<0.005	<0.005
ECS40	ECS40	2.4	May-05	0.009	0.015	0.029	<0.005	<0.005
ECS40	ECS40	7.3	May-05	0.0045	0.009	0.01	<0.005	<0.005
ECS41	ECS41	0.1	May-05	<0.005	<0.005	<0.005	<0.005	<0.005
ECS41	ECS41	2.5	May-05	<0.005	0.0015	<0.005	<0.005	<0.005
ECS41	ECS41	6.8	May-05	<0.005	0.0014	0.002	<0.005	<0.005
B18	B18-120908-2	2.0	12/9/2008	<0.0011	0.0017	<0.0011	<0.0011	<0.0055
B18	B18-120908-5	5.0	12/9/2008	0.008	0.0060	<0.0012	<0.0012	<0.0061
B18	B18-120908-7	7.0	12/9/2008	0.021	0.012	<0.0011	<0.0011	<0.0053
Soil Gas (micrograms/cubic meter)[3]								
SS-2	5815N-Warehouse1-041311		4/13/2011	**840**	**1,400**	74	<1.4	<0.44
SS-3	5815N-Warehouse2-041311		4/13/2011	**4,200**	**28,000**	<42	<42	<27
Commercial Sub-Slab Soil Gas IPIMAL - Cancer				**220**	**15**	**Not Established**	**Not Established**	**6.6**
Commercial Sub-Slab Soil Gas IPIMAL - Non-cancer				**75**	**3.9**	**Established**	**120**	**190**

NOTES:

Results in **bold** denote concentrations exceed applicable screening levels.

< denotes analyte not detected at or exceeding the reporting limit listed.

Samples collected by Farallon Consulting, L.L.C.

[1]Depth in feet below ground surface.

[2]Analyzed using U.S. Environmental Protection Agency Method 8260B.

[3] Subslab soil gas samples analyzed by U.S. Environmental Protection Agency Method Modified TO-15.

COPC = constituent of potential concern

DCE = dichloroethene

PCE = tetrachloroethene

TCE = trichloroethene

Table 2
Summary of Vapor Intrusion Assessment Sampling Parameters
5815 4th Avenue South - North Building
Capital Industries, Inc.
Seattle, Washington
Farallon PN: 457-007

Sample Location	Sample Type	Sample Identification	Sample Date	Sample Start Time	Sample End Time	Sample Duration	Initial Pressure (inches of mercury)	Final Pressure (inches of mercury)	Sampling Shroud Helium Concentration (percent)	Leak Test Helium Concentration (percent)
SS-2	Subslab	5815N-Warehouse1-041311	4/13/2011	11:10	12:02	0:52	29.5	4.5	22.5	Not Applicable
SS-3	Subslab	5815N-Warehouse2-041311	4/13/2011	14:09	14:54	0:45	29.5	6.5	13.3	Not Applicable
IA-3	Indoor Air	FAR-36029-022112	2/21/2012	8:17	16:17	8:00	30	7.0	Not Applicable	Not Applicable
		IA-3-1565-032013	3/20/2013	8:30	16:30	8:00	28.5	6.5		
IA-4	Indoor Air	FAR-25243-022112	2/21/2012	8:10	16:10	8:00	30	7.5	Not Applicable	Not Applicable
		IA-4-34193-032013	3/20/2013	8:35	16:35	8:00	29.5	7.5		
IA-5	Indoor Air	IA-5-13844-042414	4/24/2014	8:26	16:06	7:40	30	6.0	Not Applicable	Not Applicable
IA-6	Indoor Air	IA-6-33970-050514	5/5/2014	9:15	17:10	7:55	30	6.0	Not Applicable	Not Applicable
OA-1	Outdoor Air	FAR-5659-022112	2/21/2012	8:46	16:46	8:00	30	5.0	Not Applicable	Not Applicable
		IA-5-931-032013	3/20/2013	9:00	17:00	8:00	30	7.5		
OA-2	Outdoor Air	OA-2-34748-042414	4/24/2014	8:41	16:46	8:05	30	6.0	Not Applicable	Not Applicable

Table 3
Summary of Soil Gas and Air Sampling Analytical Results
5815 4th Ave South - North Building
Capital Industries, Inc.
Seattle, Washington
Farallon PN: 457-007

Sample Type	Location	Sample Identification	Sample Date	Analytical Results (micrograms per cubic meter)						
				PCE[1]	TCE[1]	cis-1,2-Dichloroethene[1]	trans-1,2-Dichloroethene[1]	1,1-Dichloroethene[1]	Vinyl Chloride[1]	Helium (%)
Subslab	SS-2	5815N-Warehouse1-041311	4/13/2011	**840**	**1,400**	**74**	<1.4	<0.68	<0.44	**0.44**
Subslab	SS-3	5815N-Warehouse2-041311	4/13/2011	**4,200**	**28,000**	<42	<42	<42	<27	<0.11
Indoor Air	IA-3	FAR-36029-022112	2/21/2012	**1.5**	**4.4**	**0.98**	<0.67	<0.067	<0.043	NA
		IA-3-1565-032013	3/20/2013	**1.6**	**7.0**	**1.6**	<0.68	<0.068	<0.044	
Indoor Air	IA-4	FAR-25243-022112	2/21/2012	**0.60**	**1.9**	**0.32**	<0.68	<0.068	<0.044	NA
		IA-4-34193-032013	3/20/2013	**0.66**	**2.4**	**0.43**	<0.67	<0.067	<0.043	
Indoor Air	IA-5	IA-5-13844-042414	4/24/2014	**1.1**	**3.4**	**0.49**	<0.65	<0.065	<0.042	NA
Indoor Air	IA-6	IA-6-33970-050514	5/5/2014	**0.95**	**3.6**	**0.34**	<0.65	<0.065	<0.042	NA
Outdoor Air	OA-1	FAR-5659-022112	2/21/2012	<0.22	<0.17	<0.13	<0.64	<0.064	<0.041	NA
		OA-1-35995-032013	3/20/2013	<0.23	<0.18	<0.13	<0.66	<0.066	<0.043	
Outdoor Air	OA-2	OA-2-34748-040214	4/24/2014	<0.21	**0.27**	<0.12	<0.61	<0.061	<0.039	NA

NOTES:

Results in **bold** denote concentrations exceeding laboratory method reporting limits.

< denotes analyte not detected at or exceeding the reporting limit listed.

[1] Subslab samples analyzed by U.S. Environmental Protection Agency (EPA) Method Modified TO-15. Indoor and outdoor air samples analyzed by EPA Method Modified TO-15/SIM

[2] Helium analyzed by Modified ASTM Method D-1946 for Helium in air using GC/TCD

PCE = tetrachloroethene

TCE = trichloroethene

NA = not analyzed

Table 4
Summary of Subslab Soil Gas Sample Cumulative Exceedance Factors
5815 4th Avenue South - North Building
Capital Industries, Inc.
Seattle, Washington
Farallon PN: 457-007

		Tetrachloroethene			Trichloroethene			cis-1,2-dichloroethene			trans-1,2-dichloroethene			Vinyl Chloride			1,1-Dichloroethene				
Indoor Air Sampling Locations[1,2]	**Sample Date**	**$C_{soilgas}$[3]**	**EF_{Cancer}**	**$EF_{Noncancer}$**	**$C_{soilgas}$[3]**	**EF_{Cancer}**	**$EF_{Noncancer}$**	**$C_{soilgas}$[3]**	**EF_{Cancer}**	**$EF_{Noncancer}$**	**$C_{soilgas}$[3]**	**EF_{Cancer}**	**$EF_{Noncancer}$**	**$C_{soilgas}$[3]**	**EF_{Cancer}**	**$EF_{Noncancer}$**	**$C_{soilgas}$[3]**	**EF_{Cancer}**	**$EF_{Noncancer}$**	**CCEF[1]**	**NCCEF[2]**
SS-2 5815N-Warehouse1-041311	4/13/2011	840	3.82	11.20	1,400	93.33	358.97	74	-	-	0.7	-	0.006	0.22	0.033	0.001	0.34	-	0.0009	**97**	**370**
SS-3 5815N-Warehouse2-041311	4/13/2011	4,200	19.09	56.00	28,000	1,866.67	7179.49	21	-	-	21	-	0.18	13.5	2.05	0.071	21	-	0.054	**1,888**	**7,236**
Commercial Subslab Soil Gas IPIMAL - Cancer3		**220**			**15**			**-**			**-**			**6.6**			**--**				
Commercial Subslab Soil Gas IPIMAL - Non-cancer3		**75**			**3.9**			**-**			**120**			**190**			**390**			**10**	**10**

NOTES:

Where concentrations are below the method reporting limit, a value one-half of the method reporting limit is recorded for calculations herein.

[1]Locations with a CCEF exceeding 10 are presented in **bold** and indicate that they are proposed for further evaluation. These buildings have a potential vapor intrusion risk due to a cumulative inhalation cancer risk of greater than 1E-05.

[2]Locations with a NCCEF exceeding 10 are presented in **bold** and indicate that they are proposed for further evaluation. These buildings have a potential vapor intrusion risk due to a cumulative noncancer hazard index greater than 1.

[3]Concentrations in micrograms/cubic meter ($\mu g/m^3$).

CCEF = cancer cumulative exceedance factor
EF_{Cancer} = Cancer exceedance factor
$EF_{Noncancer}$ = Noncancer exceedance factor
Csoilgas = Concentration of compound in subslab soil gas sample
CCEF and NCEF values = cumulative total of individual EF values
IPIMAL = inhalation pathway interim measure action level
NCCEF = non-cancer cumulative exceedance factor

Table 5
Summary of Indoor and Outdoor Air Sample Cumulative Exceedance Factors
5815 4th Avenue South - North Building
Capital Industries, Inc.
Seattle, Washington
Farallon PN: 457-007

Indoor Air Sampling Locations	Sample Date	Tetrachloroethene					Trichloroethene					cis-1,2-dichloroethene				
		$C_{outdoor}$ [3]	C_{indoor} [3]	C_{indoor_corr} [3]	EF_{Cancer}	$EF_{Noncancer}$	$C_{outdoor}$ [3]	C_{indoor} [3]	C_{indoor_corr} [3]	EF_{Cancer}	$EF_{Noncancer}$	$C_{outdoor}$ [3]	C_{indoor} [3]	C_{indoor_corr} [3]	EF_{Cancer}	$EF_{Noncancer}$
IA-3	2/21/2012	0.110	1.50	1.39	0.06	0.185	0.085	4.4	4.32	2.88	11.06	0.065	0.98	0.92	-	-
	3/20/2013	0.115	1.60	1.49	0.07	0.198	0.090	7.0	6.91	4.61	17.72	0.065	1.60	1.54	-	-
IA-4	2/21/2012	0.110	0.60	0.49	0.02	0.065	0.085	1.9	1.82	1.21	4.65	0.065	0.32	0.26	-	-
	3/20/2013	0.115	0.66	0.55	0.025	0.073	0.090	2.4	2.31	1.54	5.92	0.065	0.430	0.365	-	-
IA-5	4/24/2014	0.105	1.1	1.00	0.045	0.133	0.27	3.4	3.13	2.09	8.03	0.060	0.49	0.430	-	-
IA-6	5/5/2014	0.105	0.95	0.85	0.038	0.113	0.27	3.6	3.33	2.22	8.54	0.060	0.34	0.280	-	-
Commercial Indoor Air IPIMAL - Cancer[3]		**22**					**1.5**					**-**				
Commercial Indoor Air IPIMAL - Non-cancer[3]		**7.5**					**0.39**					**-**				

NOTES:

Where concentrations are below the method reporting limit, a value one-half of the method reporting limit is recorded for calculations herein.

Where outdoor air concentrations exceed indoor air concentrations, this results in negative corrected concentrations. These are included in the CCEF and NCCEF totals.

[1]Samples with a CCEF exceeding 10 are presented in ***bold*** and indicate a potential cumulative inhalation cancer risk due to vapor intrusion greater than 1E-05.

[2]Samples with a NCCEF exceeding 10 are presented in ***bold*** and indicate a potential cumulative risk due to vapor intrusion with a hazard index greater than 1.

[3]Concentrations in micrograms/cubic meter (µg/m^3)

CCEF = cancer cumulative exceedance factor
EF_{Cancer} = Cancer exceedance factor
$EF_{Noncancer}$ = Noncancer exceedance factor
$C_{outdoor}$ = Concentration of compound in outdoor air sample
C_{indoor} = Concentration of compound in indoor air sample
$C_{indoor\_corr} = C_{indoor} - C_{outdoor}$
CCEF and NCEF values = cumulative total of individual EF values
Exceedance Factors = Corrected indoor air concentration/IPIMAL
IPIMAL = inhalation pathway interim measure action level
NCCEF = non-cancer cumulative exceedance factor

Table 5
Summary of Indoor and Outdoor Air Sample Cumulative Exceedance Factors
5815 4th Avenue South - North Building
Capital Industries, Inc.
Seattle, Washington
Farallon PN: 457-007

Indoor Air Sampling Locations	Sample Date	trans-1,2-dichloroethene					Vinyl Chloride					1,1-Dichloroethene					CCEF[1]	NCCEF[2]
		$C_{outdoor}$[3]	C_{indoor}[3]	C_{indoor_corr}[3]	EF_{Cancer}	$EF_{Noncancer}$	$C_{outdoor}$[3]	C_{indoor}[3]	C_{indoor_corr}[3]	EF_{Cancer}	$EF_{Noncancer}$	$C_{outdoor}$[3]	C_{indoor}[3]	C_{indoor_corr}[3]	EF_{Cancer}	$EF_{Noncancer}$		
IA-3	2/21/2012	0.32	0.34	0.02	-	0.001	0.020	0.022	0.002	0.002	0.0001	0.032	0.034	0.002	-	0.00004	2.9	***11.3***
	3/20/2013	0.33	0.34	0.01	-	0.001	0.022	0.022	0.001	0.001	0.0000	0.033	0.034	0.001	-	0.00003	4.7	***17.9***
IA-4	2/21/2012	0.32	0.34	0.02	-	0.002	0.020	0.022	0.002	0.003	0.0001	0.032	0.034	0.002	-	0.0001	1.2	4.7
	3/20/2013	0.33	0.34	0.01	-	0.000	0.022	0.022	0.000	0.000	0.0000	0.033	0.034	0.001	-	0.00001	1.6	6.0
IA-5	4/24/2014	0.31	0.33	0.02	-	0.002	0.0195	0.021	0.002	0.002	0.0001	0.031	0.033	0.002	-	0.0001	2.1	8.2
IA-6	5/5/2014	0.31	0.33	0.02	-	0.002	0.0195	0.021	0.002	0.002	0.0001	0.031	0.033	0.002	-	0.0001	2.3	8.7
Commercial Indoor Air IPIMAL - Cancer[3]		**-**					**0.66**					**--**					**10**	**10**
Commercial Indoor Air IPIMAL - Non-cancer[3]		**12**					**19**					**39**						

NOTES:

Where concentrations are below the method reporting limit, a value one-half of the method reporting limit is recorded for calculations herein.

Where outdoor air concentrations exceed indoor air concentrations, this results in negative corrected concentrations. These are included in the CCEF and NCCEF totals.

[1]Samples with a CCEF exceeding 10 are presented in ***bold*** and indicate a potential cumulative inhalation cancer risk due to vapor intrusion greater than 1E-05.

[2]Samples with a NCCEF exceeding 10 are presented in ***bold*** and indicate a potential cumulative risk due to vapor intrusion with a hazard index greater than 1.

[3]Concentrations in micrograms/cubic meter (μg/m^3)

CCEF = cancer cumulative exceedance factor
EF_{Cancer} = Cancer exceedance factor
$EF_{Noncancer}$ = Noncancer exceedance factor
$C_{outdoor}$ = Concentration of compound in outdoor air sample
C_{indoor} = Concentration of compound in indoor air sample
$C_{indoor\_corr} = C_{indoor} - C_{outdoor}$
CCEF and NCEF values = cumulative total of individual EF values
Exceedance Factors = Corrected indoor air concentration/IPIMAL
IPIMAL = inhalation pathway interim measure action level
NCCEF = non-cancer cumulative exceedance factor

APPENDIX A
STANDARD OPERATING PROCEDURES

TIER 3 VAPOR INTRUSION
ASSESSMENT REPORT
5815 4th Avenue South—North Building
Seattle, Washington

Farallon PN: 457-007

APPENDIX A
STANDARD OPERATING PROCEDURES FOR INDOOR/OUTDOOR AIR AND SUB-SLAB SOIL GAS SAMPLING

Farallon PN: 457-007

June 2013

TABLE OF CONTENTS

1.0 STANDARD OPERATING PROCEDURE FOR INDOOR AND OUTDOOR AMBIENT AIR SAMPLING

The standard operating procedure (SOP) for collection of indoor and outdoor ambient air samples contains the following sections:

- Purpose
- Equipment and Supplies
- Procedures
  - Preparation of Building for Sampling
  - Sampling Methodology
  - Post-Sample Collection Procedures
  - Analysis
- Decontamination
- Documentation

1.1 PURPOSE

The purpose of this SOP is to provide personnel with the specific information needed to collect consistent and representative indoor and outdoor ambient air data, and accurately document the data collection process.

1.2 EQUIPMENT AND SUPPLIES

The following equipment and supplies are necessary to properly conduct indoor and outdoor ambient air sampling:

- A sufficient number of 6-liter Summa canisters, appropriate filters, and flow controllers to collect the indoor air samples specified in the Performance Sampling Plan;
- Appropriate wrenches, pressure gauges, and a field tool kit;
- A photoionization detector (PID) or similar instrument and the proper calibration gases to monitor indoor ambient air during the initial building inspection prior to indoor air sampling; and
- The shipping packages for the Summa canisters.

1.3 PROCEDURES

This section presents the procedures to be implemented for the building inspection and the indoor and outdoor ambient air sampling.

1.3.1 Preparation of Building for Sampling

Prior to collecting air samples in the building, Farallon will conduct a building inspection to identify potential sources of contamination. The purpose of the building inspection is to assess building construction characteristics; heating, ventilating, and air conditioning (HVAC) systems; and sources of possible chemical contaminants that may influence the results of indoor air sampling at each sampling location. Farallon will note the presence of any chemical products used and will evaluate whether these products contain the target compounds for the indoor air sampling.

The building owner/operators will be notified in advance of the sampling, and necessary access agreements and tenant notifications will be executed. It is important that tenants, custodial personnel, and others present in the sampling area be made aware of the sensitivity of the sampling and that the sampling devices must not be tampered with during the sampling process. If necessary, a Farallon representative will remain on the Site for the duration of the sampling to ensure the security and integrity of the samples. At a minimum, Farallon will periodically visit each sampling location for the duration of the sampling to observe and document sampling conditions such as changes in weather, building/tenant space use, HVAC system operation, and other activities that could affect sampling results.

Farallon will identify potential sources of volatile organic compounds (VOCs) in the building by visual observation and using a PID or similar air monitoring device to screen for the presence of VOCs in the building. If possible, Farallon will properly seal any chemicals present, or remove them from the building prior to the sampling event. If source materials are removed from the building, sampling will be delayed for a minimum of 24 hours and the spaces to be sampled will be ventilated to exchange the air present when the source materials were in the building with fresh air using either the HVAC system or other means of ventilation such as opening doors and/or windows.

During the building inspection process Farallon will also document potential outdoor sources of contamination and weather conditions that could influence indoor ambient air concentrations.

1.3.2 Indoor and Outdoor Ambient Air Sampling Methodology

Time-integrated indoor and outdoor ambient air samples are collected using 6-liter Summa canisters prepared under negative pressure and laboratory-certified to be clean for the compounds of interest for the Site. The Summa canisters will be equipped with dedicated flow regulators for collection of a sample over an 8-hour period. Farallon will follow the instructions presented below for the indoor and outdoor ambient air sampling:

- Several days in advance of sampling, check the Summa canisters for leaks to ensure that each canister is under sufficient vacuum pressure to obtain representative samples.
- Confirm that the sampling canister valves are closed (knob should be tightened clockwise).
- Attach the manifold to the canister, including the filter, flow controller, and pressure gauge.

- Confirm that a brass cap is secured at the inlet of the manifold/flow controller, creating an air-tight sampling train.
- Quickly open and close the sample canister valve and observe the gauge reading. If the initial gauge reading is less than the laboratory-recommended value, discontinue leak testing and order additional canisters. Repeat testing for each canister.
- If the initial vacuum pressure is within acceptable limits, continue to monitor the gauge to check for leaks in the manifold and at the connections to the Summa canister. Observe the gauge for 5 minutes. If the needle on the gauge drops indicating a loss of pressure, the sampling train is not air-tight. In this case, refit and/or tighten the connections until the needle holds steady. If leakage is still indicated, use an alternate manifold/flow controller and confirm that the manifold/flow controller requires replacement. Obtain replacement equipment and repeat the test.
- Ensure that the owner/operator and other parties present in the sampling space are aware that testing is being performed and that the sampling devices must not be disturbed. Document conditions in the space at the time of sampling, including work activities, potential chemical use, persons wearing dry-cleaned clothing, carpet cleaning, painting, or any changes noted from the original building inspection performed prior to the sampling event.
- Note the HVAC operational settings, including but not limited to temperature setting, heating or cooling modes, whether the HVAC system is operational, and non-standard HVAC ventilation or heating methods (e.g., use of fan or space heater, open window or door).
- Verify that the sampling locations selected remain valid under current conditions (e.g., a change in weather conditions may necessitate altering the ambient outdoor air sample location, recent use or a spill of a cleaning product may eliminate a room selected for sampling). Contact the Project Manager immediately to discuss any condition potentially requiring a change in sample location selection.
- Verify that the number engraved on the Summa canister matches the number listed on the certified-clean tag attached to the canister to ensure that the canister was properly decontaminated.
- To collect indoor air ambient samples, set up the canister in the desired sample location approximately 3 to 4 feet above the floor. Outdoor ambient air samples usually are collected near a building undergoing indoor air sampling. Select collection points where the intake point for the sampler is a minimum of 6 feet above the ground surface and upwind of the building undergoing indoor air sampling.
- Verify that the canister valve is closed tightly, and remove the threaded cap at the top of the canister.
- Attach the flow regulator/pressure gauge to the top of the canister, using a wrench to gently tighten it.

- Open the valve and record the pressure on the gauge as the "initial pressure" in the field notes and on the sample tag attached to the canister.
- Completely fill out the sample tag attached to the canister and record the following sample information:
  - Sample identification;
  - Sample start date;
  - Sample start time;
  - Location of sample: distance from walls and floor shown on the site plan;
  - Initial pressure of canister; and
  - Canister number.
- After sampling begins and the canister is verified to be operating correctly, leave the canister to fill.
- Return after approximately 6 to 7 hours to check that the canisters are operating properly. Depending on Site activities, it may be necessary to be on the Site for the duration of the sampling or to return periodically to document conditions at the time of the sampling. Consult the Project Manager to determine the specific monitoring frequency for a sample location. Check the canister pressure prior to completion of the 8-hour sampling duration because the accuracy of the flow regulators can vary slightly, resulting in a canister's filling faster or slower than expected. **The final pressure at the end of sampling should be approximately 5 to 6 inches of mercury.**
- If the pressure is above 6 inches of mercury, leave the canister to fill for the full 8-hour sampling duration. If the pressure is below 5 inches of mercury, close the canister and contact the Project Manager immediately. The Project Manager will contact the laboratory to evaluate whether sampling must be repeated using a new canister or whether sufficient vacuum is present to obtain valid laboratory data.
- At the end of sampling, record the time and the exact pressure of the canister on the sample tag for that canister, the Chain of Custody form, and in the field notes. Record any other observation that could affect sample results (e.g., weather, HVAC use, site activities).
- Close the sample canister valve, disconnect it from the manifold, and replace and tighten the brass cap on the canister inlet.

1.3.3 Post Sample-Collection Procedures

Ensure that each of the sample containers is labeled with the following information: sample identification, date and time sample was collected, starting and ending canister pressure, Site name, and company name. Record this information and the ending time of sample collection in the field notes and transfer pertinent information to the Chain of Custody form. Pack each of the Summa canisters in the original shipping container, seal with a custody seal, and send to the laboratory for analysis as soon as possible. The holding time for the analysis to be performed herein is 30 days.

1.3.4 Analysis

The indoor air samples should be analyzed using U.S. Environmental Protection Agency (EPA) Method TO-15, with low-level analysis using Selective Ion Mode (SIM) to obtain method detection and reporting limits that are sufficiently low to meet or exceed the target cleanup levels for tetrachloroethene (PCE) and trichloroethene (TCE) based on commercial exposure, which are 2.17 and 0.51 micrograms per cubic meter, respectively. Note the analytical method and target halogenated volatile organic compounds (HVOCs), PCE and TCE, on the Chain of Custody form. The air samples collected in the Summa canisters have a 30-day holding time.

1.4 DECONTAMINATION

The equipment used for air sampling does not require decontamination in the field. The Summa canisters will be individually cleaned by the contract laboratory, Air Toxics Ltd. of Folsom, California, and certified to 0.02 part per billion by volume for the project-specific analyte list prior to shipment (note: Air Toxics Ltd. reports that it can certify to only 0.1 part per billion by volume for trans-1,2-dichloroethene). Ensure that documentation of this certification is included on a tag attached to the canister and in the paperwork that accompanies the canister shipment from the laboratory.

1.5 DOCUMENTATION

Include records of field activities, environmental and building conditions, and sample documentation on standard Farallon field notes and forms.

2.0 STANDARD OPERATING PROCEDURE FOR SUB-SLAB SOIL GAS SAMPLING WITH REAL-TIME LEAK TESTING

The SOP for collection of sub-slab soil gas samples includes the following sections:

- Purpose
- Equipment and Supplies
- Procedures
  - Preparation for Sampling
  - Leak Check Test for Manifold
  - Purging
  - Sampling Methodology Using Tracer Gas
  - Post-Sample Collection Procedures
  - Analysis
- Decontamination
- Documentation

2.1 PURPOSE

The purpose of this SOP is to provide field personnel with the specific information needed to collect representative sub-slab soil gas samples, and accurately document the data collection process. This SOP is to be followed by all personnel who collect sub-slab soil gas samples.

2.2 EQUIPMENT AND SUPPLIES

The following equipment and supplies will be used to conduct sub-slab soil gas sampling:

- A Farallon custom acrylic shroud (with 0.25-inch access ports) with foam mat floor seal. The shroud will enclose the 1-liter Summa canister used to collect the sample while allowing leak testing to be performed using analytical-grade helium.
- An analytical grade helium MGD 2002 dielectric helium detector (or equivalent helium detection device).
- New 0.25-inch-outside-diameter Teflon tubing and Swagelok 0.25-inch-outside-diameter compression fittings for dedicated sampling at each sample location.
- A hand-held rotary hammer drill or subcontracted concrete corer to penetrate the slab to remove a core of 1-inch diameter or less.
- Plumber's putty or suitable substitute that does not contain VOCs to seal the core annulus and sample tubing.
- A sufficient number of 1-liter Summa canisters supplied by the analytical laboratory. Each canister will be equipped with a dedicated manifold that includes appropriate filters, pressure gauges, valves and flow controllers set for a sample collection rate of 200

milliliters per minute or less (depending on the desired sampling time interval), and/or accessories to collect samples required by the Performance Sampling Plan.

- Equipment required to collect samples using 1-liter Summa canisters, including appropriate wrenches and other tools and/or fittings.
- A Lung Box, Tedlar bags, and a low-volume sampling pump for evaluating leaks in the sampling train using helium tracer gas.
- The shipping package for the Summa canisters.
- Patch material to return the drilled hole to its original condition.
- Field notes to record sampling procedures and data.

2.3 PROCEDURES

This section presents the procedures for collection of soil gas samples representative of conditions below the building slab. The procedures include preparation for sample collection, leak detection protocols, and sample collection.

2.3.1 Preparation for Sample Collection

This section includes the procedures to prepare and stage the sampling equipment prior to performing leak detection testing and sample collection. Follow the instructions below at each sample location:

- Ensure that access agreements are in place and the building owner/operators are aware that sampling will be performed, as described in Section 1.3.1, Preparation of Building for Sampling.
- Clear the sampling locations for utilities. Building slabs may include conduits for electricity, structural cables, or other utilities that could be encountered while coring through the slab for sampling. A private utility location service will be retained by Farallon at each sample location for sites where utility locations have not yet been documented.
- Use a rotary hammer or concrete corer to drill an approximately 1-inch core or less (a 3/8-inch core typically is adequate) through the concrete floor slab of the building. Where indoor ambient air sampling also is being performed, drill the core near the ambient indoor air sample location when possible to provide a direct evaluation of attenuation factors for migration of sub-slab soil gas to indoor air.
- Place new dedicated Teflon tubing down the hole to a depth just below the base of the concrete slab. If the Summa canister flow controllers do not include appropriate filters to mitigate extraction of solid particulate into the canister, place a dedicated filter on the end of the Teflon tubing prior to placement beneath the slab. Record the length of tubing used before sealing to the subsurface. The tubing length will be used to calculate the purge volume of ambient air in the sample tubing to be removed prior to sampling.

- Apply plumber's putty or a similar VOC-free substance inside the borehole to seal the core annulus around the tubing. Putty or a similar substance will also be placed around the tubing and borehole at the interface with the building slab surface. These sealing measures should mitigate the potential introduction of ambient air into the sample. After sealing, Farallon will minimize disturbance of the sample tubing at the surface seal to minimize potential ambient air leakage during the sampling period and maintain the integrity of the sample.
- Cut a hole toward one end of the foam exercise mat through which to feed the tubing. Place the mat over the tubing.
- Place the sample canister assembly on the mat. Use either a T-fitting or a laboratory-supplied manifold to connect tubing and fittings such that there is a feed from the sub-slab sample collection tubing into the sampling canister and also to the connection exiting the shroud for leak detection.
- Configure the helium supply, helium detector, and sampling shroud for monitoring.

2.3.2 Leak Detection Protocols

Provisions will be made to eliminate or minimize leakage of ambient air into the sub-slab soil gas sample. Introduction of ambient indoor air into the sub-slab soil gas sample represents potential dilution of the sample if indoor air does not contain the target hazardous substances being evaluated, or may bias the sub-slab samples high if indoor ambient air contains concentrations of the target hazardous substances. Use of a tracer gas enables detection of ambient air incursion from above the slab if the soil gas probe or sampling canister manifold assembly is not completely sealed. Analytical-grade helium will be used as the tracer gas.

Leak testing can be performed multiple ways. One method is to collect a sample of sub-slab soil gas prior to opening the Summa canister and performing actual sample collection. This method allows immediate evaluation of a leak in the sampling train and fittings/connections and seals may be modified and retested to mitigate leakage during the sampling period. Farallon refers to this method of leak testing as real-time leak testing. A second method is to test the manifolds for leakage and proceed with sampling while maintaining a flow of helium in the sampling shroud for the duration of the sampling period. The sample is then analyzed for the target analytes and helium. The post-sampling results are then evaluated to determine whether a leak has occurred and whether the degree of leakage has affected data quality, possibly requiring resampling. The second method of leak testing does not allow for immediate evaluation of a potential leak and subsequent adjustments prior to sampling but does allow for detection of leakage that could occur throughout the sampling timeframe. This type of accumulative leakage may not be detected by the real-time method that includes evaluation of small initial and final volumes of sub-slab soil gas.

2.3.3 Leak-Detection Testing for Manifolds

The following protocol will be used to test for leaks in the laboratory-supplied manifolds and/or flow controllers. The laboratory-supplied equipment should be checked several days in advance of the sampling so new canisters, manifolds, and/or flow controllers can be obtained if the laboratory-supplied equipment fails leak-detection testing. Follow the instructions below for leak-detection testing:

- Confirm that the Summa canister valves are closed (knob should be tightened clockwise).
- Attach the manifold, including the filter, flow controller, and pressure gauge to the canister.
- Confirm that a brass cap is secured at the inlet of the manifold/flow controller, creating an air-tight sampling train.
- Quickly open and close the sample canister valve and observe the gauge reading. If the initial gauge reading is less than the laboratory-recommended value, discontinue leak testing and obtain additional canisters. Repeat testing for all new canisters.
- If the initial vacuum pressure is within acceptable limits, continue to monitor the gauge to check for leaks in the manifold and connections to the Summa canister. Observe the gauge for 5 minutes. If the needle on the gauge drops indicating a loss of pressure, the sampling train is not air-tight. In this case, refit and/or tighten the connections until the needle holds steady. If leakage is still indicated, use an alternate manifold/flow controller and confirm that the manifold/flow controller requires replacement. Obtain replacement equipment and repeat the test.
- Once the sample canisters and laboratory-supplied equipment have been tested and approved for use, proceed with field testing for potential leaks in the sampling train associated with the tubing connections and seal at the concrete slab.

2.3.4 Purging and Real-time Leak Detection

- Verify that the number engraved on the canister matches the number listed on the certified-clean tag attached to the canister to ensure that the canister was properly decontaminated.
- Remove the brass cap from the manifold/flow controller inlet and connect the tubing from the sample port using a T-fitting or laboratory-supplied manifold. The other outlet from the T-fitting is connected via Teflon tubing to the helium sampling port on the side of the acrylic sampling shroud. Record the length of each piece of tubing used for the connections here and below. The tubing lengths will be used to estimate purge volumes of ambient air that will be removed prior to sampling.
- Connect the tubing from the helium sampling port to the inlet for the Lung Box. Connect a Tedlar bag to the helium sampling port connection inside the Lung Box. Connect the low-volume air sampling pump inlet to the other port for the Lung Box. Open the valve on the Tedlar bag for sampling and seal the Lung Box.
- Ensure that the acrylic sampling shroud base is on the foam mat, and add weight to the top of the shroud if necessary to provide a tight seal that will retain the helium and mitigate introduction of additional ambient indoor air.
- Attach the tubing from the flow controller for the helium canister to the port on the acrylic sampling shroud and begin filling with helium, maintaining a minimum

concentration of 15 to 20 percent, as measured with the helium detector. **DO NOT OPEN the sample canister.**

- Purge an estimated three volumes of air from the tubing/borehole. Use the following equation to calculate the volume of air to remove:

  Volume = 3.1417 Xr^2

  Where:

  - X = the length of tubing (inches)
  - r = the inner radius (inches) of all tubing lengths being used.

  - Use the same calculation to estimate the volume of the cored boring in the concrete slab, using the radius of the boring (r value) and the depth of the boring (X value).
  - Add the two volumes together to determine one "internal" volume of air to be purged. Multiply by 3. The result will be in cubic inches. Divide by the flow rate (200 milliliters per minute = 12.2 cubic inches per minute) to determine how many minutes (or seconds) to purge the tubing. Record calculations in the field notes.
  - Use the low-flow sampling pump to evacuate the Lung Box, drawing the calculated purge volumes into the Tedlar Bag. This should be sufficient to obtain enough sample volume to evaluate whether helium is present in the sample using the helium detector. If an additional sample is required, record the additional volume of soil gas removed.

- Once the desired purge volume (calculated above) is met, close the valve on the shroud and turn off the pump. Open the Lung Box and close the valve on the Tedlar bag. Remove the Tedlar bag and use the helium detector to measure the helium concentration in the Tedlar bag. If helium concentrations in the Tedlar bag exceed 10 percent of the helium concentration in the shroud (1 to 2 percent helium in the Tedlar Bag), there is sufficient leakage to compromise the soil gas analytical results.
- Check all fittings and repeat the leak test until helium concentrations are below 10 percent of the concentration measured in the shroud.
- Complete the leak test procedure prior to completion of the sampling event. Repeat the helium leak test approximately 30 minutes prior to conclusion of sampling. If a leak is indicated, contact the Project Manager, who will decide whether sampling will be repeated using a new Summa canister.

2.3.5 Post-Sample Collection Leak Testing

Post-sample collection leak testing can be performed instead of real-time leak testing or in combination of real-time leak testing to validate sample data. The sub-slab soil gas sample will be analyzed for helium by the laboratory by Modified ASTM Method D-1946. Helium detected indicates potential ambient air leakage and may necessitate collecting a new sample if 10 percent or more of the concentration of helium maintained in the sampling shroud during the collection timeframe is detected in the sample. Evaluation of the sub-slab soil gas data, and if collected, corresponding indoor/outdoor air sampling data to determine whether additional sub-slab soil gas sampling is necessary.

2.3.6 Sample Collection

Soil gas samples will be collected during a period of decreasing barometric pressure, preferably during a storm-generated low. Sampling will not be performed during a period of consistent rainfall, based on historical soil vapor extraction data that indicate rainfall infiltrates asphalt paving, potentially creating conditions where layers of clean water affect the distribution of soil gas beneath a building. Decreasing barometric conditions result in migration of soil gas to the surface, are more representative of potential vapor intrusion risk, and are less prone to introduction of indoor air into a borehole prior to sampling.

Sampling procedures are implemented immediately following confirmation that leakage of ambient air has been eliminated or reduced to acceptable levels (i.e., less than 10 percent helium in the sample). The instructions for the sampling procedures are as follows:

- Open the sample canister valve and record the pressure on the gauge as the "initial pressure" in the field notes and on the sample tag attached to the canister. Compare this pressure to the initial leak detection of the manifold/controller. Ensure that the sample shroud is undisturbed and protects the sample canister from disturbance during sampling.

  The estimated sampling period will be 2 hours based on the pre-established flow controller setting by the laboratory that extracts the sample at a flow rate of less than 200 milliliters per minute.

- Check the canister to ensure that it is filling at the specified rate for the flow controller. The volume of air sampled is a linear function of the canister vacuum. For example, halfway into sampling, the canister should be half filled, and the gauge should read approximately 17 inches of mercury. Checking the canister pressure prior to completion of the 2-hour sampling duration is necessary because the accuracy of the flow regulators can vary slightly, resulting in a canister's filling faster or slower than expected. **The final pressure at the end of sampling should be approximately 5 to 6 inches of mercury.**

- If the pressure is above 6 inches of mercury, allow the canister to continue filling for the full 2-hour sampling duration. If the pressure is below 5 inches of mercury, close the canister and contact the Project Manager immediately. The Project Manager will check with the laboratory to evaluate whether sampling must be repeated using a new canister, or whether sufficient vacuum is present to obtain valid laboratory data.

- At the end of sampling, record the time and the exact pressure of the canister on the sample tag for that canister, the Chain of Custody form, and in the field notes. Record any other observation that could affect the sample results (e.g., weather, holes and/or cracks in the concrete, Site activities).

- Close the sample canister valve, disconnect it from the manifold, and replace and tighten the brass caps on the canister inlet.

- Remove the tubing and putty from the borehole. Use clean sand or pea gravel to fill part of the borehole annulus, and concrete for surface completion. Repair the borehole to match its original condition to the extent practicable.

2.3.7 Post-Sample-Collection Procedures

Ensure that all sample containers are labeled with the following information: sample identification, date and time sample was collected, starting and ending canister pressure, Site name, and company name. Record this information and the ending time of sample collection in the field notes and transfer pertinent information to the Chain of Custody form. Pack Summa canisters in the original shipping containers, seal with a custody seal, and send to Air Toxics Ltd. for analysis as soon as possible. The holding time for the analysis to be performed below is 30 days.

2.3.8 Analysis

The sub-slab soil gas samples should be analyzed using EPA Method TO-15. The laboratory will not use low-level analysis using SIM unless necessary to obtain method detection and reporting limits that are sufficiently low to meet or exceed the target soil gas screening levels for PCE and TCE of 21.7 and 5.1 micrograms per cubic meter, respectively, for protection of indoor air in a commercial setting. Sub-slab soil gas concentrations typically are expected to be greater than indoor air values where the constituents of concern are not used in daily operations and do not require the low-level detection limit methodology. Note the analytical method and target HVOCs on the Chain of Custody form.

2.4 DECONTAMINATION

Equipment used for soil gas sampling does not require decontamination in the field because dedicated sampling supplies and equipment are used at each location. The Summa canisters will be individually cleaned by Air Toxics Ltd. and certified to 0.02 part per billion by volume for the project-specific analyte list prior to shipment (note: Air Toxics Ltd. reports that it can certify to only 0.1 part per billion by volume for trans-1,2-dichloroethene). Ensure that documentation of this certification is included on a tag attached to the canister and in the paperwork that accompanies the canister shipment from the laboratory.

2.5 DOCUMENTATION

Include records of all field activities, environmental and building conditions, and sample documentation on standard Farallon field notes and forms.

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APPENDIX B
WEATHER RECORDS

TIER 3 VAPOR INTRUSION
ASSESSMENT REPORT
5815 4th Avenue South—North Building
Seattle, Washington

Farallon PN: 457-007

Seattle, Puget Sound, Wa, WA - Data Disclaimer

Station ID: 9447130

Seattle, Puget Sound, Wa, WA: Data Inventory

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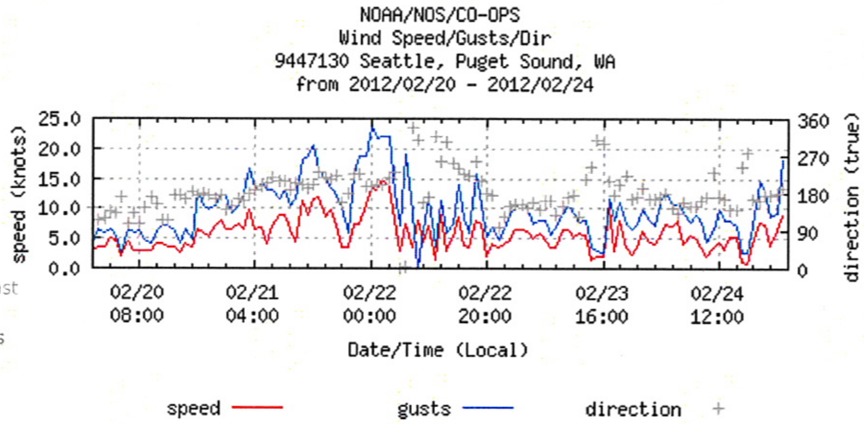
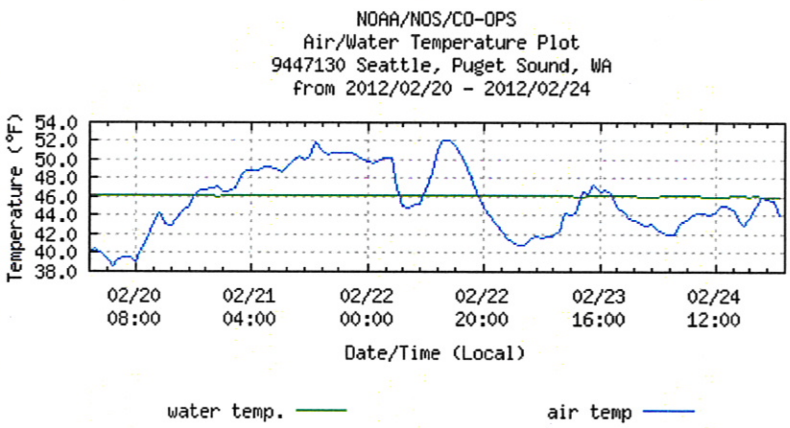
Meteorological Observations



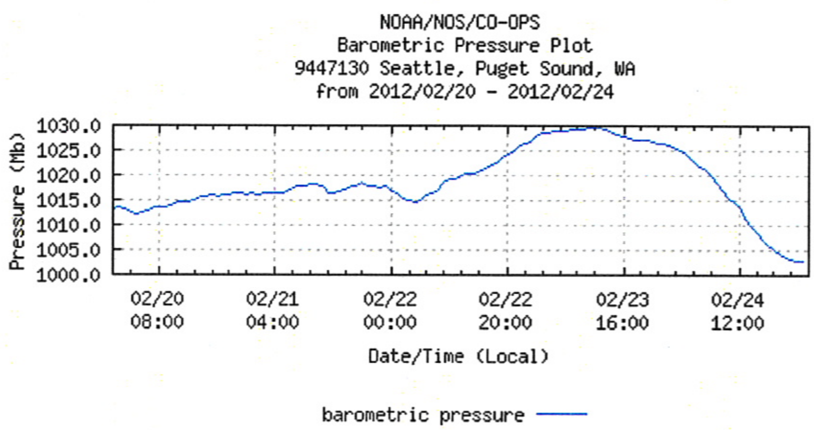
Nearby Stations

Tacoma MET, WA
Tacoma, WA
Port Townsend, WA
Port Angeles, WA
Friday Harbor, WA
Cherry Point South
Cherry Point, WA
Westport, WA
Toke Point, WA
Longview, WA
Skamokawa, WA
Wauna, OR
Saint Helens, OR

Click here for a larger plot



Click here for a larger plot



Click here for a larger plot

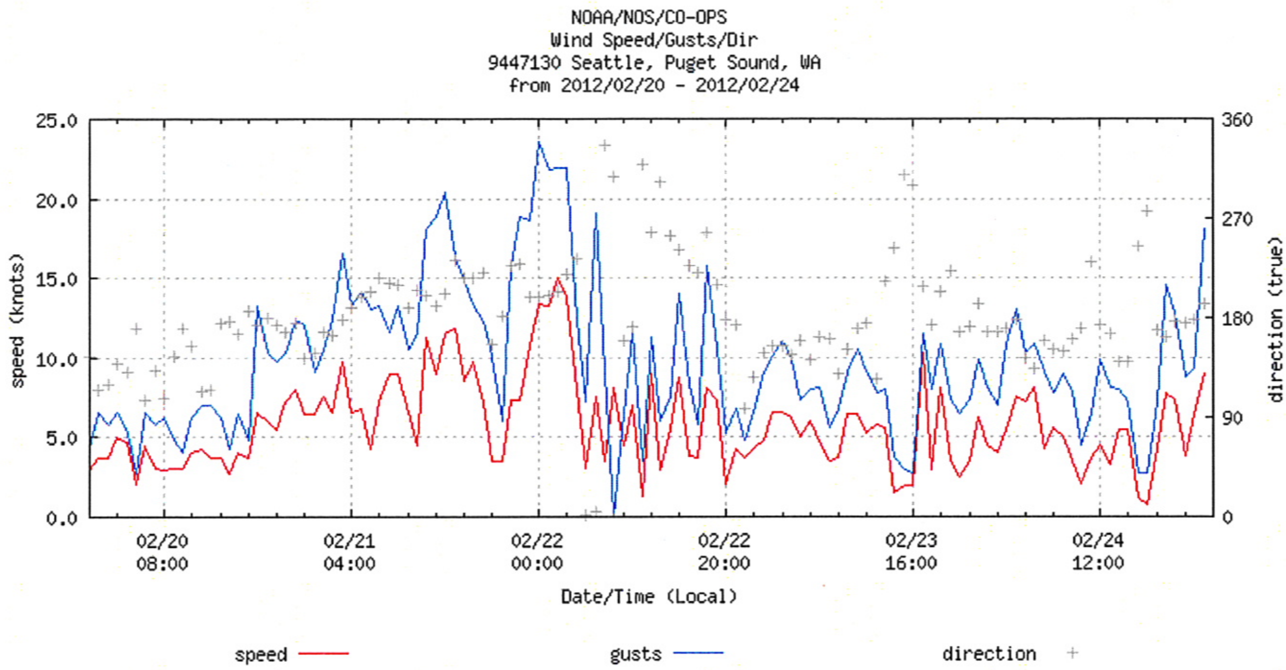
Begin Date: Feb 20 2012

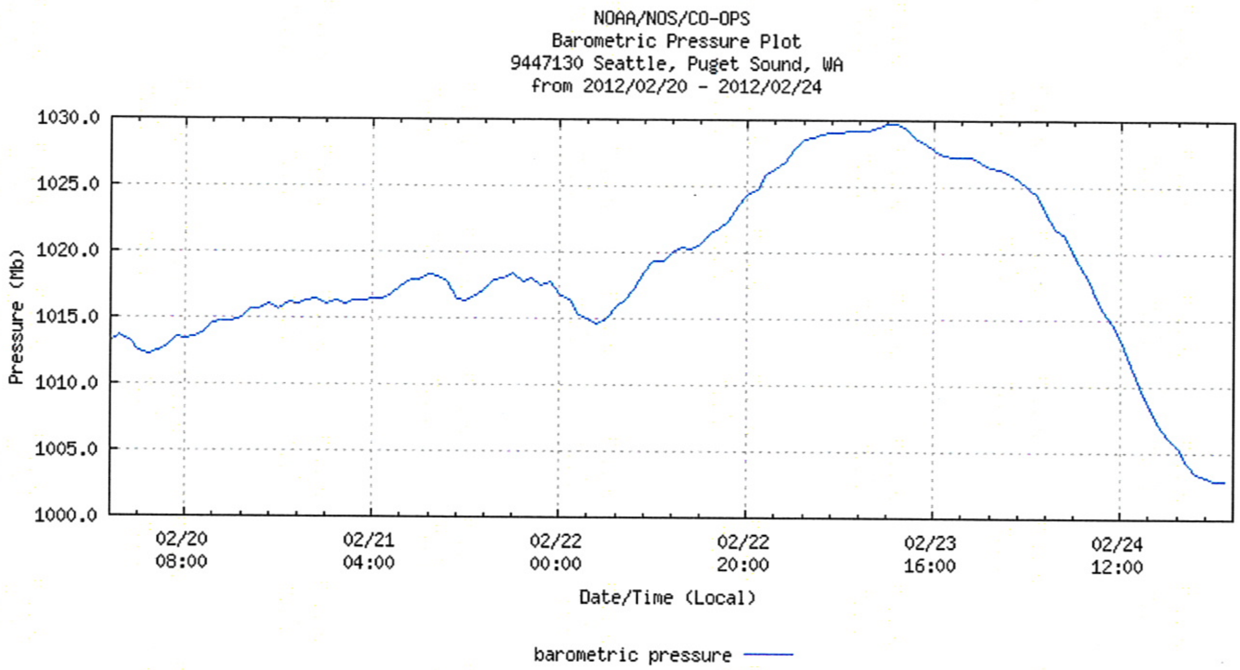
End Date:

Interval: Hourly

Data Units: Fahrenheit - knots

Time Zone: Local GMT


NOAA/NOS/CO-OPS
Wind Speed/Gusts/Dir
9447130 Seattle, Puget Sound, WA
from 2012/02/20 - 2012/02/24
speed (knots)
direction (true)
25.0
20.0
15.0
10.0
5.0
0.0
360
270
180
90
0
02/20 08:00
02/21 04:00
02/22 00:00
02/22 20:00
02/23 16:00
02/24 12:00
Date/Time (Local)
speed
gusts
direction


NOAA/NOS/CO-OPS
Barometric Pressure Plot
9447130 Seattle, Puget Sound, WA
from 2012/02/20 - 2012/02/24
1030.0
1025.0
1020.0
1015.0
1010.0
1005.0
1000.0
Pressure (Mb)
02/20 08:00
02/21 04:00
02/22 00:00
02/22 20:00
02/23 16:00
02/24 12:00
Date/Time (Local)
barometric pressure

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Tide Predictions

Current Data

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Conductivity

PORTS

Operational Forecast System

Bench Mark Sheets

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Sea Level Trends

Measurement Specifications

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Station ID: 9447130

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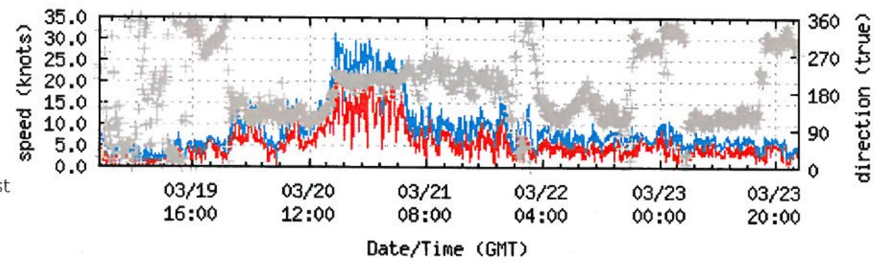
NOAA/NOS/CO-OPS
Wind Speed/Gusts/Dir
9447130 Seattle, Puget Sound, WA
from 2013/03/19 - 2013/03/23



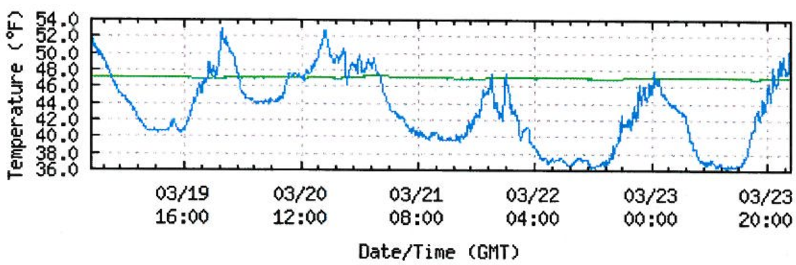
speed — gusts — direction +

Nearby Stations

Tacoma MET, WA
Tacoma, WA
Port Townsend, WA
Port Angeles, WA
Friday Harbor, WA
Cherry Point South
Cherry Point, WA
Westport, WA
Toke Point, WA
Longview, WA
Skamokawa, WA
Wauna, OR
Saint Helens, OR

Click here for a larger plot

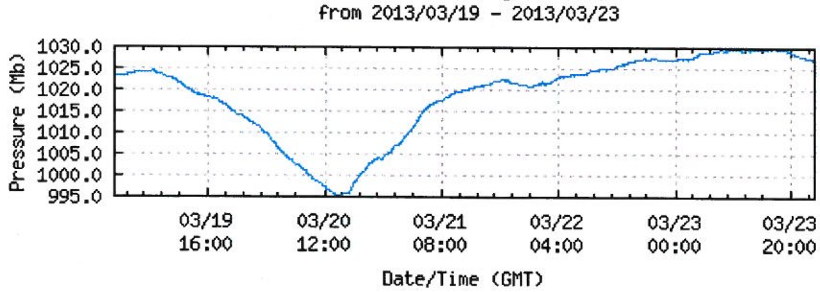
NOAA/NOS/CO-OPS
Air/Water Temperature Plot
9447130 Seattle, Puget Sound, WA
from 2013/03/19 - 2013/03/23



water temp. — air temp —

Click here for a larger plot

NOAA/NOS/CO-OPS
Barometric Pressure Plot
9447130 Seattle, Puget Sound, WA
from 2013/03/19 - 2013/03/23



barometric pressure —

Click here for a larger plot

Begin Date:
Mar 19 2013
End Date:

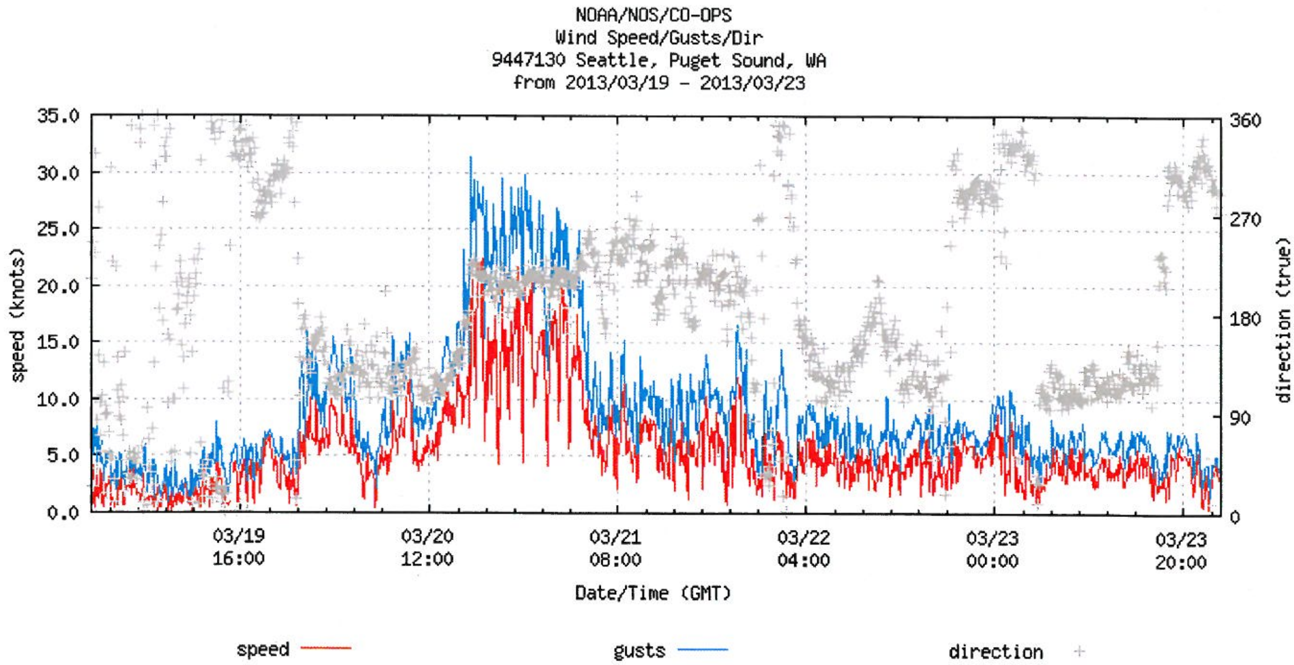
Interval:
Six minute

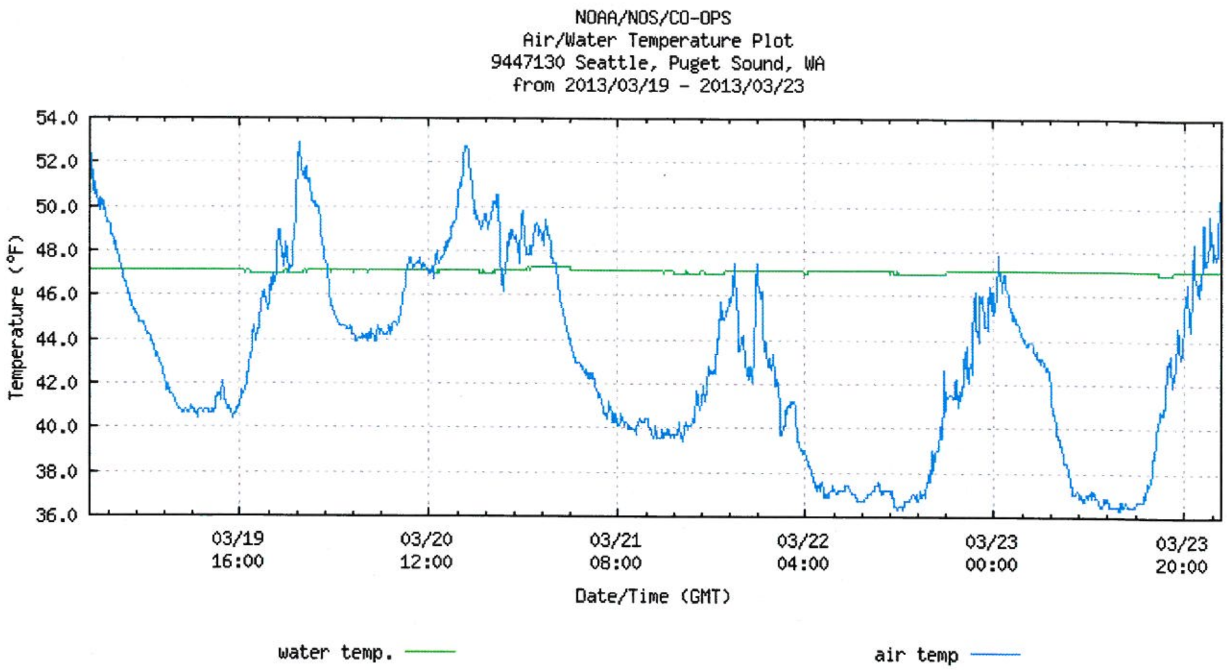
Data Units:
◉ Fahrenheit - knots

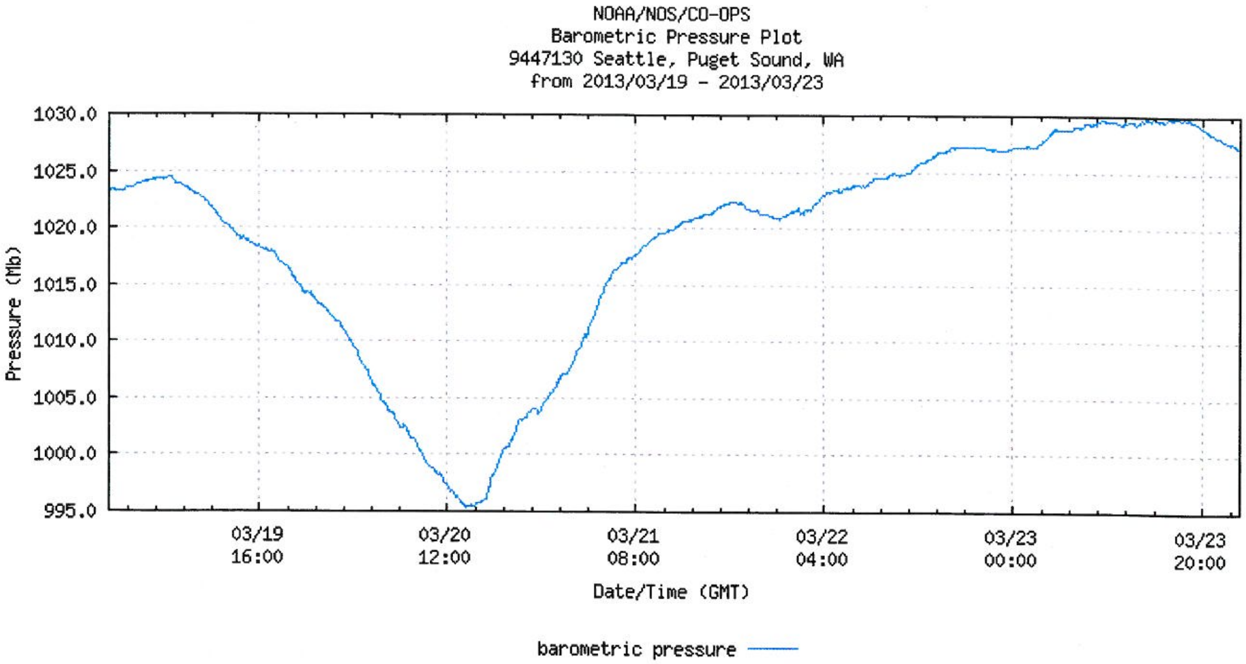
Time Zone:
○ Local
◉ GMT

Mar 23 2013 ◯ Celsius - m/sec ◯ LST

View Plot View Data Reset


NOAA/NOS/CO-OPS
Wind Speed/Gusts/Dir
9447130 Seattle, Puget Sound, WA
from 2013/03/19 - 2013/03/23
speed (knots)
direction (true)
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
360
270
180
90
0
03/19 16:00
03/20 12:00
03/21 08:00
03/22 04:00
03/23 00:00
03/23 20:00
Date/Time (GMT)
speed
gusts
direction


NOAA/NOS/CO-OPS
Air/Water Temperature Plot
9447130 Seattle, Puget Sound, WA
from 2013/03/19 - 2013/03/23
54.0
52.0
50.0
48.0
46.0
44.0
42.0
40.0
38.0
36.0
Temperature (°F)
03/19 16:00
03/20 12:00
03/21 08:00
03/22 04:00
03/23 00:00
03/23 20:00
Date/Time (GMT)
water temp.
air temp


NOAA/NOS/CO-OPS
Barometric Pressure Plot
9447130 Seattle, Puget Sound, WA
from 2013/03/19 - 2013/03/23
1030.0
1025.0
1020.0
1015.0
1010.0
1005.0
1000.0
995.0
Pressure (Mb)
03/19 16:00
03/20 12:00
03/21 08:00
03/22 04:00
03/23 00:00
03/23 20:00
Date/Time (GMT)
barometric pressure

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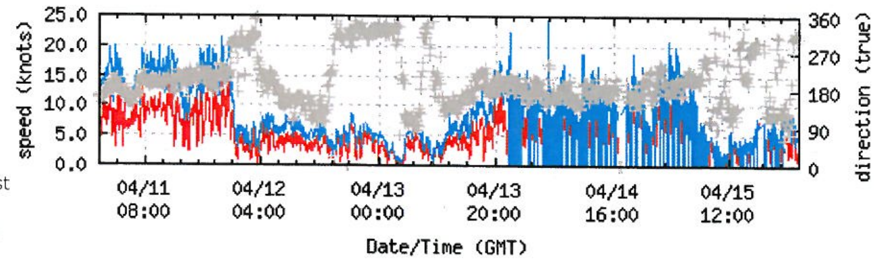
NOAA/NOS/CO-OPS
Wind Speed/Gusts/Dir
9447130 Seattle, Puget Sound, WA
from 2011/04/11 - 2011/04/15

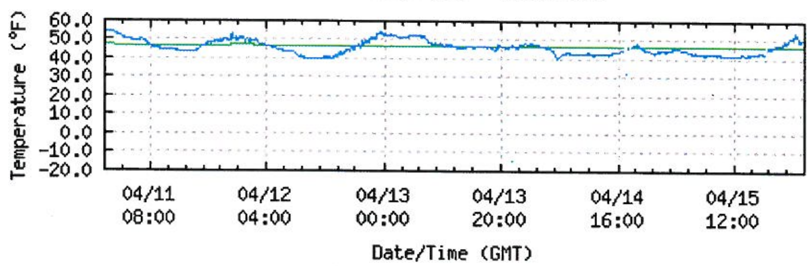


speed — gusts — direction +

Nearby Stations
Tacoma MET, WA
Tacoma, WA
Port Townsend, WA
Port Angeles, WA
Friday Harbor, WA
Cherry Point South
Cherry Point, WA
Westport, WA
Toke Point, WA
Longview, WA
Skamokawa, WA
Wauna, OR
Saint Helens, OR

Click here for a larger plot

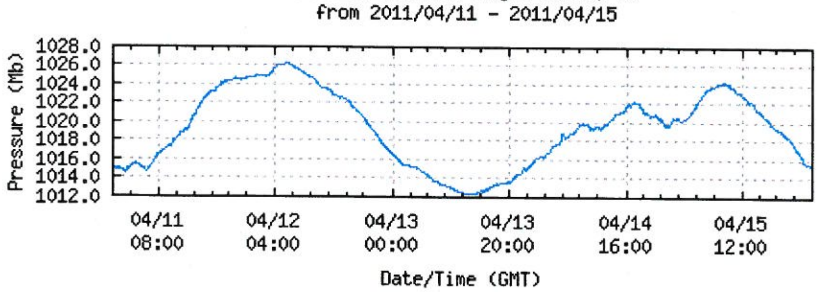
NOAA/NOS/CO-OPS
Air/Water Temperature Plot
9447130 Seattle, Puget Sound, WA
from 2011/04/11 - 2011/04/15



water temp. — air temp —

Click here for a larger plot

NOAA/NOS/CO-OPS
Barometric Pressure Plot
9447130 Seattle, Puget Sound, WA
from 2011/04/11 - 2011/04/15



barometric pressure —

Click here for a larger plot

Begin Date: Apr 11 2011

End Date:

Interval: Six minute

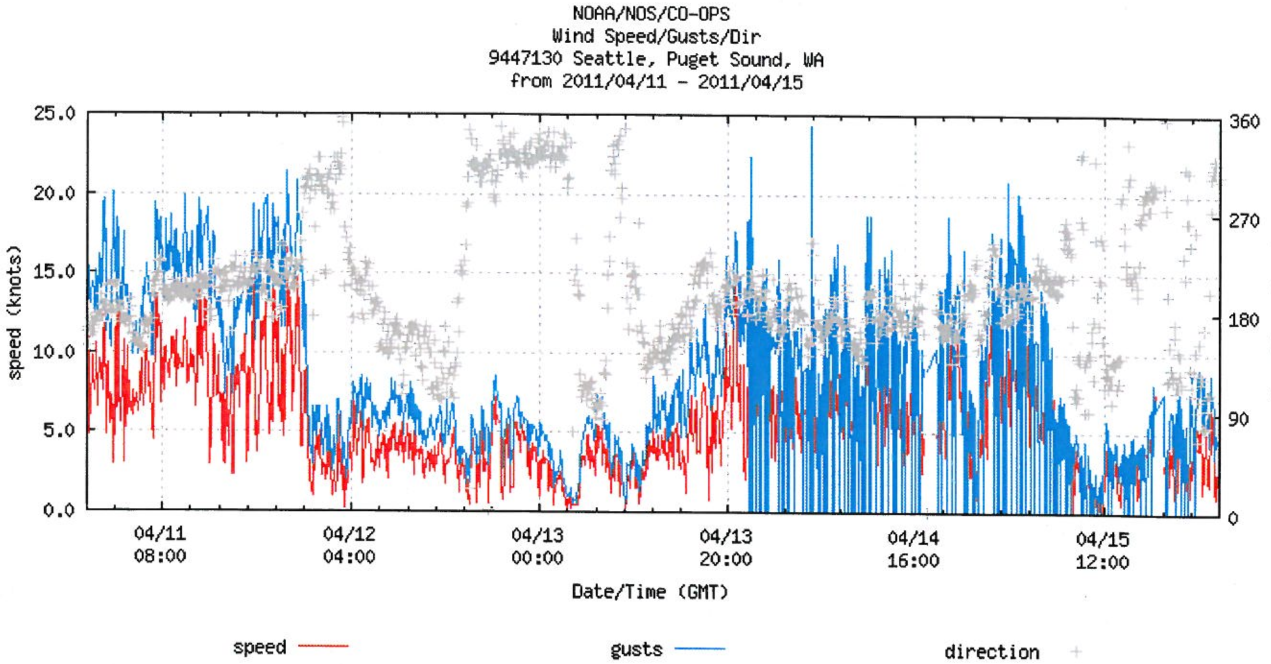
Data Units: ◉ Fahrenheit - knots

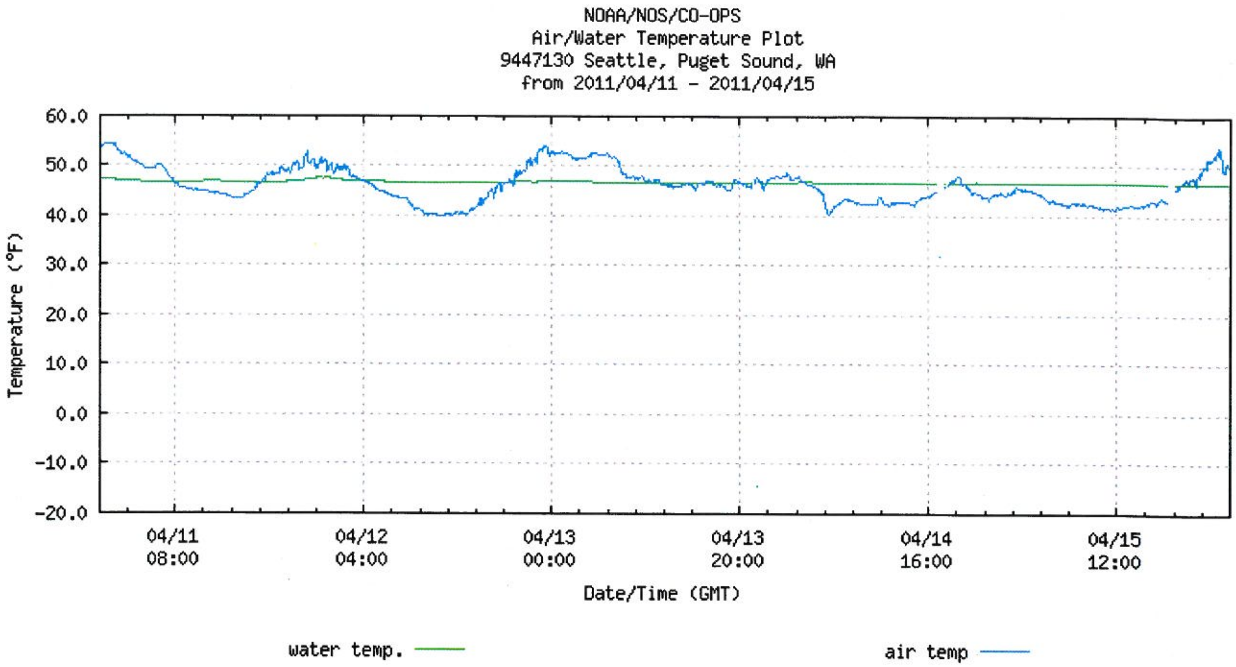
Time Zone: ○ Local ◉ GMT

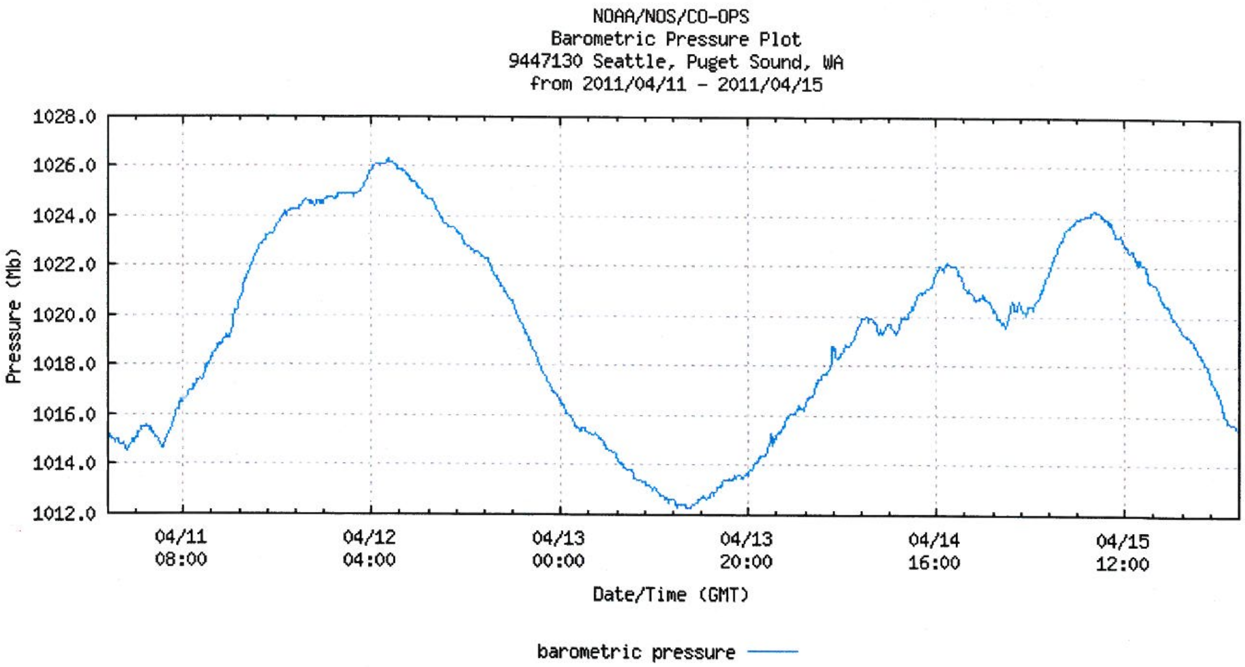
Apr 15 2011

○ Celsius - m/sec ○ LST

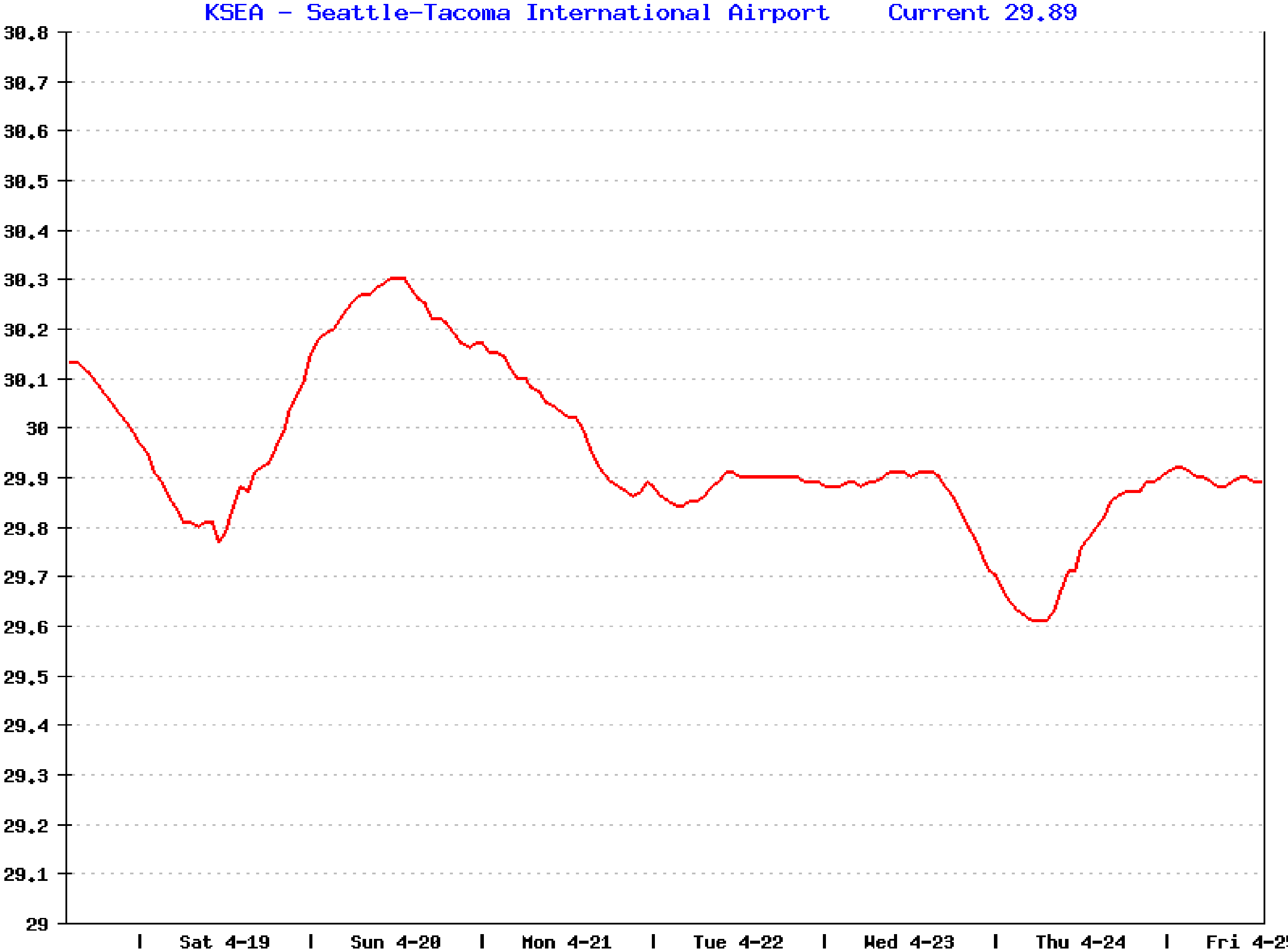
View Plot | View Data | Reset


NOAA/NOS/CO-OPS
Wind Speed/Gusts/Dir
9447130 Seattle, Puget Sound, WA
from 2011/04/11 - 2011/04/15
speed (knots)
direction (true)
25.0
20.0
15.0
10.0
5.0
0.0
360
270
180
90
0
04/11 08:00
04/12 04:00
04/13 00:00
04/13 20:00
04/14 16:00
04/15 12:00
Date/Time (GMT)
speed
gusts
direction


NOAA/NOS/CO-OPS
Air/Water Temperature Plot
9447130 Seattle, Puget Sound, WA
from 2011/04/11 - 2011/04/15
60.0
50.0
40.0
30.0
20.0
10.0
0.0
-10.0
-20.0
Temperature (°F)
04/11 08:00
04/12 04:00
04/13 00:00
04/13 20:00
04/14 16:00
04/15 12:00
Date/Time (GMT)
water temp.
air temp


NOAA/NOS/CO-OPS
Barometric Pressure Plot
9447130 Seattle, Puget Sound, WA
from 2011/04/11 - 2011/04/15
Pressure (Mb)
1028.0
1026.0
1024.0
1022.0
1020.0
1018.0
1016.0
1014.0
1012.0
04/11 08:00
04/12 04:00
04/13 00:00
04/13 20:00
04/14 16:00
04/15 12:00
Date/Time (GMT)
barometric pressure

GraphBarometer.com

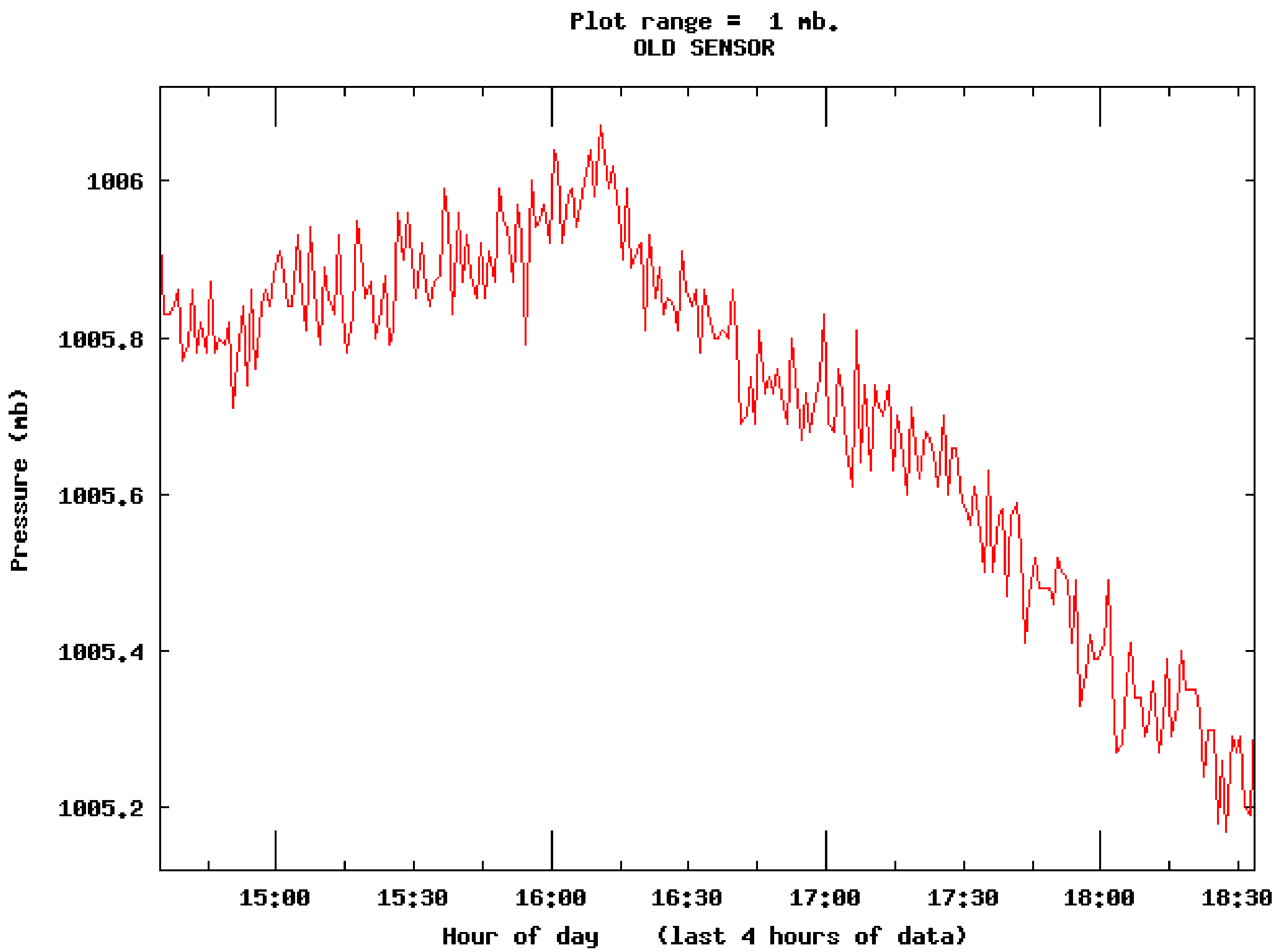


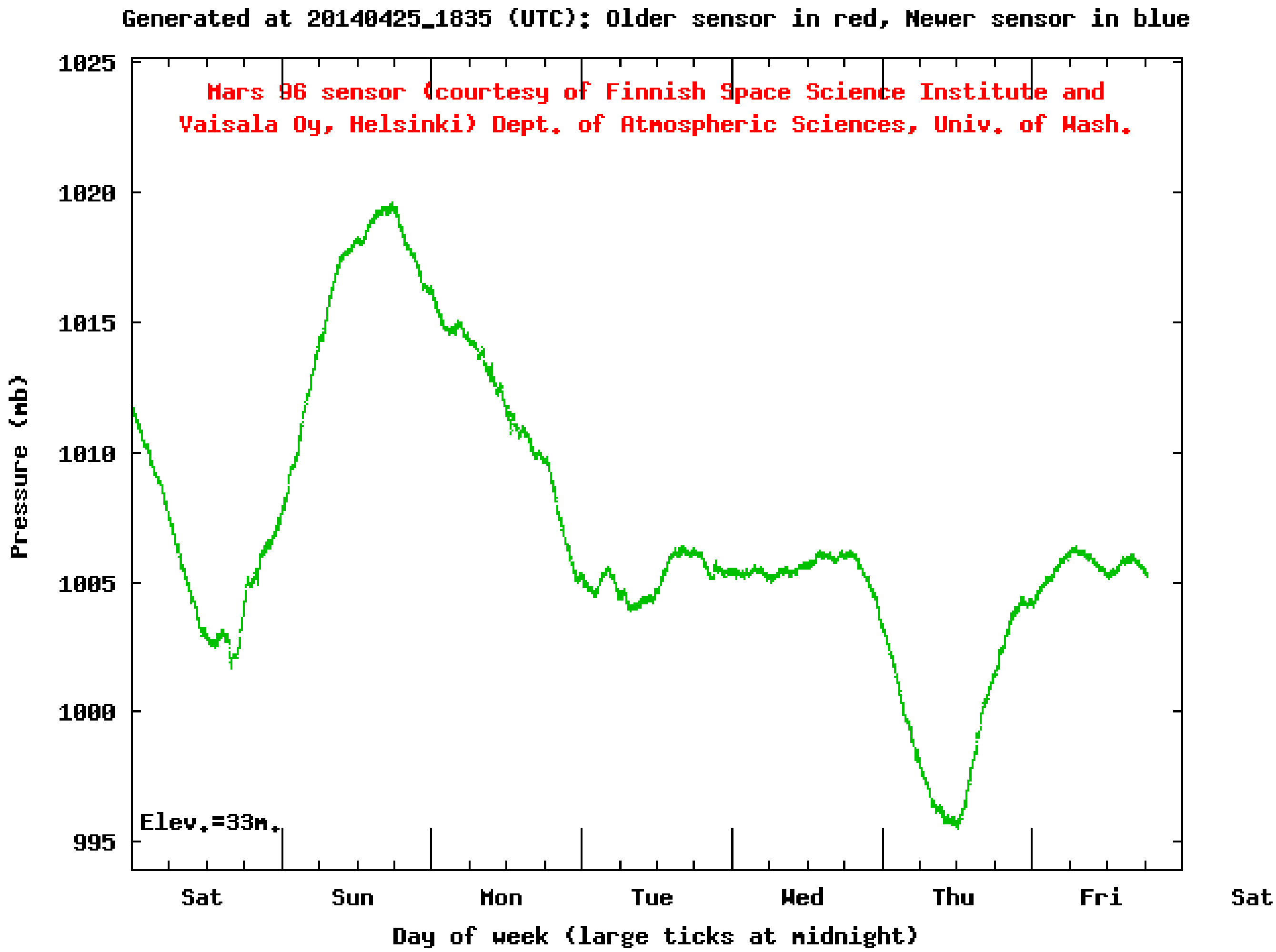
Source: KSEA Last Updated on Apr 25 2014, 10:53 am PDT

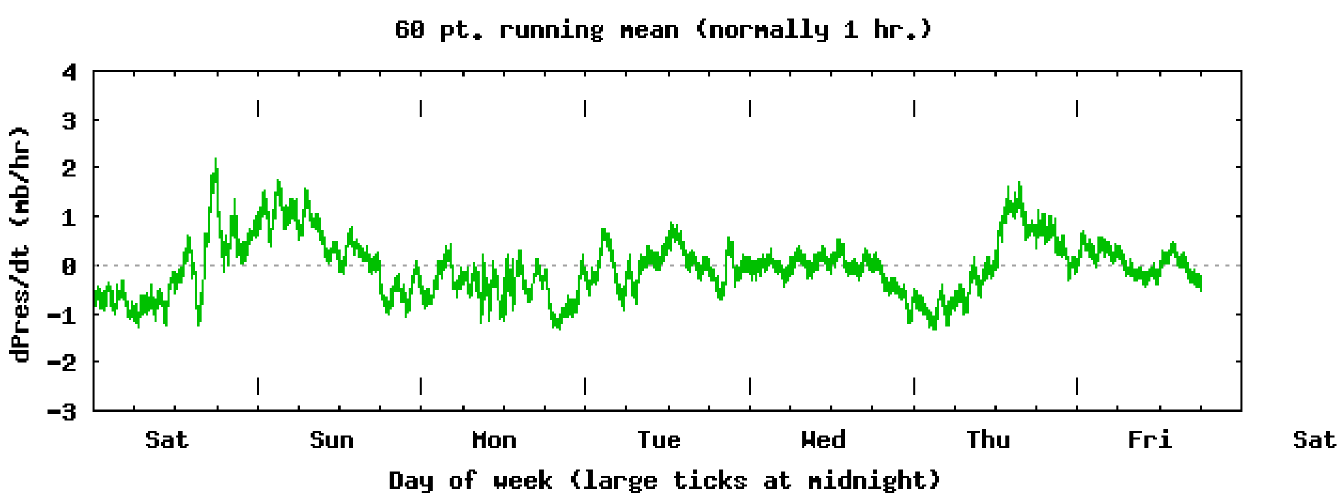
Seattle, WA	Williston, ND	Houston, TX	Dubuque, IA	Fort Wayne, IN	Buffalo, NY
Portland, OR	Bismark, ND	Phoenix, AZ	Kansas City, MO	Lansing, MI	JFK NY, NY
San Francisco, CA	Devils Lake, ND	El Paso, TX	St Louis, MO	Cleveland, OH	Albany, NY
Los Angeles, CA	Minot, ND	Corpus Christi, TX	Springfield, MO	Columbus, OH	Phil, PA
San Diego, CA	Fargo, ND	New Orleans, LA	Little Rock, AR	Louisville, KY	Norfolk, VA
Las Vegas, NV	Rapid City, SD	Minneapolis, MN	Hayward, WI	Memphis, TN	Roanoke, VA
Reno Tahoe, NV	Pierre, SD	Brainerd, MN	Wausau, WI	Nashville, TN	Charleston, SC
Salt Lake City, UT	Water Town, SD	Park Rapids, MN	Rhinelander, WI	Jackson, MS	Panama City, FL
Casper, WY	Lincoln, NE	Warroad, MN	Green Bay, WI	Pittsburgh, PA	Jacksonville, FL
Boise, ID	Wichita, KS	Longville, MN	Milwaukee, WI	Charlotte, NC	Tampa, FL
Billings, MT	Okla City, OK	Ely, MN	La Crosse, WI	Birmingham, AL	Miami, FL
Missoula, MT	Amarillo, TX	Sioux City, IA	Chicago, IL	Atlanta, GA	
Albuquerque, NM	Dallas Ft Wth, TX	Des Moines, IA	Peoria, IL	Washington, DC	All Locations
Denver, CO	Austin, TX	Mason City, IA	Indianapolis, IN	Boston, MA	

About: This site plots a 7-day history of hourly airport barometer readings. Contact

University of Washington, Dept of Atmospheric Sciences
High resolution Atmospheric Pressure
J. E. Tillman and Neal C. Johnson







These instruments are located at the Department of Atmospheric Sciences, University of Washington, Seattle Washington. They are approximately 33.5 meters (110 feet) above mean sea level. In typical atmospheric conditions this sensor reads approximately 4 millibars lower than it would at MSL.

The sensor plotted in red, called the primary sensor below, has been running continuously since 1993 with the factory calibration. The newer sensor in blue has been running with the factory calibration since 2000.

The primary sensor, developed by Vaisala Oy, Helsinki, Finland, is identical to that used for the Russian Mars 96 Program; their program includes European & US collaboration. We gratefully acknowledge Risto Pellinen and Ari-Matti Harri, Finnish Space Science Institute, for providing the sensor and Pekka Jarvi of Vaisala Oy, Helsinki, Finland , for integrating it into a commercial instrument and calibrating it for us.

Support was provided by NASA Headquarters (Planetary Instruments Program) and Jet Propulsion Laboratory. James E. Tillman, Neal C. Johnson and Fred Weller, UW, developed and maintain the system and software.

Further details about these pressure plots

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weather.gov

Weather observations for the past three days

Seattle-Tacoma Intl Airport

Enter Your "City, ST" or zip code Go

metric en español

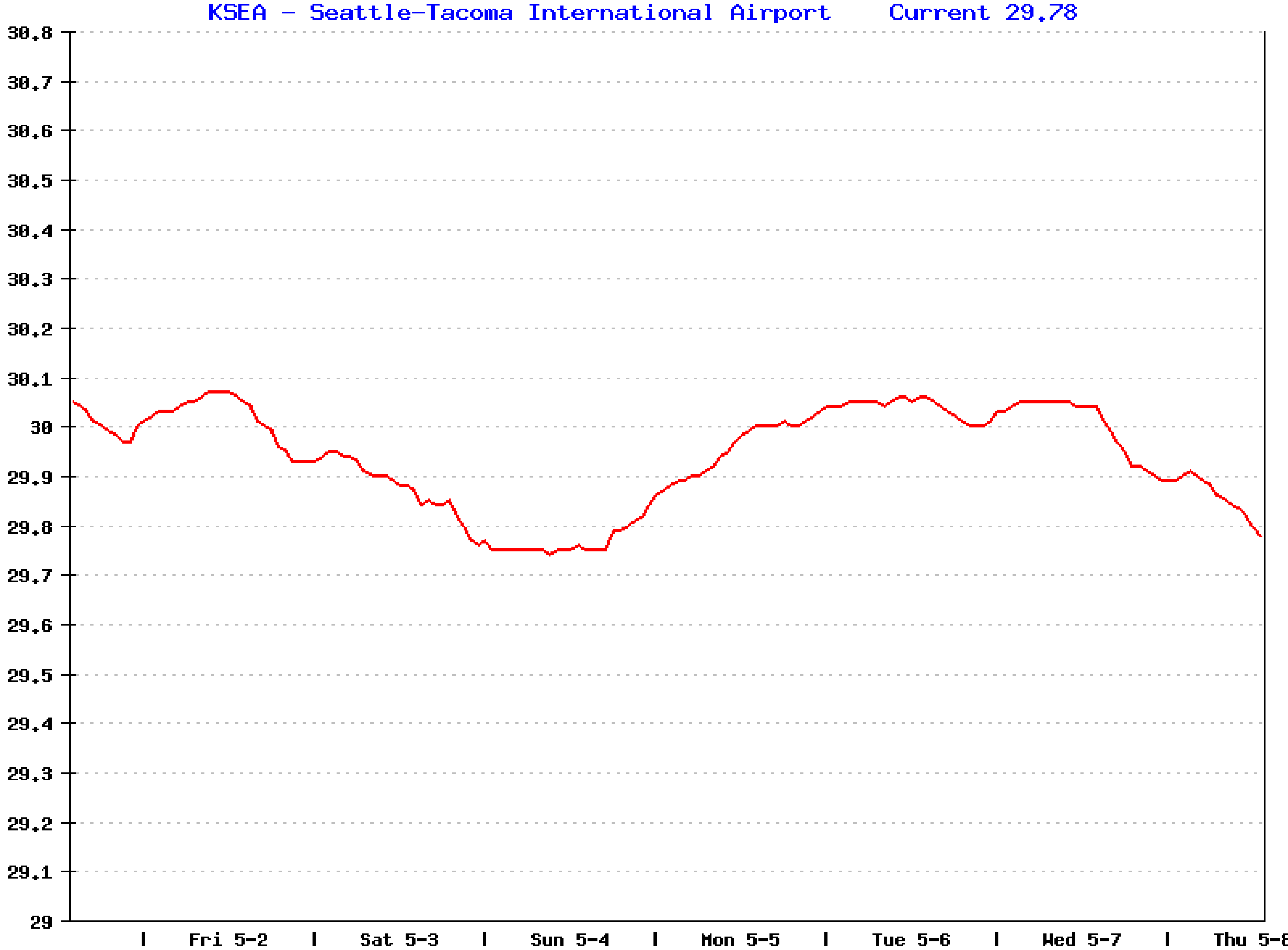
Date	Time (pdt)	Wind (mph)	Vis. (mi.)	Weather	Sky Cond.	Temperature (°F) Air	Dwpt	6 hour Max.	6 hour Min.	Relative Humidity	Wind Chill (°F)	Heat Index (°F)	Pressure altimeter (in)	Pressure sea level (mb)	Precipitation (in.) 1 hr	3 hr	6 hr
25	10:53	W 5	10.00	Mostly Cloudy	FEW017 BKN050	51	40	51	42	66%	NA	NA	29.89	1012.8			
25	09:53	Vrbl 5	10.00	Mostly Cloudy	FEW017 BKN050 BKN170	50	41			71%	48	NA	29.89	1013.0			
25	08:53	Calm	10.00	Mostly Cloudy	BKN049 BKN170	47	40			77%	NA	NA	29.90	1013.3			
25	07:53	Calm	10.00	Mostly Cloudy	BKN049 BKN160	45	41			86%	NA	NA	29.90	1013.1			
25	06:53	SE 3	10.00	Overcast	OVC049	43	41			93%	NA	NA	29.89	1012.8			
25	05:53	Calm	10.00	Mostly Cloudy	FEW047 BKN140	43	39			86%	NA	NA	29.88	1012.5			
25	04:53	S 3	10.00	Mostly Cloudy	SCT047 BKN170	42	39	47	42	89%	NA	NA	29.88	1012.5			
25	03:53	SE 5	10.00	Mostly Cloudy	BKN047	44	40			85%	41	NA	29.89	1012.9			
25	02:53	SE 5	10.00	Mostly Cloudy	BKN220	43	40			89%	40	NA	29.90	1013.1			
25	01:53	SE 8	10.00	A Few Clouds	FEW029	44	39			83%	39	NA	29.90	1013.3			
25	00:53	S 7	10.00	Mostly Cloudy	BKN230	44	41			89%	40	NA	29.91	1013.5			
24	23:53	S 5	10.00	A Few Clouds	FEW029	45	40			83%	42	NA	29.92	1013.7			
24	22:53	S 7	10.00	Mostly Cloudy	BKN029	47	42	55	46	83%	44	NA	29.92	1013.7			0.02
24	21:53	S 5	10.00	Partly Cloudy	FEW023 SCT080	46	42			86%	44	NA	29.91	1013.6			
24	20:53	SW 7	10.00	Partly Cloudy	FEW040 SCT080 SCT250	47	43			86%	44	NA	29.90	1013.1			
24	19:53	S 8	10.00	Partly Cloudy	FEW040 SCT075 SCT250	48	43			83%	44	NA	29.89	1012.9	0.02	0.02	
24	18:53	SW 13	10.00	Light Rain	SCT040 BKN070 BKN220	50	44			80%	45	NA	29.89	1012.9			
24	17:53	W 13 G 23	10.00	Mostly Cloudy	FEW025 SCT060	54	41			62%	NA	NA	29.87	1012.1			

					BKN220												
24	16:53	SW 14 G 29	10.00	Mostly Cloudy	SCT024 SCT050 BKN220	53	40	57	50	61%	NA	NA	29.87	1012.1			0.01
24	15:53	SW 13 G 22	10.00	Mostly Cloudy	FEW038 SCT050 BKN250	53	43			69%	NA	NA	29.87	1012.0			
24	14:53	SW 16 G 23	10.00	Mostly Cloudy	SCT026 SCT080 BKN250	54	45			72%	NA	NA	29.86	1011.6			
24	13:53	W 17 G 26	10.00	Mostly Cloudy	FEW020 BKN043 BKN060	51	43			74%	NA	NA	29.85	1011.6		0.01	
24	12:53	SW 20 G 32	10.00	Overcast	BKN038 BKN047 OVC055	53	46			77%	NA	NA	29.82	1010.5	0.01		
24	11:53	SW 17 G 24	10.00	Mostly Cloudy	SCT035 BKN050 BKN200	55	42			62%	NA	NA	29.80	1009.6			
24	10:53	SW 14 G 22	10.00	Mostly Cloudy	SCT030 BKN040 BKN200	54	43	55	49	67%	NA	NA	29.78	1009.1			0.33
24	09:53	S 15 G 24	10.00	Mostly Cloudy	SCT025 BKN060 BKN200	53	45			74%	NA	NA	29.76	1008.5			
24	07:53	S 12	10.00	Mostly Cloudy	FEW010 SCT050 BKN200	50	46			86%	45	NA	29.71	1006.8		0.33	
24	06:53	SW 17 G 28	10.00	Mostly Cloudy	FEW005 SCT014 BKN023	50	46			86%	44	NA	29.67	1005.4	0.26		
24	05:53	S 12 G 22	4.00	Rain Fog/Mist	FEW026 BKN029 OVC042	52	48			86%	NA	NA	29.63	1003.9	0.07		
24	04:53	S 15	10.00	Light Rain	SCT032 BKN045 OVC049	51	48	52	48	89%	NA	NA	29.61	1003.3	0.06		0.24
24	03:53	S 13	10.00	Light Rain	BKN031 BKN046 OVC070	52	47			83%	NA	NA	29.61	1003.3	0.02		
24	02:53	SE 8	10.00	Light Rain	BKN033 BKN040 OVC060	50	47			89%	47	NA	29.61	1003.5	0.03		
24	01:53	SE 10	10.00	Light Rain	SCT040 OVC050	50	46			86%	46	NA	29.62	1003.7	0.02	0.13	
24	00:53	SE 16	9.00	Light Rain	BKN036 OVC055	50	47			89%	44	NA	29.63	1004.0	0.02		
23	23:53	SE 13	7.00	Light Rain	FEW034 OVC050	49	46			90%	44	NA	29.65	1004.9	0.09		
23	22:53	SE 12	9.00	Light Rain	BKN028 BKN040 OVC048	48	45	50	48	89%	43	NA	29.67	1005.3	0.07		0.20

23	21:53	E 12	8.00	Rain	BKN037 OVC046	48	45			89%	43	NA	29.70	1006.3	0.03		
23	20:53	SE 9	10.00	Overcast	FEW030 BKN049 OVC060	48	45			89%	44	NA	29.71	1006.7	0.03		
23	19:53	E 8	6.00	Light Rain Fog/Mist	BKN030 BKN040 OVC049	49	46			90%	46	NA	29.74	1007.9	0.02	0.07	
23	18:53	E 9	9.00	Light Rain	FEW028 OVC060	50	46			86%	46	NA	29.78	1009.1	0.02		
23	17:53	E 8	10.00	Light Rain	BKN028 BKN035 OVC070	50	45			83%	47	NA	29.80	1009.9	0.03		
23	16:53	SE 10	10.00	Light Rain	FEW038 OVC060	50	44	53	50	80%	46	NA	29.83	1010.8	0.01		0.01
23	15:53	SE 12	10.00	Overcast	BKN026 OVC060	52	41			66%	NA	NA	29.86	1011.8			
23	14:53	S 9	10.00	Overcast	SCT029 BKN060 OVC150	51	42			71%	NA	NA	29.88	1012.6			
23	13:53	SW 13	10.00	Overcast	SCT023 BKN065 OVC200	51	42			71%	NA	NA	29.90	1013.1			
23	12:53	SW 9	10.00	Mostly Cloudy	SCT021 BKN075 BKN200	51	41			69%	NA	NA	29.91	1013.5			
23	11:53	SW 12 G 18	10.00	Overcast	BKN027 OVC036	50	41			71%	45	NA	29.91	1013.7			
23	10:53	S 14	10.00	Mostly Cloudy	FEW016 BKN027 BKN095	50	43	50	43	77%	45	NA	29.91	1013.4			0.01
23	09:53	S 12	10.00	Mostly Cloudy	FEW014 SCT050 BKN095 BKN200	49	43			80%	44	NA	29.90	1013.4			
23	08:53	S 13	10.00	Mostly Cloudy	FEW020 SCT040 SCT080 BKN200	47	42			83%	41	NA	29.91	1013.6			
23	07:53	S 12	8.00	Mostly Cloudy	FEW020 BKN040 BKN150	44	41			89%	38	NA	29.91	1013.6	0.01	0.01	
23	06:53	S 14	10.00	Mostly Cloudy	BKN023 BKN032 BKN150	44	40			85%	37	NA	29.91	1013.5			
23	05:53	S 12 G 26	10.00	Light Rain	SCT025 BKN030 OVC039	44	39			83%	38	NA	29.90	1013.2			
23	04:53	S 10	10.00	Overcast	FEW023 BKN038 OVC047	43	40	45	43	89%	37	NA	29.89	1013.1	0.01		0.02

23	03:53	S 12	10.00	Mostly Cloudy	FEW027 BKN070 BKN090	44	40			85%	38	NA	29.89	1012.9			
23	02:53	S 13	10.00	Mostly Cloudy	FEW010 BKN031 BKN110	44	40			85%	38	NA	29.88	1012.6			
23	01:53	S 13	10.00	Mostly Cloudy	SCT009 BKN016	44	41			89%	38	NA	29.89	1012.9	0.01	0.01	
23	00:53	S 10	10.00	Light Rain	FEW011 BKN027 OVC033	44	41			89%	39	NA	29.89	1012.9			
22	23:53	S 9	8.00	Overcast	FEW010 OVC016	44	42			93%	39	NA	29.88	1012.5			
22	22:53	S 9	7.00	Light Rain	SCT012 BKN025 OVC031	45	42	49	45	90%	40	NA	29.88	1012.5	0.09		0.22
22	21:53	SE 12	10.00	Light Rain	OVC029	46	43			89%	40	NA	29.88	1012.8	0.02		
22	20:53	S 8	10.00	Light Rain	BKN028 OVC037	45	42			90%	41	NA	29.89	1012.9	0.07		
22	19:53	S 8	8.00	Light Rain	BKN028 OVC037	46	42			86%	42	NA	29.89	1012.8	0.04	0.04	
22	18:53	SE 12	10.00	Mostly Cloudy	BKN036 BKN100 BKN200	47	39			74%	42	NA	29.89	1013.1			
22	17:53	S 8	10.00	Mostly Cloudy	FEW035 SCT060 BKN100 BKN200	48	41			77%	44	NA	29.90	1013.2			
22	16:53	S 10	10.00	Mostly Cloudy	FEW035 SCT044 BKN100 BKN200	49	42	54	46	77%	45	NA	29.90	1013.3	0.01		0.03
22	15:53	SW 16	10.00	Mostly Cloudy	FEW030 SCT060 BKN200	51	39			64%	NA	NA	29.90	1013.3			
22	14:53	S 14	10.00	Mostly Cloudy	FEW030 SCT050 BKN200	51	41			69%	NA	NA	29.90	1013.2	0.02		
22	13:53	S 15 G 21	10.00	Mostly Cloudy	FEW025 BKN045 BKN200	53	40			61%	NA	NA	29.90	1013.1			
22	12:53	S 9	10.00	Mostly Cloudy	FEW033 BKN047	52	37			57%	NA	NA	29.90	1013.0			
22	11:53	SW 8	10.00	Partly Cloudy	FEW016 SCT024	50	39			66%	47	NA	29.90	1013.2			
Date	Time (pdt)	Wind (mph)	Vis. (mi.)	Weather	Sky Cond.	Air	Dwpt	Max. 6 hour	Min. 6 hour	Relative Humidity	Wind Chill (°F)	Heat Index (°F)	altimeter (in.)	sea level (mb)	1 hr	3 hr	6 hr
						Temperature (ºF)							Pressure		Precipitation (in.)		

GraphBarometer.com



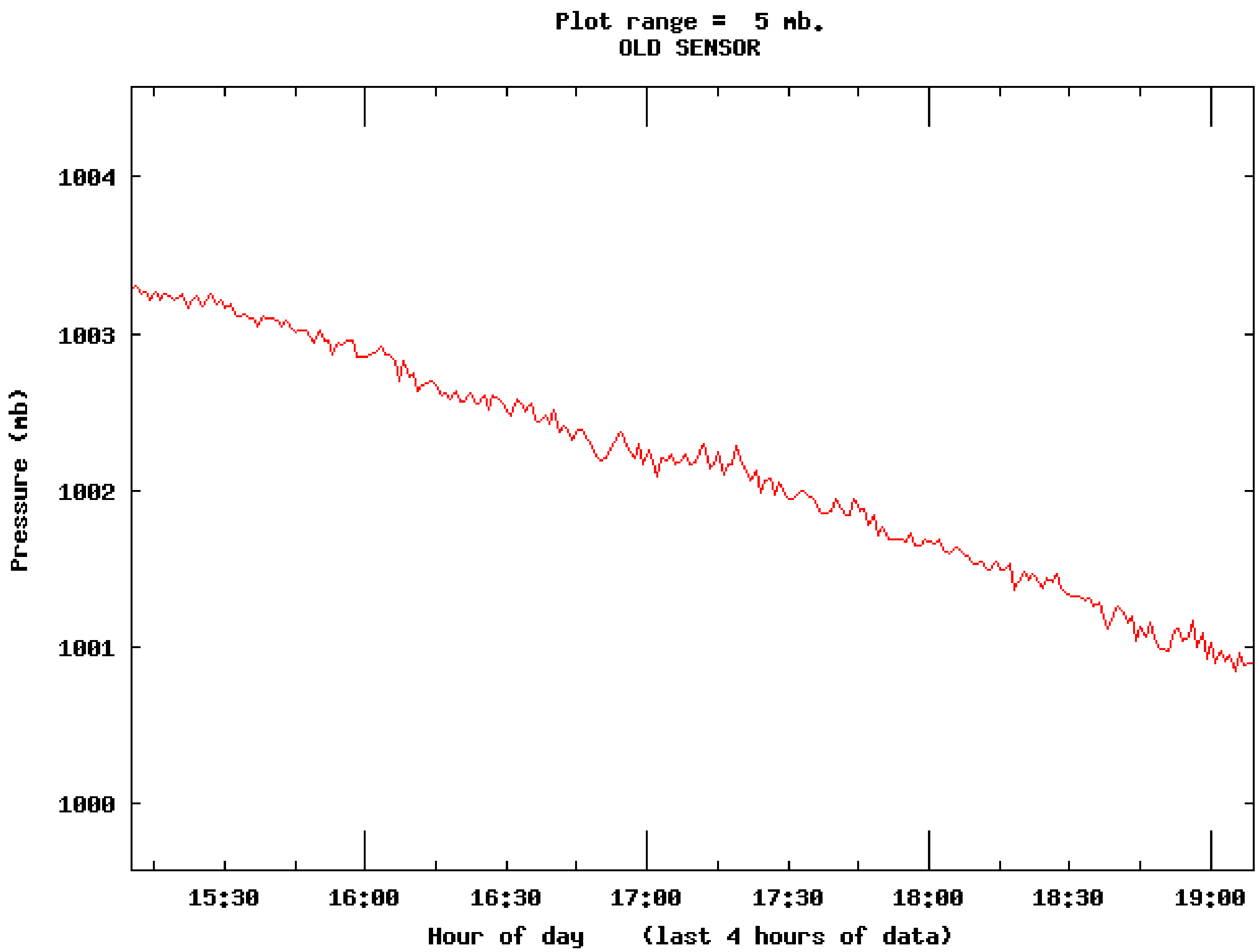
Source: KSEA Last Updated on May 8 2014, 11:53 am PDT

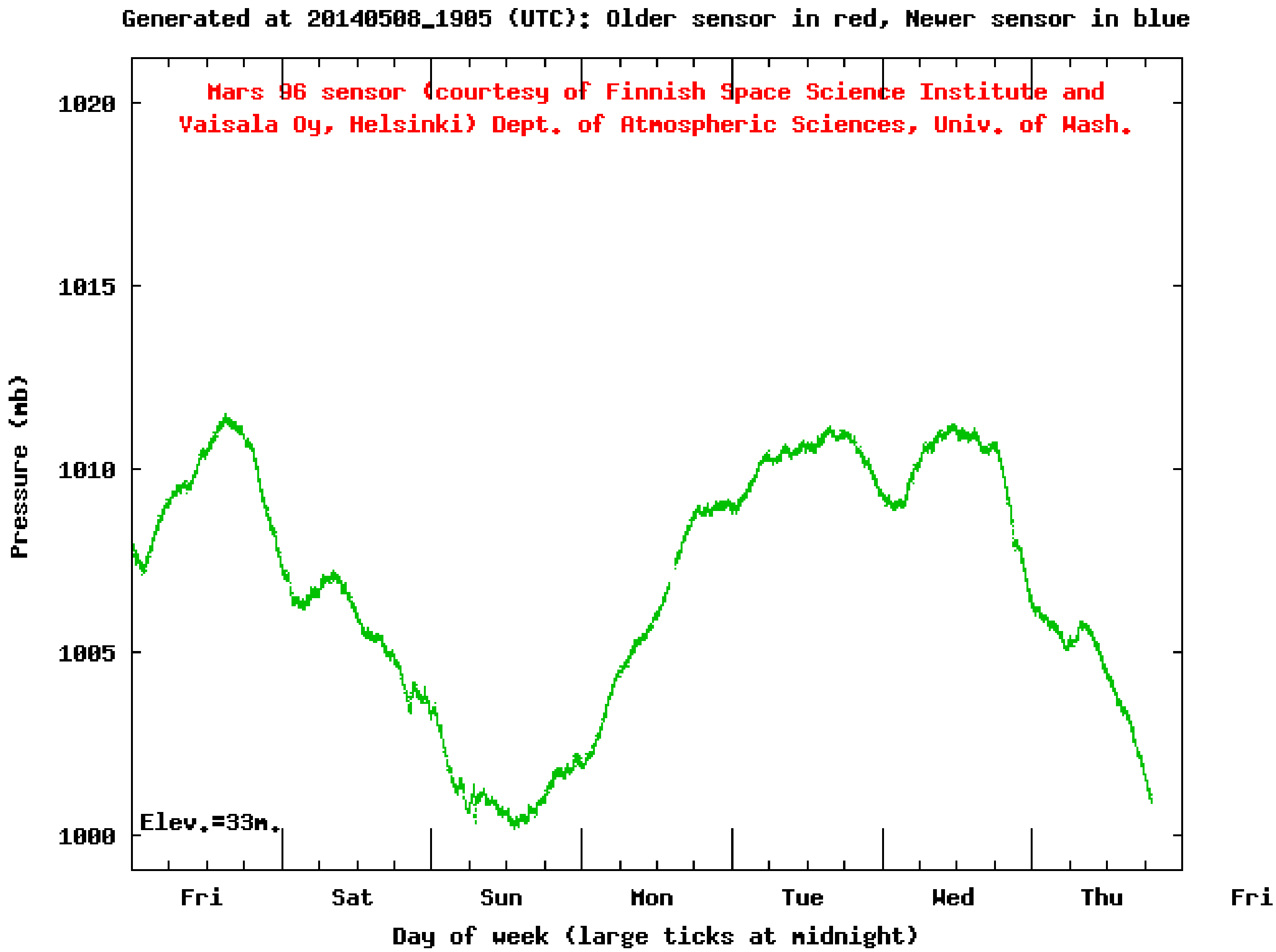
Seattle, WA	Williston, ND	Houston, TX	Dubuque, IA	Fort Wayne, IN	Buffalo, NY
Portland, OR	Bismark, ND	Phoenix, AZ	Kansas City, MO	Lansing, MI	JFK NY, NY
San Francisco, CA	Devils Lake, ND	El Paso, TX	St Louis, MO	Cleveland, OH	Albany, NY
Los Angeles, CA	Minot, ND	Corpus Christi, TX	Springfield, MO	Columbus, OH	Phil, PA
San Diego, CA	Fargo, ND	New Orleans, LA	Little Rock, AR	Louisville, KY	Norfolk, VA
Las Vegas, NV	Rapid City, SD	Minneapolis, MN	Hayward, WI	Memphis, TN	Roanoke, VA
Reno Tahoe, NV	Pierre, SD	Brainerd, MN	Wausau, WI	Nashville, TN	Charleston, SC
Salt Lake City, UT	Water Town, SD	Park Rapids, MN	Rhinelander, WI	Jackson, MS	Panama City, FL
Casper, WY	Lincoln, NE	Warroad, MN	Green Bay, WI	Pittsburgh, PA	Jacksonville, FL
Boise, ID	Wichita, KS	Longville, MN	Milwaukee, WI	Charlotte, NC	Tampa, FL
Billings, MT	Okla City, OK	Ely, MN	La Crosse, WI	Birmingham, AL	Miami, FL
Missoula, MT	Amarillo, TX	Sioux City, IA	Chicago, IL	Atlanta, GA	
Albuquerque, NM	Dallas Ft Wth, TX	Des Moines, IA	Peoria, IL	Washington, DC	All Locations
Denver, CO	Austin, TX	Mason City, IA	Indianapolis, IN	Boston, MA	

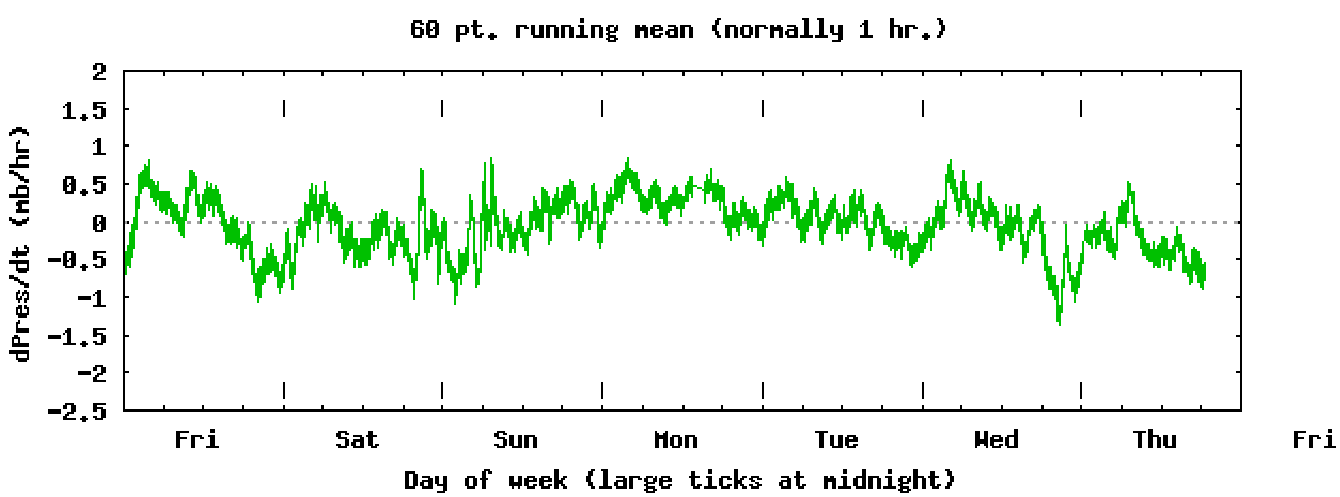
About: This site plots a 7-day history of hourly airport barometer readings.

Contact

University of Washington, Dept of Atmospheric Sciences
High resolution Atmospheric Pressure
J. E. Tillman and Neal C. Johnson







These instruments are located at the Department of Atmospheric Sciences, University of Washington, Seattle Washington. They are approximately 33.5 meters (110 feet) above mean sea level. In typical atmospheric conditions this sensor reads approximately 4 millibars lower than it would at MSL.

The sensor plotted in red, called the primary sensor below, has been running continuously since 1993 with the factory calibration. The newer sensor in blue has been running with the factory calibration since 2000.

The primary sensor, developed by Vaisala Oy, Helsinki, Finland, is identical to that used for the Russian Mars 96 Program; their program includes European & US collaboration. We gratefully acknowledge Risto Pellinen and Ari-Matti Harri, Finnish Space Science Institute, for providing the sensor and Pekka Jarvi of Vaisala Oy, Helsinki, Finland , for integrating it into a commercial instrument and calibrating it for us.

Support was provided by NASA Headquarters (Planetary Instruments Program) and Jet Propulsion Laboratory. James E. Tillman, Neal C. Johnson and Fred Weller, UW, developed and maintain the system and software.

Further details about these pressure plots

Weather observations for the past three days

Seattle-Tacoma Intl Airport

Date	Time (pdt)	Wind (mph)	Vis. (mi.)	Weather	Sky Cond.	Temperature (°F)				Relative Humidity	Wind Chill (°F)	Heat Index (°F)	Pressure		Precipitation (in.)		
						Air	Dwpt	6 hour Max.	6 hour Min.				altimeter (in)	sea level (mb)	1 hr	3 hr	6 hr
08	11:53	W 5	7.00	Light Rain	BKN055 OVC070	54	47			77%	NA	NA	29.76	1008.4	0.01		
08	10:53	S 5	10.00	Overcast	FEW025 BKN050 OVC070	56	44	57	49	65%	NA	NA	29.78	1009.0			
08	09:53	W 8	10.00	Mostly Cloudy	SCT050 BKN100	55	44			67%	NA	NA	29.80	1009.6			
08	08:53	S 5	10.00	Mostly Cloudy	SCT050 BKN100	54	42			64%	NA	NA	29.82	1010.3			
08	07:53	SW 5	10.00	Mostly Cloudy	SCT050 BKN110	51	43			74%	NA	NA	29.83	1010.7			
08	06:53	S 3	10.00	Overcast	SCT050 OVC110	50	44			80%	NA	NA	29.84	1011.0			
08	05:53	S 3	10.00	Overcast	SCT050 OVC150	50	43			77%	NA	NA	29.85	1011.5			
08	04:53	S 3	10.00	Mostly Cloudy	FEW055 BKN150	50	43	53	50	77%	NA	NA	29.86	1011.8			
08	03:53	S 3	10.00	Mostly Cloudy	BKN050	50	42			74%	NA	NA	29.88	1012.3			
08	02:53	S 8	10.00	Mostly Cloudy	SCT070 BKN190	51	42			71%	NA	NA	29.89	1012.8			
08	01:53	SW 7	10.00	Mostly Cloudy	SCT055 BKN200	51	42			71%	NA	NA	29.90	1013.2			
08	00:53	S 9	10.00	Mostly Cloudy	FEW060 BKN075	52	44			75%	NA	NA	29.91	1013.3			
07	23:53	SW 6	10.00	A Few Clouds	FEW250	53	45			74%	NA	NA	29.90	1013.0			
07	22:53	W 7	10.00	Mostly Cloudy	BKN250	53	47	65	53	80%	NA	NA	29.89	1012.8			
07	21:53	W 6	10.00	Mostly Cloudy	BKN250	54	47			77%	NA	NA	29.89	1012.8			
07	20:53	Calm	10.00	Mostly Cloudy	FEW050 BKN250	59	45			60%	NA	NA	29.89	1012.9			
07	19:53	Calm	10.00	Mostly Cloudy	FEW050 BKN250	62	40			44%	NA	NA	29.90	1013.2			
07	18:53	S 5	10.00	Partly Cloudy	FEW040 SCT250	63	41			45%	NA	NA	29.91	1013.6			
07	17:53	SW 7	10.00	Partly	FEW040	64	43			46%	NA	NA	29.92	1013.8			

				Cloudy	SCT250									
07	16:53	Calm	10.00	Partly Cloudy	FEW040 SCT250	64	42	65	55	45%	NA	NA	29.92	1013.9
07	15:53	W 5	10.00	Partly Cloudy	FEW040 SCT250	64	43			46%	NA	NA	29.95	1014.7
07	14:53	SW 9 G 16	10.00	Partly Cloudy	FEW039 SCT250	62	41			46%	NA	NA	29.97	1015.4
07	13:53	N 3	10.00	Partly Cloudy	FEW037 SCT250	62	43			50%	NA	NA	29.99	1016.0
07	12:53	Calm	10.00	Partly Cloudy	SCT025 SCT250	60	45			58%	NA	NA	30.01	1016.9
07	11:53	Calm	10.00	A Few Clouds	FEW020	57	45			64%	NA	NA	30.04	1017.8
07	10:53	S 8	10.00	A Few Clouds	FEW020	55	44	56	45	67%	NA	NA	30.04	1018.0
07	09:53	SW 5	10.00	A Few Clouds	FEW020	53	43			69%	NA	NA	30.04	1018.0
07	08:53	NW 5	10.00	A Few Clouds	FEW250	52	43			72%	NA	NA	30.04	1017.9
07	07:53	Calm	10.00	A Few Clouds	FEW250	50	42			74%	NA	NA	30.05	1018.3
07	06:53	S 3	10.00	A Few Clouds	FEW030	47	41			80%	NA	NA	30.05	1018.0
07	05:53	Calm	10.00	Mostly Cloudy	BKN029	46	42			86%	NA	NA	30.05	1018.1
07	04:53	Calm	10.00	A Few Clouds	FEW023	45	41	50	45	86%	NA	NA	30.05	1018.4
07	03:53	S 3	10.00	A Few Clouds	FEW023	46	41			83%	NA	NA	30.05	1018.4
07	02:53	SW 3	10.00	Overcast	OVC023	48	42			80%	NA	NA	30.05	1018.2
07	01:53	S 5	10.00	Overcast	OVC023	49	42			77%	47	NA	30.05	1018.2
07	00:53	S 6	10.00	Partly Cloudy	FEW055 SCT150	48	42			80%	45	NA	30.05	1018.1
06	23:53	W 5	10.00	Partly Cloudy	SCT055	49	41			74%	47	NA	30.04	1018.1
06	22:53	SW 5	10.00	Mostly Cloudy	BKN055	50	43	62	50	77%	48	NA	30.03	1017.8
06	21:53	SW 6	10.00	Mostly Cloudy	BKN045	53	46			77%	NA	NA	30.03	1017.4
06	20:53	W 3	10.00	Partly Cloudy	SCT070	53	43			69%	NA	NA	30.01	1016.7
06	19:53	NW 5	10.00	Mostly Cloudy	FEW030 SCT070 BKN200	55	44			67%	NA	NA	30.00	1016.6
06	18:53	NW 3	10.00	Mostly Cloudy	FEW030 BKN070 BKN200	59	41			51%	NA	NA	30.00	1016.5
06	17:53	W 3	10.00	Mostly Cloudy	FEW030 BKN075	61	40			46%	NA	NA	30.00	1016.6

06	16:53	W 9	10.00	Mostly Cloudy	FEW030 SCT055 BKN100	61	45	61	51	56%	NA	NA	30.01	1016.9
06	15:53	Vrbl 7	10.00	Mostly Cloudy	FEW030 BKN095	60	46			60%	NA	NA	30.02	1017.2
06	14:53	SW 10	10.00	Mostly Cloudy	FEW030 BKN095	59	46			62%	NA	NA	30.03	1017.6
06	13:53	S 9	10.00	Mostly Cloudy	FEW025 BKN090	58	45			62%	NA	NA	30.04	1017.8
06	12:53	SW 9	10.00	Mostly Cloudy	FEW022 SCT034 BKN090	56	45			67%	NA	NA	30.05	1018.1
06	11:53	SW 8	10.00	Mostly Cloudy	FEW021 BKN030	53	45			74%	NA	NA	30.06	1018.5
06	10:53	SW 7	10.00	Mostly Cloudy	FEW022 BKN029	52	44	53	50	75%	NA	NA	30.06	1018.6
06	09:53	S 5	10.00	Mostly Cloudy	FEW013 BKN022 BKN040	52	45			77%	NA	NA	30.05	1018.3
06	08:53	S 5	10.00	Overcast	BKN015 OVC024	51	45			80%	NA	NA	30.06	1018.6
06	07:53	Calm	10.00	Mostly Cloudy	FEW012 BKN019 BKN035	50	45			83%	NA	NA	30.06	1018.4
06	06:53	S 3	10.00	Overcast	BKN020 OVC035	50	45			83%	NA	NA	30.05	1018.1
06	05:53	S 5	10.00	Overcast	BKN015 OVC030	50	45			83%	48	NA	30.04	1017.9
06	04:53	SW 6	10.00	Overcast	OVC013	50	45	52	49	83%	48	NA	30.05	1018.1
06	03:53	SW 7	10.00	Overcast	BKN011 OVC030	49	45			86%	46	NA	30.05	1018.1
06	02:53	SW 6	10.00	Overcast	BKN008 OVC020	49	46			90%	46	NA	30.05	1018.1
06	01:53	SW 8	10.00	Mostly Cloudy	SCT008 BKN020	50	47			89%	47	NA	30.05	1018.1
06	00:53	SW 7	10.00	Mostly Cloudy	FEW020 SCT060 BKN090	50	47			89%	47	NA	30.05	1018.1
05	23:53	S 7	10.00	Mostly Cloudy	FEW020 SCT030 BKN090	50	47			89%	47	NA	30.04	1017.9
05	22:53	S 5	10.00	Mostly Cloudy	FEW007 SCT025 BKN090	52	49	59	51	89%	NA	NA	30.04	1017.8
05	21:53	SW 3	10.00	Mostly Cloudy	FEW025 BKN090	53	49			86%	NA	NA	30.04	1017.9
05	20:53	S 3	10.00	Mostly Cloudy	FEW025 BKN090	53	49			86%	NA	NA	30.03	1017.6
05	19:53	SW 5	10.00	Partly Cloudy	FEW020 SCT060 SCT100	54	49			83%	NA	NA	30.02	1017.1

05	18:53	SW 6	10.00	Mostly Cloudy	SCT020 BKN055	57	49			74%	NA	NA	30.01	1016.9			
05	17:53	SW 9	10.00	Mostly Cloudy	SCT025 BKN060	58	49			72%	NA	NA	30.00	1016.6			
05	16:53	SW 8	10.00	Mostly Cloudy	FEW020 SCT028 BKN065	57	47	60	54	69%	NA	NA	30.00	1016.5			
05	15:53	W 10	10.00	Mostly Cloudy	FEW025 BKN036 BKN055	56	47			72%	NA	NA	30.01	1016.7			
05	14:53	S 14	10.00	Mostly Cloudy	FEW025 BKN050 BKN100	57	46			67%	NA	NA	30.00	1016.6			
05	13:53	SW 9	10.00	Mostly Cloudy	SCT018 BKN040 BKN070	59	50			72%	NA	NA	30.00	1016.5			
05	12:53	SW 12	10.00	Mostly Cloudy	FEW015 SCT022 BKN033	58	47			67%	NA	NA	30.00	1016.3			
Date	Time (pdt)	Wind (mph)	Vis. (mi.)	Weather	Sky Cond.	Air	Dwpt	Max. 6 hour	Min. 6 hour	Relative Humidity	Wind Chill (°F)	Heat Index (°F)	altimeter (in.)	sea level (mb)	1 hr	3 hr	6 hr
						Temperature (°F)							Pressure		Precipitation (in.)		

National Weather Service
Southern Region Headquarters
Fort Worth, Texas
Disclaimer

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Last Modified: Febuary, 7 2012
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APPENDIX C
LABORATORY ANALYTICAL REPORTS

TIER 3 VAPOR INTRUSION
ASSESSMENT REPORT
5815 4th Avenue South—North Building
Seattle, Washington

Farallon PN: 457-007

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6/9/2014
Mr. Jeffrey Kaspar
Farallon Consulting, LLC
975 Fifth Avenue NW

Issaquah WA 98027-3333

Project Name:
Project #:
Workorder #: 1405197R1

Dear Mr. Jeffrey Kaspar

The following report includes the data for the above referenced project for sample(s) received on 5/9/2014 at Air Toxics Ltd.

The data and associated QC analyzed by Modified TO-15 SIM are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Air Toxics Ltd. for your air analysis needs. Air Toxics Ltd. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Kelly Buettner

Kelly Buettner
Project Manager

eurofins | Air Toxics

WORK ORDER #: 1405197R1

Work Order Summary

CLIENT:	Mr. Jeffrey Kaspar Farallon Consulting, LLC 975 Fifth Avenue NW Issaquah, WA 98027-3333	**BILL TO:**	Mr. Jeffrey Kaspar Farallon Consulting, LLC 975 Fifth Avenue NW Issaquah, WA 98027-3333
PHONE:	425-295-0808	**P.O. #**	Task 8
FAX:	425-427-0067	**PROJECT #**	
DATE RECEIVED:	05/09/2014	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	05/22/2014		
DATE REISSUED:	06/09/2014		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	IA-5-13844-042414	Modified TO-15 SIM	5.3 "Hg	5.1 psi
02A	OA-2-34748-042414	Modified TO-15 SIM	3.9 "Hg	4.9 psi
03A	IA-6-33970-050514	Modified TO-15 SIM	5.3 "Hg	5 psi
04A	Lab Blank	Modified TO-15 SIM	NA	NA
04B	Lab Blank	Modified TO-15 SIM	NA	NA
05A	CCV	Modified TO-15 SIM	NA	NA
05B	CCV	Modified TO-15 SIM	NA	NA
06A	LCS	Modified TO-15 SIM	NA	NA
06AA	LCSD	Modified TO-15 SIM	NA	NA
06B	LCS	Modified TO-15 SIM	NA	NA
06BB	LCSD	Modified TO-15 SIM	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 06/09/14

Technical Director

Certification numbers: AZ Licensure AZ0775, CA NELAP - 12282CA, NJ NELAP - CA016, NY NELAP - 11291,
TX NELAP - T104704434-13-6, UT NELAP CA009332013-4, VA NELAP - 460197, WA NELAP - C935
Name of Accrediting Agency: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2013, Expiration date: 10/17/2014.
Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 9563
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
Modified TO-15 SIM
Farallon Consulting, LLC
Workorder# 1405197R1

Three 6 Liter Summa Canister (SIM Certified) samples were received on May 09, 2014. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the SIM acquisition mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Method modifications taken to run these samples are summarized in the table below. 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.

THE WORKORDER WAS REISSUED ON 6/9/14 TO REPORT THE ADDITIONAL COMPOUND 1,1-DICHLOROETHENE PER CLIENT'S REQUEST.

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, LOD, or MDL value. See data page for project specific U-flag definition.

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

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

Client Sample ID: IA-5-13844-042414

Lab ID#: 1405197R1-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
cis-1,2-Dichloroethene	0.033	0.12	0.13	0.49
Trichloroethene	0.033	0.64	0.18	3.4
Tetrachloroethene	0.033	0.16	0.22	1.1

Client Sample ID: OA-2-34748-042414

Lab ID#: 1405197R1-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	0.031	0.050	0.16	0.27

Client Sample ID: IA-6-33970-050514

Lab ID#: 1405197R1-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
cis-1,2-Dichloroethene	0.033	0.087	0.13	0.34
Trichloroethene	0.033	0.68	0.18	3.6
Tetrachloroethene	0.033	0.14	0.22	0.95

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Client Sample ID: IA-5-13844-042414

Lab ID#: 1405197R1-01A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**v052007simr1**	**Date of Collection:**	**4/24/14 8:26:00 AM**
Dil. Factor:	**1.64**	**Date of Analysis:**	**5/20/14 03:14 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.016	Not Detected	0.042	Not Detected
1,1-Dichloroethene	0.016	Not Detected	0.065	Not Detected
cis-1,2-Dichloroethene	0.033	0.12	0.13	0.49
Trichloroethene	0.033	0.64	0.18	3.4
Tetrachloroethene	0.033	0.16	0.22	1.1
trans-1,2-Dichloroethene	0.16	Not Detected	0.65	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	82	70-130
Toluene-d8	96	70-130
4-Bromofluorobenzene	117	70-130

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Client Sample ID: OA-2-34748-042414

Lab ID#: 1405197R1-02A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**v052108simr1**	**Date of Collection:**	**4/24/14 8:41:00 AM**
Dil. Factor:	**1.53**	**Date of Analysis:**	**5/21/14 01:34 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.015	Not Detected	0.039	Not Detected
1,1-Dichloroethene	0.015	Not Detected	0.061	Not Detected
cis-1,2-Dichloroethene	0.031	Not Detected	0.12	Not Detected
Trichloroethene	0.031	0.050	0.16	0.27
Tetrachloroethene	0.031	Not Detected	0.21	Not Detected
trans-1,2-Dichloroethene	0.15	Not Detected	0.61	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	108	70-130

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Client Sample ID: IA-6-33970-050514

Lab ID#: 1405197R1-03A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**v052009simr1**	**Date of Collection:**	**5/5/14 9:15:00 AM**
Dil. Factor:	**1.63**	**Date of Analysis:**	**5/20/14 04:30 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.016	Not Detected	0.042	Not Detected
1,1-Dichloroethene	0.016	Not Detected	0.065	Not Detected
cis-1,2-Dichloroethene	0.033	0.087	0.13	0.34
Trichloroethene	0.033	0.68	0.18	3.6
Tetrachloroethene	0.033	0.14	0.22	0.95
trans-1,2-Dichloroethene	0.16	Not Detected	0.65	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	90	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	115	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1405197R1-04A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**v052006sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/20/14 01:51 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.010	Not Detected	0.026	Not Detected
1,1-Dichloroethene	0.010	Not Detected	0.040	Not Detected
cis-1,2-Dichloroethene	0.020	Not Detected	0.079	Not Detected
Trichloroethene	0.020	Not Detected	0.11	Not Detected
Tetrachloroethene	0.020	Not Detected	0.14	Not Detected
trans-1,2-Dichloroethene	0.10	Not Detected	0.40	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	82	70-130
Toluene-d8	95	70-130
4-Bromofluorobenzene	106	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1405197R1-04B

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**v052107sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/21/14 12:45 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.010	Not Detected	0.026	Not Detected
1,1-Dichloroethene	0.010	Not Detected	0.040	Not Detected
cis-1,2-Dichloroethene	0.020	Not Detected	0.079	Not Detected
Trichloroethene	0.020	Not Detected	0.11	Not Detected
Tetrachloroethene	0.020	Not Detected	0.14	Not Detected
trans-1,2-Dichloroethene	0.10	Not Detected	0.40	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	84	70-130
Toluene-d8	96	70-130
4-Bromofluorobenzene	103	70-130

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Client Sample ID: CCV

Lab ID#: 1405197R1-05A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**v052003sim**	**Date of Collection: NA**
Dil. Factor:	**1.00**	**Date of Analysis: 5/20/14 10:36 AM**

Compound	%Recovery
Vinyl Chloride	78
1,1-Dichloroethene	91
cis-1,2-Dichloroethene	94
Trichloroethene	96
Tetrachloroethene	104
trans-1,2-Dichloroethene	93

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	86	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	116	70-130

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Client Sample ID: CCV

Lab ID#: 1405197R1-05B

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**v052102sim**	**Date of Collection: NA**
Dil. Factor:	**1.00**	**Date of Analysis: 5/21/14 09:11 AM**

Compound	%Recovery
Vinyl Chloride	73
1,1-Dichloroethene	88
cis-1,2-Dichloroethene	92
Trichloroethene	94
Tetrachloroethene	101
trans-1,2-Dichloroethene	90

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	85	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	118	70-130

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Client Sample ID: LCS

Lab ID#: 1405197R1-06A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**v052004sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/20/14 11:45 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	72	70-130
1,1-Dichloroethene	96	70-130
cis-1,2-Dichloroethene	101	70-130
Trichloroethene	93	70-130
Tetrachloroethene	100	70-130
trans-1,2-Dichloroethene	76	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	82	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	116	70-130

Client Sample ID: LCSD

Lab ID#: 1405197R1-06AA

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**v052005sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/20/14 12:26 PM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	71	70-130
1,1-Dichloroethene	95	70-130
cis-1,2-Dichloroethene	100	70-130
Trichloroethene	91	70-130
Tetrachloroethene	99	70-130
trans-1,2-Dichloroethene	74	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	83	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	119	70-130

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Client Sample ID: LCS

Lab ID#: 1405197R1-06B

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**v052103sim**	**Date of Collection: NA**
Dil. Factor:	**1.00**	**Date of Analysis: 5/21/14 09:55 AM**

Compound	%Recovery	Method Limits
Vinyl Chloride	73	70-130
1,1-Dichloroethene	101	70-130
cis-1,2-Dichloroethene	105	70-130
Trichloroethene	97	70-130
Tetrachloroethene	104	70-130
trans-1,2-Dichloroethene	79	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	83	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	115	70-130

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Client Sample ID: LCSD

Lab ID#: 1405197R1-06BB

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**v052104sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 5/21/14 10:37 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	73	70-130
1,1-Dichloroethene	99	70-130
cis-1,2-Dichloroethene	103	70-130
Trichloroethene	96	70-130
Tetrachloroethene	103	70-130
trans-1,2-Dichloroethene	78	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	84	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	117	70-130

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CHAIN-OF-CUSTODY RECORD

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FOLSOM, CA 95630-4719
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Page 1 of 1

Project Manager Jeff Kaspar
Collected by: (Print and Sign) Anna Sigel - [signature]
Company FARALLON CONSULTING Email JKASPAR@FARALLONCONSULTING.com
Address 975 5th Ave NW City ISSAQUAH State WA Zip 98027
Phone 425-295-0808 Fax

Project Info:
P.O. #
Project #
Project Name

Turn Around Time:
☒ Normal
☐ Rush
specify

Lab Use Only
Pressurized by:
Date:
Pressurization Gas: N_2 He

Lab I.D.	Field Sample I.D. (Location)	Can #	Date of Collection	Time of Collection	Analyses Requested	Canister Pressure/Vacuum Initial	Final	Receipt	Final (psi)
01A	IA-5-13844-042414	13844	4/24/14	8:26	TO15 SIM HVOCS	-30	-6		
02A	OA-2-34748-042414	34748	4/24/14	8:41	TO15 SIM HVOCS	-30	-6		
03A	IA-6-33970-050514	33970	5/5/14	9:15	TO15 SIM HVOCs	-30	-6		

Relinquished by: (signature) [signature] Date/Time 5/6/14 11:25 ~~4/25/14 9:20~~ ARS ARS
Received by: (signature) EAT Date/Time 05/09/14 10:10
Relinquished by: (signature) Date/Time
Received by: (signature) Date/Time
Relinquished by: (signature) Date/Time
Received by: (signature) Date/Time

Notes:

Lab Use Only	Shipper Name	Air Bill #	Temp (°C)	Condition	Custody Seals Intact?	Work Order #
	FedEx	7987-6902-5552	NA	Good	Yes No (None)	1405197

Form 1293 rev.11