



DEPARTMENT OF
ECOLOGY
State of Washington

**Cleanup Action Plan
Former Sauro's Cleanerama Site
Tacoma, Washington
FSID: 4339824**

**Issued by:
Washington State Department of Ecology
Toxics Cleanup Program
Southwest Regional Office
Olympia, Washington**

June 2015

FINAL

TABLE OF CONTENTS

	<u>Page</u>
1.0 INTRODUCTION	1-1
1.1 REGULATORY FRAMEWORK	1-1
1.2 SUMMARY OF CURRENT SITE CONDITIONS AND CONCEPTUAL SITE MODEL	1-2
2.0 PROPOSED CLEANUP ACTION	2-1
2.1 GOALS AND OBJECTIVES OF THE CLEANUP ACTION	2-1
2.2 CLEANUP ACTION ALTERNATIVES EVALUATED IN RI/FS	2-1
2.3 GENERAL DESCRIPTION OF THE SELECTED CLEANUP ACTION	2-2
2.3.1 Monitored Natural Attenuation	2-2
2.3.2 Institutional Controls	2-4
3.0 CLEANUP STANDARDS	3-1
3.1 GROUNDWATER CLEANUP LEVELS	3-1
3.2 GROUNDWATER POINT OF COMPLIANCE	3-1
4.0 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS	4-1
5.0 PUBLIC PARTICIPATION/COMMUNICATIONS	5-1
6.0 SCHEDULE FOR IMPLEMENTATION	6-1
7.0 REPORTING, QUALITY ASSURANCE/ CONTROL, DATA SUBMISSION	7-1
7.1 REPORTING	7-1
7.2 QUALITY ASSURANCE/QUALITY CONTROL	7-1
7.3 DATA SUBMISSION	7-2
8.0 USE OF THIS DOCUMENT	8-1
9.0 REFERENCES	9-1

FIGURES

<u>Figure</u>	<u>Title</u>
1	Vicinity Map
2	Conceptual Site Model
3	Cleanup Action- MNA with Institutional Controls

TABLES

<u>Table</u>	<u>Title</u>
1	Cleanup Action- Monitored Natural Attenuation Sampling Plan
2	Groundwater and Soil Cleanup Levels

APPENDIX

<u>Appendix</u>	<u>Title</u>
A	Health and Safety Plan

LIST OF ABBREVIATIONS AND ACRONYMS

AO	Agreed Order
ARAR	Applicable or Relevant and Appropriate Requirement
draft CAP	draft Cleanup Action Plan
CFR	Code of Federal Regulations
cis-1,2-DCE	Cis-1,2-Dichloroethene
City	City of Tacoma
COC	Constituent of Concern
CSM	Conceptual Site Model
CUL	Cleanup Level
DCA	Disproportionate Cost Analysis
Ecology	Washington State Department of Ecology
EIM	Electronic Information Management
EISB	Enhanced <i>in situ</i> Bioremediation
EPA	U.S. Environmental Protection Agency
ERH	Electrical Resistance Heating
FS	Feasibility Study
MCL	Maximum Contaminant Level
MNA	Monitored Natural Attenuation
MTCA	Model Toxics Control Act
PCE	Tetrachloroethene
RAO	Remedial Action Objective
RCW	Revised Code of Washington
RI	Remedial Investigation
SAP	Sampling and Analysis Plan
SEPA	State Environmental Policy Act
VC	Vinyl Chloride
VCP	Voluntary Cleanup Program
VOC	Volatile Organic Compound
WAC	Washington Administrative Code
WARM	Washington Ranking Method

1.0 INTRODUCTION

This document presents the draft Cleanup Action Plan (draft CAP) for the former Sauro's Cleanerama dry cleaner property (Sauro's property or the property) located at 1401, 1407, and 1409 Pacific Avenue in Tacoma, Washington (Figure 1). Historical operations conducted at the former Sauro's property resulted in releases of hazardous substances (chlorinated solvents) to soil and groundwater that impacted adjacent and downgradient properties. Therefore, the overall Site¹ evaluated for this draft CAP includes the Sauro's property and the surrounding impacted area. The approximate extent of the Site falls within the project area shown on Figure 1.

The City of Tacoma (City) purchased the Sauro's property from the Sauro Estate on January 9, 2009. Subsequently, on March 30, 2009, the City and Washington State Department of Ecology (Ecology) entered into AO No. DE 4283. The AO defines the mutual objectives of Ecology and the City and the associated Site cleanup work needed. Landau Associates has assisted the City in implementing AO requirements including the Remedial Investigation (RI)/Feasibility Study (FS; Landau Associates 2014) and the draft CAP.² The Ecology issued Facility Site ID as 4339824 and the Cleanup Site ID as 3310.

The cleanup action alternative chosen in the RI/FS (Landau Associates 2014) and approved by Ecology in July 2014 (Coleman, M. 2014) is monitored natural attenuation (MNA) with institutional controls. This draft CAP was prepared in accordance with the requirements of the Model Toxics Control Act (MTCA) as identified under Washington Administrative Code (WAC) 173-340-380(1)(a). This draft CAP assumes the reader is generally familiar with the Site history, results of previous Site investigations, and current Site conditions. Detailed information related to Site background and history, hydrogeologic setting, previous Site investigations, interim action, and development of groundwater screening criteria and screening levels is provided in the RI/FS.

1.1 REGULATORY FRAMEWORK

The previous owner (Sauro Estate) conducted a number of pre-RI field investigation activities as independent actions beginning in 1992 (Kennedy Jenks 1992). Ecology first listed the "Sauro Estate" in their Integrated Site Information System on July 12, 2000, marking the date of Site discovery or receipt of a Site release report (Ecology website 2014a). The Sauro Estate entered the Site into Ecology's Voluntary Cleanup Program (VCP) on March 28, 2001. The Site was withdrawn from the VCP on

¹ As defined by the Sauro's property Agreed Order (AO) No. DE 4283, the Site is defined to include both the real property where Sauro's Cleanerama operated (1401, 1407, and 1409 Pacific Avenue) as well as the extent of contamination caused by the hazardous releases from the former Sauro's property.

² The project schedule in the AO was modified three times with Ecology approval to allow for additional RI groundwater characterization. The most recent schedule extension request was approved in December 2012 (Landau Associates 2012).

November 20, 2006, and on February 16, 2007, Ecology informed the Sauro's Estate that they intended to address remediation at the Site under a formal process with an AO. From September 6, 2007 to February 6, 2008, Ecology conducted a site hazard assessment and subsequently placed the Site on its Confirmed and Suspected Contaminated Sites List, and gave the Site a "1" ranking under the Washington Ranking Method (WARM)³.

On January 9, 2009, the City purchased the property from the Sauro's Estate with the intent of redevelopment for commercial use. On March 19, 2009, the City and Ecology entered into AO No. DE 4283; all investigations conducted since March 19, 2009 are termed "RI field investigations" (except for the interim action⁴). The order requires that the City perform an RI/FS and prepare a report and prepare a draft CAP. Site cleanup, including this draft CAP, is being accomplished under Revised Code of Washington (RCW) 70.105D.090, MTCA. Ecology holds regulatory authority over MTCA in the State of Washington.

1.2 SUMMARY OF CURRENT SITE CONDITIONS AND CONCEPTUAL SITE MODEL

The conceptual site model (CSM) represents current Site conditions since the 2009 interim action, identifying potential sources of hazardous substances, potentially affected media, and potential migration and exposure pathways for human and ecological receptors. The CSM was presented in the RI/FS. A diagram of the CSM is shown on Figure 2.

The constituents of concern (COCs) at the Site are tetrachloroethene (PCE), a chlorinated solvent volatile organic compound (VOC), and its breakdown products. Breakdown products include trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), and vinyl chloride (VC).

The identified source of PCE contamination was a sump historically located in the basement of the dry cleaning business (north central portion of the property) where wastewater and waste dry cleaning liquids were apparently discharged (GeoEngineers 2001). Releases from the sump, potential piping, and connections and spills associated with the sump and adjacent PCE aboveground storage tank (Farallon 2005) are the primary release mechanisms by which COCs may be transferred from the source to affected environmental media. Secondary release mechanisms include leaching and infiltration from soil into groundwater and vapor migration from soil (or impacted groundwater) into indoor air spaces. The primary source (the sump) and the surrounding soil (immediately adjacent to sump) were excavated and hauled off of the property in 2001 (Farallon 2005). The bulk of the remaining secondary release

³ The WARM categorizes contaminated sites between 1 and 5, with 1 representing the highest priority for cleanup.

⁴ The City elected to conduct the interim action to expedite cleanup of contaminated soil and encourage redevelopment of the property. The interim action was concluded in January 2010.

mechanism (contaminated soil in the vadose zone throughout the property) was excavated and hauled off the property in the 2009/2010 interim action, with some residual soil contamination identified during confirmation sampling. Following excavation, residual soil contamination was capped beneath a geotextile fabric liner, clean fill, and a parking lot. Therefore, following the 2009 interim action, the primary remaining affected medium of concern was groundwater and potentially, indoor air.

Potential human receptors were identified for the Site based on current and reasonable future Site land use; it was determined that no likely potential ecological receptors are applicable to the Site. Potential human receptors and exposure pathways include:

- Potential future exposures of underground parking lot occupants (workers and customers) to COCs in air via inhalation
- Potential exposure of temporary construction workers via dermal contact and inhalation of COCs in Site groundwater.

2.0 PROPOSED CLEANUP ACTION

The following sections describe the proposed cleanup action at the Site.

2.1 GOALS AND OBJECTIVES OF THE CLEANUP ACTION

The proposed cleanup action was designed to meet the Remedial Action Objectives (RAOs) defined in the RI/FS, which consist of:

- RAO-1: Prevent direct human contact with soil containing hazardous constituents above the direct contact soil cleanup level (CUL)⁵
- RAO-2: Prevent human ingestion of Site groundwater containing concentrations of COCs above the groundwater CULs
- RAO-3: Prevent contaminated soil containing concentrations of COCs above soil CULs from impacting groundwater
- RAO-4: Prevent groundwater containing concentrations of COCs above surface water CULs from discharging to the Thea Foss waterway
- RAO-5: Obtain groundwater CULs at the point of compliance within a reasonable time frame.

The selection of MNA with institutional controls as the cleanup action to be performed at the Site will address each of these goals and objectives and complies with WAC 174-340-360.

2.2 CLEANUP ACTION ALTERNATIVES EVALUATED IN RI/FS

The RI/FS thoroughly evaluated four alternatives for cleanup action at the Site. A summary of alternatives evaluated in the RI/FS is as follows:

- Alternative 1: MNA with Institutional Controls (selected and approved alternative)
 - This alternative consists of implementing an MNA remedy to demonstrate that naturally occurring *in situ* attenuation processes are effective in reducing the plume extent and establishing institutional controls to prevent or limit intrusive activities that could bring workers into contact with contaminated soil.
- Alternative 2: Enhanced *In Situ* Bioremediation (EISB)
 - This alternative utilizes EISB to enhance naturally occurring biological processes to achieve remediation of contaminated groundwater and soil by periodically injecting electron donor solution through wells that would enhance the biologically active zone.
- Alternative 3: Ozone Sparging
 - This alternative involves injecting a strong oxidant into the subsurface for rapid VOC mass reduction in groundwater and enhanced desorption in contaminated saturated soil using ozone sparging.

⁵ Cleanup levels for the Site are presented in Section 3.

- Alternative 4: Electrical Resistance Heating (ERH)
 - This alternative utilizes ERH to treat contaminated groundwater and saturated soil. ERH uses heat generated by the resistance of the soil matrix to the flow of electrical current to raise subsurface temperatures up to the boiling point of water; this, in turn, converts volatile compounds to the vapor phase where they can be captured by a vapor recovery system.

2.3 GENERAL DESCRIPTION OF THE SELECTED CLEANUP ACTION

In the RI/FS, the costs and benefits associated with the evaluated remedial alternatives were compared using a disproportionate cost analysis (DCA). The DCA compared the relative environmental benefits of each alternative against those provided by the most permanent alternative evaluated. The selected cleanup action includes MNA as the primary remedial technology and institutional controls as the secondary remedial technology. The major components of these two remedial technologies are described below:

- **MNA (Groundwater):** Implementing an MNA remedy to demonstrate that naturally occurring *in situ* attenuation processes are effective in reducing the plume extent.
- **Institutional Controls (Soil and Groundwater):** Establishing institutional controls in City-controlled areas of the Site and the former Sauro's property, preventing or limiting intrusive activities that would bring workers into contact with contaminated soil and groundwater.

2.3.1 MONITORED NATURAL ATTENUATION

The primary component of the MNA remedy includes monitoring chemical concentrations and natural attenuation parameters in groundwater from existing monitoring wells on an ongoing basis to achieve the following:

- Ensure that human health and the environment continue to be protected
- Evaluate the behavior of the plume (i.e., expanding, contracting, or stabilizing)
- Determine whether natural chemical or biological degradation continues to occur, reducing the contaminant mass and associated concentrations
- Evaluate whether Site cleanup will continue to progress toward cleanup in a reasonable restoration timeframe.

The City conducted quarterly MNA sampling from fall 2012 to fall 2013, yielding 5 quarters of data (presented in the RI/FS). Based on data collected during the 2012 and 2013 quarterly MNA sampling, the City proposes to modify the program for the final remedy by:

- Removing wells MW-1 and RNS-MW7:
 - MW-1 is screened only in the fill and the VOC results have been below CULs since April 2009. MW-2 is adequately representative of the area where MW-1 and MW-2 are located. It is located just upgradient of MW-1, is screened in the fill and just into the Qvi geologic unit, and results for VC are occasionally at or above the CUL; cis-1,2-DCE is

the other COC detected, but its concentrations are close to non-detect and well below the CUL.

- RNS-MW7 was included in the quarterly MNA sampling (not ever part of RI VOC sampling) to see if it may serve as a reasonable background well location. The MNA results from this well have not been that different from some other cross-gradient wells and have not been proven useful. Generally speaking, groundwater in this part of Tacoma was fairly industrial historically, so locating the perfect background well is not feasible. It is proposed that this well no longer be sampled.
- Reducing sample depths at LAI-MW5 and RNS-MW2 to one depth per well:
 - LAI-MW5: VOC results at the two sample depths are nearly identical and both are located within the pre-Fraser geologic unit. The following is proposed: 1) remove the upper sample depth and keep the lower sample depth; and 2) replace the MNA sample depth (which had been the midpoint between the two VOC sampling depths) to be equivalent to the lower VOC sample depth.
 - RNS-MW2: VOC results at the two sample depths are approximately the same. The upper sample depth is within the Qvi geologic unit; whereas, the lower is understood to be within the pre-Fraser geologic unit. The following is proposed: 1) remove the upper sample depth and keep the lower sample depth; and 2) replace the MNA sample depth (which had been the midpoint between the two VOC sampling depths) to be equivalent to the lower VOC sample depth.

Groundwater sampling will be conducted in general accordance with the *Draft Sampling and Analysis Plan* (SAP), with minor changes as described above and summarized in Table 1. The Draft SAP was prepared by Landau Associates for the RI and documents procedures for groundwater sampling, field documentation, sample handling and documentation, and waste handling (Landau Associates 2013). A site-specific health and safety plan has been developed and is provided in Appendix A.

The proposed MNA remedy will consist of conducting groundwater monitoring at nine existing monitoring wells (LAI-MW1 through LAI-MW5, MW-2, MW-13, RNS-MW2, and RNS-MW6), shown on Figure 3. Sampling will focus on collection of the Site COCs (the four VOCs), which provide the best documentation of natural attenuation. The MNA remedy will be used to demonstrate that naturally occurring *in situ* attenuation processes are effective in limiting the plume extent to its current extent; that discharge to surface water is not occurring; and that contaminant concentrations are stable or declining. A number of factors provide evidence that natural attenuation processes are effectively limiting plume migration: 1) completion of the 2009 interim soil removal action at the former Sauro's property; 2) existing groundwater monitoring data indicates that the secondary plume has diminished to the former Sauro's property line along Court A; and 3) knowledge of the age of the release (as old as 50 years). Ongoing monitoring will be conducted per U.S. Environmental Protection Agency (EPA) guidance (EPA 1998) and the recommended MNA performance monitoring schedule in Ecology guidance (Ecology website 2005); i.e., the wells indicated above will be monitored on the following schedule:

- Year 1: quarterly (this component effectively covered in 2012 through 2013)

- Years 2 and 3: semi-annually
- Subsequent years (assume years 4 – 30): annually.

Groundwater monitoring results will be compared to groundwater CULs at applicable performance monitoring locations to evaluate the effectiveness of the MNA remedy and direct future sampling activities.

2.3.2 INSTITUTIONAL CONTROLS

The City proposes implementing the secondary component of the remedy (institutional controls) to achieve the following:

- Prohibit the use of Site groundwater as a potable water supply (already addressed by City ordinance)
- Restrict intrusive activities on City-owned property or right-of-way
- Require that proper safety measures and soil management practices be implemented as part of any project involving disturbance of soil at the Site (in accordance with WAC 173-340-440).

For the City-owned property, the institutional controls will be conveyed as a restrictive covenant (Environmental Covenant – UECA Compliant) on the City property and recorded on the deeds registered with Pierce County/City of Tacoma. This covenant will be binding on the owner’s successors and assignees. Documented administrative procedures will need to be established to ensure that redevelopment and utility maintenance activities on City property are coordinated carefully to prevent unacceptable exposure of subsurface contamination to temporary construction contractors. Copies of the Environmental Covenant will be provided to the County Auditor, the City of Tacoma Planning Department (per WAC 173-340-440 (10)) and the owner of affected adjacent private properties.

Regarding the impacted private properties, the current owner (private investor) purchased the two properties since the AO was signed and is aware of the subsurface impacts and the City’s commitment to adhering to the AO requirements. The City will provide an update on the project and status of subsurface impacts to the current owner of the private properties. A documented administrative procedure will be established to ensure that the City will coordinate with the owner of the two private properties. The work will be performed in such a manner that the City will address any required environmental monitoring for dewatering or excavation that could generate contaminated waste and ensure that worker health and safety is adequately protected.

The physical component of institutional controls (physical barriers, including liners and pavement) is already in place at the former Sauro’s property (overlies the residual soil contamination) and throughout much of the Site (extent of impacted groundwater above CULs). The existing institutional controls prevent activities that would result in risk to human health and the environment. As mentioned, the administrative components of the institutional control remedy are not yet in place.

3.0 CLEANUP STANDARDS

This section develops Site cleanup standards for chemical constituents that were detected in affected Site media. Cleanup standards consist of 1) CULs defined by regulatory criteria that are adequately protective of human health and the environment and, 2) the point of compliance at which the CULs must be met.

3.1 GROUNDWATER CLEANUP LEVELS

As described in the RI/FS, the highest beneficial use for groundwater is considered drinking water. Although Site groundwater is not used for drinking water, the MTCA Method A CULs are considered conservative and were proposed in the RI/FS and approved by Ecology in July 2014 (Coleman e-mail 2014). MTCA regulations (WAC 173-340-704) indicate that “Method A may be used to establish cleanup levels at sites that have few hazardous substances and . . . sites where numerical standards are available in this chapter for applicable state and federal laws for all indicator hazardous substances in the media for which the Method A cleanup level is being used.” The COCs in groundwater include PCE and breakdown products. These COCs and their associated CULs⁶ are provided in Table 2.

3.2 GROUNDWATER POINT OF COMPLIANCE

Under MTCA, the point of compliance is the point or location on the Site where the CULs must be attained. The standard point of compliance for groundwater, as established under WAC 173-340-720(8), is typically throughout the site when the highest beneficial use is drinking water. There are no existing drinking water wells within the Site or immediate surrounding area (Ecology website 2014b). The Site is in Tacoma, where the public water purveyor, Tacoma Water, supplies potable water service throughout the Site and surrounding area. In accordance with Tacoma Water’s Customer Service Policy Section 4.0 and the Tacoma Municipal Code Title 12.10, customers within the City limits shall have water service provided to them by Tacoma Water. Therefore, customers (property owners) within the Site will not be allowed to install private drinking water supply wells. Since there are no drinking water wells and new ones cannot be installed, groundwater may not be used as a potable drinking water source within the Site or the immediate surrounding area. However, because MTCA Method A is being used, this assumes protection of groundwater; therefore, the point of compliance will be throughout the Site. The compliance monitoring locations consist of the nine wells to be monitored for MNA.

⁶ Cis-1,2-DCE does not have a MTCA Method A value; therefore, the Federal/State maximum contaminant level (MCL), 70 micrograms per liter, is used as a CUL.

4.0 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

In accordance with MTCA, all cleanup actions conducted under MTCA shall comply with applicable state and federal laws [WAC 173-340-710(1)]. MTCA defines applicable state and federal laws to include legally applicable requirements and those requirements that are relevant and appropriate. Collectively, these requirements are referred to as applicable or relevant and appropriate requirements (ARARs). This section provides a brief overview of potential ARARs for Site cleanup. The primary ARAR is the MTCA cleanup regulation (WAC 173-340), especially with respect to the development of CULs and procedures for development and implementation of a cleanup under MTCA. The primary ARARs that may be applicable to the cleanup action include the following:

- Federal MCLs for drinking water [40 Code of Federal Regulations (CFR) Part 141].
- Washington Clean Air Act, Chapter 70.94 RCW.
- Washington Water Pollution Control Act and the following implementing regulation: Water Quality Standards for Surface Waters (WAC 173-201A). These regulations establish water quality standards for surface waters of the State of Washington consistent with public health and the propagation and protection of fish, shellfish, and wildlife. These standards are used in the development of groundwater CULs for the Site.
- Washington Hazardous Waste Management Act (Chapter 70.105 RCW) and the following implementing regulation: Dangerous Waste Regulations (WAC 173-303). These regulations establish a comprehensive statewide framework for the planning, regulation, control, and management, of dangerous waste. The regulation designates those solid wastes which are dangerous or extremely hazardous to the public health and environment. The management of excavated contaminated soil from the Site will be conducted in accordance with these regulations to the extent that any dangerous wastes are discovered or generated during the cleanup action.
- Washington Solid Waste Management Act (Chapter 70.95 RCW) and the following implementing regulation: Minimum Functional Standards for Solid Waste Handling (WAC 173-304). These regulations establish a comprehensive statewide program for solid waste management including proper handling and disposal. The management of excavated contaminated soil from the Site will be conducted in accordance with these regulations to the extent that this soil could be managed as solid waste instead of dangerous waste.
- Hazardous Waste Operations (WAC 296-843). Establishes safety requirements for workers providing investigation and cleanup operations at Sites containing hazardous materials. These requirements will be applicable to onsite cleanup activities and will be addressed in a Site health and safety plan prepared specifically for these activities.
- Solid and Hazardous Waste Management (RCW 70.105; Chapter 173-303 WAC; 40 CFR 241, 257; Chapter 173-350 and 173-351 WAC) and Land Disposal Restrictions (40 CFR 268; WAC 173-303-340).
- Washington Industrial Safety and Health Act (RCW 49.17) and the Federal Occupational Safety and Health Act (29 CFR 1910, 1926).
- State Environmental Policy Act (SEPA; RCW 43.21C and Chapter 197-11 WAC).

- State and federal groundwater criteria are considered in the development of CULs. State Dangerous Waste Regulations may be applicable to contaminated soil or groundwater removed from the Site during cleanup activities due to contamination characteristics. Substantive SEPA requirements will be addressed concurrent with the Site draft CAP to the degree applicable for the selected cleanup action.

5.0 PUBLIC PARTICIPATION/COMMUNICATIONS

Consideration of public concerns is an inherent part of the Site cleanup process under MTCA (see WAC 173-340-600). Prior to implementation of a cleanup action, this draft CAP will be issued by Ecology for public comment as specified in WAC 173-340-380. Under this process, Ecology will publish a notice in the site registry regarding the availability of this draft CAP document for public review and comment.

6.0 SCHEDULE FOR IMPLEMENTATION

Following public review of the AO and draft CAP, the cleanup will progress in a series of implementation phases, including engineering and design (negligible for this cleanup), implementation of institutional controls, and performance and compliance monitoring. Long term performance/compliance monitoring is the primary activity related to this cleanup action. Monitoring of potential property sale/acquisition and redevelopment activities at private property within the Site boundaries and enforcement of institutional controls and restrictive covenants will also be a critical element for success of this cleanup action.

As previously discussed, groundwater monitoring will be conducted per EPA guidance (EPA 1998) and the recommended MNA performance monitoring schedule in Ecology guidance (Ecology website 2005); wells will be monitored on the following schedule:

- Year 1: quarterly (this component was effectively covered in 2012 through 2013)
- Years 2 and 3: semi-annually (begins in January 2015)
- Subsequent years (assume years 4 – 30): annually. Annual sampling will be conducted in July.

A groundwater compliance monitoring plan will be developed for Ecology approval within 30 days of signing of an AO for Implementation. The intent of this plan is to serve as a concise work plan for field use. Institutional controls will be implemented within 90 days of signing of the AO for implementation.

7.0 REPORTING, QUALITY ASSURANCE/ CONTROL, DATA SUBMISSION

This section discusses requirements for reporting, quality control/quality assurance procedures, and data submission for the project.

7.1 REPORTING

As previously discussed, wells will be sampled quarterly for the first year, semi-annually for the second and third years, and annually for subsequent years (assume years 4 through 30). Results from sampling events will be documented in regular status reports, which will be provided as technical memorandums and will include figures, data tables, and laboratory analytical data, as applicable, for the previous sampling event. Technical memorandum status reports will be submitted to Ecology within 60 days of each sampling event.

Upon completion of the cleanup action and follow-up confirmation sampling, a draft remedial action completion report will be prepared for submittal to Ecology documenting the results and performance of the cleanup action, and summarizing performance sampling and monitoring results, and the results of confirmation sampling. If the confirmation sampling results adequately demonstrate that cleanup has successfully remediated groundwater to below the Site CULs, the report will include or be accompanied by a request for a “no further action”, in the form of a Satisfaction Letter, determination from Ecology. If evidence of residual contamination above CULs is identified by confirmation sampling, appropriate recommendations will be made for continued MNA sampling or implementation of an alternative remedy. After receipt of comments from Ecology, a final report will be prepared for submittal to Ecology.

7.2 QUALITY ASSURANCE/QUALITY CONTROL

Groundwater sampling will be conducted in general accordance with the Draft SAP (Landau Associates 2013), with minor changes as summarized in Table 1. The Draft SAP documents procedures for groundwater sampling, field documentation, sample handling and documentation, and waste handling (Landau Associates 2013).

Samples will be delivered to the laboratory under chain-of-custody procedures in a cooler with ice. Analytical data will be received electronically from the laboratory and will be tabulated using the laboratory electronic deliverable. Following tabulation, data entry will be verified for accuracy and corrections will be made as necessary. The laboratory data will then be evaluated using applicable sections from the EPA Contract Laboratory Program National Functional Guidelines. Appropriate data

validation qualifiers will be applied to the data based on this review, and data will be compared to applicable CULs.

7.3 DATA SUBMISSION

Data from MNA sampling will be tabulated and presented in the status reports and the draft remedial action completion report and submitted to Ecology for review. Additionally, all pertinent and applicable data collected during each of the sampling events will be submitted electronically to Ecology via Ecology's Electronic Information Management (EIM) system online database application as required by WAC 173-340-840 and Ecology Toxics Cleanup Program Policy 840. EIM submittals will be made after each sampling event.

8.0 USE OF THIS DOCUMENT

This Cleanup Action Plan has been prepared for use by the City of Tacoma and Ecology for specific application to the former Sauro's Cleanerama Site in Tacoma, Washington. The reuse of information, conclusions, and recommendations provided herein for extensions of the project or for any other project, without review and authorization by Landau Associates and Ecology, shall be at the user's sole risk. Landau Associates warrants that within the limitations of scope, schedule, and budget, our services have been provided in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions as this project. We make no other warranty, either express or implied.

The Ecology Review Draft of this document was prepared under the supervision and direction of the following key staff:

LANDAU ASSOCIATES, INC.

Brittany N. Gordon
Senior Staff Biologist

Eric F. Weber, L.Hg., CWRE
Principal

The Final Draft of this document was prepared by:

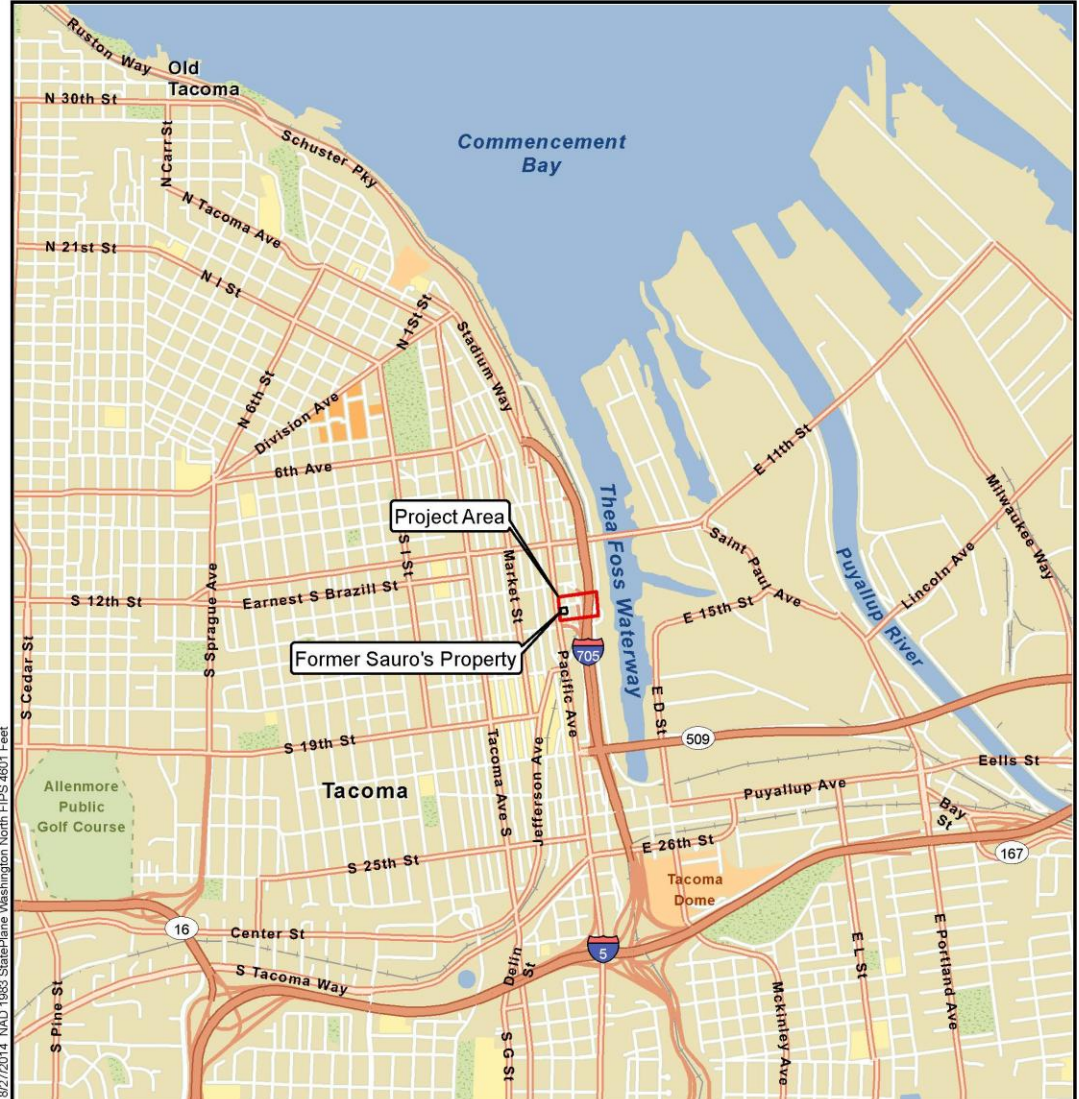
WASHINGTON STATE DEPARTMENT OF ECOLOGY
SOUTHWEST REGIONAL OFFICE, TOXICS CLEANUP PROGRAM

Marv Coleman
Cleanup Project Manager

9.0 REFERENCES

- *Draft Cleanup Action Plan, Former Sauro's Cleanarama Site*. Ecology Review Draft Prepared by Landau Associates, October 3, 2014; Final Draft Prepared by Ecology, November 2014.
- *Remedial Investigation/Feasibility Study, Sauro's Cleanarama Site*. Prepared by Landau Associates, August 29, 2014.
 - Email message from Marv Coleman, Site Manager, Inspector, Washington State Department of Ecology, to Eric Weber, Landau Associates, and Calvin Taylor, City of Tacoma. Re: *RI FS Comments*. July 9, 2014.
 - Ecology website. Toxics Cleanup Program Web Reporting. <https://fortress.wa.gov/ecy/tcpwebreporting/report.aspx>. Washington State Department of Ecology. Accessed April 25, 2014a.
 - Ecology website. Washington State Well Log Viewer. <https://fortress.wa.gov/ecy/waterresources/map/WCLSWebMap/default.aspx>. Washington State Department of Ecology. Accessed February 25, 2014.
- Ecology website. *Guidance on Remediation of Petroleum-Contaminated Ground Water By Natural Attenuation*. Washington State Department of Ecology. Publication No. 05-09-091 (Version 1.0). July 2005. Available at: <https://fortress.wa.gov/ecy/publications/publications/0509091.pdf>. Accessed January 2014.
- *Monitored Natural Attenuation Remedy Evaluation Sampling Work Plan, Sauro's Cleanarama Site*. Prepared by Landau Associates, September 6, 2012.
- *Soil Vapor Intrusion, Evaluation of Neighboring Properties, Sauro's Cleanarama*. Prepared by Landau Associates, August 19, 2009.
- *Interim Cleanup Action Work Plan, 1401, 1407, & 1409 Pacific Avenue, Sauro's Property*. Prepared by Landau Associates, May 18, 2009.
- *Technical Memorandum, Excavation Shoring Considerations, Proposed Environmental Remediation Excavation, Sauros Property, Tacoma, Washington*. Prepared by Landau Associates, April 7, 2009.
- *Remedial Investigation Work Plan Addendum, Sauro Site*. Prepared by Landau Associates, March 26, 2009.
- *DRAFT Remedial Investigation Work Plan, Sauro Property, 1401 Pacific Avenue, Tacoma, Washington*. Prepared by Landau Associates, February 23, 2009.
- *DRAFT Work Plan Interim Cleanup Action 1401, 1407 & 1409 Pacific Avenue, Sauro's Property, Tacoma, Washington*. Prepared by Landau Associates, April 22, 2009.
- *Additional Characterization and Pilot Feasibility Testing, Former Sauro's Cleanarama Site, Tacoma, Washington*. Prepared by Farallon Consulting, Inc, January 11, 2008.
- *DRAFT Phase I ESA Sauro Property-1401, 1407 & 1409 Pacific Avenue, Tacoma, Washington*. Prepared by Landau Associates, June 6, 2008.
- *Phase II Investigation Repoert, Sauro Property-1401, 1407 & 1409 Pacific Avenue, Tacoma, Washington*. Prepared by Landau Associates, June 17, 2008.
- *Additional Groundwater Characterization, former Sauro's Cleanarama Site, Tacoma, Washington*. Prepared by Robinson, Noble, & Saltbush, August 2006.
- *Summary of Additional Subsurface Investigation, Former Sauro's Cleanarama, Tacoma, Washington*. Prepared by Farallon Consulting, Inc, August 25, 2005.
- *DRAFT Subsurface Environmental Assessment, Sauro's Cleanarama, 1401 Pacific Avenue, Tacoma, Washington*. Prepared by GeoEngineers, Inc, November 11, 2003.
- *Subsurface Environmental Assessment, Sauro's Cleanarama, 1401 Pacific Avenue, Tacoma, Washington*. Prepared by GeoEngineers, Inc, March 21, 2001.
- *Supplemental Site Exploration, TRC Building, 1423 Pacific Avenue, Tacoma, Washington*. Prepared by Environmental Associates, October 16, 2001.

- *Phase II Environmental Assessment (Limited Soil Sampling and Testing), the 1409 Pacific Avenue Project, Tacoma, Pierce County, Washington.* Prepared by Saltbush Environmental Services, Inc, April 25, 2000.
- *Subsurface Environmental Assessment, Sauro's Cleanarama, 1401 Pacific Avenue, Tacoma, Washington.* Prepared by GeoEngineers, Inc, October 27, 2000.
 - EPA. *Technical Protocol for Natural Attenuation of Chlorinated Solvents in Groundwater.* U.S. Environmental Protection Agency, Office of Research and Development. EPA/600/R-98/128. September, 1998.
- *Preliminary Environmental Assessment, Sauro's Cleanarama, Tacoma, Washington.* Prepared by Kennedy/Jenks Consultants, October 27, 1992.



G:\Projects\084048\013014\CAP\Figure1\VicMap.mxd 8/27/2014 NAD 1983 StatePlane Washington North FIPS 4601 Feet



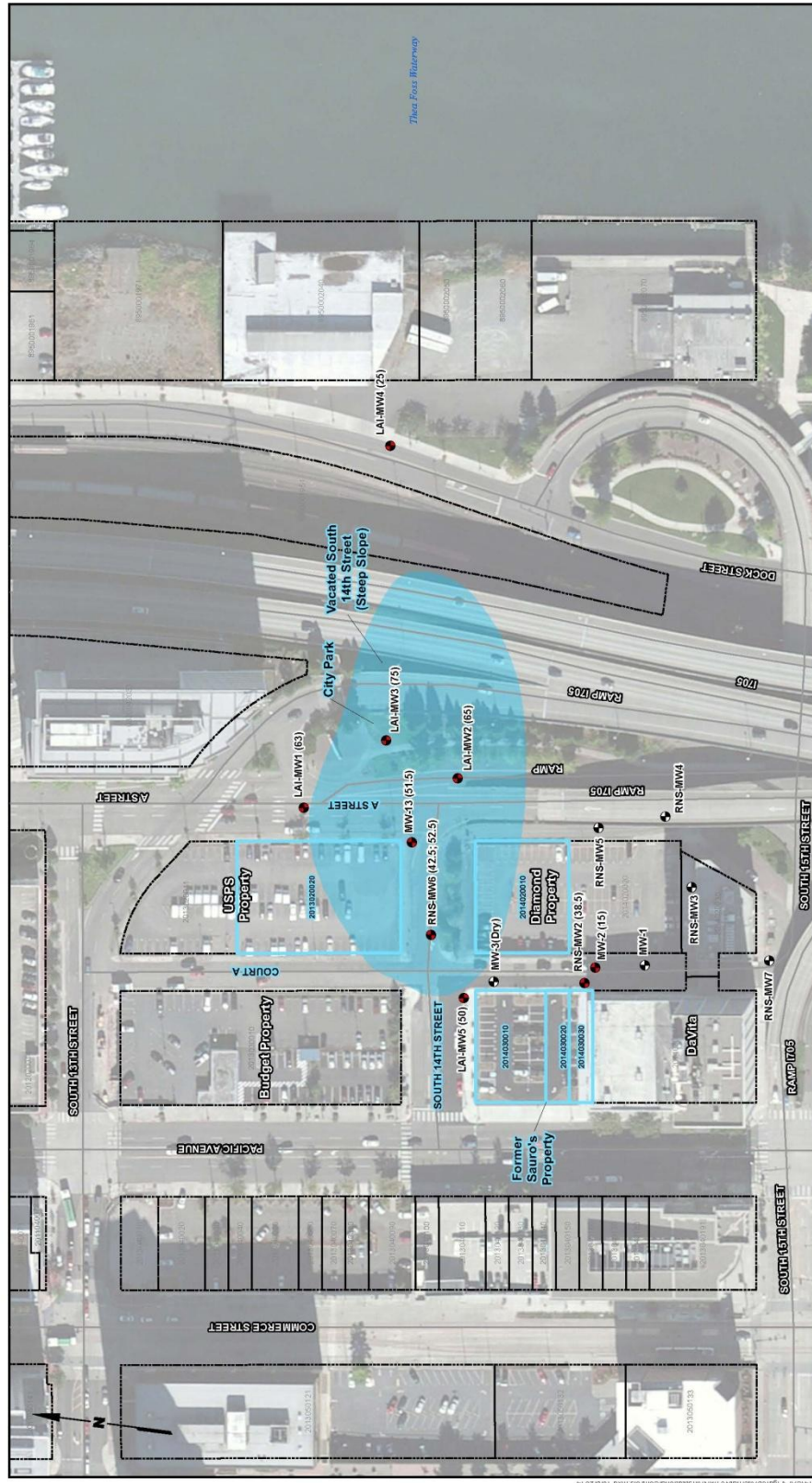
Data Source: Esri 2012



Sauro's Property CAP
Tacoma, Washington

Vicinity Map

Figure
1



LEGEND

- MNA Remedy Monitoring Wells (Sample Depth in feet)
- Other Existing Monitoring Wells
- Properties for Institutional Controls
- Current Extent of Site

NOTES

- There are nine MNA remedy wells. Actual frequency of sampling to be determined with physical institutional controls generally in place. Administrative controls to be established.
- Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Data Sources: Pierce County GIS; Esri World Imagery 2011.

Sauro's Property CAP
Tacoma, Washington

Cleanup Action - MNA with Institutional Controls

Figure 3

**TABLE 1
CLEANUP ACTION - MONITORED NATURAL ATTENUATION SAMPLING PLAN
SAURO'S PROPERTY CAP
TACOMA, WASHINGTON**

Location	VOCs Sampling Depth (ft)	VOCs Concentration Data Sample Method	MNA Parameters Sampling Depth (ft)	MNA Parameters Sample Method
LAH-MW1	63	PDB	63	WAT
LAH-MW2	65	PDB	65	WAT
LAH-MW3	75	PDB	75	WAT
LAH-MW4	25	PDB	25	WAT
LAH-MW5	42	PDB	50	WAT
LAH-MW5 (a)	50	PDB		
MW1-PP	18(b)	PP	18	PP
MW2-PP	15(b)	PP	15	PP
MW13	51.5	PDB	51.5	WAT
RNS-MW2	21.5	PDB	38.5	WAT
RNS-MW2 (a)	38.5	PDB		
RNS-MW6 (b)	42.5	PDB	47.5	WAT
RNS-MW6 (b)	52.5	PDB		
RNS-MW7	NPS	NPS	41	WAT

Sample point from RI to be discontinued
Revised sample depth

NPS = not previously sampled
PP = peristaltic pump w/dedicated tubing
PDB = permeable diffusion bag
Q = quarterly
SA = semiannual
WAT = (dedicated) Waterra foot valve (w/dedicated tubing 5/8" HDPE tubing)

(a) The Monitored Natural Attenuation (MNA) sampling depth has been revised to be the same as the remaining volatile organic compound (VOC) sampling depth.
(b) For RNS-MW6, where there is two VOC sampling depths, the MNA sampling depth is the mid-point between the two VOC sampling depths.

**TABLE 2
GROUNDWATER AND SOIL CLEANUP LEVELS
SAURO'S PROPERTY RI/FS
TACOMA, WASHINGTON**

Medium	Units	Groundwater and Soil			Groundwater Federal/State Primary MCL cis-1,2-DCE	Point of Compliance
		MTCA Method A PCE	Groundwater Method A TCE	CUL or Screening Level cis-1,2-DCE VC		
Groundwater	µg/L	5	5	NE	70	Throughout Site
Soil - direct contact	µg/kg	50	30	NE	NE	Ground surface to 15 ft BGS
Soil - protective of groundwater (d)	µg/kg					Throughout Site

MCL = Maximum Contaminant Levels
 MTCA = Model Toxics Control Act
 NE = not established
 µg/L = micrograms per liter
 µg/kg = micrograms per kilogram

(a) Cis-1,2-DCE does not have a Model Toxics Control Act (MTCA) Method A cleanup level (CUL) for groundwater; therefore, the Federal/State primary MCL value of 70 µg/L is used as a cleanup level.

Note:
 Federal ARARs and MTCA Method A values based on CLARC database (accessed November 25, 2013)

Health and Safety Plan



**WORK LOCATION PERSONNEL PROTECTION
AND SAFETY EVALUATION FORM**

**Attach Pertinent Documents/Data
Fill in Blanks As Appropriate**

Job No.:	<u>0094048.013</u>	Revised:	
Prepared by:	<u>Brittany Gordon</u>	Reviewed by:	<u>Christine Kimmel</u>
Date:	<u>August 29, 2014</u>	Date:	<u>September 2, 2014</u>

A. WORK LOCATIONS DESCRIPTION

1. **Project Name:** Former Sauro's Property Monitored Natural Attenuation Groundwater Sampling
2. **Location:** Tacoma, Washington
3. **Anticipated Activities:** Groundwater sampling
4. **Size:** Approximately 2 acres
5. **Surrounding Population:** Mixed industrial and commercial
6. **Buildings/Homes/Industry:** Commercial/industrial buildings, roadways, parking areas
7. **Topography:** Mostly flat paved surface or landscaping, gradual slope toward the Foss Waterway
8. **Anticipated Weather:** 25 to 80 degrees Fahrenheit
9. **Unusual Features:** Occasional work in roadways
10. **Site History:** Groundwater beneath the Site contains chlorinated solvent contamination associated with a former dry cleaning facility. The approved 2014 RI/FS proposed monitored natural attenuation of PCE with institutional controls as the Site remedy. This groundwater sampling plan will monitor natural breakdown of PCE for approximately 30 years. Year 1 will consist of quarterly sampling, years 2 and 3 will consist of semi-annual sampling, and subsequent years will consist of annual sampling.

B. HAZARD DESCRIPTION

1. **Background Review:** Complete Partial

If partial, why?

2. **Hazardous Level:** B C D Unknown

Justification: Existing data regarding site conditions

3. **Types of Hazards:** (Attach additional sheets as necessary)

- A. Chemical Inhalation Explosive
 Biological Ingestion O2 Def. Skin Contact

Describe: Sampling of groundwater impacted by VOCs.

- B. Physical Cold Stress Noise Heat Stress Other

Describe: Physical hazards associated with working outdoors near roadways. Potential for cold, wet weather or hot dry weather.

- C. Radiation

Describe:

4. **Nature of Hazards:**

- Air Describe: Potential for volatile constituents to be released from contaminated groundwater.

- Soil Describe:

- Surface Water Describe:

- Groundwater Describe: Potential for contact with or ingestion of contaminated groundwater.

- Other Describe:

5. Chemical Contaminants of Concern N/A

The primary chemical contaminants of concern are VOCs. The table below lists information for these primary compounds and other potential contaminants.

Contaminant	PEL (ppm)	I.D.L.H. (ppm)	Source/Quantity Characteristics	Route of Exposure	Symptoms of Acute Exposure	Instruments Used to Monitor Contaminant
Trichloroethene	50 ppm	1,000 ppm	Present in groundwater Max 260 µg/L	Inhalation, ingestion, dermal contact,	Eye, nose, and throat irritation; headache; nausea	Footnote A
Vinyl Chloride	1 ppm	5 ppm	Present in groundwater Max 118 µg/L	Inhalation, ingestion, dermal contact	Weakness, abdominal pain	Footnote A
cis-1,2-Dichloroethene	200 ppm	4,000 ppm	Present in groundwater Max 200 µg/L	Inhalation, ingestion, dermal contact	Dizziness, nausea, dermatitis, irritation of mucous membranes	Footnote A
Tetrachloroethene	50 ppm	150 ppm	Present in groundwater Max 1500 µg/L	Inhalation, ingestion, dermal contact	Eye, nose, skin and throat irritation; nausea, flushed face and neck; dizziness, incoherent; drowsy	Footnote A

Footnote A Based on previous samples collected, concentrations of VOCs in groundwater are not expected to result in measurable concentrations of VOCs in ambient air during sampling.

ppm: Parts per Million

PEL: Personal Exposure Limit

IIDLH: Immediately Dangerous to Life and Health

µg/L: Micrograms per Liter

6. Physical Hazards of Concern N/A

Hazard	Description	Location	Procedures Used to Monitor Hazard
Road hazards from working along roadways.	Interaction with moving vehicles.	Monitoring well locations that are in public right-of-way.	Use of flaggers and traffic control, alert observation of surroundings, wear highly visible safety vests, park vehicle between work zone and oncoming traffic.
Weather Stress.	Exposure to hot or cold temperatures, wind, and rain.	Site wide.	Have drinking water accessible, wear appropriate clothing (light for heat, warm for cold), wear sunscreen, avoid caffeine, take short breaks as needed.
Slip, trips, and falls.	Uneven terrain, slippery surfaces.	Site wide.	Visual observations, keep work area clear of debris, keep focused on working activities.
Travel to and from project site.	Operating motor vehicle in traffic on highways and rural roads.	Route to and from site.	Operate motor vehicle while well rested and physically able to drive safely. Conduct pre-trip vehicle inspection, all vehicles to be maintained and in good working order. Obey all traffic laws including no cell phone use while driving. Secure all cargo properly to avoid shifting. Allow sufficient time for travel to site at safe speeds. Engage emergency brake when parking vehicles. Establish planned route prior to departure.

7. Work Location Instrument Readings N/A

Location: _____
Percent O₂: _____ Percent LEL: _____
Radioactivity: _____ PID: _____
FID: _____ Other: _____
Other: _____ Other: _____
Other: _____ Other: _____

Location: _____
Percent O₂: _____ Percent LEL: _____
Radioactivity: _____ PID: _____
FID: _____ Other: _____
Other: _____ Other: _____
Other: _____ Other: _____

Location: _____
Percent O₂: _____ Percent LEL: _____
Radioactivity: _____ PID: _____
FID: _____ Other: _____
Other: _____ Other: _____
Other: _____ Other: _____

Location: _____
Percent O₂: _____ Percent LEL: _____
Radioactivity: _____ PID: _____
FID: _____ Other: _____
Other: _____ Other: _____
Other: _____ Other: _____

8. Hazards Expected In Preparation For Work Assignment N/A

Describe:

C. PERSONAL PROTECTIVE EQUIPMENT**1. Level of Protection**

A B C D

Location/Activity: All

2. Protective Equipment (specify probable quantity required)

Respirator N/A

- SCBA, Airline
 Full-Face Respirator
 Half-Face Respirator (Cart. organic vapor)
 Escape mask
 None
 Other:
 Other:

Clothing N/A

- Fully Encapsulating Suit
 Chemically Resistant Splash Suit
 Safety Vests
 Tyvek Coverall
 Saranex Coverall
 Coverall, Specify
 Other:

Head & Eye N/A

- Hard Hat
 Goggles
 Face Shield
 Safety Eyeglasses
 Other: Hearing protection

Hand Protection N/A

- Undergloves; Type:
 Gloves; Type: Nitrile
 Overgloves; Type:
 None
 Other:

Foot Protection N/A

- Neoprene Safety Boots with Steel Toe/Shank
 Disposable Overboots
 Other:

3. Monitoring Equipment N/A

- | | |
|---|--------------------------------|
| <input type="checkbox"/> CGI | <input type="checkbox"/> PID |
| <input type="checkbox"/> O ² Meter | <input type="checkbox"/> FID |
| <input type="checkbox"/> Rad Survey | <input type="checkbox"/> Other |
| <input type="checkbox"/> Detector Tubes | |

Type:

D. PERSONNEL DECONTAMINATION (ATTACH DIAGRAM)

- Required Not Required

Avoid hand to mouth contact, no eating/drinking in exclusion zone. Wash hand and face after work shift.

EQUIPMENT DECONTAMINATION (ATTACH DIAGRAM)

- Required Not Required

If required, describe and list equipment:

Decontamination of non-dedicated or non-disposable sampling equipment with Alconox[®]/tap water solution followed by tap water rinse and de-ionized water rinse.

E. PERSONNEL

	Name	Work Location Title/Task	Medical Current	Fit Test Current
1.	Kristin Hooper	Senior Staff Geologist	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2.	Sierra Mott	Staff Scientist	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3.	Ben Lee	Senior Staff Engineer	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4.	Dave Rupert	Senior Staff Geologist	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
5.	Jamie Sloan	Staff Scientist	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
6.			<input type="checkbox"/>	<input type="checkbox"/>
7.			<input type="checkbox"/>	<input type="checkbox"/>
8.			<input type="checkbox"/>	<input type="checkbox"/>
9.			<input type="checkbox"/>	<input type="checkbox"/>
10.			<input type="checkbox"/>	<input type="checkbox"/>

Site Safety Coordinator: Kristin Hooper

F. ACTIVITIES COVERED UNDER THIS PLAN

Task No.	Description	Preliminary Schedule
1	Groundwater Sampling	2015-2016: Semi-Annually 2016- ~2044: Annually

EMERGENCY FACILITIES AND NUMBERS

Hospital:
St. Joseph Medical Center
1717 South J Street
Tacoma, Washington 98405

Directions: Attachment A

Telephone: (253) 426-4101

Emergency Transportation Systems (Fire, Police, Ambulance) – 911

Emergency Routes – Map (Attachment A)

Emergency Contacts:

<u>Offsite</u>	
<u>Landau Associates</u>	
Christine Kimmel	(206) 786-3801
Eric Weber	(253) 284-4878

**HEALTH AND SAFETY PLAN
APPROVAL/SIGN OFF FORMAT**

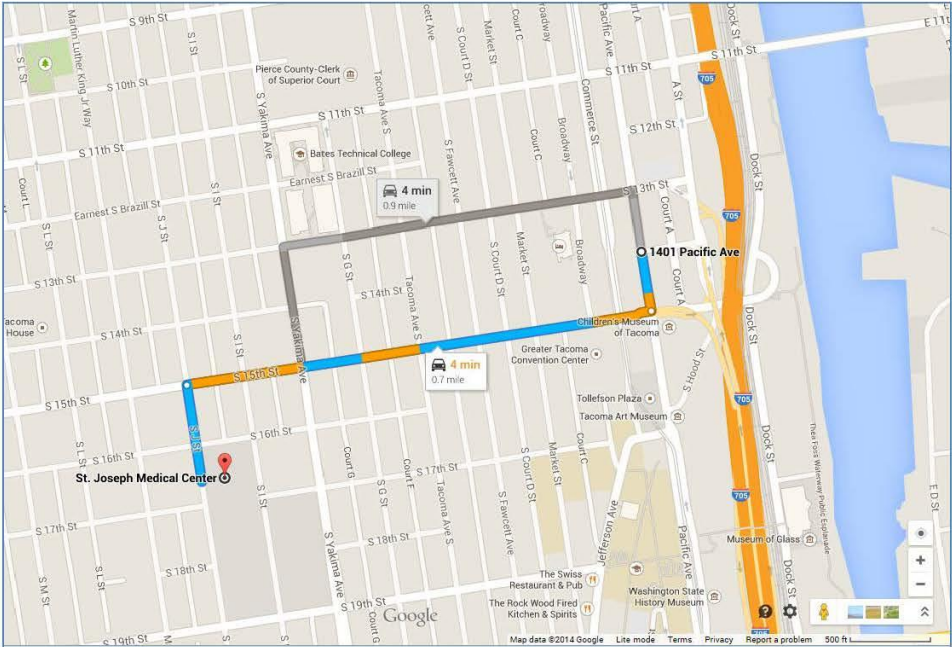
I have read, understood, and agreed with the information set forth in this Health and Safety Plan (and attachments) and discussed in the Personnel Health and Safety briefing.

_____	_____	_____
Name	Signature	Date
_____	_____	_____
Name	Signature	Date
_____	_____	_____
Name	Signature	Date
_____	_____	_____
Name	Signature	Date
Kristin Hooper	_____	_____
Site Safety Coordinator	Signature	Date
Christine Kimmel	_____	_____
Landau Associates' Health and Safety Manager	Signature	Date
Eric Weber	_____	_____
Project Manager	Signature	Date

Personnel Health and Safety Briefing Conducted By:

_____	_____	_____
Name	Signature	Date

ATTACHMENT A OFFSITE WORK - ROUTE TO HOSPITAL



Directions:

- 1. Head south on Pacific Avenue toward South 15th Street.
- 2. Turn right on South 15th Street.
- 3. Turn left on South J Street.