FARALLON CONSULTING

Washington
Issaquah | Bellingham | Seattle
Oregon
Portland | Baker City
California
Oakland | Folsom | Irvine

FEASIBILITY STUDY REPORT

AGRI-TECH AND YAKIMA STEEL FABRICATORS
6 AND 10½ EAST WASHINGTON AVENUE
YAKIMA, WASHINGTON

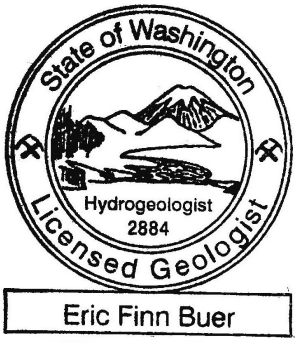
Submitted by:
Farallon Consulting, L.L.C.
975 5th Avenue Northwest
Issaquah, Washington 98027

Farallon PN: 765-001

For:
Yakima Steel Fabricators, Inc.
6 East Washington Avenue
Yakima, Washington 98903

February 10, 2020

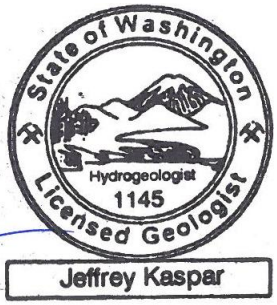
Prepared by:



Eric Buer, L.G., L.H.G.
Senior Hydrogeologist

Suzanne. E. Stumpf, P.E.
Senior Engineer

Reviewed by:



Jeffrey Kaspar, L.G., L.H.G.
Principal Geologist

TABLE OF CONTENTS

FIGURES

TABLES

CHART

APPENDICES

ACRONYMS AND ABBREVIATIONS

4,4-DDD	4,4-dichlorodiphenyldichloroethane
4,4-DDE	dichlorodiphenyldichloroethene
Agreed Order	Agreed Order No. DE 6091 entered into by the Washington State Department of Ecology and Yakima Steel Fabricators, Inc. pursuant to the authority of the Washington State Model Toxics Control Act Cleanup Regulation, as established in Section 050(1) of Chapter 70.105D of the Revised Code of Washington, with an effective date of October 27, 2008.
Agri-Tech, Inc	Agri-Tech
Agri-Tech Building	the single-story warehouse building on the Agri-Tech property consisting of Yakima County Parcel No. 19133141409
ARARs	applicable or relevant and appropriate requirements
Bay Chemical	Bay Chemical Company
Bay Chemical site	the property west-adjacent to the Site, Yakima County Tax Parcel No. 19133141010, that was previously was owned by Northern Pacific Railroad, predecessor of the current owner, BNSF Railway
bgs	below ground surface
BNSF	"BNSF Railway" is current Co name
CAP	Cleanup Action Plan
cis-1,2-DCE	cis-1,2-dichloroethene
Cleanup Alternative	cleanup action alternative consisting of remedial technologies with the potential to achieve cleanup standards for each medium of concern
COCs	constituents of concern
compliance monitoring	the collection, analysis, and reporting of environmental data to determine the short- and long-term effectiveness of a cleanup action, and whether protection is being achieved in accordance with cleanup objectives

COPCs	constituents of potential concern
CSM	conceptual site model
CSM TM	Technical Memorandum Regarding Conceptual Site Model Technical Memorandum, Agri-Tech and Yakima Steel Fabricators Site, Yakima Steel Fabricators, Yakima Washington dated November 14, 2018 from Messrs. Eric Buer and Jeff Kaspar of Farallon Consulting, L.L.C. to Mr. Chris Wend of Washington State Department of Ecology
DCA	disproportionate cost analysis
DRO	total petroleum hydrocarbons as diesel-range organics
Ecology	Washington State Department of Ecology
EMMP	Environmental Media Management Plan
Farallon	Farallon Consulting, L.L.C.
FS	Feasibility Study
FS Work Plan	*Feasibility Study Work Plan, Agri-Tech and Yakima Steel Fabricators, 6 and 10½ East Washington Avenue, Yakima, Washington* dated May 3, 2011 prepared by Farallon Consulting, L.L.C.
HVOCs	halogenated volatile organic compounds
ISCR	in-situ chemical reduction
Metals Source TM	Technical Memorandum Regarding Metals Source Evaluation, Agri-Tech and Yakima Steel Fabricators Site, Yakima Steel Fabricators, Yakima, Washington dated June 9, 2017 from Messrs. Eric Buer and Jeff Kaspar of Farallon Consulting, L.L.C. to Mr. Chris Wend of Washington State Department of Ecology
mg/kg	milligrams per kilogram
µg/l	micrograms per liter
MNA	monitored natural attenuation
MTCA	Washington State Model Toxics Control Act Cleanup Regulation

PCE	tetrachloroethene
Revised RI Report	*Revised Remedial Investigation Report, Agri-Tech & Yakima Steel Fabricators, 6 and 10½ East Washington Avenue, Yakima, Washington* dated June 10, 2004 prepared by Farallon Consulting, L.L.C.
RCW	Revised Code of Washington
RI	Remedial Investigation
SAP	Sampling and Analysis Plan
Site	the area that includes the portions of the properties at 6 and 10½ East Washington Avenue in Yakima, Washington where constituents of concern have come to be located at concentrations exceeding cleanup levels
SMS	Washington State Sediment Management Standards
TCE	trichloroethene
WAC	Washington Administrative Code
Wetland Evaluation TM	Technical Memorandum Regarding Wetland Evaluation Technical Memorandum, Agri-Tech and Yakima Steel Fabricators Site, Yakima, Washington dated July 17, 2017 from Messrs. Eric Buer and Jeff Kaspar of Farallon Consulting, L.L.C. to Mr. Chris Wend of Washington State Department of Ecology
YSF	Yakima Steel Fabricators, Inc.
YSF Building	the single-story building on the YSF property consisting of Yakima County Parcel No. 19133141009

1.0 INTRODUCTION

Farallon Consulting, L.L.C. (Farallon) has prepared this Feasibility Study Report (FS Report) on behalf of Yakima Steel Fabricators, Inc. (YSF) for the YSF and Agri-Tech facilities located at 6 and 10½ East Washington Avenue in Yakima, Washington (herein referred to as the Site) (Figure 1). The Site comprises Yakima County Tax Parcel Nos. 19133141009 and 19133141409 totaling 6.24 acres of land (Figure 2). Historical operations on the Site included operation of a lime and sulfur formulating plant and operation of a fruit packing supplies and equipment company. The Site is currently used operated as a steel fabrication facility. Historical operations on the Site and on the west-adjacent property resulted in the release of the constituents of potential concern (COPCs), including metals, halogenated volatile organic compounds (HVOCs), carcinogenic polycyclic aromatic hydrocarbons (cPAHs), chlorinated pesticides, and chlorinated herbicides, that have contaminated Site soil and groundwater. The "site" as defined under the Washington State Model Toxics Control Act Cleanup Regulation (MTCA) comprises the portions of the Site where COPCs have come to be located at concentrations exceeding their respective MTCA cleanup levels.

This FS Report was prepared to satisfy Agreed Order No. DE 6091 entered into by the Washington State Department of Ecology (Ecology) and YSF pursuant to the authority of MTCA, as established in Section 050(1) of Chapter 70.105D of the Revised Code of Washington (RCW 70.105D), with an effective date of October 27, 2008 (Agreed Order). The Agreed Order was issued in accordance with the provisions of MTCA, as established in Chapter 173-340 of the Washington Administrative Code (WAC 173-340). The scope of work for this FS Report was described in the *Feasibility Study Work Plan, Agri-Tech and Yakima Steel Fabricators, 6 and 10 1/2 East Washington Avenue, Yakima, Washington* dated May 3, 2011 prepared by Farallon (2011) (FS Work Plan), which was approved by Ecology before work commenced. A copy of the FS Work Plan is provided in Appendix A. The Agreed Order was amended with the First Amendment to Agreed Order No. DE 6091 dated October 17, 2016, which specified additional characterization and reporting requirements for the Site Remedial Investigation (RI), conducted by Farallon between 1997 and 2018.

1.1 PURPOSE

The purpose of the FS was to develop and evaluate Cleanup Alternatives to facilitate selection of a final cleanup action in accordance with WAC 173-340-350(8). The FS was conducted to screen available remedial technologies and identify a set of technically feasible and practicable technologies that comprise Cleanup Alternatives. The Cleanup Alternatives were then evaluated in accordance with the requirements for cleanup actions established in WAC 173-340-360(2) and the expectations for Cleanup Alternatives specified in WAC 173-340-370.

The FS identified preferred Cleanup Alternative 2 – Limited Source Removal, Institutional and Engineered Controls, and Monitored Natural Attenuation as the Cleanup Alternative that provides the greatest degree of permanence and protectiveness and the highest MTCA Composite Benefit Score that is technically practicable at the Site. The preferred Cleanup Alternative meets the regulatory criteria cited above for a final cleanup action and is proposed for approval from Ecology as the selected Cleanup Alternative. The selected Cleanup Alternative, once approved for the Site by Ecology, will be documented in a Cleanup Action Plan (CAP) that will be prepared in accordance with WAC 173-340-380 and the Agreed Order.

1.2 REPORT ORGANIZATION

This FS Report has been prepared to meet applicable requirements under WAC 173-340-350(7) and 173-340-350(8). The report has been organized into the following sections:

- **Section 2, Site Description and Background,** provides a description of the Site and the adjacent Bay Chemical site and their historical usage, and a summary of Site geology and hydrogeology.
- **Section 3, Conceptual Site Model,** summarizes the conceptual site model (CSM) developed for the Site, which discusses confirmed source areas, contaminant fate and transport, an exposure assessment, a Terrestrial Ecological Evaluation (TEE), and the media and constituents of concern (COCs).
- **Section 4**, **Technical Elements,** describes the applicable or relevant and appropriate requirements (ARARs) for the Site, and the cleanup standards.
- **Section 5, Feasibility Study,** describes the evaluation of feasible remediation technologies, the Cleanup Alternatives considered, the evaluation of the Cleanup Alternatives conducted, and the preferred Cleanup Alternative and its implementation at the Site. Compliance monitoring, the restoration time frame, and continency actions also are discussed.
- **Section 6, Bibliography,** provides a list of the source materials used in preparing this FS Report.
- **Section 7, Limitations,** presents Farallon's standard limitations associated with conducting the work reported herein and preparing this FS Report.

2.0 SITE DESCRIPTION AND BACKGROUND

This section provides a description of the Site and the adjacent Bay Chemical site and their historical usage, and a summary of area geology and hydrogeology.

2.1 SITE DESCRIPTION AND HISTORICAL USAGE

The Site consists of Yakima County Parcel Nos. 19133141009 (YSF property) and 19133141409 (Agri-Tech property), together totaling 6.24 acres of land (Figure 2). Two structures are present at the Site: a single-story building on the YSF property used for steel fabrication and as business offices (YSF Building); and a single-story warehouse building on the Agri-Tech property (Agri-Tech Building). The Agri-Tech Building is leased by the operator of YSF and is used for steel fabrication. The YSF Building floor is asphalt in the eastern and central portions, and a 2-inch poured concrete slab in the western third of the building. The Agri-Tech Building floor is a 2-inch poured concrete slab that extends a few feet east of the Agri-Tech Building footprint (Figure 2). The areas east and south of the YSF Building are used for storage of steel and equipment.

The Site is zoned for industrial use (City of Yakima M-1 designation). Historical Site uses include the following:

- Construction and operation of a lime- and sulfur-formulating plant by Yakima Farmers Supply on the Agri-Tech property from approximately 1960 through 1971. The formulating plant was demolished between 1978 and 1982.
- Operation of a fruit-packing supplies and equipment company on the Agri-Tech property from 1982 through 1989.
- Operation of a steel-fabrication facility on the YSF property from approximately 1980 to the present.

Additional details of historical Site and adjacent property uses are provided in the *Revised Remedial Investigation Report, Agri-Tech & Yakima Steel Fabricators, 6 and 10^{1}/$_{2}$ East Washington Avenue, Yakima, Washington* dated June 10, 2004 prepared by Farallon (2004) (Revised RI Report); and the Technical Memorandum regarding Metals Source Evaluation, Agri-Tech and Yakima Steel Fabricators Site, Yakima Steel Fabricators, Yakima, Washington dated June 9, 2017, from Messrs. Eric Buer and Jeff Kaspar of Farallon (2017a) to Mr. Chris Wend of Ecology (Metals Source TM) (Appendix B). Based on historical uses and physical characteristics of the Site, four areas of investigation at the Site have been established (Figure 2):

- Area 1 includes the former Yakima Farmer Supply lime- and sulfur-processing plant and the area of the processing plant waste pit (also referred to as the Area 1 waste pit), currently located under the YSF and Agri-Tech Buildings (Figure 2).
- Area 2 consists of the central and eastern portions of the YSF property between the YSF Building and the automobile recycling facility east-adjacent to the Site. Area 2 is suspected of previously including stockpiles of bulk lime and sulfur.

- Area 3 consists of the portion of the Site south and southwest of the YSF Building. Ecology identified Area 3 as a potential area of metals contamination due to activities historically conducted at the west-adjacent property formerly leased to Bay Chemical Company. Area 3 also includes the Site wetland buffer area.
- Area 4 consists of the topographically distinct (i.e., 3 to 5 feet below surrounding Site topography) wetland on the southern portion of the Site. Area 4 has unique environmental conditions, including seasonal standing water and saturated surface soil, and is subject to sediment criteria that do not apply to other portions of the Site.

2.2 BAY CHEMICAL SITE DESCRIPTION AND HISTORICAL USAGE

The property west-adjacent to the Site, Yakima County Parcel No. 19133141010, previously was owned by Northern Pacific Railroad, predecessor of current owner Burlington-Northern Santa Fe Railroad (BNSF) and was leased to Bay Chemical Company (Bay Chemical), a manufacturer of liquid zinc sulfate, from 1963 to late 1975 or early 1976 (Figure 2). The BNSF-leased property makes up a portion of an Ecology-listed facility known as the Former Bay Chemical site (herein referred to as the Bay Chemical site). Additional details regarding Bay Chemical zinc sulfate production practices, raw materials storage, and associated impacts on the Site are provided in the Metals Source TM (Appendix B).

According to the *Former Bay Chemical Site Remedial Investigation Report, Volume 1* dated March 1997 prepared by ERC and Pacific Groundwater Group (1997), metals associated with flue dust at the Bay Chemical site are arsenic, antimony, cadmium, chromium, copper, lead, manganese, mercury, and zinc. These metals have been detected in soil and groundwater at the Bay Chemical site and at the Site.

2.3 GEOLOGY AND HYDROGEOLOGY

This section discusses Site geology and hydrogeology as they apply to the FS. Detailed descriptions of the Site physical and environmental setting including regional geography, geology, hydrogeology, surface water, critical areas, sensitive receptors, and climate are provided in the Revised RI Report.

2.3.1 Geology

Farallon observed subsurface conditions during the RI and recorded observations on boring and test pit logs (Appendix C). The general Site stratigraphy for each area of investigation at the Site is described below.

The Area 1 ground surface, including the portion that overlies the Area 1 waste pit, is capped with asphalt between buildings. Concrete slabs are present in the western third of the YSF Building, and in the entire Agri-Tech Building (Figure 2). Subsurface stratigraphy in Area 1 comprises primarily poorly graded sand and gravel with discontinuous silt lenses to the maximum depth explored of 27 feet below ground surface (bgs) (boring B-2). In the Area 1 waste pit, granular

yellow sulfur-bearing soil was observed approximately 2 to 3 feet bgs overlying a thick caulk-like substance ranging in color from green-gray to yellow-gray mixed, with native soil observed to a maximum depth of approximately 8 feet bgs. The thick caulk-like substance was inferred to be lime and sulfur residue that was drained into the Area 1 waste pit during the period the lime- and sulfur-formulating plant was operated by Yakima Farmers Supply on the Agri-Tech property from approximately 1960 through 1971.

The Area 2 and Area 3 ground surface is hardpacked gravel. The Area 4 ground surface comprises soft organic soils that are seasonally saturated with occasional standing water (Farallon 2017b) (Appendix D). Subsurface stratigraphy in Areas 2, 3, and 4 comprises dense, poorly graded sand and gravel with discontinuous brown to gray silt beds ranging in thickness from 2 to 5 feet to the maximum depth explored of 32.5 feet bgs (monitoring well MW-7B). Fill material previously was placed along the western portion of Area 3 to a maximum depth of 6 feet bgs as part of the cleanup action performed at the Bay Chemical site (Figure 3). Additional fill material, including quarry spalls, was observed intermittently in the central portion of Area 3 (grid cells B, C, D, G, and I; Figure 3) from the ground surface to depths ranging from 1.5 to 7 feet bgs.

2.3.2 Hydrogeology

Groundwater was encountered at the Site at depths of approximately 3 to 10 feet bgs, and flows approximately south-southeast with a gradient of between 0.003 and 0.005 foot per foot (Figure 4). Groundwater monitoring data collected from the monitoring well pair MW-7A (shallow) and MW-7B (deep) in June 2011 indicated a slight positive head difference between the shallow and deep aquifers of approximately 0.018 foot at this location.

Previous investigations documented in the Revised RI Report indicated that regional groundwater flow direction does not vary seasonally, and shows no significant response to seasonal irrigation, which has diminished in recent years. Quarterly monitoring performed by Farallon (2004) in 1997 and 1998 indicated that groundwater elevations fluctuate approximately 3 feet seasonally, from a low in March to a high in September. Seasonal irrigation associated with local irrigation ditches for agricultural use that had historically occurred prior to the early 2000s resulted in higher regional groundwater elevations during spring and summer seasonal conditions and lower groundwater elevations during the fall and winter seasons. Rising groundwater levels were believed to be a source of surface water present at Area 4 along with seasonal precipitation. The decline of regional irrigation practices has resulted in the wetland area shrinking over time and surface water occurrence diminishing to minor seasonal occurrences.

Publicly available groundwater monitoring data for the west-adjacent Bay Chemical site indicated that the measured depth to groundwater on the western boundary of the Site ranged from approximately 4.5 to 9 feet bgs during monitoring events conducted in 2017 and 2018 (Farallon 2018a) (Appendix E).

3.0 REMEDIAL INVESTIGATION AND CONCEPTUAL SITE MODEL

The overall objective of the RI performed by Farallon was to collect and evaluate sufficient information to support the development of feasible Cleanup Alternatives for the Site in accordance with WAC 173-340-360 through 173-340-390. Specific objectives of the RI were to identify: the COPCs and media of concern at the Site; the potential source(s) of the release(s) of COPCs; and the nature and extent of COPCs in the identified media of concern; and to develop and refine a CSM for the Site.

The Site RI was completed by Farallon in several phases, which included characterization of soil and groundwater between 1997 and 2018. The results for the entire RI are contained in the following documents:

- Revised RI Report;
- Metals Source TM, provided in Appendix B;
- Technical Memorandum Regarding Wetland Evaluation Technical Memorandum, Agri-Tech and Yakima Steel Fabricators Site, Yakima, Washington dated July 17, 2017 from Messrs. Buer and Kaspar of Farallon (2017b) to Mr. Wend of Ecology (Wetland Evaluation TM), provided in Appendix D; and
- Technical Memorandum Regarding Conceptual Site Model Technical Memorandum, Agri-Tech and Yakima Steel Fabricators Site, Yakima Steel Fabricators, Yakima Washington dated November 14, 2018 from Messrs. Buer and Kaspar of Farallon (2018b) to Mr. Wend of Ecology (CSM TM), provided in Appendix F.

A CSM was developed for the Site, documented in the CSM TM (Appendix F), which was approved by Ecology (2018b) on December 21, 2018. This section summarizes the following elements of the CSM: confirmed source areas, contaminant fate and transport, an exposure assessment, a TEE, and the media and COCs.

3.1 CONFIRMED SOURCE AREAS

The CSM TM identified the following sources to soil and groundwater at the Site:

- Area 1 waste pit soil with concentrations of volatile organic compounds and chlorinated pesticides exceeding preliminary cleanup levels that were acting as a source of HVOCs and chlorinated pesticides to shallow groundwater beneath the Area 1 waste pit;
- Residual shallow soil with concentrations of metals exceeding preliminary cleanup levels remaining beneath the YSF and Agri-Tech Buildings in Area 1 that were not remediated during the Bay Chemical site cleanup;
- A shallow, localized volume of soil in Area 3 proximate to test pit I-TP3 to a depth of approximately 7 feet bgs with concentrations of total petroleum hydrocarbons as diesel-range organics (DRO) exceeding preliminary cleanup levels; and

- Shallow soil in Area 3 with concentrations of metals, aldrin, and/or dieldrin exceeding preliminary cleanup levels.

Arsenic, suspected to be naturally occurring, was the only COPC detected in groundwater samples collected from Area 3 monitoring wells MW-7A and MW-7B at concentrations that exceed preliminary cleanup levels. Total and dissolved cadmium and zinc were detected at concentrations that exceed preliminary cleanup levels in Area 3 monitoring well MW-11. The source of these metals on a more-likely-than-not basis is the Bay Chemical site. Area 4 was evaluated separately from Areas 1 through 3 in accordance with Washington State Sediment Management Standards (SMS) (WAC 173-204-520), documented in the Wetland Evaluation TM (Appendix D). Results from the evaluation of Area 4 indicated that Area 4 does not qualify as a "Site," and therefore does not require additional evaluation as part of the Feasibility Study.

3.2 CONTAMINANT FATE AND TRANSPORT

Farallon used historical Site soil and groundwater data collected through 2011 to evaluate the following potential routes of migration for COPCs at the Site:

- Leaching from soil to groundwater;
- Lateral and vertical transport in groundwater;
- Discharge from groundwater to surface water; and
- Volatilization from soil gas, soil, and groundwater to ambient air.

Results from Farallon's evaluation indicated that HVOC leaching from Area 1 waste pit soil to groundwater is occurring at a slow rate, which has resulted in a limited area of shallow groundwater with concentrations of HVOCs exceeding preliminary cleanup levels beneath the YSF Building and, on a more-likely-than-not basis, the Agri-Tech Building. Results from groundwater monitoring at Area 1 wells WDOE-6, MW-2, and MW-6 indicated that reductive dechlorination of tetrachloroethene (PCE) to vinyl chloride is occurring in groundwater proximate to and down-gradient of the Area 1 waste pit. Low concentrations of HVOCs in shallow groundwater at the Area 1 waste pit that are not fully degraded prior to transport along the groundwater flow path to the south are diluted and dispersed, and in the case of cis-1,2-dichloroethene (cis-1,2-DCE) and vinyl chloride, potentially biodegraded aerobically beyond the anaerobic environment of the waste pit, prior to commingling with the dissolved-phase HVOC groundwater plume migrating onto the Site from the up-gradient Yakima Railroad Area. The up-gradient Yakima Railroad Area groundwater plume is suspected to be the source of HVOCs in groundwater that are periodically detected in monitoring wells MW-1 and MW-7B and potentially monitoring wells MW-3 and MW-4 (Figure 4). Reported concentrations of PCE in groundwater as high as 13 micrograms per liter (µg/l) were reported for up-gradient wells at the Cameron Yakima Site in 2017 (Ecology 2018a).

Chlorinated pesticides detected in Area 1 waste pit soil are expected to attenuate slowly and continue to have the potential to leach to shallow groundwater based on historical monitoring

results (Appendix F). Historical monitoring results have indicated that pesticide concentrations in Area 1 are attenuating and do not appear to extend beyond the southern boundary of the YSF and Agri-Tech Buildings (Appendix F). Chlorinated pesticides were not reported at concentrations exceeding preliminary cleanup levels in Areas 2 through 4 groundwater.

The limited area of DRO exceeding the preliminary cleanup level at test pit TP3 in Area 3 soil between depths of approximately 3 and 7 feet bgs is expected to remain stable and continue to slowly biodegrade over time (Appendix F, Attachment B). The potential for DRO to leach to groundwater was not assessed. However, groundwater sampling at monitoring well MW-5 was conducted during the RI and DRO was not detected in groundwater at that location cross-gradient of the DRO source in soil. The compacted gravel surface cap in Area 3 reduces the potential for DRO to leach to groundwater.

Metals, aldrin, and/or dieldrin were detected at concentrations slightly exceeding preliminary cleanup levels in shallow soil at a limited number of locations in Area 3 (Appendix F, Attachment B), although Area 3 groundwater monitoring analytical results do not indicate that metals are leaching into groundwater. Aldrin and/or dieldrin in Area 3 soil are expected to continue to degrade and attenuate over time; metals detected in Area 3 soil are expected to remain in-situ into the foreseeable future. Based on historical groundwater monitoring analytical results, metals in Area 3 soil are not expected to migrate to groundwater at concentrations exceeding preliminary cleanup levels. The compacted gravel surface cap in Area 3 also reduces the potential for metals and chlorinated pesticides to leach to groundwater.

Historical transport of metals in groundwater migrating onto the Site from the west-adjacent Bay Chemical site represents a potential for groundwater to impact surface water. The evaluation of the wetland area in Area 4 confirmed the presence of the metals manganese, cadmium, and zinc in porewater and sediment (Appendix D). However, as noted in Section 2.3.2, surface water occurrence at the Site has diminished with the cessation of regional irrigation and groundwater elevations have decreased. Surface water occurrence at the Site has more recently been associated with wet seasonal conditions in the winter and spring, with precipitation being a primary source of surface water. The influx of precipitation and runoff is more likely to result in temporary infiltration of standing surface water, resulting in downward migration of metals in soil and sediment to groundwater.

3.3 EXPOSURE ASSESSMENT

This section summarizes the results from the exposure assessment presented in the CSM TM (Appendix F).

3.3.1 Soil

The CSM TM documented the exposure pathways for soil and groundwater. The exposure pathways for shallow soil containing COPCs are the direct contact and inhalation pathways. Direct contact may include dermal contact and ingestion pathways for both human and ecological receptors. Inhalation pathways may include volatilization of volatile COPCs or, in the case of

nonvolatile COPCs such as metals and chlorinated pesticides, particulate dust. Complete direct contact and inhalation pathways for soil include direct contact with affected soil in Area 3 where soil is exposed and not covered with a compacted gravel surface, and with Area 1 soil under unique circumstances when soil is exposed while subsurface work is conducted. However, due to the presence of the YSF and Agri-Tech Buildings and their associated floor slabs, the exposure pathway to Area 1 soil is not considered complete under normal circumstances. The inhalation pathway is considered complete for volatile COPCs in Area 1 because no evaluation of soil gas or indoor air has been conducted. The inhalation pathway risk is greatest beneath the Agri-Tech Building where the highest concentrations of volatile COPCs exist. Historical soil and groundwater data suggest that inhalation risk associated with the vapor intrusion pathway at the YSF Building is likely minimal.

3.3.2 Groundwater

Potential exposure pathways for COPCs in groundwater are the direct contact (i.e., dermal contact and ingestion) and inhalation pathways. Because the Site is connected to the municipal water supply and no production or irrigation wells are located on or proximate to the Site, the direct contact and ingestion pathways for groundwater are considered incomplete. Temporary construction workers conducting subsurface work could have direct contact exposure risk to contaminated groundwater. The inhalation pathway for groundwater is considered complete in Area 1 because volatile COPCs that may represent a vapor intrusion risk are present in Area 1 groundwater, and the groundwater to indoor air exposure pathway was not evaluated during the RI. As cited above, the inhalation pathway risk is higher at the Agri-Tech Building than the YSF Building based on the distribution of volatile COPCs in soil and groundwater.

Groundwater was suspected of being a potential seasonal source of surface water at Area 4 when regional irrigation was occurring. Surface water in Area 4 has not been sampled to evaluate whether metals are present at concentrations that pose a risk to human health. Therefore, the groundwater to surface water and surface water exposure pathways are retained as complete (when surface water is present) until these pathways can be evaluated.

3.4 TERRESTRIAL ECOLOGICAL EVALUATION

The CSM TM documented a simplified TEE that was performed for the Site in accordance with WAC 173-340-7490 and 173-340-7492. The simplified TEE documented that exposure pathways to shallow soil in Area 3 with concentrations of metals and/or select chlorinated pesticides exceeding the soil concentration values for industrial or commercial sites listed in Table 749-2 likely will be addressed through a combination of direct remediation and implementation of institutional and engineered controls.

3.5 MEDIA OF CONCERN

Media of concern were documented in the CSM TM (Appendix F). The completed RI work confirmed that soil and groundwater are media of concern on the Site. Results from sampling of shallow groundwater at monitoring well MW-11, proximate to Area 4, indicated that surface water,

when present, may be an affected media, and therefore has been retained as a medium of concern, but has not been confirmed as such. Bioassay testing indicated that sediment is not a medium of concern, as documented in the Wetland Evaluation TM (Appendix D).

Indoor air has been retained as a medium of concern, but has not been confirmed as an affected medium. Soil gas or indoor air quality was not evaluated during the RI work due to the absence of regulatory criteria requiring evaluation of this medium or pathway at the time the RI was completed.

3.6 CONSTITUENTS OF CONCERN

The COCs include the COPCs that have been detected at concentrations exceeding preliminary cleanup levels or are suspected to exceed preliminary cleanup levels for pathways that have not been fully evaluated (i.e., surface water and/or indoor air) and will require cleanup. COCs are identified below by medium of concern.

3.6.1 Soil

The HVOCs PCE, trichloroethene (TCE), cis-1,2-DCE, and 1,2-dichloropropane; the chlorinated pesticides aldrin and dieldrin; DRO; and the metals cadmium, copper, lead, mercury, and zinc, have been identified as COCs for soil (Table 1).

3.6.2 Groundwater

The HVOCs PCE, TCE, cis-1,2-DCE, vinyl chloride, and 1,2-dichloropropane; and the chlorinated pesticides 4,4-dichlorodiphenyldichloroethane (4,4-DDD), 4,4-dichlorodiphenyldichloroethene (4,4-DDE), and dieldrin have been identified as COCs for groundwater (Table 2). Metals have not been retained as COCs for groundwater based on historical groundwater analytical data (Appendix F).

3.6.3 Surface Water

The metals arsenic, cadmium, copper, lead, manganese, mercury, and zinc have been identified as COCs for Area 4 surface water (when present) based on groundwater analytical results from Bay Chemical monitoring wells located near Area 4 (Appendix E) and information regarding historical metals associated with Bay Chemical flue dust(Appendix B).

3.6.4 Soil Gas and Indoor Air

PCE, TCE, and vinyl chloride have been identified as COCs for soil gas and indoor air based on historical soil and groundwater data from the Area 1 waste pit (Table 4).

4.0 TECHNICAL ELEMENTS

4.1 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Cleanup of contaminated media at the Site will be conducted under the Agreed Order. The primary ARARs related to the remedial action are:

- MTCA, RCW 70.105D and WAC 173-340;
- Washington State Solid Waste Management Laws and Regulations, RCW 70.95, WAC 173-351, and WAC 173-304;
- Washington State Dangerous Waste Regulations, WAC 173-303;
- SMS, WAC 173-204;
- Water Quality Standards for Surface Waters of the State of Washington, WAC 173-201A;
- Protection of Upper Aquifer Zones, WAC 173-154; and
- The Yakima County Critical Areas Ordinance, Title 16C of the Yakima County Code.

These primary ARARs are anticipated to be the most-applicable to the remedial action, because they provide the framework for the remedial action, including applicable and relevant regulatory guidelines, cleanup standards, waste disposal criteria, references for additional ARARs, and standards for documentation of the remedial action.

Other applicable ARARs for cleanup of the Site are:

- The Occupational Safety and Health Act, Part 1910 of Title 29 of the Code of Federal Regulations;
- Washington State General Occupational Health Standards, WAC 296-62;
- Safety Standards for Construction Work, WAC 296-155;
- Accreditation of Environmental Laboratories, WAC 173-50.
- Minimum Standards for Construction and Maintenance of Wells, WAC 173-160;
- The Underground Injection Control Program, WAC 173-218; and
- Applicable local permits and ordinances required by the City of Yakima Municipal Code.

4.2 CLEANUP STANDARDS

As defined in WAC 173-340-700, cleanup standards include establishing cleanup levels and the points of compliance at which the cleanup levels are to be attained. The cleanup standards for the Site have been established in accordance with WAC 173-340-700 through 173-340-760 to be protective of human health and the environment.

4.2.1 Cleanup Levels

The cleanup levels are the concentrations of COCs that are to be met for each medium of concern at the point of compliance defined for the Site. Preliminary cleanup levels for the media of concern were identified in the CSM TM (Appendix F), and are presented below and in Tables 1 through 4 for Site COCs. Preliminary cleanup levels were based on MTCA standard formula values[1] for industrial properties, where appropriate; lower values such as the concentrations presented in MTCA Table 749-2, *Priority Contaminants of Ecological Concern for Sites that Qualify for the Simplified Terrestrial Ecological Evaluation Procedure*, were selected where warranted according to Farallon's Exposure Assessment.

4.2.1.1 Soil

The selected cleanup levels for COCs in soil at the Site are:

- HVOCs
  - 0.05 milligrams per kilogram (mg/kg) for PCE;
  - 0.025 mg/kg for TCE;
  - 0.078 mg/kg for cis-1,2-DCE;
  - 0.025 mg/kg for 1,2-dichloropropane;
- Chlorinated pesticides
  - 0.34 mg/kg for 4,4-DDD;
  - 0.45 mg/kg for 4,4-DDE;
  - 0.0028 mg/kg for dieldrin;
- Total petroleum hydrocarbons
  - 2,000 mg/kg for DRO;
- Metals
  - 0.69 mg/kg for cadmium;
  - 284 mg/kg for copper;
  - 220 mg/kg for lead;
  - 2.09 mg/kg for mercury; and
  - 570 mg/kg for zinc.

[1] As of November 14, 2018.

4.2.1.2 Groundwater

The selected cleanup levels for COCs in groundwater at the Site are:

- Volatile organic compounds
    - 5.0 µg/l for PCE;
    - 5.0 µg/l for TCE;
    - 16 µg/l for cis-1,2-DCE;
    - 0.20 µg/l for vinyl chloride;
    - 1.22 µg/l for 1,2-dichloropropane;
- Chlorinated pesticides
    - 0.36 µg/l for 4,4-DDD;
    - 0.26 µg/l for 4,4-DDE; and
    - 0.0055 µg/l for dieldrin.

4.2.1.3 Surface Water

The selected cleanup levels for COCs in surface water at the Site are as follows:

- Metals
    - 150 µg/l for arsenic;
    - 0.25 µg/l for cadmium;
    - 9.0 µg/l for copper;
    - 2.5 µg/l for lead;
    - 0.012 µg/l for mercury; and
    - 100 µg/l for zinc.

4.2.1.4 Indoor Air

The selected cleanup levels for COCs in indoor air at the Site are as follows:

- 9.62 micrograms per cubic meter for PCE;
- 0.37 micrograms per cubic meter for TCE; and
- 0.28 micrograms per cubic meter for vinyl chloride.

4.2.2 Points of Compliance

The point(s) of compliance are defined in WAC 173-340-200 as the location(s) where cleanup levels established in accordance with WAC 173-340-720 through 173-340-760 will be attained.

The points of compliance for the Site were established in accordance with WAC 173-340-740(6) and 173-340-7490 for soil, and WAC 173-340-720(8) for groundwater.

4.2.2.1 Soil

The point of compliance for soil for the Site was established to be protective of the direct contact, groundwater, and vapor intrusion exposure pathways and terrestrial ecological receptors. Use of the standard point of compliance for soil throughout the Site is not possible because of the shallow localized areas of metals, aldrin, and/or dieldrin that will remain in soil following completion of the limited source removal excavations proposed under the preferred Cleanup Alternative selected in the FS.

A conditional point of compliance was established for soil that will remain in-situ at the bottom of the proposed engineered control (surface barrier) identified in preferred Cleanup Alternative 2 – Limited Source Removal, Institutional and Engineered Controls, and Monitored Natural Attenuation. For soil that will be excavated as part of the preferred Cleanup Alternative, the conditional point of compliance was set at the bottom of the biologically active zone for sites with institutional controls 6 feet bgs, in compliance with WAC 173-340-7490(4)(a). Farallon is requesting a variance for four locations inside the Area 4 buffer, including G-TP1, G-TP-2, G-TP3, and N-TP1, with detections of metals and/or dieldrin that exceed their preliminary cleanup levels (Section 5.2.3).

The disproportionate cost analysis (DCA) completed in the FS, discussed in Section 5.3.3, supports, and confirms, the use of a conditional point of compliance at the Site because the vast majority of the Site will be covered with a physical barrier of concrete and/or asphalt preventing direct contact with residual contaminated soil. All remaining contamination in soil will be contained within the Site boundaries. The conditional point of compliance for soil will be managed by recording an environmental covenant on the property deed.

4.2.2.2 Groundwater

The standard point of compliance for groundwater is defined as the uppermost level of the saturated zone extending vertically to the lowest depth that potentially could be impacted by the COCs throughout the Site (WAC 173-340-720[8]).

Where it can be demonstrated under WAC 173-340-350 through 173-340-390 that it is not practicable to meet the cleanup level throughout the Site within a reasonable restoration time frame, a conditional point of compliance may be approved by Ecology. The preferred Cleanup Alternative selected in the FS includes a restriction on groundwater use (via an environmental covenant). The conditional points of compliance have been set as close as practicable to sources of hazardous substances, including the Area 1 waste pit. Groundwater monitoring wells that will be used as conditional points of compliance are existing monitoring wells MW-2, MW-4, and MW-7A, and new monitoring wells MW-8 and MW-9.

5.0 FEASIBILITY STUDY

The purpose of the FS was to develop and evaluate Cleanup Alternatives to facilitate selection of a final cleanup action at the Site in accordance with WAC 173-340-350(8). The FS was intended to provide sufficient information to identify a preferred Cleanup Alternative to be evaluated by Ecology. The confirmed final cleanup action approved by Ecology will be documented in a CAP to be prepared in accordance with the Agreed Order.

The FS included screening of potentially feasible remedial technologies and development of a range of Site-wide Cleanup Alternatives ranging from no additional cleanup action through a comprehensive Site-wide cleanup that achieves the cleanup standards identified in Section 4.2 in the shortest possible restoration time frame without reliance on institutional or engineered controls. The Cleanup Alternatives were evaluated with respect to threshold and other requirements for cleanup actions set forth in MTCA.

This FS evaluated four Cleanup Alternatives according to criteria provided in MTCA (WAC 173-340-360[2], Minimum Requirements for Cleanup Actions). In accordance with WAC 173-340-350(8)(c)(ii), the FS included one comprehensive Cleanup Alternative, as defined in WAC 173-340-200, to serve as the baseline against which other alternatives were evaluated, to assess whether the cleanup action selected is permanent to the maximum extent practicable.

The FS identified a preferred Cleanup Alternative for the Site in conformance with WAC 173-340-360 through 173-340-390. The preferred Cleanup Alternative is considered to present the highest degree of permanence and protectiveness considering current and potential future Site conditions to the maximum extent practicable according to the provisions of WAC 173-340-360(3)(e), Disproportionate Cost Analysis. The DCA uses a semi-quantitative procedure per WAC 173-340-360(3)(e)(ii) to compare the cost of implementation against the environmental benefit to be achieved, and to identify which permanent Cleanup Alternative is most-practicable under MTCA.

5.1 EVALUATION OF FEASIBLE REMEDIATION TECHNOLOGIES

Farallon performed a preliminary screening of potential remediation technologies typically applied to sites contaminated with the same or comparable COCs, to eliminate technologies that did not meet the minimum requirements of implementability, effectiveness, and cost, and to identify technologies that would be most-favorable for application, considering current and potential future conditions at the Site.

Response actions, cleanup technologies, and process options considered potentially effective and implementable in the context of physical and chemical Site conditions are presented in Table 5. The initial screening of cleanup technologies focused primarily on implementability and effectiveness. The technologies were evaluated also with respect to cost relative to other options considered for the affected environmental media (e.g., soil, groundwater). Relative cost is based on published sources and professional judgment, and is used to further distinguish technologies

with similar implementability and effectiveness. Among equally implementable and effective technologies, the lower relative cost technology is preferred. Cleanup technology alternatives were evaluated based on the criteria for selection of permanent cleanup actions (WAC 173-340-360(3)(d), which included ranking permanent cleanup action criteria from 0 (least favorable) to 5 (most favorable). Technology evaluation scores were then summed, enabling a general ranking of technologies for application at the Site.

Treatment technologies considered included in- and ex-situ physical, chemical, and biological techniques. Institutional controls evaluated included recording an environmental covenant on the property deed, and providing for compliance monitoring. Engineering controls included containment caps such as physical barriers. In-situ technologies considered included enhanced bioremediation, thermal treatment, soil vapor extraction, air sparging, and monitored natural attenuation (MNA). Ex-situ technologies considered included soil washing, thermal desorption, and direct-source removal by excavation for disposal at an approved landfill.

Conditions at the Site that influence the evaluation of implementability and effectiveness of a technology include:

- Site use as an active steel- and steel-fabrication facility, which involves use of the southern portion of the Site (Area 3) for material storage;
- The presence of source areas directly beneath and/or adjacent to existing Site structures;
- Shallow groundwater conditions;
- The presence of a Type III wetland in Area 4 on the southern portion of the Site, requiring a 75-foot buffer under the Yakima County Code Critical Areas Ordinance; and
- The fine-grained lithology of low-hydraulic transmissivity limiting potential effectiveness of injection and/or extraction in-situ treatment technologies in the Area 1 waste pit.

5.1.1 Retained Technologies

Table 5 summarizes the results from the technology screening for a wide range of cleanup technologies, and identifies the most-favorable technologies for the Site conditions to be retained for inclusion in the Site-wide Cleanup Alternatives described in Section 5.2, Cleanup Alternatives, were then evaluated according to MTCA threshold and other requirements defined in WAC 173-340-360(2) and 173-340-370, described in Section 5.3.2, Evaluation Results. The highest-ranked technologies to be incorporated into Site-wide Cleanup Alternatives are summarized below.

5.1.1.1 Institutional and Engineered Controls

Institutional and engineered controls can be effective protective measures preventing exposure to impacted soil and groundwater, and are considered to be readily implementable at the Site at a significantly lower cost than active cleanup technologies.

Institutional controls are measures undertaken to limit or prohibit activities that may interfere with the integrity of a cleanup action or that could result in adverse exposure to

hazardous substances at the Site, and are implemented in accordance with WAC 173-340-440. Institutional controls evaluated included an environmental covenant prohibiting domestic use of shallow groundwater at the Site and/or provisions for long-term compliance monitoring of groundwater to demonstrate that natural attenuation is occurring.

Engineering controls refer to containment or treatment systems designed to prevent or limit movement of or exposure to hazardous substances. Engineering controls evaluated included capping of new areas, and ongoing maintenance of existing physical barriers to mitigate direct contact with hazardous constituents and, if needed, an Environmental Media Management Plan (EMMP) to govern the handling of impacted media during future maintenance or development projects.

5.1.1.2 Monitored Natural Attenuation

Natural attenuation relies on natural processes to attenuate concentrations of hazardous constituents in soil and/or groundwater. Although natural attenuation occurs at most contaminated sites, certain optimal subsurface conditions must exist for a site to be effectively and completely remediated within a reasonable restoration time frame.

MNA is the process of monitoring subsurface conditions to ensure that natural attenuation continues to occur until remediation has been completed. MNA is considered an effective means of reducing risk to human health and the environment at some sites, especially when the risk of exposure is low and a longer restoration time frame is acceptable. MNA is considered a potentially applicable component for cleanup of soil and groundwater at the Site.

5.1.1.3 Excavation and Landfill Disposal

Excavation of impacted soil and disposal at an appropriately engineered and permitted facility is an effective approach to reducing risk to human health and the environment. Excavation and landfill disposal employs standard construction practices and readily available construction and earthmoving equipment. Subtitle C- and D-permitted landfills are designed to securely manage hazardous and nonhazardous soil over the long term.

Depending on the final extents, excavation may require either shoring to protect existing structures, or demolition of existing structures and rebuilding upon completion of cleanup. Dewatering may be required when excavating beneath groundwater. However, due to the presence of highly conductive gravels in the Site subsurface, any excavation would be planned to minimize the need for construction dewatering. Should excavation dewatering be necessary, wastewater from excavation dewatering would require testing to determine discharge treatment requirements, if any. Excavation(s) would be backfilled with suitable imported material placed according to geotechnical specifications required for resurfacing according to future Site-use plans. Excavation and landfill disposal of soil from the selected source areas is considered an effective, and implementable technology at the Site.

5.1.1.4 In-Situ Chemical Reduction

The application of in-situ chemical reduction (ISCR) for the proposed cleanup action relies on injection of Regenesis Chemical Reducing Solution, a proprietary treatment solution, to react with HVOCs and chlorinated pesticides in soil and groundwater. The treatment solution must come into contact with contaminated media to strip electronegative elements (e.g., chlorine) from the HVOCs and chlorinated pesticides, reducing the treatment solution, and essentially breaking the existing molecules, reducing their toxicity and accelerating the degradation and natural attenuation process of the byproducts. Limiting factors for ISCR include the requirement to disperse the treatment solution in the subsurface in a manner that the solution will be in direct contact with the contaminated media, which requires sufficiently porous or permeable soil. Once in place, the treatment solution must remain in contact with the contaminated media long enough to allow the chemical reduction to take place prior to being diluted and dispersed by groundwater flow.

5.1.2 Rejected Technologies

Table 5 identifies cleanup technologies that were eliminated from further consideration for application at the Site because they are not amenable to or are less-suited to Site-specific conditions than other technologies, and/or did not perform as well as other technologies evaluated in the FS with regard to implementability, effectiveness, and/or cost considerations.

5.2 CLEANUP ALTERNATIVES

The cleanup technologies derived from the technology screening were used to develop a suite of Site-wide Cleanup Alternatives for cleanup of the affected media of concern at the Site (Table 6). A No Action Cleanup Alternative (Cleanup Alternative 1) also was considered. Based on Site-specific conditions, the most-practicable cleanup approach for the Site will include a limited source removal action, institutional and engineered controls, and long-term monitoring to confirm that natural attenuation of residual COCs is occurring in soil and groundwater. Institutional and engineered controls will be required in areas where concentrations of COCs exceeding applicable cleanup levels remain following completion of active remediation.

5.2.1 Cleanup Alternative 1 – No Action

Cleanup Alternative 1 assumes that no additional remedial action[2] will occur at the Site. Although the existing paved surfaces and buildings currently functioning as containment measures would remain in-place for the foreseeable future, an environmental covenant would be recorded on the property to restrict potential exposure to Site soil and groundwater, and additional engineered controls would be added. COCs would remain in soil and groundwater at concentrations exceeding cleanup levels until naturally attenuated over the long term; no monitoring would be conducted to evaluate or document the attenuation process.

[2] Previous remedial action at the Site included excavation of metals-contaminated soil as part of the Bay Chemical site cleanup action, described in Metals Source TM.

5.2.1.1 Implementation

Residual concentrations of COCs would be contained beneath existing paved surfaces and buildings for the foreseeable future; contamination migration from soil to groundwater and via groundwater transport would be limited by the existing impervious surfaces. Groundwater at the Site currently is not used, and future use of shallow groundwater at the Site is not anticipated. An environmental covenant would be recorded for the Site that would include:

- Locations of all media of concern that exceed the final cleanup levels established for the Site;
- Restrictions on disturbing or excavating contaminated soil to prevent direct contact and inhalation exposure;
- Restrictions on use and/or contact with shallow groundwater; and
- Restrictions on contact with surface water in Area 4 (when present).

5.2.1.2 Time Frame and Estimated Cost

Recording the environmental covenant placing restrictions on the Site would occur over a period of 6 months. COCs would continue to degrade and attenuate naturally into the foreseeable future. The cost for implementing Cleanup Alternative 1 is $3,000.

5.2.2 Elements Common to Cleanup Alternatives 2 through 4

The following elements are common to Cleanup Alternatives 2 through 4:

- No action for Area 2.
- No action for Area 4.
- Evaluation of the indoor air pathway through subslab soil gas in the Agri-Tech Building.
- An additional round of groundwater monitoring at the Site prior to completion of the CAP.
- Preparation of a Compliance Monitoring Plan and a Sampling and Analysis Plan (SAP) for performance, protection, and confirmation monitoring per WAC 173-340-410 for the cleanup actions performed.
- Preparation of an EMMP to govern the handling of contaminated environmental media during cleanup action activities and future redevelopment or utility work, as necessary, and general worker protection. The EMMP will include a SAP developed per WAC 173-340-810.

Because no confirmed source areas were identified for Area 2 soil, Cleanup Alternatives 2 through 4 do not include remediation in Area 2. Similarly, all Cleanup Alternatives include no action for Area 4, which did not qualify as a "site" requiring remedial action under SMS (Wetland Evaluation TM), nor has sufficient surface water been present recently to conduct an evaluation of this medium.

Indoor air has been retained as a medium of concern although it has not been confirmed as an affected medium. Therefore, all alternatives include an evaluation of sub-slab soil gas in the Agri-Tech Building to further evaluate the soil gas to indoor air exposure pathway. Concentrations of COCs in groundwater beneath the YSF Building are less than Ecology Method B Screening Level concentrations protective of the potential risk of soil gas to indoor air exposure. COCs in soil are less than the preliminary cleanup levels for unrestricted use, indicating that volatilization of COCs from soil to soil gas in the vicinity of the YSF Building is more likely than not a de minimis risk for vapor intrusion.

If concentrations of COCs in subslab soil gas at the Agri-Tech Building exceed preliminary screening levels, measures could be implemented to mitigate the soil gas to indoor air exposure pathway or indoor air may be directly evaluated to assess wither mitigation measures are necessary. Mitigation measures may comprise active measures such as subslab depressurization, or passive measures such as venting. Soil gas to indoor air mitigation measures, if confirmed to be necessary, would be documented in the CAP to be prepared for the Site unless more immediate actions are required as an interim action.

Groundwater monitoring has not been performed at the Site since 2011. Concentrations of COCs in groundwater may have attenuated since the latest monitoring event. Therefore, Cleanup Alternatives 2 through 4 include one round of groundwater sampling from existing monitoring wells to evaluate current groundwater quality and flow direction. Cleanup Alternatives 2 and 3 include installation of additional groundwater monitoring wells MW-8 and MW-9 as part of their provision for compliance monitoring (Figures 5 and 6). Monitoring wells MW-8 and MW-9 will be located down-gradient of the Area 1 waste pit as close as practicable to the YSF Building southern boundary. Cleanup Alternative 4 does not include the installation of the two additional wells because the source material would be removed as part of that alternative.

Cleanup Alternatives 2 through 4 include development of a Compliance Monitoring Plan and associated SAP that would be prepared for performance, protection, and confirmation monitoring per WAC 173-340-410. The scope of the Compliance Monitoring Plan would be adjusted as needed to address all Cleanup Action elements, described in Sections 5.2.3 through 5.2.5. Cleanup Alternatives 2 through 4 also include development of an EMMP to provide for handling of contaminated media in accordance with federal, state, and local requirements, and for worker protection during excavation work.

5.2.3 Cleanup Alternative 2 – Limited Source Removal, Institutional and Engineered Controls, and Monitored Natural Attenuation

Cleanup Alternative 2 includes limited source removal of soil in select portions of Area 3 where COCs exceed preliminary cleanup levels; use of engineered controls to cap and eliminate direct contact with shallow soil contamination at Areas 1 and 3, and to limit surface water infiltration through contaminated soil; compliance groundwater sampling to monitor natural attenuation of HVOCs and pesticides; and institutional controls to protect ecological and human receptors from exposure to COCs remaining in shallow soil and groundwater (Figure 5). Farallon is requesting a

variance for four locations, including G-TP1, G-TP-2, G-TP3, and N-TP1 which are inside the Area 4 buffer and have reported concentrations of metals and/or dieldrin that exceed their respective PCULs but do not exceed soil concentrations for priority contaminants of ecological concern for industrial sites (WAC 173-340-900, Table 749-2).

Limited source excavation, installation of an asphalt surface as an engineered barrier in Area 3, and sealing of the existing asphalt surface in Area 1 would limit potential exposure pathways and minimize risk to human health and environment. Based on historical groundwater measurements, PCE and TCE concentrations in groundwater collected from monitoring well WDOE-6 have declined by over 90 percent in the past 20 years. Additional attenuation of parent HVOCs in the Area 1 waste pit over the next 15 years is expected reduce concentrations in groundwater enough to meet preliminary cleanup levels. Concentrations of HVOC degradation products, including cis-1,2-DCE and vinyl chloride, in groundwater are expected to decline with reductions in the parent HVOCs.

Engineered controls would include the existing building concrete floor slabs and surrounding impervious asphalt surfaces, and a new asphalt cap constructed in Area 3 to prevent exposure to residual soil with concentrations of metals exceeding preliminary cleanup levels (Figure 5). Institutional controls would include an environmental covenant citing where residual soil contamination exists and maintenance requirements for the capped areas, and restricting use of shallow groundwater. The environmental covenant may also include mitigation measure requirements for addressing vapor intrusion, if applicable.

5.2.3.1 Implementation

In addition to the common elements of Cleanup Alternatives 2 through 4 listed above, Cleanup Alternative 2 includes the following components:

- Obtaining necessary permits, including but not limited to a clearing and grading permit associated with planned excavation activities.
- Negotiating a Site access agreement with the current operator of the YSF business prior to mobilization and preparing the Site for cleanup. Materials and equipment in areas subject to cleanup would be relocated, and erosion- and runoff-control measures would be implemented as needed prior to excavation.
- Excavating soil with COCs exceeding preliminary cleanup levels. Select portions of Area 3 would be excavated to depths ranging from 3 to 6 feet bgs (Figure 5). No shoring is anticipated for the shallow soil excavation activities. A 1:1 slope back is assumed for each remedial excavation area.
- Disposing of excavated soil containing COCs at concentrations exceeding preliminary cleanup levels at a Subtitle C or D landfill and/or an approved facility authorized to accept metals- and/or petroleum-contaminated soil. For the purposes of this FS, it was assumed that approximately 450 tons of soil will be excavated, transported, and disposed of at a Subtitle C landfill, and approximately 3,100 tons of soil will be disposed of at a Subtitle D landfill.

- Importing and compacting backfill material and restoring to the surrounding grade in preparation of placement of an asphalt cap.
- Paving the entirety of Area 3, excluding the Area 4 buffer (approximately 84,000 square feet), with approximately 4 inches of asphalt to provide a physical barrier to eliminate direct contact with residual soil with concentrations of COCs that exceed preliminary cleanup levels, and to minimize surface water infiltration.
- Sealing the existing 85,000 square feet of asphalt in Area 1 to eliminate direct contact with residual soil with concentrations of COCs, and to minimize surface water infiltration.
- Conducting semiannual groundwater monitoring events for the first year, and annual groundwater monitoring events for Years 2 through 5. Biannual groundwater monitoring events will be conducted for Years 6 through 15. Wells would be monitored for indicator COCs and natural attenuation geochemical parameters. The environmental covenant would reference and require implementation of a Compliance Monitoring Plan.
- Preparing annual progress reports documenting cleanup action activities completed to date and planned, and summarizing compliance groundwater monitoring.

Institutional controls would be implemented per WAC 173-340-440, and would include an environmental covenant recorded on the property deed. The environmental covenant would include the following:

- A Compliance Monitoring Plan and an associated SAP for performance, protection, and confirmation monitoring per WAC 173-340-410;
- Locations of all media of concern that exceed the final cleanup levels established for the Site;
- Restrictions on disturbing or excavating contaminated soil to prevent direct contact and inhalation exposure;
- Restrictions on use and/or contact with shallow groundwater; and
- Restrictions on contact with surface water in Area 4 (when present).
- Stipulated requirements for inspections and maintenance of the engineered barrier and asphalt cap at an 18-month frequency for 5 years; and
- Maintenance of vapor intrusion mitigation measures, if required.

5.2.3.2 Time Frame and Estimated Cost

The limited source excavation and capping would be performed over the course of approximately 1 month. The environmental covenant to be recorded on the property deed would be developed over the course of up to 6 months. Institutional and engineered controls would be implemented until COC cleanup levels were demonstrated to have been achieved

in all affected media. For the purposes of this FS, monitoring and maintenance activities were assumed to be completed in Year 15.

The estimated cost to complete Cleanup Alternative 2 is summarized below from Table 7:

Capital Cost:	$1,459,000
Ongoing Periodic and Future Cost:	$ 225,000
Cleanup Alternative 2 Total:	$1,684,000

5.2.4 Cleanup Alternative 3 – In-Situ Chemical Reduction, Limited Source Removal, Institutional and Engineered Controls, and Monitored Natural Attenuation

Cleanup Alternative 3 involves all the elements of Cleanup Alternative 2, including implementing limited source removal of soil in select portions of Area 3; protection of human health and ecological receptors through construction of an asphalt cap; monitored natural attenuation for groundwater; and implementation of institutional controls, with additional active remediation of soil and groundwater in Area 1 using ISCR for HVOCs and chlorinated pesticides (Figure 6).

ISCR treatment would be performed through 44 temporary injection points spaced for an assumed 15-foot radius of influence, installed in Area 1 where concentrations of COCs in soil and groundwater were previously confirmed to exceed preliminary cleanup levels (Figure 6). The treatment solution, Regenesis Chemical Reducing Solution, would be injected to achieve the appropriate radius of influence, and to ensure contact with and treatment of surrounding contaminated media. Pilot testing would be conducted prior to implementing the technology to refine specific application parameters and confirm that the technology is feasible for conditions in the former waste pit.

Contact with the chemical reduction solution will remove electrons from HVOCs and chlorinated pesticide chemical bonds, breaking the existing molecules and accelerating the natural attenuation process of resulting byproducts. For the purpose of the FS, three injection events are assumed to be needed over a 6-month period to achieve the cleanup objectives.

5.2.4.1 Implementation

Implementation of limited source removal and institutional and engineered controls would be consistent with that described under Cleanup Alternative 2. It is assumed that the environmental covenant would include the elements described under Cleanup Alternative 2.

Implementation of ISCR would include the following elements that are not common to Cleanup Alternative 2 and are required to complete the ISCR injections:

- Obtaining an underground injection control registration from the Ecology Underground Injection Control Program to perform the ISCR work.

- Clearing equipment and materials from portions of the YSF and Agri-Tech Buildings prior to injection. Individual injection locations would be cored before injection work was performed.
- Advancing 44 direct-push temporary injection points in a depth interval between 5 and 10 feet bgs for each injection event using a full-size direct-push drill rig.
- Real-time monitoring of down-gradient groundwater quality at monitoring wells MW-2, MW-6, MW-8, MW-9,and WDOE-6, including gauging groundwater elevations, and obtaining field measurements for pH and oxidation-reduction potential.
- Conducting quarterly groundwater monitoring for 1 year during the injection events to further evaluate groundwater conditions at and down-gradient of the treatment area.
- Conducting semiannual groundwater monitoring for 2 years after the injection events, and annually for 3 additional years to further evaluate groundwater conditions and reductions in COC concentrations in groundwater. For the purposes of this FS, it was assumed that five monitoring wells will be sampled for each groundwater monitoring event to evaluate the status of the cleanup at Area 1.

5.2.4.2 Time Frame and Estimated Cost

Limited source excavation, recording of an environmental covenant, and construction of a surface cap would be performed as described under Cleanup Alterative 2. ISCR pilot testing and injection would be performed over an approximately 6-month period. Confirmation monitoring would be implemented over a 5-year period. For the purposes of this FS, monitoring and maintenance activities were assumed to be completed in Year 5.

The estimated cost to complete Cleanup Alternative 3 is summarized below from Table 7:

Capital Cost:	$2,323,000
Ongoing Periodic and Future Cost:	$ 205,000
Cleanup Alternative 3 Total:	$2,528,000

5.2.5 Cleanup Alternative 4 – Complete Source Removal and Monitored Natural Attenuation

Cleanup Alternative 4 involves complete removal of soil with concentrations of COCs exceeding preliminary cleanup levels via direct excavation in Areas 1 and 3, and MNA for COCs in groundwater following source removal. Soil with concentrations of COCs exceeding preliminary cleanup levels would be disposed of off the Site at a Subtitle C- or D-permitted landfill, as applicable to meet federal, state, and local requirements. Complete source removal would require significant disruption to the business, structural engineering associated with either removing existing buildings or shoring and supporting the existing buildings to facilitate excavation, and backfilling and regrading of the Site upon completion (Figure 7).

Farallon evaluated both complete removal of the existing buildings on the Site and providing adequate shoring, reinforcement, and modification to allow for excavation inside the existing Site buildings. While modest cost savings can be realized through performing additional engineering and reinforcement to facilitate excavation with the Site buildings in-place, this approach added considerable short-term risk to construction workers and had a higher potential for cost over-runs from original estimates. Additionally, the estimated costs savings were not sufficient to affect the evaluation of alternatives relative to Cleanup Alternatives 2 and 3. Therefore, to ensure an appropriately conservative approach, Farallon evaluated Cleanup Alternative 4 on the basis that the existing Site buildings would be completely removed.

Although Cleanup Alternative 4 includes compliance monitoring, it does not require implementation of institutional or engineered controls, protective engineered barriers, or a long-term monitoring program following completion of the cleanup action. In accordance with WAC 173-340-350(8)(c)(ii), Cleanup Alternative 4 is a permanent Cleanup Alternative, as defined in WAC 173-340-200, and serves as a baseline against which other Cleanup Alternatives can be evaluated to determine whether a preferred Cleanup Alternative is permanent to the maximum extent practicable.

5.2.5.1 Implementation

It was assumed that Cleanup Alternative 4 will include the following elements:

- Protecting existing monitoring wells MW-4 and MW-6.
- Decommissioning existing monitoring wells WDOE-6 and MW-2 in accordance with WAC 173-160-381.
- Establishing a detailed Site access agreement and compensation contract with the current YSF business owner.
- Relocating steel-fabrication operations to a temporary alternate location, partial demolition of the YSF and Agri-Tech Buildings, and removal of the concrete floor slabs to facilitate direct excavation of source material.
- Excavating soil with COCs exceeding cleanup levels (maximum depth of 10 feet bgs based on existing soil analytical data from the RI) performed sequentially across the Site from north to south. Excavated soil would be replaced with clean structural backfill and compacted as the excavation progresses to the south.
- Disposing of excavated soil at a Subtitle C or D landfill facility authorized to manage soil contaminated with metals, HVOCs, chlorinated pesticides, and/or petroleum hydrocarbons.
- Site grading and replacing on-Site buildings, including floor slabs and surrounding asphalt-paved areas.

- Installing two new monitoring wells, MW-8 and MW-9, followed by groundwater sampling to monitor the progress of natural attenuation of HVOCs and chlorinated pesticides.
- Conducting quarterly compliance groundwater monitoring for a minimum of 1 year following source removal, and semiannual groundwater monitoring for 4 additional years. For the purposes of the FS, it was assumed that compliance monitoring activities would be completed in Year 5.

5.2.5.2 Time Frame and Estimated Cost

Cleanup Alternative 4 would be implemented over the course of 12 to 18 months. Compliance monitoring would continue for 5 years. The estimated cost to complete Cleanup Alternative 4 is summarized below from Table 3:

Capital Cost:	$31,129,000
Ongoing Periodic and Future Cost:	$ 101,000
Cleanup Alternative 4 Total:	$31,230,000

5.3 CLEANUP ALTERNATIVE EVALUATION

This section presents the evaluation of Cleanup Alternatives 1 through 4 performed against the requirements set forth in MTCA under WAC 173-340-350 through 173-340-370. The Cleanup Alternative evaluation considered results from the collective RI work, and Site-specific conditions, including the nature and extent of COCs, and the exposure assessment documented in the CSM TM. The evaluation of Cleanup Alternatives also considered impacts to current Site use. Presented below are a summary of the evaluation process per MTCA, the evaluation results, and the results from the DCA completed for the Site.

5.3.1 Evaluation Process

The FS considered the requirements under WAC 173-340-350 and the criteria defined in WAC 173-340-360 for screening potentially feasible Cleanup Alternatives for the Site. A Cleanup Alternative must satisfy the following threshold criteria specified in WAC 173-340-360(2)(a):

- Protect human health and the environment;
- Comply with cleanup standards;
- Comply with applicable state and federal laws; and
- Provide for compliance monitoring.

In addition to meeting the threshold criteria, cleanup actions under MTCA must meet the following additional requirements specified in WAC 173-340-360(2)(b):

- Provide for a reasonable restoration time frame based on the factors provided in WAC 173-340-360(4)(b);

- Use permanent solutions to the maximum extent practicable based on the criteria defined in WAC 173-340-360(3)(f); and
- Consider public concerns raised during public comment on the CAP (WAC 173-340-600).

The factors used to evaluate the reasonableness of the restoration time frame per WAC 173-340-360(4)(b) were:

- Potential risks posed by COCs at the Site to human health and the environment;
- Practicability of achieving a shorter restoration time frame;
- Current use of the Site, surrounding areas, and associated resources that are or may be affected by releases from the Site;
- Availability of alternative water supplies;
- Likely effectiveness and reliability of institutional controls;
- Ability to control and monitor migration of hazardous substances from the Site;
- Toxicity of the hazardous substances at the Site; and
- Natural processes that reduce concentrations of hazardous substances and have been documented to occur at the Site or under similar Site conditions.

The criteria used to evaluate the degree of permanence to the maximum extent practicable per WAC 173-340-360(3)(f) were:

- Protectiveness: Overall protectiveness of human health and the environment, including the degree to which existing risks are reduced; the time required to reduce risk at the Site and attain cleanup standards, and risks at the Site resulting from implementing the alternative; and improvement of overall environmental quality.
- Permanence: The degree to which the alternative permanently reduces the toxicity, mobility, or volume of hazardous substances, including the adequacy of the alternative in destroying the hazardous substances, the reduction or elimination of hazardous substance releases and sources of releases, the degree of irreversibility of the waste treatment process, and the characteristics and quantity of treatment residuals generated.
- Long-term effectiveness: The degree of certainty that the alternative will be successful, the reliability of the alternative during the period of time that hazardous substances are expected to remain on the Site at concentrations that exceed preliminary cleanup levels, and the magnitude of residual risk with the alternative in place. The following types of cleanup action components may be used as a guide, in descending order, when assessing the relative degree of long-term effectiveness: reuse or recycling; destruction or detoxification; immobilization or solidification; disposal on- or off-Site in an engineered, lined, and monitored facility; isolation or containment with attendant engineered controls on the Site; and institutional controls and monitoring.

- Management of short-term risks: The risk to human health and the environment associated with the alternative during construction and implementation, and the effectiveness of measures that will be taken to manage such risks. This criterion includes risks to workers and customers at businesses adjoining the Site, and members of the public on surrounding public roads resulting from implementation of the cleanup alternative.
- Technical and administrative implementability: Ability to be implemented, including consideration of whether the alternative is technically feasible, administrative and regulatory requirements, permitting, scheduling, size, complexity, monitoring requirements, access for construction operations and monitoring, and integration with the business operations at the Site and adjoining business operations.
- Consideration of public concerns: Whether the community has concerns regarding the alternative and, if so, the extent to which the alternative addresses those concerns. This process includes concerns from individuals, community groups, local governments, federal and state agencies, or any other organization that may have an interest in or knowledge of the Site.
- Cost: The cost to implement the alternative, including the cost of construction and anticipated long-term costs. Long-term costs include operation and maintenance, monitoring, and reporting costs.

5.3.2 Evaluation Results

Evaluation results for each Cleanup Alternative are summarized in Table 8 and discussed below.

5.3.2.1 Threshold Requirements

The evaluation of Cleanup Alternatives 1 through 4 against the threshold requirements of WAC 173-340-360(2)(a) is summarized below.

Protection of Human Health and the Environment

According to the exposure assessment presented in the CSM TM, summarized in Section 3.3, the two types of exposure risk associated with the presence of COCs at the Site are human health and terrestrial ecological risk. Mitigating the potential ecological and human health risk associated with exposure to COCs in soil and groundwater at the Site will be the primary objective of any cleanup action implemented.

Under Cleanup Alternative 1 (No Action), subsurface contamination other than metals would continue to attenuate naturally over time. The Site's industrial use, access control, and existing containment would provide a moderate level of protection, which would be increased by recording an environmental covenant on the Site. But no provisions are made for additional engineered controls or to ensure maintenance of the containment elements or to monitor natural attenuation. Therefore, Cleanup Alternative 1 does not meet the minimum requirements under MTCA for protection of human health and the environment.

Cleanup Alternatives 2 through 4 satisfy the MTCA requirement of protection of human health and the environment. Cleanup Alternative 2 (Limited Source Removal, Institutional and Engineered Controls, and Monitored Natural Attenuation) provides additional protection through implementation of institutional and engineered controls, and ensures that future monitoring and maintenance activities are conducted to limit exposure to COCs in soil, groundwater, and indoor air, if applicable. Cleanup Alternative 3 (In-Situ Chemical Reduction, Limited Source Removal, Institutional and Engineered Controls, Monitored Natural Attenuation) includes the institutional and engineered controls identified under Cleanup Alternative 2, and provides additional protection through active remediation of contaminated soil and groundwater in the Area 1 waste pit and down-gradient area, shortening the overall time to achieve cleanup levels and reliance on institutional controls. Alternative 4 does not include institutional or engineered controls because complete source removal obviates long-term mitigation of exposure to contaminated media.

Compliance with Cleanup Standards

Active remedial measures under Cleanup Alternatives 2, 3, and 4 are designed to achieve cleanup standards within a reasonable restoration time frame through excavation of source material, additional direct treatment of contaminated soil and groundwater (Cleanup Alternative 3), or complete excavation of all areas with COCs exceeding cleanup levels (Cleanup Alternative 4). Under Alternative 2, compliance with cleanup standards would occur via natural attenuation processes following limited source removal, but over a longer time frame than under either Cleanup Alternative 3 or Cleanup Alternative 4. Natural attenuation processes under Cleanup Alternative 1 would require a much longer time frame to achieve cleanup standards than any of the other Cleanup Alternatives.

Compliance with State and Federal Laws

Along with the cleanup levels selected per MTCA, numerous laws and associated regulations influence how a remedial action is implemented. Applicable chemical-, location-, and action-specific state and federal laws are listed in Section 4, Technical Elements. Permitting by agencies, substantive standards promulgated by state and local agencies, best management practices, workplace safety, and off-Site waste disposal practices are a few of the aspects that must be formally addressed in the design and implementation phases of a cleanup action to ensure compliance with applicable laws. Cleanup Alternative 1 does not meet the minimum requirements of MTCA. Cleanup Alternatives 2 through 4 include features that can be designed and implemented in compliance with state and federal laws, including MTCA.

Provision for Compliance Monitoring

Compliance monitoring per WAC 173-340-410 refers to the collection, analysis, and reporting of environmental data to determine the short- and long-term effectiveness of a cleanup action, and whether protection is being achieved in accordance with cleanup objectives. A Compliance Monitoring Plan will be developed in conjunction with the CAP required by the Agreed Order, and will include standard field techniques and laboratory analytical methods in a SAP. Cleanup Alternative 1 does not meet the minimum

requirements of MTCA. Cleanup Alternatives 2 through 4 include comprehensive compliance monitoring programs that meet the MTCA compliance monitoring requirements.

5.3.2.2 Other Requirements

The results from the evaluation of Cleanup Alternatives 1 through 4 against other requirements specified in WAC 173-340-360(2)(b) are provided below. Because the criteria to use permanent solutions to the maximum extent practicable and consideration of public concerns are addressed under the criteria for evaluation of permanent cleanup actions, the results from the evaluation of both of these criteria are presented in Section 5.3.2.3.

Reasonable Restoration Time Frame

The restoration time frame is the time needed to meet cleanup standards (i.e., to meet all cleanup levels in all media at all points of compliance). For alternatives equivalent in other respects, MTCA places a preference on alternatives that achieve cleanup levels in a shorter period of time. Under MTCA, eight factors are used to determine whether a cleanup action provides for a reasonable restoration time frame, presented in Section 5.3.1, Evaluation Process. Cleanup Alternative 2 (Limited Source Removal, Institutional and Engineered Controls, and Monitored Natural Attenuation), Cleanup Alternative 3 (In-Situ Chemical Reduction, Limited Source Removal, Institutional and Engineered Controls, and Monitored Natural Attenuation), and Cleanup Alternative 4 (Complete Source Removal), offer a reasonable restoration time frame under MTCA.

The restoration time frame for Alternative 1 is the longest and would rely on attaining cleanup standards for affected media solely through natural attenuation. Cleanup Alternatives 2, and 3 use limited soil excavation to remove source material in Area 3. Under Cleanup Alternatives 2 and 3, contaminated soil remaining in-place would be managed through the recording of an environmental covenant on the property deed. Cleanup Alternative 3 supplements the limited soil excavation in Area 3 with ISCR treatment of soil and groundwater in the Area 1 waste pit and down-gradient area, reducing the overall restoration time frame. Cleanup Alternative 4 would remove all source soil with COC concentrations exceeding preliminary cleanup levels from the Site and on a more likely than not basis have the shortest restoration timeframe relative to the other Cleanup Alternatives.

For purposes of this FS, the restoration time frame for groundwater under Cleanup Alternative 2 was estimated to be 15 years. During this time, the extent of contaminated groundwater would remain primarily under the Agri-Tech Building and the asphalt cap between the Agri-Tech and YSF Buildings (Figure 5), and would meet the cleanup levels at proposed monitoring wells MW-8 and MW-9, which are proposed conditional points of compliance. Alternative 3 has an estimated restoration time frame of 5 years for

groundwater due to the ISCR treatment at Area 1. The restoration time frame for groundwater under Cleanup Alternative 4 is estimated to be between 12 and 18 months.

The longer restoration time frames associated with soil and groundwater under Cleanup Alternatives 2 and 3 are considered reasonable based on the following:

- Potential risks to human health and the environment posed by COCs at the Site would be low after the cleanup actions had been implemented. The environmental covenant to be implemented under Cleanup Alternatives 2 and 3 would require protective measures that would effectively and reliably limit exposure to residual contamination as natural attenuation processes continue to reduce HVOC and chlorinated pesticide concentrations in soil, groundwater, and potentially indoor air.
- Practicable active remedial measures that could achieve a shorter restoration time frame than that under Cleanup Alternative 2 are limited, and are included under Cleanup Alternative 3.
- Shallow groundwater is not used at the Site; municipal water is provided to this area. Contamination from the Site in soil and groundwater is sufficiently bounded and has not migrated off the Site at concentrations exceeding the preliminary cleanup levels.
- Institutional and engineered controls included under Cleanup Alternatives 2 and 3 are effective and reliable in mitigating potential exposure to COCs exceeding preliminary cleanup levels.
- Cleanup Alternatives 2 and 3 provide for adequate control and monitoring of potential migration of COCs from the Site during the period which they are expected to remain at concentrations exceeding preliminary cleanup levels.

5.3.2.3 Use of Permanent Cleanup Actions to the Maximum Extent Practicable

MTCA specifies that when a cleanup action is selected, preference is to be given to actions that are permanent to the maximum extent practicable. Multiple approaches to cleanup of the Site are possible, as identified in Cleanup Alternatives 1 through 4. Under MTCA, seven criteria are used to evaluate whether a cleanup action is permanent to the maximum extent practicable (Section 5.3.1, Evaluation Process). Active treatment approaches such as those under Alternatives 2, 3, and 4 offer the greatest degree of permanence by actively reducing the mass of COCs at the source areas.

Per WAC 173-340-360(3)(f), the following criteria were considered in the evaluation of permanence to the maximum extent practicable. Table 9 summarizes the results from the evaluation, which scored each of the seven criteria on a scale of 1 to 10, with 10 being most favorable, and 1, least favorable. A mathematically derived MTCA Composite Benefit Score is presented in Table 9. The derived MTCA Composite Benefit Scores are discussed as part of the DCA, presented in Section 5.3.3.

Protectiveness

Cleanup Alternative 1 (No Action) would not provide protection beyond that provided by the existing surface barriers composed of concrete, gravel, and asphalt, and would include recording an environmental covenant for the Site. Cleanup standards for HVOCs and chlorinated pesticides would be achieved by natural attenuation processes over the course of many years.

Cleanup Alternative 2 (Limited Source Removal, Institutional and Engineered Controls, and Monitored Natural Attenuation) would accelerate the achievement of cleanup standards through removal of source material in soil in Area 3, and provides for monitoring of natural attenuation processes in Area 1. Based on historical groundwater sampling data, Area 1 groundwater is expected to achieve the preliminary cleanup levels herein used to evaluate this alternative in approximately 15 years. Cleanup Alternative 2 provides additional environmental and public health protection via the recording of an environmental covenant on the property deed to restrict potential exposure to contaminated soil and groundwater. Existing surface barriers in Area 1 would be retained, and supplemented with an asphalt cap in Area 3 to provide additional protection from future exposure to contaminated soil in Area 3, and from mobilization and migration of COCs to groundwater to the maximum extent practicable.

Cleanup Alternative 3 (In-Situ Chemical Reduction, Limited Source Removal, Institutional and Engineered Controls, and Monitored Natural Attenuation) provides the same source removal in Area 3 and protective measures and monitoring of COC concentrations for shallow groundwater as Cleanup Alternative 2, and adds ISCR treatment of soil and groundwater in the Area 1 waste pit and down-gradient area, which would further reduce groundwater exposure risk, and would reduce the restoration time frame for groundwater to approximately 5 years.

Cleanup Alternative 4 (Complete Source Removal) is the most-protective Cleanup Alternative. The cleanup action components would achieve cleanup standards over the shortest term and not require institutional or engineered controls.

Permanence

Cleanup Alternative 1 (No Action) and Cleanup Alternative 2 (Limited Source Removal, Institutional and Engineered Controls, and Monitored Natural Attenuation), would limit the mobility of COCs using the existing concrete, gravel and asphalt caps at the Site. Cleanup Alternative 2 includes a supplemental asphalt cap in Area 3 to further reduce the potential for direct exposure to, infiltration of, and future migration to groundwater of residual metals and limited areas of chlorinated pesticides in soil. Both alternatives offer permanent solutions; however, the restoration time frames are greater than Cleanup Alternatives 3 and 4.

Cleanup Alternative 3 (In-Situ Chemical Reduction, Limited Source Removal, Institutional and Engineered Controls, and Monitored Natural Attenuation) would reduce the mass of

hazardous substances using ISCR treatment of soil and groundwater in the Area 1 waste pit and the down-gradient area where HVOCs and chlorinated pesticides exceed preliminary cleanup levels, resulting in a higher confidence level for a permanent cleanup approach with a shorter restoration time than Cleanup Alternatives 1 and 3. Cleanup Alternative 4 (Complete Source Removal and Monitored Natural Attenuation) is considered to provide the highest degree of permanence. All source soil would be removed, resulting in a corresponding cleanup of groundwater and potentially indoor air.

Long-Term Effectiveness

Cleanup Alternative 1 (No Action) would provide some effectiveness over the long term from the existing surface barriers that limit exposure to soil while COCs naturally attenuate. However, potential exposure to soil containing COCs at concentrations exceeding preliminary cleanup levels would remain relatively unrestricted in Area 3, and no provision is made for compliance monitoring over the long term.

Cleanup Alternative 2 (Limited Source Removal, Institutional and Engineered Controls, and Monitored Natural Attenuation) would effectively reduce Site risks by source excavation in Area 3, and disposal at a permitted facility. Cleanup Alternative 2 also provides for supplemental engineered and institutional controls and compliance monitoring while HVOCs and chlorinated pesticides at the Area 1 waste pit naturally attenuate over a period of 15 years. Cleanup Alternative 3 (In-Situ Chemical Reduction, Limited Source Removal, Institutional and Engineered Controls, and Monitored Natural Attenuation) has a higher degree of confidence for long-term effectiveness associated with the in-situ treatment of soil and groundwater in the Area 1 waste pit. Cleanup Alternative 4 (Complete Source Removal) would effectively reduce Site risk by mass excavation in all areas where COCs exceed preliminary cleanup levels, and is considered to provide the highest degree of long-term effectiveness.

Management of Short-Term Risk

Cleanup Alternative 1 (No Action) presents no short-term risk. Cleanup Alternative 2 (Limited Source Removal, Institutional and Engineered Controls, and Monitored Natural Attenuation) presents the lowest short-term risk of Cleanup Alternatives 2 through 4 during implementation of the limited removal of source material in Area 3 and transport for off-Site disposal. Cleanup Alternative 3 (In-Situ Chemical Reduction, Limited Source Removal, Institutional and Engineered Controls, and Monitored Natural Attenuation) presents a higher degree of short-term risk associated with the indoor drilling and injection of caustic remedial solution required to perform the ISCR of Area 1 waste pit soil and groundwater. ISCR injection work is hazardous to the people performing the work, and would need to be repeated for three events; therefore, this alternative is rated lower for short-term risk. Cleanup Alternative 4 (Complete Source Removal) also is considered to present more short-term risk than Cleanup Alternative 2 due to the need for demolition of existing structures, extended construction, and transport of hazardous materials off the Site that would be performed during the complete removal, although these elements of the cleanup action can be effectively managed.

Technical and Administrative Implementability

Cleanup Alternative 1 (No Action) requires recording an environmental covenant for the Site. Implementation of Cleanup Alternative 2 (Limited Source Removal, Institutional and Engineered Controls, and Monitored Natural Attenuation) would not involve technically complex field activities or administrative complications, although modest impacts to Site business operations would occur during the period of source removal, backfilling, and construction of the asphalt cap. Implementation of Cleanup Alternative 3 (In-Situ Chemical Reduction, Limited Source Removal, Institutional and Engineered Controls, and Monitored Natural Attenuation) would involve more technically complex field activities, including vacating significant portions of both Site buildings, preparation for and execution of the Area 1 injection work, and all of the elements identified under Alternative 2.

Cleanup Alternative 4 (Complete Source Removal) would require extensive administrative and logistical coordination, in addition to significant prolonged disruption to operations at the Site, including halting and relocating current operations, and demolishing and replacing multiple existing structures (see Section 5.2.5 Cleanup Alternative 4) and floor slabs; significantly expanding the excavation of source areas, extended periods of hauling and increased truck traffic on local roads; and complete Site restoration. Cleanup Alternative 4 therefore is considered the least-implementable Cleanup Alternative.

Consideration of Public Concerns

Concentrations of COCs exceeding preliminary cleanup levels are limited to discrete areas of the Site, an active steel-fabrication facility with controlled access. No complete pathway currently exists for public exposure via direct contact and groundwater impacts pose no current threat to human health or the environment on or off the Site. Implementation of construction activities would include measures to prevent public exposure to hazardous materials. Cleanup Alternatives would address potential public concerns about residual levels of COCs at the Site and excavation and transport of contaminated soil to an off-Site disposal facility.

Cleanup Alternative 2 (Limited Source Removal, Institutional and Engineered Controls, and Monitored Natural Attenuation) and Cleanup Alternative 3 (In-Situ Chemical Reduction, Limited Source Removal, Institutional and Engineered Controls, and Monitored Natural Attenuation), would result in a modest increase in hauling traffic on public roadways for a limited period of time. Cleanup Alternative 4 (Complete Source Removal) would result in extensive and prolonged hauling traffic on public roadways over the course of relocating steel-fabrication operations; and demolition, excavation, and restoration work, estimated to require approximately 12 to 18 months to complete. Cleanup Alternative 4 also may have the highest public concern of the four alternatives due to the impacts to the business and workers associated with the temporary shutdown and transfer to an alternative location.

Cost

Estimated costs for implementation of the four Cleanup Alternatives are summarized in Table 7. The estimated cost for implementing Cleanup Alternative 1 (No Action) is $3,000. The estimated cost for implementing Cleanup Alternative 2 (Limited Source Removal, Institutional and Engineered Controls, and Monitored Natural Attenuation) is $1,684,000.

The estimated cost for implementing Cleanup Alternative 3 (In-Situ Chemical Reduction, Limited Source Removal, Institutional and Engineered Controls, and Monitored Natural Attenuation), which includes all of the elements identified under Alternative 2 and ISCR treatment for soil and groundwater in the Area 1 waste pit, is $2,528,000. The estimated cost for implementing Cleanup Alternative 4 (Complete Source Removal and Monitored Natural Attenuation) is $31,230,000. Cleanup Alternative 4 costs include relocating steel-fabrication operations, demolition and replacement of the existing structures and concrete floor slabs, and removal of approximately 30,000 tons of soil that would be disposed of off the Site and replaced with imported material before the Site was restored for continued operation as a steel-fabrication facility.

5.3.3 Disproportionate Cost Analysis

The purpose of the DCA was to facilitate selection of the Cleanup Alternative that provides the highest degree of permanence to the maximum extent practicable. The following cleanup alternatives were considered for the DCA:

- Cleanup Alternative 1 – No Action;
- Cleanup Alternative 2 – Limited Source Removal, Institutional and Engineered Controls, and Monitored Natural Attenuation;
- Cleanup Alternative 3 – In-Situ Chemical Reduction, Limited Source Removal, Institutional and Engineered Controls, and Monitored Natural Attenuation; and
- Cleanup Alternative 4 – Complete Source Removal and Monitored Natural Attenuation.

The DCA for the Site was conducted in accordance with the methodology provided by WAC 173-340-360(3)(e). The Cleanup Alternative evaluation presented in Table 9 is provided in the format suggested by Ecology (2009). Table 9 presents a quantitative assessment of the MTCA criteria for determining whether a cleanup action uses permanent solutions to the maximum extent practicable (WAC 173-340-360[3][f]). A numeric score ranging from 0 to 10 was assigned to each of the criteria based on best professional judgment. The higher the score, the more-favorable the Cleanup Alternative is under MTCA. The criteria scores were weighted according to Ecology (2009) suggestions, as indicated in Table 9.

A MTCA Composite Benefit Score was calculated for each alternative by summing the mathematical product of each criterion score and the weighting factor, which provided the quantitative measure of environmental benefit that would be realized by implementation of each Cleanup Alternative. The weighting factors for the six criteria were:

- Protectiveness: 30 percent;
- Permanence: 20 percent;
- Long-Term Effectiveness: 20 percent;
- Short-Term Effectiveness: 10 percent;
- Implementability: 10 percent; and
- Public Concerns: 10 percent.

For example, if the scores for each of the above listed criteria were 7.5, 7, 6, 3, 7, and 6, respectively, the MTCA Composite Benefit Score would be calculated as: (7.5) x (0.3) + (7) x (0.2) + (6) x (0.2) + (3) x (0.1) + (7) x (0.1) + (6) x (0.1) = 6.45. On a scale of 0 to 10, with 10 having the highest environmental benefit, a score of 6.45 represents moderate environmental benefit.

Table 9 summarizes the basis for the scoring and the estimated costs for the four Cleanup Alternatives. Chart 1 graphically presents the results from the DCA. The red bars on Chart 1 reflect the environmental benefit offered by each Cleanup Alternative as measured by the MTCA Composite Benefit Score on the left vertical axis of the graph. The blue bars reflect the estimated cost of each alternative on the right vertical axis of the graph. The incremental benefit of a Cleanup Alternative relative to its incremental cost thus can be discerned.

Implementing Cleanup Alternative 1 results in a MTCA Composite Benefit Score of 3.8. The approximately $1.6 million to implement Cleanup Alternative 2 would increase the MTCA Composite Benefit Score to 6.7, an increase of 76 percent (an approximately $21,157 per percent increase in benefit estimated by the MTCA Composite Benefit Score).

Implementing Cleanup Alternative 3 requires an investment of approximately $2.53 million, resulting in a MTCA Composite Benefit Score of 7.0, an increase of 84 percent over Cleanup Alternative 1 – No Action, and approximately 4 percent over Cleanup Alternative 2. Cleanup Alternative 3 increases the total cost to perform the cleanup action by approximately $845,000 over Cleanup Alternative 2 (approximately 50 percent); this added cost results in a slightly more beneficial cleanup alternative according to the MTCA Composite Benefit Score. However, the additional benefit is achieved at a cost of approximately $168,000 per percent increase, a disproportionate cost per added percent-increase in the MTCA Composite Benefit Score. Therefore, Cleanup Alternative 2 is preferred to Cleanup Alternative 3 because it meets the requirements of MTCA to remediate the Site without incurring disproportionate costs for marginal additional benefit.

Implementing Cleanup Alternative 4 would cost approximately 19 times the estimated cost for Cleanup Alternative 2 to increase the MTCA Composite Benefit Score to 8.1, an approximately 21 percent increase (an approximately $1.4 million per percent increase in benefit estimated by the MTCA Composite Benefit Score). Although Alternative 4 provides some additional environmental benefits over Cleanup Alternative 2 as demonstrated by their MTCA Composite Benefit Scores, the additional cost is clearly disproportionate to the benefits gained.

Implementing Cleanup Alternative 2 offers the greatest environmental benefit estimated by the MTCA Composite Benefit Score for the unit cost incurred of the four Cleanup Alternatives evaluated. Cleanup Alternative 2 (Limited Source Removal, Institutional and Engineered Controls, and Monitored Natural Attenuation) therefore is selected as the preferred Cleanup Alternative for application at the Site.

5.4 PREFERRED CLEANUP ALTERNATIVE

Cleanup Alternative 2 (Limited Source Removal, Institutional and Engineered Controls, and Monitored Natural Attenuation) is the preferred Cleanup Alternative. Selection of Cleanup Alternative 2 as the preferred Cleanup Alternative was based on the results from the evaluation presented in Section 5.3, Cleanup Alternative Evaluation, which was conducted in accordance with the requirements set forth in MTCA under WAC 173-340-350 through 173-340–370, and based on Farallon's best professional judgment for implementing cleanup technologies at the Site. The results from the FS Cleanup Alternative evaluation are summarized in Table 9. Figure 3 depicts the primary elements that would be implemented under Cleanup Alternative 2.

Preferred Cleanup Alternative 2 satisfies the MTCA threshold criteria specified in WAC 173-340-360(2)(a) and meets additional requirements specified in WAC 173-340-360(2)(b), and expectations specified in WAC 173-340-370. While Cleanup Alternative 3 includes additional remediation of soil and groundwater in Area 1, the additional environmental benefit is achieved at a disproportionate cost to the incremental gains in the MTCA Composite Benefit Score. Alternative 4 also achieves a slightly higher MTCA Composite Benefit Score than the preferred Cleanup Alternative, but at a cost that is clearly disproportionate to the additional environmental benefits realized and has the highest degree of public concern associated with the impacts to the business. Cleanup Alternative 2 therefore uses permanent solutions to the maximum extent practicable per WAC 173-340-360(3)(f) and Ecology (2009) and achieves the highest MTCA Benefit Score that is practicable of 6.7. The basis for the MTCA Composite Benefit Score derived for Cleanup Alternative 2 is summarized below:

- Protectiveness is considered favorable, with a score of 7 out of 10 reflecting a high degree of protectiveness provided by source excavation and the added surface barrier system in Area 3. Engineered controls provide for periodic inspection and maintenance of the containment systems. Institutional controls in the form of an environmental covenant limit future exposure, and a groundwater monitoring program would enable evaluation of natural attenuation processes over time.

- Permanence is considered acceptable, with a score of 5 out of 10 resulting from the source area excavations with disposal at a permitted off-Site disposal facility, and reliance on permanent and reliable engineered barrier systems to limit future mobility, rather than involving widespread destruction at the Site.
- Long-Term Effectiveness is considered acceptable, with a score of 6 out of 10 based on reliance on engineered barriers and natural attenuation processes, the associated environmental covenant, and periodic inspection and repair of the barrier systems outside source excavation areas.
- Short-Term Risk Management is considered very favorable, with a score of 8 out of 10, indicating low risk and impact to facility operations from source area excavations.
- Implementability is considered very favorable, with a score of 8 out of 10, as limited source excavation, paving, and institutional and engineered controls are readily implementable and would occur in areas having a low impact on facility operations.
- Public Concerns are considered very favorable, with a score of 8 out of 10, as public perception during excavation work is anticipated to have minimal impact.

5.5 IMPLEMENTATION

Technical elements, including the preliminary cleanup levels and the points of compliance for the remedial action at the Site, are described in Section 4. Cleanup Alternative 2 (Limited Source Removal, Institutional and Engineered Controls, and Monitored Natural Attenuation) achieves the preliminary cleanup levels that are protective of human health direct contact exposure to COCs at the selected points of compliance in a reasonable restoration time frame, estimated to be 15 years. Implementation of Cleanup Alternative 2 consists of the following primary elements that would be incorporated into a CAP:

- Preparing an EMMP per WAC 173-340-810.
- Preparing a Compliance Monitoring Plan and an associated SAP for performance, protection, and confirmation monitoring per WAC 173-340-410.
- Obtaining necessary permits, including but not limited to a clearing and grading permit associated with planned excavation activities.
- Negotiating a Site access agreement with the current operator of the YSF business prior to mobilization and preparing the Site for cleanup. Materials and equipment in areas subject to cleanup would be relocated, and erosion- and runoff-control measures would be implemented as needed prior to excavation.
- Excavating soil with COCs exceeding preliminary cleanup levels. Select portions of Area 3 would be excavated to depths ranging from 3 to 6 feet bgs. No shoring is anticipated for the shallow soil excavation activities. A 1:1 slope back is assumed for each remedial excavation area.

- Disposing of excavated soil containing COCs at concentrations exceeding preliminary cleanup levels at a Subtitle C or D landfill and/or an approved facility authorized to accept metals- and/or petroleum-contaminated soil. For the purposes of this FS, it was assumed that approximately 450 tons of soil will be excavated, transported, and disposed of at a Subtitle C landfill, and approximately 3,100 tons of soil will be disposed of at a Subtitle D landfill.
- Importing and compacting backfill material and restoring to the surrounding grade in preparation of placement of an asphalt cap.
- Paving the entirety of Area 3 (approximately 84,000 square feet) with approximately 4 inches of asphalt to provide a physical barrier to eliminate direct contact with residual soil with concentrations of COCs that exceed cleanup levels, and to minimize surface water infiltration.
- Sealing the existing 85,000 square feet of asphalt in Area 1 to eliminate direct contact with residual soil with concentrations of COCs, and to minimize surface water infiltration.
- Conducting semiannual groundwater monitoring events for the first year, and annual groundwater monitoring events for Years 2 through 5. Biannual groundwater monitoring will be conducted for Years 6 through 15. Wells would be monitored for indicator COCs and natural attenuation geochemical parameters. The environmental covenant would reference and require implementation of a Groundwater Monitoring Plan.
- Preparing annual progress reports documenting cleanup action activities completed to date and planned, and summarizing compliance groundwater monitoring.

Implementation of Cleanup Alternative 2 is described in Section 5.2.3, Cleanup Alternative 2 – Limited Source Removal, Institutional and Engineered Controls, and Monitored Natural Attenuation. Details of the implementation of Cleanup Alternative 2 will be provided in a CAP to be prepared per WAC 173-340-380.

The estimated cost to complete Cleanup Alternative 2 is summarized below from Table 7 and is estimated to be $1,625,000.

5.6 COMPLIANCE MONITORING

Compliance monitoring will be conducted during excavation in accordance with a Compliance Monitoring Plan, as specified in WAC 173-340-410, which will include protection, performance, and confirmation soil sampling. The post-remediation Groundwater Monitoring Plan will include sampling of up to groundwater monitoring wells semiannually for 1 year, annually for 4 years through Year 5, and biannually for Years 6 through 15 following completion of the source area excavations (Figure 5).

5.7 RESTORATION TIME FRAME

As indicated in Section 5.3.2, Evaluation Results, preliminary groundwater cleanup standards are expected to be attained within approximately 15 years of completion of source area excavations. Achievement of cleanup standards for chlorinated pesticides and HVOCs in soil outside the source area excavations will be monitored as natural attenuation processes occur in Area 1. Soil with COCs that exceed preliminary cleanup levels herein that is not directly excavated will be contained within the boundaries of the 8.6-acre property comprising the Site. The conditional point of compliance for soil and groundwater would be managed by recording an environmental covenant on the property deed. The restoration time frame is considered reasonable under MTCA, as additional protective controls, inspections, and monitoring will be employed, no off-Site effects of COCs from source areas at the Site have been identified, and cleanup levels for shallow groundwater will be attained in a reasonable restoration time frame.

As indicated in Section 5.2.3.2, Time Frame and Estimated Cost, the active excavation elements of Cleanup Alternative 2 would be implemented over the period of approximately 1 month. The environmental covenant recorded on the property deed would be developed over the course of up to 6 months, and long-term institutional and engineered controls would be implemented until preliminary cleanup levels have been demonstrated to have been achieved. For the purposes of this FS, monitoring, inspections, and maintenance activities were assumed to be completed in Year 5.

5.8 CONTINGENCY ACTIONS

The decision process for evaluating whether modifications to the selected Cleanup Alternative are warranted, and the monitoring requirements that will be implemented to document effectiveness will be provided in the CAP and the associated Compliance Monitoring Plan to be prepared. The primary contingency action trigger will be non-compliance with applicable groundwater cleanup levels in groundwater samples collected from the monitoring well network by the end of Year 5, as set forth in the CAP.

6.0 BIBLIOGRAPHY

ERC and Pacific Groundwater Group. 1997. *Former Bay Chemical Site Remedial Investigation Report, Volume 1.* March.

Farallon Consulting, L.L.C. (Farallon). 2004. *Revised Remedial Investigation Report, Agri-Tech & Yakima Steel Fabricators, 6 and 10^1/$_2$ East Washington Avenue, Yakima, Washington*. Prepared for Yakima Steel Fabricators. June 15.

———. 2011. *Feasibility Study Work Plan, Agri-Tech and Yakima Steel Fabricators, 6 and 10^1/$_2$ East Washington Avenue, Yakima, Washington*. Prepared for Yakima Steel Fabricators, Inc. May 3.

———. 2017a. Technical Memorandum Regarding Metals Source Evaluation, Agri-Tech and Yakima Steel Fabricators Site, Yakima, Washington. From Eric Buer and Jeff Kaspar. To Chris Wend, Washington State Department of Ecology. June 9.

———. 2017b. Technical Memorandum Regarding Wetland Evaluation Technical Memorandum, Agri-Tech and Yakima Steel Fabricators Site, Yakima, Washington. From Eric Buer and Jeff Kaspar. To Chris Wend, Washington State Department of Ecology. July 17.

———. 2018a. Letter Regarding *March 2018—Quarterly Groundwater Monitoring and Sampling and Annual Containment Area Inspection Progress Report, Bay Chemical Site, Yakima, Washington*. From Emerald Erickson-Mulanax and Amy Essig Desai. To Chris Wend, Washington State Department of Ecology. April 9.

———. 2018b. Technical Memorandum Regarding Conceptual Site Model Technical Memorandum, Agri-Tech & Yakima Steel Fabricators Site, Yakima Steel Fabricators, Yakima, Washington. From Eric Buer and Jeff Kaspar. To Chris Wend, Washington State Department of Ecology. November 14.

SECOR International Incorporated. 1998. *Draft Remedial Investigation, Yakima Railroad Area, Yakima, Washington.* Volume 1 of 3. Prepared for Cameron Yakima Working Group, c/o Mark Valentine, de maximis, inc. December 31.

Washington State Department of Ecology (Ecology). 2008. *Agreed Order No. DE 6091 in the Matter of Remedial Action by: Yakima Steel Fabricators, Inc*. Effective October 27.

———. 2016. *First Amendment to Agreed Order No. DE 6091 in the Matter of Remedial Action by: Yakima Steel Fabricators, Inc*. October 17.

———. 2016. *Feasibility Study Checklist.* Toxics Cleanup Program. Publication No. 16-09-007. May.

———. 2018a. *Yakima Railroad Area, PCE Contamination, Groundwater Quality Performance Monitoring Data Summary 2017*. Toxics Cleanup Program. Publication No. 18-03-027. July.

———. 2018b. Letter Regarding Conceptual Site Model Technical Memorandum Agri-Tech and Yakima Steel Fabricators Site, Site Name: Agri Tech and Yakima Steel Fabricators; Site Address: 6 & 10½ E Washington, Yakima; Facility/Site ID No.: 479; Cleanup Site ID No.: 3639. From Chris Wend. To Jeff Kaspar, Farallon Consulting, L.L.C. December 21.

7.0 LIMITATIONS

7.1 GENERAL LIMITATIONS

The conclusions contained in this report/assessment are based on professional opinions with regard to the subject matter. These opinions have been arrived at in accordance with currently accepted hydrogeologic and engineering standards and practices applicable to this location. The conclusions contained herein are subject to the following inherent limitations:

- **Accuracy of Information**. Farallon obtained, reviewed, and evaluated certain information used in this report/assessment from sources that were believed to be reliable. Farallon's conclusions, opinions, and recommendations are based in part on such information. Farallon's services did not include verification of its accuracy or authenticity. Should the information upon which Farallon relied prove to be inaccurate or unreliable, Farallon reserves the right to amend or revise its conclusions, opinions, and/or recommendations.
- **Reconnaissance and/or Characterization**. Farallon performed a reconnaissance and/or characterization of the Site that is the subject of this report/assessment to document current conditions. Farallon focused on areas deemed more likely to exhibit hazardous materials conditions. Contamination may exist in other areas of the Site that were not investigated or were inaccessible. Site activities beyond Farallon's control could change at any time after the completion of this report/assessment.

For the foregoing reasons, Farallon cannot and does not warrant or guarantee that the Site is free of hazardous or potentially hazardous substances or conditions, or that latent or undiscovered conditions will not become evident in the future. Farallon's observations, findings, and opinions can be considered valid only as of the date of the report.

This report/assessment has been prepared in accordance with the contract for services between Farallon and Yakima Steel Fabricators, Inc., and currently accepted industry standards. No other warranties, representations, or certifications are made.

7.2 LIMITATION ON RELIANCE BY THIRD PARTIES

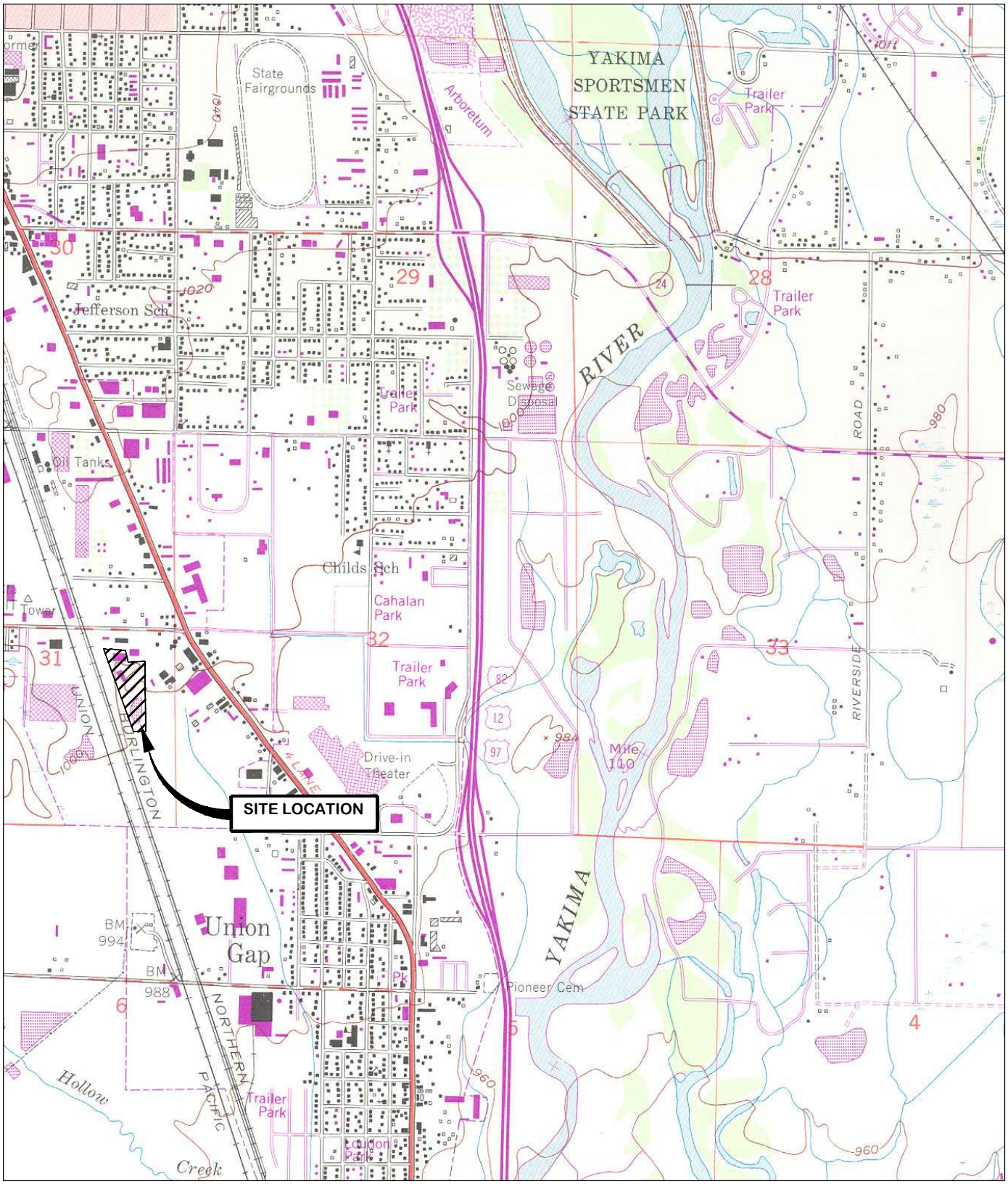
Reliance by third parties is prohibited. This report has been prepared for the exclusive use of Yakima Steel Fabricators, Inc., to address the unique needs of Yakima Steel Fabricators, Inc. at the Site at a specific point in time.

This is not a general grant of reliance. No one other than Yakima Steel Fabricators, Inc. may rely on this report unless Farallon agrees in advance to such reliance in writing. Any unauthorized use, interpretation, or reliance on this report/assessment is at the sole risk of that party, and Farallon will have no liability for such unauthorized use, interpretation, or reliance.

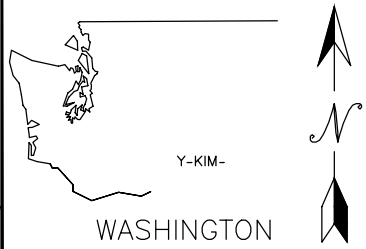
FIGURES

FEASIBILITY STUDY REPORT
Agri-Tech and Yakima Steel Fabricators
6 and 10½ East Washington Avenue
Yakima, Washington

Farallon PN: 765-001



R= =R=NC=: 7.5 MINUT= USGS QUADRANGL= YAKIMA SOUTH, WASHINGTON. DAT=D 1953 AND PHOTOR=VIS=D 1981



FARALLON CONSULTING

Washington
Issaquah | Bellingham | Seattle

Oregon
Portland | Baker City

California
Oakland | Folsom | Irvine

Quality Service for Environmental Solutions | farallonconsulting.com

FIGURE 1

SITE VICINITY MAP
AGRI-TECH AND YAKIMA STEEL FABRICATORS
6 & 10 ½ EAST WASHINGTON AVENUE
YAKIMA, WASHINGTON

FARALLON PN: 765-001

Drawn By: DEW | Checked By: EB | Date: 4/3/2019 | Disk Reference: 765001A

R:\Projects\765-001\CAD\Feasibility Study\765-001a.dwg 2/7/2020 9:39 AM (Nick Miller)

LEGEND

- AREA BOUNDARY
- SITE BOUNDARY
- TAX PARCEL BOUNDARY
- FENCE
- RAILROAD
- BAY CHEMICAL CLEANUP AREA
- APPROXIMATE BOUNDARY OF FORMER YAKIMA FARMERS SUPPLY WASTE PIT
- AREA = 1 — FORMER YAKIMA FARMERS SUPPLY WASTE PIT LOCATION
- AREA = 2 — FORMER YAKIMA FARMER SUPPLY LIME AND SULFUR STOCKPILE LOCATIONS
- AREA = 3 — YAKIMA STEEL STORAGE YARD AND WETLAND AREA
- AREA = 4 — FORMER POND / CURRENT WETLANDS AREA
- EXISTING CONCRETE SLAB
- EXISTING ASPHALT SURFACE
- 75' WETLAND BUFFER

- MW-7 — SHALLOW MONITORING WELL INSTALLED BY FARALLON (2002)
- MW-7B — DEEP MONITORING WELL INSTALLED BY FARALLON (2002)
- MW-2 — SHALLOW MONITORING WELL INSTALLED BY AGRA EARTH & ENVIRONMENTAL, INC. (1997)
- MW-4 — DEEP MONITORING WELL INSTALLED BY AGRA EARTH & ENVIRONMENTAL, INC. (1997)
- WDOE-6 — MONITORING WELL INSTALLED BY ECOLOGY (1992)
- MW-1 — BAY CHEMICAL MONITORING WELL (2009)
- MW-5 — DECOMMISSIONED MONITORING WELL

NOTE:

1. FIGURES WERE PRODUCED IN COLOR. GRAYSCALE COPIES MAY NOT REPRODUCE ALL ORIGINAL INFORMATION

FORMER BAY CHEMICAL FLUE DUST STOCKPILE AREA

FORMER BAY CHEMICAL SLUDGE SETTLING POND AREA

PARCEL # 19133141010
BAY CHEMICAL SITE

PARCEL # 19133141408

PARCEL # 19133141409

ASPHALT

- AREA 1 -

MW-10

ASPHALT

OFFICES

FABRICATION AREA

YAKIMA STEEL FABRICATORS BUILDING

WASTE PIT

CONCRETE

AGRI-TECH BUILDING
(FORMER LIME SULFUR FORMULATING PLANT LOCATION)

CONCRETE

MW-1

WDOE-6

EAST WASHINGTON AVENUE

BUILDING
(FORMER YAKIMA FARMERS SUPPLY MAIN WAREHOUSE)

PARCEL # 19133141005

- ASPHALT -

(FORMER YAKIMA FARMERS SUPPLY LEASED WAREHOUSE)

PARCEL # 19133141011
BUILDING

- ASPHALT -

BNSF RAILROAD SPUR

PARCEL # 19133114003

MW-5

- AREA 3 -

CANOPY

FABRICATION AND LOADING AREA

MW-6

MW-2

ASPHALT

STEEL STORAGE AREA

- AREA 2 -

MW-11

- DITCH -

75' WETLAND BUFFER

MATERIALS STORAGE AREA

- GRAVEL -

- AREA 4 -

FORMER POND / CURRENT WETLANDS AREA

OLD BARB WIRE FENCE

PARCEL # 19133141009

- GRAVEL -

- GRAVEL -

ROAD

MW-4

MW-3

- DITCH -

- DITCH -

PARCEL # 19133232408

PARCEL # 19133232433

CASCADE AUTO RECYCLING

PARCEL # 19133141406

PARCEL # 19133233009

0 100

APPROXIMATE SCALE IN FEET

FARALLON CONSULTING

Washington
Issaquah | Bellingham | Seattle

Oregon
Portland | Baker City

California
Oakland | Folsom | Irvine

Quality Service for Environmental Solutions | farallonconsulting.com

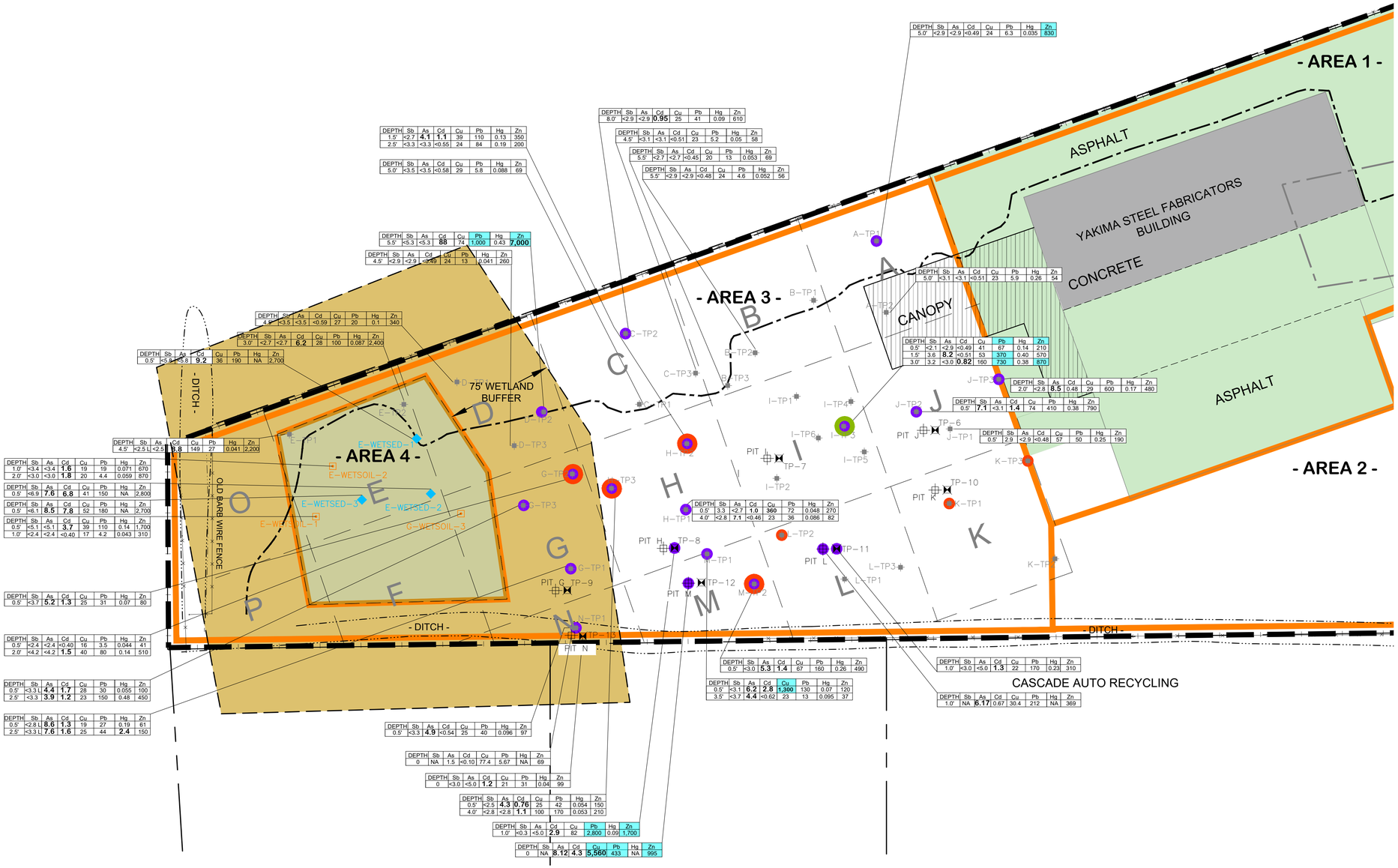
FIGURE 2

SITE PLAN AND TAX PARCEL LOCATIONS
AGRI-TECH AND YAKIMA STEEL FABRICATORS
6 & 10 ½ EAST WASHINGTON AVENUE
YAKIMA, WASHINGTON

FARALLON PN: 765-001

Drawn By: LT | Checked By: EB | Date: 5/7/2019 | Disk Reference: 765001a

R:\Projects\765-001\CAD\Feasibility Study\765-001a.dwg 2/7/2020 10:39 AM (Nick Miller)



DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
5.0'	<2.9	<2.9	<0.49	24	6.3	0.035	830

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
8.0'	<2.9	<2.6	**0.95**	25	41	0.09	610

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
4.5'	<3.1	<3.1	<0.51	23	5.2	0.05	58

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
5.5'	<2.7	<2.7	<0.45	20	13	0.053	69

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
5.5'	<2.9	<2.9	<0.48	24	4.6	0.052	56

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
1.5'	<2.7	**4.1**	**1.1**	39	110	0.13	350
2.5'	<3.3	<3.3	<0.55	24	84	0.19	200

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
5.0'	<3.5	<3.5	<0.58	29	5.8	0.088	69

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
5.5'	<5.3	<5.3	**88**	74	1,000	0.43	**7,000**

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
4.5'	<2.9	<2.9	<0.49	24	13	0.041	260

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
4.5'	<3.5	<3.5	<0.59	27	20	0.1	340

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
3.0'	<2.7	<2.7	**6.2**	28	100	0.087	2,400

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
0.5'	<5.8	<5.8	**9.2**	36	190	NA	2,700

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
5.0'	<3.1	<3.1	<0.51	23	5.9	0.26	54

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
0.5'	<2.1	<2.9	<0.49	41	67	0.14	210
1.5'	3.6	**8.2**	<0.51	53	370	0.40	570
3.0'	3.2	<3.0	**0.82**	160	730	0.38	870

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
2.0'	<2.8	**8.5**	0.48	29	600	0.17	480

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
0.5'	**7.1**	<3.1	**1.4**	74	410	0.38	790

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
0.5'	<2.9	<2.9	<0.48	57	50	0.25	190

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
4.5'	<2.5 L	<2.5	**9.8**	149	27	0.041	2,200

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
1.0'	<3.4	<3.4	**1.6**	19	19	0.071	670
2.0'	<3.0	<3.0	**1.8**	20	4.4	0.059	870

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
0.5'	<6.9	**7.6**	**6.8**	41	150	NA	2,800

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
0.5'	<6.9	**7.6**	**6.8**	41	150	NA	2,800

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
0.5'	<6.1	**8.5**	**7.8**	52	180	NA	2,700

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
0.5'	<5.1	<5.1	**3.7**	39	110	0.14	1,700
1.0'	<2.4	<2.4	<0.40	17	4.2	0.043	310

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
0.5'	<3.7	**5.2**	**1.3**	25	31	0.07'	80

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
0.5'	<2.4	<2.4	<0.40	16	3.5	0.044	41
2.0'	<4.2	<4.2	**1.5**	40	80	0.14	510

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
0.5'	<3.3 L	**4.4**	**1.7**	28	30	0.055	100
2.5'	<3.3	**3.9**	**1.2**	23	150	0.48	450

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
0.5'	<2.8 L	**8.6**	**1.3**	19	27	0.19	61
2.5'	<3.3 L	**7.6**	**1.6**	25	44	**2.4**	150

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
0.5'	<3.3	**4.9**	<0.54	25	40	0.096	97

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
0	NA	1.5	<0.10	77.4	5.67	NA	69

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
0	<3.0	<5.0	**1.2**	21	31	0.04	99

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
0.5'	<2.5	**4.3**	**0.76**	25	42	0.054	150
4.0'	<2.8	<2.8	**1.1**	100	170	0.053	210

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
1.0'	<0.3	<5.0	**2.9**	82	2,800	0.09	1,700

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
0	NA	**8.12**	**4.3**	**5,560**	433	NA	995

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
0.5'	3.3	<2.7	**1.0**	**360**	72	0.048	270
4.0'	<2.8	**7.1**	<0.46	23	36	0.086	82

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
0.5'	<3.0	**5.3**	**1.4**	67	160	0.26	490

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
0.5'	<3.1	**6.2**	**2.8**	**1,300**	130	0.07	120
3.5'	<3.7	**4.4**	<0.62	23	13	0.095	37

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
1.0'	<3.0	<5.0	**1.3**	22	170	0.23	310

DEPTH	Sb	As	Cd	Cu	Pb	Hg	Zn
1.0'	<3.0	**6.17**	0.67	30.4	212	NA	369

LEGEND

- AREA BOUNDARY
- SITE BOUNDARY
- TAX PARCEL BOUNDARY
- FENCE
- RAILROAD
- BAY CHEMICAL CLEANUP AREA
- APPROXIMATE BOUNDARY OF FORMER YAKIMA FARMERS SUPPLY WASTE PIT
- **AREA 1** FORMER YAKIMA FARMERS SUPPLY WASTE PIT LOCATION
- **AREA 2** FORMER YAKIMA FARMERS SUPPLY LIME AND SULFUR STOCKPILE LOCATIONS
- **AREA 3** YAKIMA STEEL STORAGE YARD
- **AREA 4** FORMER POND / CURRENT WETLANDS AREA
- D–TP3 TEST PIT LOCATION FARALLON CONSULTING (2011)
- E–WETSED–1 WET SEDIMENT SAMPLE LOCATION FARALLON CONSULTING (2011)
- E–WETSOIL–2 WET SOIL SAMPLE LOCATION FARALLON CONSULTING (2011)
- PIT B WASHINGTON STATE DEPARTMENT OF ECOLOGY (ECOLOGY) TEST PIT (2007)
- TP–2 ENVIRONMENTAL PARTNERS, INC. TEST PIT (2007)
- M ECOLOGY SAMPLING GRID DESIGNATION
- AREA OF EXISTING ASPHALT CAP
- AREA OF EXISTING CONCRETE CAP
- 75' WETLAND BUFFER

Sb = ANTIMONY
As = ARSENIC
Cd = CADMIUM
Cu = COPPER
Pb = LEAD
Hg = MERCURY
Zn = ZINC
NA = NOT ANALYZED
< = INDICATES CONCENTRATIONS NOT DETECTED AT OR ABOVE THE STATED LABORATORY PRACTICAL QUANTITATION LIMIT

SOIL ANALYTICAL RESULTS IN MILLIGRAMS PER KILOGRAM
DEPTH IN FEET (') BELOW GROUND SURFACE (BGS)

ANALYTE HIGHLIGHTED IN BLUE EXCEEDS CLEANUP LEVEL BASED ON PRIORITY CONTAMINANTS OF ECOLOGICAL CONCERN FOR SOIL LESS THAN 6' BGS

CLEANUP LEVELS PROTECTIVE OF GROUNDWATER

Sb	As	Cd	Cu	Pb	Hg	Zn
5.42	2.92	0.69	284	3,000	2.09	5,970

CLEANUP LEVELS FOR CONTAMINANTS OF ECOLOGICAL CONCERN IN BIOLOGICALLY ACTIVE ZONE

Sb	As	Cd	Cu	Pb	Hg	Zn
NA	20	36	550	220	9	570

BOLD = INDICATES CONCENTRATIONS EXCEED WASHINGTON STATE MODEL TOXICS CONTROL ACT CLEANUP REGULATION METHOD B CLEANUP LEVELS PROTECTIVE OF GROUNDWATER.

NA = NOT APPLICABLE

PCUL = PRELIMINARY CLEANUP LEVEL

- > PCUL FOR DRO
- > PCUL FOR DIELDRIN/ALDRIN
- > PCUL FOR METALS

FARALLON IS REQUESTING AN EXCEPTIONS FOR THREE SOIL SAMPLES, INCLUDING G-TP1, G-TP3, AND M-TP3 WHICH ARE EITHER INSIDE THE AREA 4 BUFFER OR SO CLOSE THAT EXCAVATION IS IMPRACTICAL WITHOUT DISTURBING THE BUFFER.

NOTE:

1. FIGURES WERE PRODUCED IN COLOR. GRAYSCALE COPIES MAY NOT REPRODUCE ALL ORIGINAL INFORMATION.

N

0 40
APPROXIMATE SCALE IN FEET

FARALLON CONSULTING
Quality Service for Environmental Solutions | farallonconsulting.com

Washington: Issaquah | Bellingham | Seattle
Oregon: Portland | Baker City
California: Oakland | Folsom | Irvine

FIGURE 3

SOIL ANALYTICAL RESULTS
FOR METALS
AGRI-TECH AND YAKIMA STEEL FABRICATORS
6 & 10 ½ EAST WASHINGTON AVENUE
YAKIMA, WASHINGTON

FARALLON PN: 765-001

Drawn By: LT | Checked By: EB | Date: 5/7/2019 | Disk Reference: 765001A

R:\Projects\765-001\CAD\Feasibility Study\765-001a.dwg 2/7/2020 10:37 AM (Nick Miller)

LEGEND

- AREA BOUNDARY
- SITE BOUNDARY
- TAX PARCEL BOUNDARY
- FENCE
- RAILROAD
- APPROXIMATE BOUNDARY OF FORMER YAKIMA FARMERS SUPPLY WASTE PIT
- GROUNDWATER ANALYTICAL RESULTS ARE IN MICROGRAMS PER LITER
- PCE = TETRACHLOROETHENE
- TCE = TRICHLOROETHENE
- CIS-1,2-DCE = CIS 1,2-DICHLOROETHENE
- VC = VINYL CHLORIDE
- VOCs = VOLATILE ORGANIC COMPOUNDS
- -- = NOT ANALYZED
- < = INDICATES CONCENTRATIONS NOT DETECTED AT OR ABOVE THE STATED LABORATORY PRACTICAL QUANTITATION LIMIT

CLEANUP LEVELS	PCE	TCE	CIS-1,2-DCE	VC
	5	5	16	0.20

ANALYTE HIGHLIGHTED IN BLUE EXCEEDS CLEANUP LEVEL INDICATED IN TABLE ABOVE.

- MW-7- SHALLOW MONITORING WELL INSTALLED BY FARALLON (2002)
- MW-7B DEEP MONITORING WELL INSTALLED BY FARALLON (2002)
- MW-2 SHALLOW MONITORING WELL INSTALLED BY AGRA EARTH & ENVIRONMENTAL, INC. (1997)
- MW-4 DEEP MONITORING WELL INSTALLED BY AGRA EARTH & ENVIRONMENTAL, INC. (1997)
- MW-5 DECOMMISSIONED WELL DURING BAY CHEMICAL CLEANUP (2007)
- =-6 MONITORING WELL INSTALLED BY ECOLOGY (1992)
- MW-10 BAY CHEMICAL MONITORING WELL (2009)
- AREA OF EXISTING ASPHALT SURFACE
- AREA OF EXISTING CONCRETE SLAB
- (995.68) GROUNDWATER ELEVATION IN FEET (JUNE , 2011) RELATIVE TO NAVD 29 DATUM
- 995.50 GROUNDWATER ELEVATION CONTOUR DASHED WHERE INFERRED
- APPROXIMATE DIRECTION OF GROUNDWATER FLOW

NOTE:

1. FIGURES WERE PRODUCED IN COLOR. GRAYSCALE COPIES MAY NOT REPRODUCE ALL ORIGINAL INFORMATION

DATE	PCE	TCE	CIS-1,2-DCE	VC
12/3/97	<1.0	1.51	12.4	2.42
3/3/98	1.59	1.46	3.21	<1.0
6/3/98	<1.0	<1.0	7.13	<1.0
9/2/98	1.27	3.06	17.6	<1.0
12/4/02	<2	<2	15	<2.0
6/1/11	1.6	1.5	8.9	0.025

DATE	PCE	TCE	CIS-1,2-DCE	VC
12/3/97	3.64	<1.0	<1.0	<1.0
3/3/98	3.39	<1.0	<1.0	<1.0
6/3/98	6.5	1.18	<1.0	<1.0
9/2/98	4.22	0.71	0.25	<1.0
12/3/02	6	<2	<2	<2
6/2/11	3.2	0.31	0.10	<0.020

DATE	PCE	TCE	CIS-1,2-DCE	VC
5/92	420	430	270	<10
12/3/97	---	---	---	---
3/3/98	49.6	108	83.7	4.24
6/3/98	75.6	60.4	45.6	<1.0
9/2/98	20.8	18.7	11.4	<1.0
12/3/02	<2	<2	14	<2
6/1/11	5.7	31	300	37

DATE	PCE	TCE	CIS-1,2-DCE	VC
6/2/11	1.8	0.10	<0.10	<0.020

DATE	PCE	TCE	CIS-1,2-DCE	VC
6/2/11	1.6	0.22	<0.10	<0.020

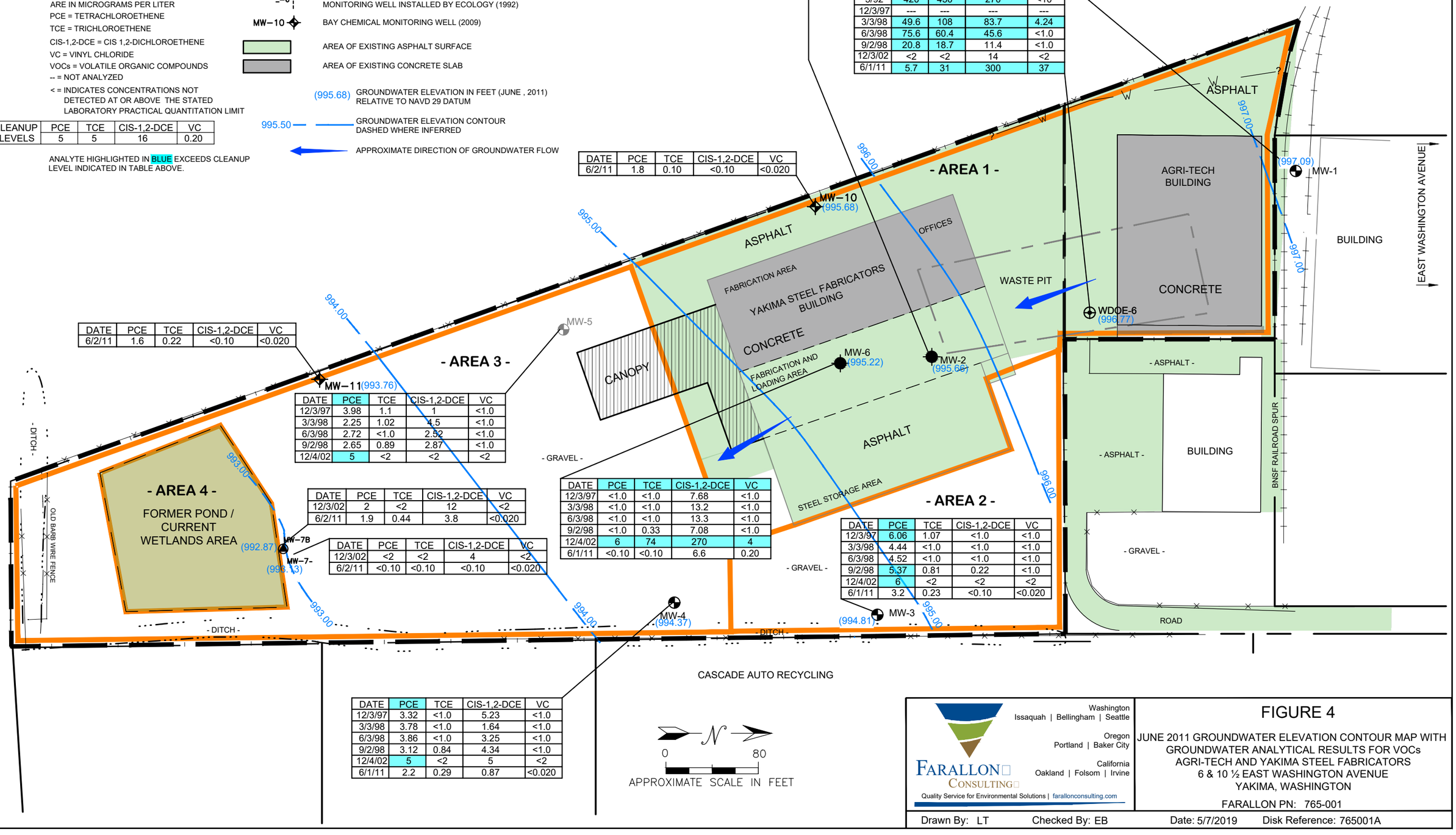
DATE	PCE	TCE	CIS-1,2-DCE	VC
12/3/02	2	<2	12	<2
6/2/11	1.9	0.44	3.8	<0.020

DATE	PCE	TCE	CIS-1,2-DCE	VC
12/3/02	<2	<2	4	<2
6/2/11	<0.10	<0.10	<0.10	<0.020

DATE	PCE	TCE	CIS-1,2-DCE	VC
12/3/97	3.32	<1.0	5.23	<1.0
3/3/98	3.78	<1.0	1.64	<1.0
6/3/98	3.86	<1.0	3.25	<1.0
9/2/98	3.12	0.84	4.34	<1.0
12/4/02	5	<2	5	<2
6/1/11	2.2	0.29	0.87	<0.020

DATE	PCE	TCE	CIS-1,2-DCE	VC
12/3/97	<1.0	<1.0	7.68	<1.0
3/3/98	<1.0	<1.0	13.2	<1.0
6/3/98	<1.0	<1.0	13.3	<1.0
9/2/98	<1.0	0.33	7.08	<1.0
12/4/02	6	74	270	4
6/1/11	<0.10	<0.10	6.6	0.20

DATE	PCE	TCE	CIS-1,2-DCE	VC
12/3/97	6.06	1.07	<1.0	<1.0
3/3/98	4.44	<1.0	<1.0	<1.0
6/3/98	4.52	<1.0	<1.0	<1.0
9/2/98	5.37	0.81	0.22	<1.0
12/4/02	6	<2	<2	<2
6/1/11	3.2	0.23	<0.10	<0.020



FARALLON CONSULTING
Quality Service for Environmental Solutions | farallonconsulting.com

Washington
Issaquah | Bellingham | Seattle

Oregon
Portland | Baker City

California
Oakland | Folsom | Irvine

FIGURE 4

JUNE 2011 GROUNDWATER ELEVATION CONTOUR MAP WITH GROUNDWATER ANALYTICAL RESULTS FOR VOCs
AGRI-TECH AND YAKIMA STEEL FABRICATORS
6 & 10 ½ EAST WASHINGTON AVENUE
YAKIMA, WASHINGTON

FARALLON PN: 765-001

Drawn By: LT | Checked By: EB | Date: 5/7/2019 | Disk Reference: 765001A

R:\Projects\765-001\CAD\Feasibility Study\765-001a.dwg 2/7/2020 9:52 AM (Nick Miller)

LEGEND

- AREA BOUNDARY
- SITE BOUNDARY
- TAX PARCEL BOUNDARY
- FENCE
- RAILROAD
- BAY CHEMICAL CLEANUP AREA
- APPROXIMATE BOUNDARY OF FORMER YAKIMA FARMERS SUPPLY WASTE PIT
- AREA = 1 — FORMER YAKIMA FARMERS SUPPLY WASTE PIT LOCATION
- AREA = 2 — FORMER YAKIMA FARMER SUPPLY LIME AND SULFUR STOCKPILE LOCATIONS
- AREA = 3 — YAKIMA STEEL STORAGE YARD
- AREA = 4 — FORMER POND / CURRENT WETLANDS AREA
- D–TP3 — TEST PIT LOCATION FARALLON CONSULTING (2011)
- PIT B — WASHINGTON STATE DEPARTMENT OF ECOLOGY (ECOLOGY) TEST PIT (2007)
- TP–2 — ENVIRONMENTAL PARTNERS, INC. TEST PIT (2007)
- PROPOSED EXCAVATION BOTTOM AND TOP AREA
- PROPOSED AREA OF NEW ASPHALT CAP
- AREA OF EXISTING ASPHALT CAP
- AREA OF EXISTING CONCRETE CAP
- 75' WETLAND BUFFER
- MW–7A — SHALLOW MONITORING WELL INSTALLED BY FARALLON (2002)
- MW–7B — DEEP MONITORING WELL INSTALLED BY FARALLON (2002)
- MW-2 — SHALLOW MONITORING WELL INSTALLED BY AGRA EARTH & ENVIRONMENTAL, INC. (1997)
- MW-4 — DEEP MONITORING WELL INSTALLED BY AGRA EARTH & ENVIRONMENTAL, INC. (1997)
- WDOE–6 — MONITORING WELL INSTALLED BY ECOLOGY (1992)
- MW–10 — BAY CHEMICAL MONITORING WELL (2009)
- MW-8 — PROPOSED MONITORING WELL
- CIRCLED WELLS ARE PROPOSED POINTS OF CONDITIONAL COMPLIANCE

NOTE:

1. FIGURES WERE PRODUCED IN COLOR. GRAYSCALE COPIES MAY NOT REPRODUCE ALL ORIGINAL INFORMATION

FORMER BAY CHEMICAL FLUE DUST STOCKPILE AREA

FORMER BAY CHEMICAL SLUDGE SETTLING POND AREA

PARCEL # 19133141010
BAY CHEMICAL SITE

PARCEL # 19133141408

ASPHALT

- AREA 1 -

YAKIMA STEEL FABRICATORS BUILDING

CONCRETE

AGRI-TECH BUILDING
(FORMER LIME SULFUR FORMULATING PLANT LOCATION)

CONCRETE

BUILDING
(FORMER YAKIMA FARMERS SUPPLY MAIN WAREHOUSE)

EAST WASHINGTON AVENUE

MW–1

MW–10

WDOE–6

MW–6

MW–2

FABRICATION AREA

FABRICATION AND LOADING AREA

CANOPY

PARCEL # 19133141005

- ASPHALT -

(FORMER YAKIMA FARMERS SUPPLY LEASED WAREHOUSE)

PARCEL # 19133141011
BUILDING

- ASPHALT -

BNSF RAILROAD SPUR

PARCEL # 19133114003

- GRAVEL -

ROAD

MW–11

- AREA 3 -

- GRAVEL -

MW-9

MW-8

STEEL STORAGE AREA

- AREA 2 -

- GRAVEL -

MW–4

MW-3

- DITCH -

- DITCH -

- DITCH -

- AREA 4 -
FORMER POND
CURRENT
WETLANDS AREA

MATERIALS STORAGE AREA

75' WETLAND BUFFER

OLD BARB WIRE FENCE

MW–7B

MW–7A

PARCEL # 19133232408

PARCEL # 19133232433

PARCEL # 19133233009

CASCADE AUTO RECYCLING

PARCEL # 19133141406

0 100

APPROXIMATE SCALE IN FEET

FARALLON CONSULTING
Quality Service for Environmental Solutions | farallonconsulting.com

Washington
Issaquah | Bellingham | Seattle

Oregon
Portland | Baker City

California
Oakland | Folsom | Irvine

FIGURE 5

CLEANUP ALTERNATIVE 2
AGRI-TECH AND YAKIMA STEEL FABRICATORS
6 & 10 ½ EAST WASHINGTON AVENUE
YAKIMA, WASHINGTON

FARALLON PN: 765-001

Drawn By: LT | Checked By: EB | Date: 5/7/2019 | Disk Reference: 765001a-FS

R:\Projects\765-001\Engineering\FeasibilityStudy\765-001a-FS.dwg 2/7/2020 10:45 AM (Nick Miller)

LEGEND

- AREA BOUNDARY
- SITE BOUNDARY
- TAX PARCEL BOUNDARY
- FENCE
- RAILROAD
- APPROXIMATE BOUNDARY OF FORMER YAKIMA FARMERS SUPPLY WASTE PIT
- AREA = 1 — FORMER YAKIMA FARMERS SUPPLY WASTE PIT LOCATION
- AREA = 2 — FORMER YAKIMA FARMER SUPPLY LIME AND SULFUR STOCKPILE LOCATIONS
- AREA = 3 — YAKIMA STEEL STORAGE YARD
- AREA = 4 — FORMER POND / CURRENT WETLANDS AREA
- D–TP3 — TEST PIT LOCATION FARALLON CONSULTING (2011)
- PIT B — WASHINGTON STATE DEPARTMENT OF ECOLOGY (ECOLOGY) TEST PIT (2007)
- TP–2 — ENVIRONMENTAL PARTNERS, INC. TEST PIT (2007)
- PROPOSED EXCAVATION BOTTOM AND TOP AREA
- PROPOSED AREA OF NEW ASPHALT CAP
- AREA OF EXISTING ASPHALT CAP
- AREA OF EXISTING CONCRETE CAP
- 75' WETLAND BUFFER
- IN-SITU CHEMICAL REDUCTION (ISCR) INJECTION POINT AND ESTIMATED RADIUS OF influence
- MW–7A — SHALLOW MONITORING WELL INSTALLED BY FARALLON (2002)
- MW–7B — DEEP MONITORING WELL INSTALLED BY FARALLON (2002)
- MW-2 — SHALLOW MONITORING WELL INSTALLED BY AGRA EARTH & ENVIRONMENTAL, INC. (1997)
- MW-4 — DEEP MONITORING WELL INSTALLED BY AGRA EARTH & ENVIRONMENTAL, INC. (1997)
- WDOE–6 — MONITORING WELL INSTALLED BY ECOLOGY (1992)
- MW–10 — BAY CHEMICAL MONITORING WELL (2009)
- MW-8 — PROPOSED MONITORING WELL
- CIRCLED WELLS ARE PROPOSED POINTS OF CONDITIONAL COMPLIANCE

NOTE:

1. FIGURES WERE PRODUCED IN COLOR. GRAYSCALE COPIES MAY NOT REPRODUCE ALL ORIGINAL INFORMATION

FORMER BAY CHEMICAL FLUE DUST STOCKPILE AREA

FORMER BAY CHEMICAL SLUDGE SETTLING POND AREA

PARCEL # 19133141010
BAY CHEMICAL SITE

PARCEL # 19133141408

PARCEL # 19133141005

PARCEL # 19133141011
BUILDING

PARCEL # 19133114003

PARCEL # 19133232408

PARCEL # 19133232433

PARCEL # 19133233009

CASCADE AUTO RECYCLING

PARCEL # 19133141406

- AREA 1 -
- AREA 2 -
- AREA 3 -
- AREA 4 -
FORMER POND
CURRENT
WETLANDS AREA

ASPHALT
CONCRETE
YAKIMA STEEL FABRICATORS BUILDING
FABRICATION AND LOADING AREA
CANOPY
STEEL STORAGE AREA
MATERIALS STORAGE AREA
- GRAVEL -
- ASPHALT -
- DITCH -
OLD BARB WIRE FENCE
75' WETLAND BUFFER
ROAD

AGRI-TECH BUILDING
(FORMER LIME SULFUR FORMULATING PLANT LOCATION)

BUILDING
(FORMER YAKIMA FARMERS SUPPLY MAIN WAREHOUSE)

(FORMER YAKIMA FARMERS SUPPLY LEASED WAREHOUSE)

EAST WASHINGTON AVENUE

BNSF RAILROAD SPUR

MW-1 MW-2 MW-3 MW-4 MW-6 MW-7A MW-7B MW-8 MW-9 MW–10 MW–11 WDOE-6

PIT A TP–1 PIT B B–TP1 TP–2 PIT C TP–3 PIT D TP–4 D–TP1 PIT E TP–5 E–TP1 E–TP2 PIT F TP–6 F–TP1 PIT G TP–9 G–TP1 G–TP2 G–TP3 PIT H TP–8 H–TP1 H–TP2 H–TP3 PIT I TP–7 I–TP1 I–TP2 I–TP3 I–TP4 I–TP5 I–TP6 PIT J TP–10 J–TP1 J–TP2 J–TP3 PIT K K–TP1 K–TP2 K–TP3 PIT L TP–11 L–TP1 L–TP2 L–TP3 PIT M TP–12 M–TP1 M–TP2 PIT N N–TP1 A–TP1 A–TP2 B–TP2 B–TP3 C–TP1 C–TP2 C–TP3

6' 4' 5' 3'

0 100
APPROXIMATE SCALE IN FEET

FARALLON CONSULTING
Quality Service for Environmental Solutions | farallonconsulting.com

Washington
Issaquah | Bellingham | Seattle

Oregon
Portland | Baker City

California
Oakland | Folsom | Irvine

FIGURE 6

CLEANUP ALTERNATIVE 3
AGRI-TECH AND YAKIMA STEEL FABRICATORS
6 & 10 ½ EAST WASHINGTON AVENUE
YAKIMA, WASHINGTON

FARALLON PN: 765-001

Drawn By: LT | Checked By: EB | Date: 5/7/219 | Disk Reference: 765001a-FS

R:\Projects\765-001\Engineering\FeasibilityStudy\765-001a-FS.dwg 2/7/2020 10:00 AM (Nick Miller)

LEGEND

- AREA BOUNDARY
- SITE BOUNDARY
- TAX PARCEL BOUNDARY
- FENCE
- RAILROAD
- APPROXIMATE BOUNDARY OF FORMER YAKIMA FARMERS SUPPLY WASTE PIT
- AREA = 1 — FORMER YAKIMA FARMERS SUPPLY WASTE PIT LOCATION
- AREA = 2 — FORMER YAKIMA FARMER SUPPLY LIME AND SULFUR STOCKPILE LOCATIONS
- AREA = 3 — YAKIMA STEEL STORAGE YARD
- AREA = 4 — FORMER POND / CURRENT WETLANDS AREA
- D–TP3 — TEST PIT LOCATION FARALLON CONSULTING (2011)
- PIT B — WASHINGTON STATE DEPARTMENT OF ECOLOGY (ECOLOGY) TEST PIT (2007)
- TP–2 — ENVIRONMENTAL PARTNERS, INC. TEST PIT (2007)

- PROPOSED EXCAVATION BOTTOM AND TOP AREA
- AREA OF EXISTING ASPHALT CAP
- AREA OF EXISTING CONCRETE CAP
- 75' WETLAND BUFFER
- MW–7A — SHALLOW MONITORING WELL INSTALLED BY FARALLON (2002)
- MW–7B — DEEP MONITORING WELL INSTALLED BY FARALLON (2002)
- MW-2 — SHALLOW MONITORING WELL INSTALLED BY AGRA EARTH & ENVIRONMENTAL, INC. (1997)
- MW-4 — DEEP MONITORING WELL INSTALLED BY AGRA EARTH & ENVIRONMENTAL, INC. (1997)
- WDOE–6 — MONITORING WELL INSTALLED BY ECOLOGY (1992)
- MW–10 — BAY CHEMICAL MONITORING WELL (2009)
- MW-8 — PROPOSED MONITORING WELL
- CIRCLED WELLS ARE PROPOSED POINTS OF CONDITIONAL COMPLIANCE
- WELLS TO BE DECOMMISSIONED

MAXIMUM EXCAVATION DEPTH IN FEET BELOW GROUND SURFACE

- 2
- 6
- 10

NOTE:

1. FIGURES WERE PRODUCED IN COLOR. GRAYSCALE COPIES MAY NOT REPRODUCE ALL ORIGINAL INFORMATION

FORMER BAY CHEMICAL FLUE DUST STOCKPILE AREA

FORMER BAY CHEMICAL SLUDGE SETTLING POND AREA

PARCEL # 19133141010
BAY CHEMICAL SITE

PARCEL # 19133141408

PARCEL # 19133141005

PARCEL # 19133141011

PARCEL # 19133114003

PARCEL # 19133232408

PARCEL # 19133232433

PARCEL # 19133233009

PARCEL # 19133141406

CASCADE AUTO RECYCLING

- AREA 1 -
- AREA 2 -
- AREA 3 -
- AREA 4 -
FORMER POND CURRENT WETLANDS AREA

DEPTH OF EXCAVATION = 2'
DEPTH OF EXCAVATION = 6'
DEPTH OF EXCAVATION = 10'
DEPTH OF EXCAVATION = 6'

AGRI-TECH BUILDING
(FORMER LIME SULFUR FORMULATING PLANT LOCATION)

BUILDING
(FORMER YAKIMA FARMERS SUPPLY MAIN WAREHOUSE)

(FORMER YAKIMA FARMERS SUPPLY LEASED WAREHOUSE)
BUILDING

YAKIMA STEEL FABRICATORS BUILDING

CONCRETE

CANOPY

FABRICATION AREA

FABRICATION AND LOADING AREA

STEEL STORAGE AREA

MATERIALS STORAGE AREA

TO BE DECOMMISSIONED

- ASPHALT -
- GRAVEL -
- DITCH -
ROAD

EAST WASHINGTON AVENUE

BNSF RAILROAD SPUR

75' WETLAND BUFFER

OLD BARB WIRE FENCE

MW–1 MW–2 MW–3 MW–4 MW–6 MW–7A MW–7B MW–8 MW–9 MW–10 MW–11 WDOE–6

PIT A PIT B PIT C PIT D PIT E PIT F PIT G PIT H PIT I PIT J PIT K PIT L PIT M PIT N

0 100
APPROXIMATE SCALE IN FEET

FARALLON CONSULTING
Quality Service for Environmental Solutions | farallonconsulting.com

Washington
Issaquah | Bellingham | Seattle

Oregon
Portland | Baker City

California
Oakland | Folsom | Irvine

FIGURE 7

CLEANUP ALTERNATIVE 4
AGRI-TECH AND YAKIMA STEEL FABRICATORS
6 & 10 ½ EAST WASHINGTON AVENUE
YAKIMA, WASHINGTON

FARALLON PN: 765-001

Drawn By: LT | Checked By: EB | Date: 5/7/2019 | Disk Reference: 765001a-FS

R:\Projects\765-001\Engineering\FeasibilityStudy\765-001a-FS.dwg 2/7/2020 10:28 AM (Nick Miller)

TABLES

FEASIBILITY STUDY REPORT
Agri-Tech and Yakima Steel Fabricators
6 and 10½ East Washington Avenue
Yakima, Washington

Farallon PN: 765-001

Table 1
Soil and Sediment Constituents of Concern and Cleanup Levels
Agri-Tech and Yakima Steel Fabricators
Yakima, Washington
Farallon PN: 765-001

Constituent of Potential Concern	Carcinogen or Non-Carcinogen	Soil and Sediment Cleanup Levels											Retained As Constituent of Concern for Feasibility Study
		Soil										Sediment	
		Soil Method A Unrestricted Land Use (mg/kg)	Soil Method A Industrial Properties (mg/kg)	Soil Method B Non-Cancer (mg/kg)[1]	Soil Method B Cancer (mg/kg)[1]	Soil Method B Protective of Groundwater Vadose Zone @ 25 degrees C (mg/kg)[1]	Soil Method B Protective of Groundwater Vadose Zone @ 13 degrees C (mg/kg)[1]	Soil Method B Protection of Groundwater Saturated Zone (mg/kg)[1]	Soil Method C Non-Cancer (mg/kg)[1]	Soil Method C Cancer (mg/kg)[1]	Soil Priority Contaminants of Ecological Concern Industrial or Commercial Site (mg/kg)[2]	Dry Weight Sediment Cleanup Objective (mg/kg)	
Tetrachloroethene	Carcinogen	0.05	0.05	480	476.19	0.053	**0.050**	0.0028	21,000	62,500	Not Applicable	Not Applicable	**Yes**
Trichloroethene	Carcinogen	0.03	0.03	40	12	0.026	**0.025**	0.0015	1,750	2,853.26	Not Applicable	Not Applicable	**Yes**
cis-1,2-dichloroethene	Non-Carcinogen	Not Applicable	Not Applicable	160	Not Applicable	0.080	**0.078**	0.0052	7,000	Not Applicable	Not Applicable	Not Applicable	**Yes**
Vinyl chloride	Carcinogen	Not Applicable	Not Applicable	240	0.67	0.002	**0.0017**	0.0001	10,500	87.50	Not Applicable	Not Applicable	No
1,1-dichloroethene	Non-Carcinogen	Not Applicable	Not Applicable	4,000	Not Applicable	0.050	**0.046**	0.0025	175,000	Not Applicable	Not Applicable	Not Applicable	No
1,2-dichloropropane	Carcinogen	Not Applicable	Not Applicable	7,200	27.78	0.026	**0.025**	0.0017	315,000	3,645.83	Not Applicable	Not Applicable	**Yes**
4,4-DDE (DDE)	Carcinogen	Not Applicable	Not Applicable	Not Applicable	2.94	0.45	**0.45**	0.022	Not Applicable	386.03	1	Not Applicable	No
4,4-DDD (DDD)	Carcinogen	Not Applicable	Not Applicable	Not Applicable	4.17	**0.34**	Not Applicable	0.017	Not Applicable	546.88		**0.31**	No
Dieldrin	Carcinogen	Not Applicable	Not Applicable	4	0.063	0.0028	**0.0028**	0.0001	175	8.20	0.17	**0.0049**	**Yes**
Endrin	Non-Carcinogen	Not Applicable	Not Applicable	24	Not Applicable		Not Applicable	0.022	1,050	Not Applicable	**0.4**	**0.0085**	No
Heptachlor epoxide	Carcinogen	Not Applicable	Not Applicable	1.04	0.11	**0.08**	Not Applicable	0.0040	45.50	14.42	0.6	Not Applicable	No
Aldrin	Non-Carcinogen	Not Applicable	Not Applicable	2.40	0.059	0.0025	**0.0025**	0.0001	105	7.72	0.17	Not Applicable	**Yes**
Alpha chlordane* (Chlordane total)	Carcinogen	Not Applicable	Not Applicable	40	2.86	2.06	**2.06**	0.10	1,750	375	7	Not Applicable	No
DRO	Non-Carcinogen	**2,000**	2,000	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	15,000	**340**	**Yes**
ORO	Non-Carcinogen	**2,000**	2,000	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No
cPAHs (TEC)	Carcinogen	0.10	2	Not Applicable	0.14	**2.33**	Not Applicable	0.12	Not Applicable	17.98	300	**17**	No
Antimony	Non-Carcinogen	Not Applicable	Not Applicable	32	Not Applicable	5.42	**5.42**	0.27	1,400	Not Applicable	Not Applicable	Not Applicable	No
Arsenic	Carcinogen	20	20	24	0.67	2.92	**2.92**	0.15	1,050	87.50	20	**14**	No
Cadmium	Non-Carcinogen	2	2	80	Not Applicable	0.69	**0.69**	0.035	Not Applicable	Not Applicable	36	**2.10**	**Yes**
Copper	Non-Carcinogen	Not Applicable	Not Applicable	3,200	Not Applicable	284	**284**	14.26	140,000	Not Applicable	550	**400**	**Yes**
Lead	Non-Carcinogen	250	1,000	Not Applicable	Not Applicable	3,000	3,000	150	Not Applicable	Not Applicable	**220**	**360**	**Yes**
Mercury	Non-Carcinogen	2	2	Not Applicable	Not Applicable	2.09	**2.09**	0.10	Not Applicable	Not Applicable	9	**0.66**	**Yes**
Zinc	Non-Carcinogen	Not Applicable	Not Applicable	24,000	Not Applicable	5,971	5,970	298.98	1,050,000	Not Applicable	**570**	**3,200**	**Yes**

NOTES:

Bold denotes selected cleanup level.

[1] Cleanup level is based on standard Washington State Model Toxics Control Act Cleanup Regulation (MTCA) Method B (unrestricted land use) or Method C (industrial land use) values from the Cleanup and Risk Calculations tables (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx).

[2] Cleanup level is based on MTCA Table 749-2, Priority Contaminants of Ecological Concern for Sites that Qualify for a Simplified Terrestrial Ecological Evaluation.

"Not Applicable" is used where the constituent of concern will not affect the media of potential concern due to an incomplete pathway, or no pertinent standard exists.

C = Celsius

cPAHs = carcinogenic polycyclic aromatic hydrocarbons

DDD = dichlorodiphenyldichloroethane

DDE = dichlorodiphenyldichloroethylene

DRO = total petroleum hydrocarbons as diesel-range organics

mg/kg = milligrams per kilogram

ORO = total petroleum hydrocarbons as oil-range organics

TEC = toxicity equivalent concentration

Table 2
Groundwater Constituents of Concern and Cleanup Levels
Agri-Tech and Yakima Steel Fabricators
Yakima, Washington
Farallon PN: 765-001

Constituent of Potential Concern	Carcinogen or Non-Carcinogen	Groundwater Cleanup Levels					Retained As Constituent of Concern for Feasibility Study
		Groundwater Method A (µg/l)	Groundwater Method B Non-Cancer (µg/l)[1]	Groundwater Method B Cancer (µg/l)[1]	Groundwater Method C Non-Cancer (µg/l)[1]	Groundwater Method C Cancer (µg/l)[1]	
Tetrachloroethene	Carcinogen	**5**	48	20.83	105	208.33	**Yes**
Trichloroethene	Carcinogen	**5**	4	0.54	8.75	9.51	**Yes**
cis-1,2-dichloroethene	Non-Carcinogen	Not Applicable	**16**	Not Applicable	35	Not Applicable	**Yes**
Vinyl chloride	Carcinogen	**0.20**	24	0.029	52.50	0.29	Yes
1,1-dichloroethene	Non-Carcinogen	Not Applicable	**400**	Not Applicable	875	Not Applicable	No
1,2-dichloropropane	Carcinogen	Not Applicable	720	**1.22**	1,575	12.15	**Yes**
4,4-DDE (DDE)	Carcinogen	Not Applicable	Not Applicable	**0.26**	Not Applicable	2.57	**Yes**
4,4-DDD (DDD)	Carcinogen	Not Applicable	Not Applicable	**0.36**	Not Applicable	3.65	**Yes**
Dieldrin	Carcinogen	Not Applicable	0.80	**0.0055**	1.75	0.055	**Yes**
Endrin	Non-Carcinogen	Not Applicable	**4.80**	Not Applicable	10.50	Not Applicable	No
Heptachlor epoxide	Carcinogen	Not Applicable	0.10	**0.0048**	0.23	0.048	No
Aldrin	Non-Carcinogen	Not Applicable	0.24	**0.0026**	0.53	0.026	No
Alpha chlordane* (chlordane total)	Carcinogen	Not Applicable	8	**0.25**	17.50	2.50	No
DRO	Non-Carcinogen	**500**	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No
ORO	Non-Carcinogen	**500**	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No
cPAHs (TEC)	Carcinogen	**0.10**	Not Applicable	0.012	Not Applicable	0.12	No
Antimony	Non-Carcinogen	Not Applicable	**6.40**	Not Applicable	14	Not Applicable	No
Arsenic	Carcinogen	**5**	4.80	0.058	10.50	0.58	No
Cadmium	Non-Carcinogen	**5**	8	Not Applicable	17.50	Not Applicable	No
Copper	Non-Carcinogen	Not Applicable	Not Applicable	**640**	Not Applicable	1,400	No
Lead	Non-Carcinogen	**15**	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No
Mercury	Non-Carcinogen	**2**	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No
Zinc	Non-Carcinogen	Not Applicable	**4,800**	Not Applicable	10,500	Not Applicable	No

NOTES:

Bold denotes selected cleanup level.

[1]Cleanup level is based on standard Washington State Model Toxics Control Act Cleanup Regulation Method B (unrestricted land use) or Method C (industrial land use) values from the Cleanup and Risk Calculations tables. (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx)

"Not Applicable" is used where the constituent of concern will not affect the media of potential concern due to an incomplete pathway, or no pertinent standard exists.

cPAHs = carcinogenic polycyclic aromatic hydrocarbons

DDD = dichlorodiphenyldichloroethane

DDE = dichlorodiphenyldichloroethylene

DRO = total petroleum hydrocarbons as diesel-range organics

µg/l = micrograms per liter

ORO = total petroleum hydrocarbons as oil-range organics

TEC = toxic equivalent concentration

Table 3
Surface Water Constituents of Concern and Cleanup Levels
Agri-Tech and Yakima Steel Fabricators
Yakima, Washington
Farallon PN: 765-001

Constituent of Potential Concern	Carcinogen or Non-Carcinogen	Surface Water Cleanup Levels										Retained As Constituent of Concern for Feasibility Study
		Surface Water Method B Non-Cancer (µg/l)[1]	Surface Water Method B Cancer (µg/l)[1]	Aquatic Life Criteria Freshwater Acute, WAC 173-201A (µg/l)[2]	Aquatic Life Criteria Freshwater Chronic, WAC 173-201A (µg/l)[2]	Human Health Criteria for Consumption of Water and Organisms, WAC 173-201A (µg/l)[2]	Human Health Criteria for Consumption of Organisms Only, WAC 173-201A (µg/l)[2]	Aquatic Life Criteria Freshwater Acute, CWA §304 (µg/l)	Aquatic Life Criteria Freshwater Chronic, CWA §304 (µg/l)	Aquatic Life Criteria Freshwater Acute, NTR 40 CFR 131 (µg/l)	Aquatic Life Criteria Freshwater Chronic, NTR 40 CFR 131 (µg/l)	
Antimony	Non-Carcinogen	1,040	Not Applicable	Not Applicable	Not Applicable	12	180	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Yes
Arsenic	Carcinogen	17.7	0.0982	360	190	10	10	340	**150**	360	190	Yes
Cadmium	Non-Carcinogen	40.5	Not Applicable	calc[3]	calc[3]	Not Applicable	Not Applicable	2.0	**0.25**	3.9	1.0	Yes
Copper	Non-Carcinogen	2,880	Not Applicable	calc[3]	calc[3]	1,300	Not Applicable	13.0	**9.0**	17.0	11.0	Yes
Lead	Non-Carcinogen	Not Applicable	Not Applicable	calc[3]	calc[3]	Not Applicable	Not Applicable	65.0	**2.5**	65.0	**2.5**	Yes
Manganese	Non-Carcinogen	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Yes
Mercury	Non-Carcinogen	Not Applicable	Not Applicable	2.1	**0.012**	Not Applicable	Not Applicable	1.4	0.77	2.1	**0.012**	Yes
Zinc	Non-Carcinogen	Not Applicable[4]	Not Applicable	calc[3]	calc[3]	Not Applicable[4]	Not Applicable[4]	120	120	110	**100**	Yes

NOTES:

Bold denotes selected cleanup level.

[1]Cleanup level is based on standard Washington State Model Toxics Control Act Cleanup Regulation Method B (unrestricted land use) values from the Cleanup and Risk Calculations tables. (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx)

[2]Value from Table 240, Section 250 of the Water Quality Standards for Surface Waters of the State of Washington, as established in Chapter 173-201A of the Washington Administrative Code (WAC 173-201A), as amended August 1, 2016.

[3]Site-specific value to be calculated using hardness values for surface water samples from the Site. Calculations are based on formulas in Table 240, Section 250 of the Water Quality Standards for Surface Waters of the State of Washington (WAC 173-201A), as amended August 1, 2016.

[4]Method B equations and human health criteria for surface water are based on the assumption that surface water has the potential to support fish or shellfish populations. This criterion does not apply to the wetland on the Site.

"Not Applicable" is used where no standard has been established for the constituent of concern.

calc = calculated value
CFR = Code of Federal Regulations
CWA = Clean Water Act
µg/l = micrograms per liter
NTR = National Toxics Rule

Table 4
Soil Gas and Indoor Air Constituents of Concern and Cleanup Levels
Agri-Tech and Yakima Steel Fabricators
Yakima, Washington
Farallon PN: 765-001

Constituent of Potential Concern	Carcinogen or Non-Carcinogen	Air Cleanup Levels				Retained As Constituent of Concern for Feasibility Study
		Air Method B Non-Cancer ($\mu g/m^3$)[1]	Air Method B Cancer ($\mu g/m^3$)[1]	Air Method C Non-Cancer ($\mu g/m^3$)[1]	Air Method C Cancer ($\mu g/m^3$)[1]	
Tetrachloroethene	Carcinogen	18.29	**9.62**	40	96	**Yes**
Trichloroethene	Carcinogen	0.91	**0.37**	2	6	**Yes**
cis-1,2-dichloroethene	Non-Carcinogen	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No
Vinyl chloride	Carcinogen	45.71	**0.28**	100	3	**Yes**
Chloromethane	Non-Carcinogen	**41.10**	Not Applicable	90.0	Not Applicable	No
1,1-dichloroethene	Non-Carcinogen	**91.43**	Not Applicable	200	Not Applicable	No
1,2-dichloropropane	Carcinogen	1.83	**0.25**	4	3	No
4,4-DDE (DDE)	Carcinogen	Not Applicable	**0.026**	Not Applicable	0.26	No
4,4-DDD (DDD)	Carcinogen	Not Applicable	**0.036**	Not Applicable	0.36	No
Dieldrin	Carcinogen	Not Applicable	**0.00054**	Not Applicable	0.01	No
Endrin	Non-Carcinogen	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No
Heptachlor epoxide	Carcinogen	Not Applicable	**0.00096**	Not Applicable	0.01	No
Aldrin	Non-Carcinogen	Not Applicable	**0.00051**	Not Applicable	0.01	No
Alpha chlordane* (chlordane total)	Carcinogen	0.32	**0.025**	0.70	0.25	No
DRO	Non-Carcinogen	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No
ORO	Non-Carcinogen	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No
cPAHs (TEC)	Carcinogen	Not Applicable	**0.0023**	Not Applicable	0.02	No
Antimony	Non-Carcinogen	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No
Arsenic	Carcinogen	0.007	**0.00058**	0.015	0.006	No
Cadmium	Non-Carcinogen	0.005	**0.0014**	0.010	0.014	No
Copper	Non-Carcinogen	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No
Lead	Non-Carcinogen	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No
Mercury	Non-Carcinogen	**0.14**	Not Applicable	0.30	Not Applicable	No
Zinc	Non-Carcinogen	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No

NOTES:

Bold denotes selected cleanup level.

[1]Cleanup level is based on standard Washington State Model Toxics Control Act Cleanup Regulation Method B (unrestricted land use) or Method C (industrial land use) values from the Cleanup and Risk Calculations tables.

"Not Applicable" is used where the constituent of concern will not affect the media of potential concern due to an incomplete pathway, or no pertinent standard exists.

cPAHs = carcinogenic polycyclic aromatic hydrocarbons

DDD = dichlorodiphenyldichloroethane

DDE = dichlorodiphenyldichloroethylene

DRO = total petroleum hydrocarbons as diesel range organics

$\mu g/m^3$ = micrograms per cubic meter of air

ORO = total petroleum hydrocarbons as oil-range organics

TEC = toxicity equivalent concentration

Table 5
Cleanup Action Alternative Technology Screening
Agri-Tech and Yakima Steel Fabricators
Yakima, Washington
Farallon PN: 765-001

Cleanup Technology	Media	COC Applicability	Description	Protectiveness	Permanence	Effectiveness	Implement-ability	Cost	Combined Score	Rank	Retained/ Rejected	Screening Comment
No Remedial Action	Soil, Groundwater	All	No further actions to address contamination. Source areas and residual contaminants are left untreated. Natural attenuation processes would occur.	1	1	1	5	5	13	N/A	Retained	Provides baseline for comparison to other technologies.
Engineered Controls/Engineered Barriers	Soil, Groundwater	All	Engineered Controls are technologies that prevent/limit exposure to hazardous substances.	4	3	4	5	5	21	1	Retained	Paving materials, fences, would help prevent further contaminant mobilization into groundwater. Method may be combined with other remedial technology.
Source Removal	Soil	All	Source removal removes all contamination by excavation of contaminated soil and disposal at an appropriate facility.	5	5	5	2	3	20	2	Retained	Excavation of contaminated soil would significantly reduce the time frame for final cleanup. Depending on the scale of removal, implementation of engineered controls to mitigate the risk of exposure, and damage to existing buildings may be needed prior to excavation. Additional investigation to characterize the Site and the nature and extent of COCs would be required.
Institutional Controls	Soil, Groundwater	All	Institutional controls are administrative measures that limit exposure to contaminants (e.g., environmental covenants).	3	2	4	5	5	19	3	Retained	Use restrictions and educational programs would limit exposure until contaminants are below cleanup levels.
Monitored Natural Attenuation	Groundwater	All except metals	Source areas and residual contaminants are left untreated. Periodic events to monitor natural attenuation processes would be scheduled.	3	2	3	5	5	18	4	Retained	Natural attenuation processes would occur. Long-term groundwater monitoring events would be performed until cleanup levels were met. Historical parameters have shown that natural attenuation is already occurring.
In-Situ Chemical Reduction	Soil, Groundwater	VOCs, petroleum hydrocarbons, pesticides	In-situ chemical reduction technology injects chemical reducers into soil or groundwater to react with COCs, breaking the molecules and changing them into harmless compounds.	3	3	4	3	3	16	5	Retained	ISCR can treat both chlorinated pesticides and VOCs. In-situ chemical reduction is expected to be challenging to implement due to source area cemented lime lithology. Multiple rounds of treatment are expected.
Enhanced Bioremediation	Soil, Groundwater	VOCs, petroleum hydrocarbons	Enhanced bioremediation technology injects water with nutrients and microbes saturated with dissolved oxygen into soil to degrade organic contaminants in soil and groundwater.	3	3	3	3	3	15	6	Rejected	Enhanced bioremediation would not be not be effective because Area 1 source is cemented in lime matrix. Pesticides are resistant to biodegradation and would not be adequately treated.
In-Situ Thermal Treatment	Soil, Groundwater	VOCs, petroleum hydrocarbons, pesticides	In-situ thermal treatment technology heats soil and groundwater to break down the contaminants into harmless by-products.	3	4	4	2	1	14	7	Rejected	In-situ thermal treatment could be effective in source areas because the technology treats soil uniformly and works well in silty soils. Costs per area treated are very high making technology prohibitively expensive. Effectiveness on low-volatility pesticides is limited.
In-Situ Chemical Oxidation	Soil, Groundwater	VOCs, petroleum hydrocarbons, pesticides	In-situ chemical oxidation technology injects chemical oxidizers into soil or groundwater to react with COCs, breaking the molecules and changing them into harmless compounds.	3	3	3	2	2	13	8	Rejected	In-situ chemical oxidation does not treat both VOCs and pesticides, requiring an extra treatment step. Injections are is expected to be challenging to implement due to source area cemented lime lithology. Multiple rounds of treatment are expected.

Table 5
Cleanup Action Alternative Technology Screening
Agri-Tech and Yakima Steel Fabricators
Yakima, Washington
Farallon PN: 765-001

Cleanup Technology	Media	COC Applicability	Description	Protectiveness	Permanence	Effectiveness	Implement-ability	Cost	Combined Score	Rank	Retained/ Rejected	Screening Comment
Thermal Desorption	Soil	VOCs, petroleum hydrocarbons, pesticides	Ex-situ thermal desorption removes contaminants by exposing soil to high levels of heat while tumbling in a rotating dryer. Emissions are treated using carbon, if necessary.	3	3	3	1	1	11	9	Rejected	Fine-grained lithology and potentially high water content make the soil poorly suited for thermal desorption. This technology does not treat for metals, which may add to the solid waste stream. Large volumes of soil are required to bring unit treatment costs down to levels comparable with other technologies.
Soil Vapor Extraction	Soil, Groundwater	VOCs	Soil vapor extraction technology removes VOCs through application of a vacuum in the subsurface to remove and treat soil vapors. High vapor pressure in VOCs supports removal of source mass.	2	2	3	2	2	11	9	Rejected	Soil lithology and COC properties would limit the effectiveness of SVE technology. Pesticides have low volatility, and would not be effectively treated by an SVE system.
Soil Washing	Soil	VOCs, petroleum hydrocarbons	Soil washing technology removes volatile contaminants by washing the soil with a chemical additive, scrubbing, and then separating the soil and wash water.	3	3	2	1	1	10	10	Rejected	Soil washing would not be effective due to the silt and lime-sulfur residue in the soil. Pesticides have strong adsorptive properties, making removal difficult. The wastewater stream is expected to be substantial.
Air Sparging	Soil, Groundwater	VOCS, petroleum hydrocarbons	Air sparging technology removes volatile contaminants by injecting pressurized air into the contaminated subsurface, collecting and treating soil vapors. High vapor pressure in VOCs supports removal of source mass. The resulting aerobic environment supports degradation of petroleum hydrocarbons.	2	2	2	2	2	10	10	Rejected	Air sparging would not be effective in shallow soil, or would mobilize contaminants in the saturated zone. Pesticides are resistant to biodegradation and have low volatility, resulting in low effectiveness of treatment of these compounds.

NOTES:
COCs = constituents of potential concern
NA = not applicable
SVE = soil vapor extraction
VOCs = volatile organic compounds

Table 6
Summary of Remedial Alternatives
Agri-Tech and Yakima Steel Fabricators
Yakima, Washington
Farallon PN: 765-001

Target Media	Area of Concern	COCs	Alternative 1	Alternative 2[1]	Alternative 3[1]	Alternative 4[1]
Soil	Area 1	HVOCs, Pesticides and Metals	No Action	Institutional Controls and Engineered Barrier	In-situ chemical reduction for HVOCs and pesticides	Excavation and complete removal of soil with COCs exceeding preliminary cleanup levels.
	Area 2	None		No action	No action	No action
	Area 3	Metals, pesticides, and TPH		Limited excavation of soil with COCs exceeding preliminary cleanup levels. Capping remaining soil with COCs exceeding preliminary cleanup levels.	Limited excavation of soil with COCs exceeding preliminary cleanup levels. Capping remaining soil with COCs exceeding preliminary cleanup levels.	Excavation and complete removal of all soil with COCs exceeding preliminary cleanup levels.
	Area 4	None		No action	No action	No action
Groundwater	Area 1	HVOCs, Pesticides	No Action	Monitored natural attenuation	In-situ chemical reduction for HVOCs and pesticides	Monitored natural attenuation
	Area 2	HVOCs			Monitored natural attenuation	
	Area 3	HVOCS				
	Area 4	None		No action	No action	No action
Indoor Air	Area 1	HVOCs	Not Addressed	Subslab soil gas evaluation and possible mitigation.	Subslab soil gas evaluation and possible mitigation.	Subslab soil gas evaluation and possible mitigation.

NOTES:

[1]Monitored natural attenuation is assumed to be a component of all alternatives as either a primary technology, or a secondary technology following application of another of the technologies listed.

HVOCs = halogenated volatile compounds

TEE = Terrestrial Ecological Evaluation

Table 7
Remedial Alternatives Cost Summary
Agri-Tech and Yakima Steel Fabricators
Yakima, Washington
Farallon PN: 765-001

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
CONSTRUCTION COSTS				
Site Preparation and Construction	$0	$28,000	$50,500	$2,274,000
Excavation and Disposal	$0	$396,000	$395,665	$9,506,000
In-Situ Chemical Reduction and Enhanced Bioremediation	$0	$0	$448,800	$0
Engineered Barrier - Cap	$0	$461,000	$461,142	$0
Site Restoration	$0	$10,000	$10,000	$9,746,000
Subtotal Construction	$0	$895,000	$1,366,107	$21,526,000
Contingency and Taxes				
Contingency Percent	---	20%	25%	20%
Contingency Total	$0	$179,000	$342,000	$4,305,000
Subtotal Contingency and Construction	$0	$1,074,000	$1,708,000	$25,831,000
Washington and Local Sales Tax (6.5% + 3.6%)	$0	$108,000	$173,000	$2,609,000
Total Construction Cost	**$0**	**$1,182,000**	**$1,881,000**	**$28,440,000**
ENGINEERING COSTS				
Project Management (6% total construction costs)	$0	$64,000	$102,000	$791,000
Remedial Design, Permitting	$0	$128,000	$204,000	$949,000
Construction Management (8% total construction costs)	$0	$85,000	$136,000	$949,000
Subtotal Engineering and Project Management	**$0**	**$277,000**	**$442,000**	**$2,689,000**
TOTAL CAPITAL COST	**$0**	**$1,459,000**	**$2,323,000**	**$31,129,000**
ONGOING PERIODIC AND FUTURE COSTS				
Cap Inspections and Maintenance	$0	$73,000	$63,000	$0
Performance Groundwater Monitoring	$0	$19,000	$37,000	$37,000
Confirmational Groundwater Monitoring	$0	$103,000	$75,000	$37,000
Progress Reporting	$0	$27,000	$27,000	$27,000
Record Environmental Covenant for Soil and Groundwater	$3,000	$3,000	$3,000	$0
TOTAL ONGOING PERIODIC and FUTURE COST	**$3,000**	**$225,000**	**$205,000**	**$101,000**
CLEANUP ALTERNATIVE TOTAL COST	**$3,000**	**$1,684,000**	**$2,528,000**	**$31,230,000**

Table 8
MTCA Threshold Criteria
Agri-Tech and Yakima Steel Fabricators
Yakima, Washington
Farallon PN: 765-001

Requirements	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Description	No remedial action. The COCs would naturally attenuate over the long term.	Implementation of institutional controls and engineered barriers in Areas 1 and 3, direct excavation in Area 3, and periodic groundwater monitoring and inspections of cap.	In-situ chemical reduction in Area 1, direct excavation and engineered barrier in Area 3, and periodic groundwater monitoring and inspections of cap.	Excavation in Areas 1 and 3, disposal, and periodic groundwater monitoring.
Threshold Requirements				
Protection of Human Health and the Environment	**No** - Alternative will not protect human health and the environment.	**Yes** - Alternative will protect human health and the environment.	**Yes** - Alternative will protect human health and the environment.	**Yes** - Alternative will protect human health and the environment.
Compliance with Cleanup Standards	**Yes** - Cleanup levels will be met throughout the Site in the long term through natural attenuation by biodegradation.	**Yes** - Cleanup levels will be met throughout the Site in the long term through natural attenuation by biodegradation.	**Yes** - Cleanup levels will be met throughout the Site in the long term through natural attenuation by biodegradation.	**Yes** - Cleanup levels will be met throughout the Site in the long term through natural attenuation by biodegradation.
Compliance with Applicable State and Federal Laws	**No** - Alternative does not comply with applicable laws.	**Yes** - Alternative complies with applicable laws.	**Yes** - Alternative complies with applicable laws.	**Yes** - Alternative complies with applicable laws.
Provision for Compliance Monitoring	**No** - Alternative does not include provision for compliance monitoring (i.e., groundwater monitoring).	**Yes** - Alternative includes provision for compliance monitoring (i.e., groundwater monitoring).	**Yes** - Alternative includes provision for compliance monitoring (i.e., groundwater monitoring).	**Yes** - Alternative includes provision for compliance monitoring (i.e., groundwater monitoring).
Other Requirements				
Permanent to the Maximum Extent Practicable (see detail below)	**No** - Alternative is not permanent to the maximum extent practicable.	**Yes** - Alternative is permanent and protective to the maximum extent practicable. Soil exceeding the TEE cleanup level for metals and the Site-specific cleanup level for TPH in Area 3 would be removed. Natural attenuation with long-term monitoring, institutional controls, and engineered barriers would be implemented to maintain protection of human health and the environment.	**Yes** - Alternative is permanent and protective to the maximum extent practicable. In-situ chemical reduction would reduce COCs in Area 1. COCs in Area 3 would be addressed by removal of soil. Long-term monitoring, institutional controls, and engineered barriers would be implemented to maintain protection of human health and the environment.	**Yes** - Alternative is permanent and protective to the maximum extent practicable. Cleanup standards will be achieved by removal of contaminated soil.
Reasonable Restoration Time Frame	Restoration time frame is long based on low rate of natural attenuation of COCs occurring in groundwater.	Restoration time frame for TPH and metals exceeding TEE is short, requiring approximately 1 to month to remove in Area 3. Restoration timeframe in Area 1 is assumed to be 5 years, however longer may be needed based on low rate of natural attenuation of COCs occurring in groundwater.	Restoration time frame for Area 1 likely would be 5 years from the onset of application of in-situ chemical reduction. Restoration time frame for TPH and metals exceeding TEE would be over a 1- to 2-month period.	Restoration time frame is short for soil, which would be removed by excavation over a 3- to 4-month period. Restoration time frame for groundwater would be long based on the low rate of natural attenuation of COCs.
Consideration for Public Concerns	By providing no remedial action, alternative does not address public concerns about protection of human health and the environment.	Public concerns would be addressed through implementation of institutional controls and an engineered barrier that would limit the potential for exposure to COCs, and result in attaining cleanup levels at the conditional points of compliance.	Public concerns would be addressed through implementation of the cleanup action, resulting in attaining cleanup levels at the standard points of compliance in Area 1. Public concerns regarding Area 3 would be addressed through implementation of institutional controls and an engineered barrier that would limit the potential for exposure to COCs, resulting in attaining cleanup levels at the conditional points of compliance.	Public concerns would be addressed through implementation of the cleanup action, which will result in attaining cleanup levels at the standard points of compliance.

NOTES:

COCs = constituents of concern

MTCA = Washington State Model Toxics Control Act Cleanup Regulation

TEE = Terrestrial Ecological Evaluation

Table 9
MTCA Composite Benefit Score Summary
Agri-Tech and Yakima Steel Fabricators
Yakima, Washington
Farallon PN: 765-001

	Alternative 1	**Alternative 2**	**Alternative 3**	**Alternative 4**
Description	No action taken; existing surface barriers remain in-place. Site access is controlled through its industrial use as a steel-fabrication facility.	Implementation of institutional controls and engineered barriers in Areas 1 and 3, direct excavation in Area 3, and periodic groundwater monitoring and inspections of cap.	In-situ chemical reduction in Area 1; direct excavation and an engineered barrier in Area 3; and periodic groundwater monitoring.	Complete source removal of all soils exceeding preliminary cleanup levels and monitored natural attenuation for remaining COCs in groundwater.
Protectiveness (30% Weighted Factor)	Alternative would not achieve overall protection of human health and the environment. Contaminated soil exceeding cleanup levels would be contained by existing engineered controls in Area 1 only. = 2.	Alternative would achieve overall protection of human health and the environment. Contaminated soil exceeding cleanup levels would be contained by institutional controls and an engineered barrier in Area 3. = 7.	Alternative would achieve overall protection of human health and the environment. Contaminated soil exceeding cleanup levels would be treated in-situ (Area 2) or contained by institutional controls (Area 3). = 8.	Alternative would achieve overall protection of human health and the environment. = 9.
Permanence (20% Weighted Factor)	Alternative would not be permanent to the maximum extent practicable. Soil exceeding the preliminary cleanup levels in Areas 1 and 3 would remain in-place. = 2.	Alternative would be permanent to the maximum extent practicable. Soil exceeding the TEE cleanup level for metals and the preliminary cleanup level for TPH in Area 3 would be removed. = 5.	Alternative would be permanent to the maximum extent practicable. In-situ chemical reduction and excavation would reduce or remove COCs in soil and groundwater in Areas 1 and 3. = 7.	Alternative would permanently protect human health and the environment by removing soil with COC concentrations greater than the cleanup levels. = 10.
Long-Term Effectiveness (20% Weighted Factor)	Alternative would be effective over the long-term by resulting in the breakdown and permanent reduction by natural attenuation of COC concentrations in groundwater at the Site. Existing engineered barriers in Area 1 remain in-place. = 4.	Alternative would be effective over the long-term by resulting in the breakdown and permanent reduction by natural attenuation of COC concentrations in groundwater at the Site. Engineered barriers would be implemented to contain COCs left in-place. = 6.	Alternative would be effective over the long-term by a permanent reduction in COCs resulting from in-situ chemical reduction injections and removal by excavation. Engineered barriers would be implemented to contain COCs left in-place. = 7.	Alternative would be effective over long-term by removing soil with resulting in the destruction and permanent reduction of COC concentrations in groundwater at the Site. = 10.
Short-Term Risk Management (10% Weighted Factor)	Alternative does not require disturbing contaminated media or other construction activities. Soil exceeding preliminary cleanup levels remains in-situ in Area 3, presenting potential for direct exposure. = 4.	Alternative disturbs affected media, presenting short-term risk to workers, and a nuisance to the public during construction and off-Site transport . = 8.	Alternative would present a higher degree of short-term risk associated with the handling and high-pressure injection of chemical reagents for multiple injection events; distubance of affected media, and nuisance during construction. = 5.	Alternative disturbs affected media and presents additional short-term risks to workers during demolition and excavation; disturbance of contaminated media; and a nuisance to adjacent property owners during construction and transportation off the Site. = 6.
Technical and Administrative Implementability (10% Weighted Factor)	Alternative requires no action be taken. = 9.	Implementation of institutional controls is administratively feasible for the Site, and periodic inspection of the engineered barrier is implementable. With no existing structure or utilites in Area 3, excavations are implementable in this area. = 8.	Alternative would pose some technical implementability concerns regarding the installation of the high-pressure injection gallery and delivery of solution into the low-permeability formation for adequate contact with COCs. = 6.	Alternative would pose significant technical implementability concerns with removal of existing building, and excavation sidewall sloping extending onto adjacent properties. = 2.
Public Concerns (10% Weighted Factor)	Alternative results in minimal public disturbance but also does not address residual COCs in soil and groundwater. = 7.	Alternative may result in short-term construction disturbance at the Yakima Steel Fabricators facility. = 8.	Alternative would pose public concerns regarding injection of chemical reagents via high-pressure points. = 7.	Alternative would maximize removal of impacted soil. Highest public conern is expected during Site clearing, excavation, loading, and transport of contaminated soil off the Site. = 6.
MTCA Composite Benefit Score[1]	**3.8**	**6.7**	**7.0**	**8.1**
Estimated Cost	**$0**	**$1,684,000**	**$2,528,000**	**$31,230,000**

NOTES:

[1] Washington State Model Toxics Control Act Cleanup Regulation (MTCA) Composite Benefit Score was obtained quantitatively with a "score" from 0 (least favorable) to 10 (most favorable) for each evaluation criterion multiplied by the stated weighting factor. The final MTCA Composite Benefit Scores are calculated by summing the mathematical product of each score and the indicated weighting factor for each of the six criteria. The basis for the weighting factors for the six criteria were obtained from Washington State Department of Ecology (2009) Disproportionate Cost Analysis Outline.

COCs = constituents of concern

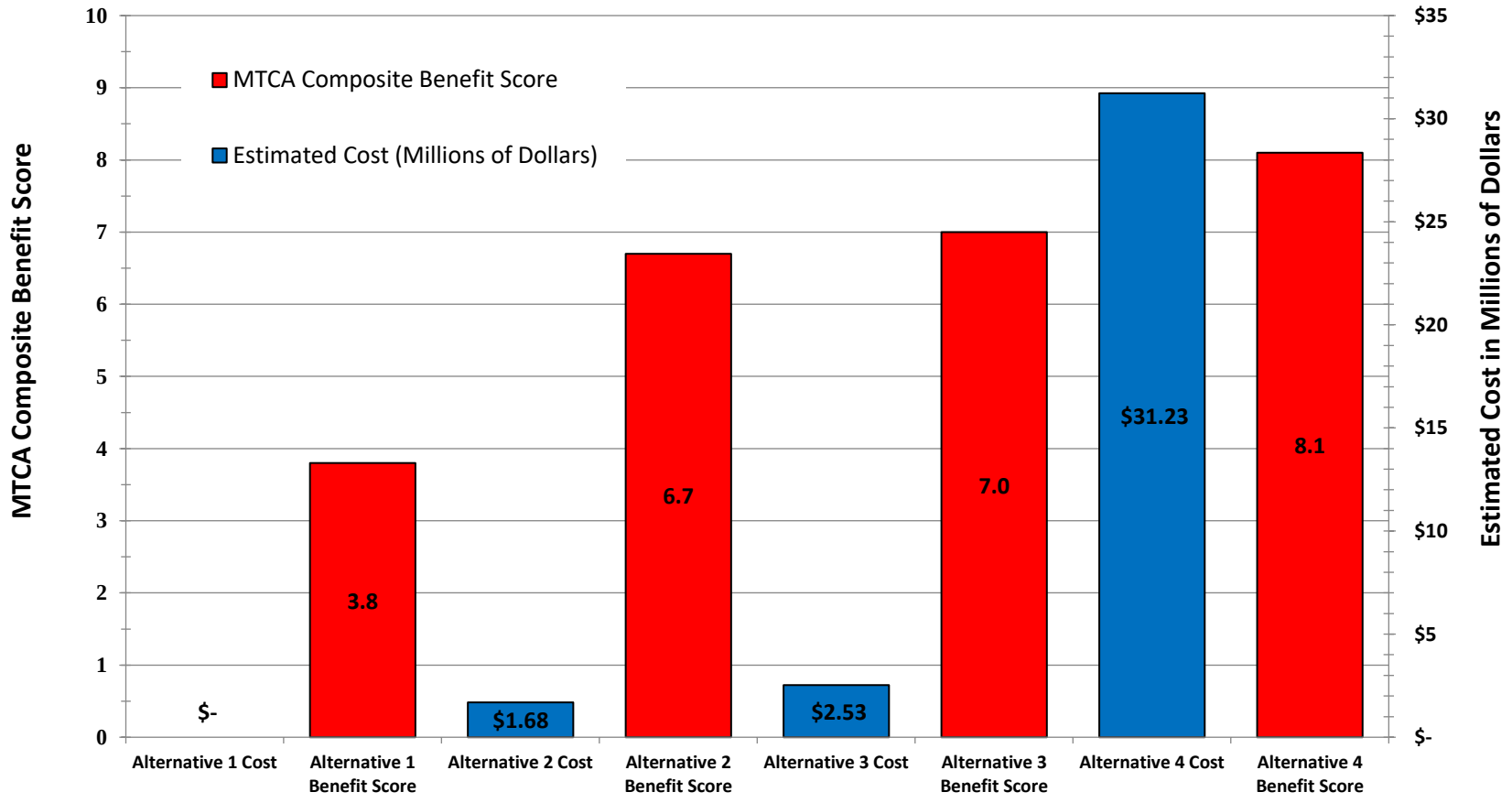
TEE = Terrestrial Ecological Evaluation

CHART

FEASIBILITY STUDY REPORT
Agri-Tech and Yakima Steel Fabricators
6 and 10½ East Washington Avenue
Yakima, Washington

Farallon PN: 765-001

Chart 1
Disproportionate Cost Analysis Results
Agri-Tech and Yakima Steel Fabricators
Yakima, Washington
Farallon PN: 765-001



FARALLON CONSULTING
Quality Service for Environmental Solutions | farallonconsulting.com

Washington
Issaquah | Bellingham | Seattle

Oregon
Portland | Bend | Baker City

California
Oakland | Folsom | Irvine

CHART 1
AGRI-TECH AND YAKIMA STEEL FABRICATORS
6 AND $10^1/_2$ EAST WASHINGTON AVENUE
YAKIMA, WASHINGTON

FARALLON PN: 765-001

P:\765 Yakima Steel Fab\765001 Yakima Steel Master\Deliverables\2019 FS Rpt\Tables\2019-04-06 FS-Tables, Chart 1Chart 1 DCA

APPENDIX A
FEASIBILITY STUDY WORK PLAN

FEASIBILITY STUDY REPORT
Agri-Tech and Yakima Steel Fabricators
6 and 10½ East Washington Avenue
Yakima, Washington

Farallon PN: 765-001

FARALLON consulting

975 5th Avenue Northwest, Issaquah, Washington 98027
Tel: (425) 295-0800 Fax: (425) 295-0850
www.farallonconsulting.com

FEASIBILITY STUDY WORK PLAN

AGRI-TECH AND YAKIMA STEEL FABRICATORS
6 AND 10½ EAST WASHINGTON AVENUE
YAKIMA, WASHINGTON

Submitted by:
Farallon Consulting, L.L.C.
975 5th Avenue Northwest
Issaquah, Washington 98027

Farallon PN: 765-001

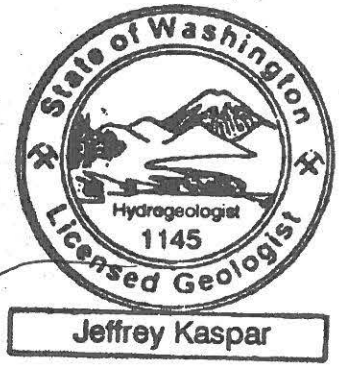
For:
Yakima Steel Fabricators, Inc.
6 East Washington Avenue
Yakima, Washington 98903

May 3, 2011

Prepared by:

Brett T. Carp
Environmental Scientist

Reviewed by:



Jeffrey Kaspar, L.G., L.H.G.
Senior Project Manager

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

1.0 INTRODUCTION

Farallon Consulting, L.L.C. (Farallon) has prepared this Feasibility Study Work Plan (FS Work Plan) on behalf of Yakima Steel Fabricators, Inc. (YSF) and Agri-Tech, Inc. (Agri-Tech) for the YSF and Agri-Tech facilities located at 6 and 10½ East Washington Avenue in Yakima, Washington (herein referred to as the Site) (Figure 1). The Site includes Yakima County Tax Parcel Nos. 19133141009 and 19133141409 (Figure 2). The FS Work Plan describes the work to be performed for the Feasibility Study (FS) and the schedule for implementation. The work is being conducted to meet the requirements of Agreed Order No. DE 6091 (Agreed Order) entered into by the Washington State Department of Ecology (Ecology) and YSF pursuant to the authority of the Washington State Model Toxics Control Act, as established in Section 050(1) of Chapter 70.105D of the Revised Code of Washington, with an effective date of October 27, 2008. The Agreed Order was issued in accordance with the provisions of the Washington State Model Toxics Control Act Cleanup Regulation (MTCA), as established in Chapter 173-340 of the Washington Administrative Code (WAC 173-340).

A remedial investigation (RI) was completed on behalf of Agri-Tech and YSF in June 2004 pursuant to Ecology Agreed Order No. DE 97TC-C154 issued for the Site on October 6, 1997. Results from the RI were summarized in the Revised Remedial Investigation Report dated June 10, 2004, prepared by Farallon (2004b) (RI Report). The RI Report documents that concentrations of hazardous substances exceeding the preliminary screening levels established for the Site were detected in soil and groundwater. The preliminary screening levels for the constituents of potential concern (COPCs) identified in the RI Report were established as MTCA Method B soil cleanup levels protective of a potable groundwater source (WAC 173-340-747). Upon completion, the RI Report fulfilled the requirements for delineation of the COPCs identified at the Site as stipulated in Agreed Order No. DE 97TC-C154.

Agreed Order No. DE 6091 was issued in October 2008 to complete an FS and address the data gaps in the RI identified by Ecology following supplemental site investigation work completed by Ecology in July 2007 in Area 3 of the Site, located on the southern portion of the YSF property (Figure 3). This FS Work Plan presents the basis for the scope of work for performing additional site investigation activities to refine the understanding of COPCs in Area 3 of the Site and to complete an FS that will provide the basis for development of a Cleanup Action Plan for the Site.

1.1 PURPOSE AND SCOPE

As established in WAC 173-340-350(8), the purpose of an FS is to develop and evaluate technically feasible cleanup alternatives to enable selection of a cleanup action for a site in accordance with WAC 173-340-360. The purpose of the work described in this FS Work Plan is to provide the framework for developing and evaluating appropriate cleanup alternatives for use in selecting a cleanup action for the Site.

As mandated by Ecology in the Agreed Order, the FS Work Plan also includes an additional remedial investigation component. The purpose of the additional site investigation work is to

address data gaps pertaining to the distribution of COPCs at Area 3 of the YSF property. In addition to addressing the data gaps identified by Ecology, Farallon will perform groundwater monitoring and sampling to evaluate current groundwater conditions and facilitate evaluation of potential technically feasible remedial alternatives for groundwater.

1.2 WORK PLAN ORGANIZATION

Section 2 of the FS Work Plan presents a summary of the physical setting, ownership history, 2007 soil sampling data collected by Ecology and Environmental Partners, Inc. of Issaquah, Washington (EPI), and subsequent to the cleanup excavation activities conducted by the Burlington Northern Santa Fe Railway Company (BNSF) at the Bay Chemical Company (Bay Chemical) site. Section 3 discusses the data gaps identified following July 2007 soil sampling activities conducted on the southern portion of the YSF property and how they will be addressed. Section 4 presents the scope of work for the additional site investigation, including soil sampling, groundwater monitoring and sampling, and sediment sampling. The technical approach for completing the FS is described in Section 5. Section 6 presents a schedule for completing the work elements of the FS Work Plan as required by the Agreed Order. A list of the documents used in preparing the FS Work Plan is provided in Section 7.

2.0 SITE DESCRIPTION AND BACKGROUND

A summary of the physical setting, ownership history, 2007 soil sampling, and subsequent cleanup excavation activities conducted by BNSF at the Bay Chemical site is provided in the following sections. Additional information regarding Site features, ownership and operation, historical Site use, surrounding properties, Yakima Railroad Area (YRRA) sites, previous investigations, and the physical and environmental setting of the Site are provided in detail in the RI Report (Farallon 2004b).

2.1 PHYSICAL SETTING AND SITE FEATURES

As defined in the Agreed Order, the Site includes the YSF property (Yakima County Tax Parcel No. 19133141009) and the Agri-Tech property (Yakima County Tax Parcel No. 19133141409) (Figure 2). The Site is located in the northeast corner of the southeast quarter of Section 31, Township 13 North, Range 19 East of the Willamette Meridian. The approximate latitude and longitude of the Site is North 46 degrees, 34 minutes latitude, West 120 degrees, 29 minutes longitude. The Site is approximately 7.23 acres in area and located in an area of Yakima zoned for light industrial use. Site topography is relatively flat, with less than 5 feet of relief across the approximately 7.23-acre area. The Site slopes very slightly to the southeast, following the regional topographic trend of the Ahtanum Valley. The current Site grade is the result of fill and grading activities conducted in the late 1970s. Farallon understands that the zoning for properties south of the Site recently was changed from light industrial to a commercial status to allow for commercial redevelopment.

The YSF property includes a single-story steel-framed, aluminum-sided building measuring approximately 225 by 225 feet that is subdivided into three areas (Figure 2). The western portion of the YSF building was constructed in 1980, and currently is used for steel fabrication and business offices. The central portion of the building is used for steel fabrication and loading of finished product, and the eastern portion is used for steel storage. The floors of the central and eastern portions of the building are paved with asphalt; the floor of the western portion of the building is paved with concrete. The exterior areas immediately north, south, and west of the YSF building are paved with asphalt. The remaining areas of the YSF property are unpaved. A pond classified by the Yakima County Assessor's Office as a potential wetland is located near the southern boundary of the YSF property.

The Agri-Tech property includes a 20,625-square-foot single-story cinder block slab-on-grade building measuring approximately 164 by 124 feet that was constructed in 1982. The building was constructed by Team Research Engineering Corporation, which owned the property prior to its purchase by Agri-Tech in 1989. The interior of the building consists of a concrete floor slab. The northern, southern, and western areas immediately surrounding the building are asphalt-paved. A concrete slab is present along the eastern portion of the building extending to the property boundary.

The property adjacent to the west of the Site (Yakima County Tax Parcel No. 19133141010) was previously owned by Northern Pacific Railroad, predecessor of Burlington Northern Santa Fe

Railway. This property was leased to Bay Chemical, a manufacturer of soil micronutrients, from 1963 to late 1975 or early 1976. Three parcels adjoin the eastern side of the Site: the Reiland property (Yakima County Tax Parcel No. 19133141406), the Matthews property (Yakima County Tax Parcel No. 19133232433), and the GJS Investments, L.L.C. property (Yakima County Tax Parcel No. 19133232408). Yakima County Tax Parcel No. 19133141408 is located adjacent to the northwest. The Isaak property (Yakima County Tax Parcel No. 19133141005) and the Columbia Investment property (Yakima County Tax Parcel No. 19133141011) also adjoin the northern property boundary of the Site. The Bradley property (Yakima County Tax Parcel No. 19133233009) adjoins the southern property boundary of the Site.

2.2 SITE HISTORY

The Site was developed in 1947 by the Yakima Farmers Supply Company (Yakima Farmers Supply). Historical documents indicate that Yakima Farmers Supply was a cooperative of farmers, but do not include names of cooperative members. Yakima Farmers Supply filed for bankruptcy in 1971. Receivership of the title and ownership of the Site from 1971 to 1978 remain unknown. The Site was owned and operated from 1978 to 1989 by ANCO Industrial Park. After removing all of the former Yakima Farmers Supply improvements and grading the Site, ANCO Industrial Park sold various parcels of the Site between 1978 and 1989.

YSF purchased Yakima County Tax Parcel No. 19133141009 in 1979 and constructed the current building in 1980. YSF historically has operated as a steel fabrication facility. Available Site documents do not indicate that the steel fabrication operations on the YSF property required the use or storage of the COPCs identified in the RI Report, with the exception of diesel fuel. Diesel fuel and oil used for vehicle and equipment maintenance have been stored in an aboveground storage tank on the YSF property and used for Site equipment such as forklifts and cranes. The oil products were stored inside the YSF building. YSF continues to operate but under new ownership. The property was not sold to the new owner/operator of the YSF business.

Team Research Engineering Corporation purchased Yakima County Tax Parcel No. 19133141409 in 1980 and constructed the current Agri-Tech building in 1982. Team Research Engineering Corporation operated as a veterinary/pharmaceutical supply company until 1989. Agri-Tech purchased Yakima County Tax Parcel No. 19133141409 in 1989 and operated a fruit packing supplies and equipment sales and service business. Available documentation did not indicate when Agri-Tech discontinued that business operation, nor whether historical operations on the Agri-Tech property required the use or storage of the COPCs identified in the RI Report. The Agri-Tech building was vacant in 1997 and was leased to various tenants between 1997 and 2003. Property use from 2003 to 2009 has not been researched as a component of this FS Work Plan.

Agri-Tech and YSF entered into Agreed Order No. DE 97TC-C154 with Ecology on October 6, 1997 to conduct an RI at the Site. The objective of the RI was to collect, develop, and evaluate sufficient information for the Site to enable development of a scope of work for conducting an FS in accordance with WAC 173-340-350(8) and selection of a cleanup action in accordance with WAC 173-340-360 through 173-340-390. The RI addressed characterization of the nature

and extent of the COPCs identified for the Site, which included halogenated and non-halogenated volatile organic compounds, pesticides, herbicides, petroleum hydrocarbon-related compounds, polychlorinated biphenyls (PCBs), and heavy metals. The COPCs identified for the Site were associated with operations of former Site owner Yakima Farmers Supply.

The selection of COPCs was based also on surrounding property use. Ecology identified the west-adjacent Bay Chemical site as a potential source of metals and requested that the metals identified on the Bay Chemical site be included as COPCs during the RI (Farallon 2004b). Tetrachloroethene (PCE) also was identified by Ecology as a COPC, initially due to releases of this compound associated with various up-gradient sources in the YRRA that were migrating down-gradient toward and potentially onto the Site. However, Ecology identified a potential source of PCE at the Site in the former Yakima Farmer Supply Waste Pit (Area 1) during installation of a monitoring well for the YRRA investigation. PCE subsequently was included as a COPC for the Site. In addition, if a compound was detected in soil and/or groundwater during the RI, it was included for consideration for the RI until additional data were collected to eliminate it as a defined COPC.

SECOR International Incorporated (SECOR) conducted an RI (SECOR RI) for the Cameron Yakima Working Group that included an evaluation of the known historical sources of PCE and the distribution of PCE in the YRRA. The YRRA, as defined by Ecology in the Consent Decree (CY-96-3196-WFN) dated May 5, 1997 entered into with the Cameron Yakima Working Group, consists of approximately 6 square miles of primarily commercial and industrial properties that parallel the north to south trending railroad corridor that extends from the northern portion of Yakima south to Union Gap.

The YRRA includes 13 subfacilities that have been identified by Ecology as potential sources of releases of PCE. Although each subfacility has not been included in the YRRA Consent Decree, each potentially liable person has been responsible for conducting site investigations to ascertain whether a release of PCE has occurred at their facility and whether that release is contributing to the regional PCE plume in the YRRA area. The findings of the SECOR RI indicate that there are multiple subfacilities located up-gradient of the Site that have concentrations of PCE in groundwater that are equal to or greater than the concentrations of PCE detected in up-gradient monitoring well MW-1 and cross-gradient monitoring wells MW-3 and MW-5 at the Site (Figure 3). The results of the RI performed at the Site have confirmed that the sources of PCE identified at the Site are not contributing to the YRRA regional groundwater plume based on the groundwater analytical data that indicate that the concentrations of PCE entering the Site from up-gradient off-Site sources within the YRRA are comparable to concentrations of PCE at down-gradient monitoring wells at the Site. The groundwater sampling results obtained during the FS will be used to further assess the potential for contribution of PCE from the Site to the YRRA. Prospective remedial alternatives for the Site will include measures to control potential contributions to the YRRA regional plume.

During completion of the RI, Ecology indicated that MTCA Method B soil and groundwater cleanup levels will be evaluated as the selected preliminary screening levels for the identified COPCs (Farallon 2004b). Ecology further indicated that a comparison of the standard MTCA Method B and modified MTCA Method B soil and groundwater cleanup levels was to be

performed. Modified MTCA Method B soil and groundwater cleanup levels were calculated using the Ecology (2001) *Worksheet for Calculating Soil Cleanup Levels for Unrestricted and Industrial Land Use*. Following review of the information derived from the screening level comparison, the most stringent values were selected for each COPC and medium of concern. The preliminary cleanup level of 5.0 micrograms per liter was retained for PCE in groundwater based on the consistent use of this value throughout the YRRA. MTCA Method A values for unrestricted land use were selected for lead and total petroleum hydrocarbons as diesel-range organics (DRO) and as oil-range organics (ORO) because standard MTCA Method B cleanup levels do not exist and modified MTCA Method B cleanup levels could not be calculated using the data collected during the RI. Ecology concurred with the selection of the preliminary cleanup levels for the COPCs. The preliminary screening levels are presented in the RI and in Tables 1 through 4 herein.

Ecology acknowledged the termination of Agreed Order No. DE 97TC-C154 and completion of the RI work after approving the RI Report dated June 10, 2004 (Farallon 2004b). Farallon (2004a) also prepared a Technical Memorandum Regarding Preliminary Evaluation of Technically Feasible Remedial Alternatives, which included a brief description of prospective cleanup alternatives that could be evaluated during completion of an FS. The technical memorandum was provided to Ecology.

2.3 2007 SOIL SAMPLING

In 2007, Plaintiffs Mr. Merv Wark, Ms. Sharon Wark, and YSF entered into litigation against Ecology seeking reimbursement of funds expended to complete the RI and the RI Report (Washington State Office of the Attorney General 2007). During the course of litigation, Ecology and EPI conducted additional soil sampling on the southern portion of the YSF property. EPI was contracted by YSF as an expert witness for the Plaintiffs. Ecology reported that the analytical results from the soil sampling identified detectable concentrations of several COPCs, including ORO, carcinogenic polycyclic aromatic hydrocarbons (cPAHs), metals, organochlorine pesticides, and volatile organic compounds (VOCs) (Ecology 2008a, 2008b, 2008f). Farallon used the sampling data provided by Ecology and EPI to plot the test pit locations depicted on Figure 3. The analytical data are presented on Figures 4 and 5 and in Tables 1 through 4. The test pit locations recorded by Ecology using global positioning coordinates do not appear to coincide with the established sampling grids at all locations. Farallon therefore is uncertain of the accuracy of the test pit locations. The test pit locations for EPI appear to correspond with the sampling grid data provided. Farallon estimated the test pit locations using the EPI Site Plan. Resolving the test pit locations may not be necessary to address the data gaps for soil quality. The sections that follow present the results of the 2007 sampling event.

2.3.1 Petroleum Hydrocarbons

A summary of the analytical results for the soil samples analyzed for petroleum hydrocarbon constituents and cPAHs are presented in Table 1. One of the four soil samples collected from sampling grids B and H (Figure 3) contained a concentration of ORO that exceeded the preliminary screening level of 2,000 milligrams per kilogram (mg/kg). The soil sample collected

from Pit B at an estimated depth of 0.5 foot below ground surface (bgs) contained the only concentration of ORO above the preliminary screening level. Pit B is located proximate to the area used for fueling forklifts and a crane with diesel fuel. Soil samples collected in this area at a depth of approximately 1.25 feet bgs contained concentrations of ORO below the preliminary screening level. Concentrations of ORO at sampling grid H were below the preliminary screening level.

Concentrations of cPAHs also were detected in surficial soil samples collected by Ecology at sampling grids B and H where concentrations of ORO were detected. The concentration of total cPAHs detected in a soil sample collected from Pit H exceeded the MTCA Method A cleanup level of 0.1 mg/kg.

The concentrations of ORO were interpreted by the laboratories as being lube oils. Diesel fuel was not detected at concentrations above the preliminary screening level of 2,000 mg/kg. The areas sampled likely were representative of minor surficial oil leaks from the YSF equipment and are not anticipated to be representative of significant releases of ORO. The affected area at sampling grid B was removed during the cleanup activities conducted by BNSF at the Bay Chemical site (Figure 3). No further investigation of ORO or cPAHs is recommended at this time. One noted exception will be the sampling soil and sediment within the wetland area of Area 3 described in Section 4.1.3. Samples from the wetland will be screened for the presence or absence of petroleum hydrocarbons and if present quantified to evaluate whether further investigation or cleanup is required.

2.3.2 Metals

Table 2 presents a summary of the analytical results for the soil samples analyzed for metals. Metals detected that were not previously identified as COPCs during the RI (Farallon 2004b) but were analyzed by Ecology and/or EPI include manganese and thallium. The soil sample collected from Ecology Pit D (Figure 3) contained the only concentration of manganese exceeding the Ecology Method B cleanup level of 11,000 mg/kg. Concentrations of thallium at all sample locations were below the laboratory practical quantitation limit (PQL) or low enough to warrant no further investigation. There currently is no established MTCA cleanup level for thallium.

Concentrations of one or more metals exceeding either the preliminary screening level or MTCA Method B cleanup levels were detected in the soil samples collected from sampling grids A through E, H, and M (Table 3; Figure 4). The soil sample collected from Pit M contained the only concentration of copper above the MTCA Method B cleanup level. Neither Ecology nor EPI noted any unusual conditions at this location that would explain this single anomalous detection of copper.

The origin of the metals detected at YSF is believed to be the adjacent Bay Chemical site. With the exception of the single detection of copper (Test Pit M), all other metals identified at the Site have been detected at the Bay Chemical site. The site investigation work to be performed will include analyses for metals that were detected at concentrations exceeding the preliminary

screening levels, or MTCA Method B cleanup levels where no screening level has been established, including antimony, arsenic, cadmium, copper, lead, manganese, mercury, and zinc.

2.3.3 Organochlorine Pesticides

A summary of the analytical results for soil samples that contained concentrations of organochlorine pesticides is presented in Table 3. Several pesticides identified as COPCs were detected at concentrations exceeding the preliminary screening levels presented in the RI, including aldrin; alpha chlordane; 4,4-DDD; 4,4-DDE; dieldrin; and heptachlor epoxide. The locations of the samples and analytical results are presented on Figure 5 and include sampling grids A, C, D, G, H, I, J, K, L, M, and N. The analytical results of soil samples collected from test pits within many of these grids included PQLs that were not sufficiently low to determine whether a concentration of an analyte exceeded the preliminary cleanup level. Farallon noted these occurrences as exceeding the preliminary screening level. Further investigation will be performed in sampling grids where concentrations of the analyte were below a PQL that was greater than a preliminary screening level for a COPC.

The cleanup at the Bay Chemical site resulted in removal of substantial amounts of soil containing pesticides along the western portion of the Site. The Bay Chemical site cleanup activities were performed following Ecology's test pit sampling in July 2007. Farallon understands that no testing for pesticides was performed during the BNSF cleanup activities at the Bay Chemical site to profile the waste soil removed to the containment cell.

2.3.4 Volatile Organic Compounds

A summary of the analytical results for soil samples that contained concentrations of VOCs detected above the laboratory PQL is presented in Table 4. A concentration of PCE of 0.101 mg/kg, which exceeds the preliminarily screening level of 0.053 mg/kg was detected in the soil sample collected from Ecology Pit B at a depth of 0.5 foot bgs. In addition, the laboratory PQLs for the VOCs 1,2-dichloropropane and 1,1-dichloroethene (1,1-DCE) exceed their respective preliminary screening levels for soil samples collected from sampling grids B and H. The affected area of sampling grid B was excavated during the cleanup activities at the Bay Chemical site (Figure 5). Approximately 4 to 6 feet of soil was removed. No testing for VOCs was required by Ecology during the cleanup activities. No excavation was performed at sampling grid H.

2.4 BAY CHEMICAL SITE CLEANUP ACTIVITIES

Investigations conducted at the west-adjacent Bay Chemical site determined that operations conducted at that property had resulted in metals-contaminated soil and groundwater that extended onto the Site (Ecology 2008d, 2008e). An Ecology-approved cleanup action was initiated by BNSF at the Bay Chemical site in 2007 and completed in late 2008. Farallon understands that the cleanup action consisted of: 1) excavation of soil containing concentrations of metals at or above the established property-specific cleanup levels; 2) consolidation and placement of the excavated soil in a containment area on the property; 3) groundwater monitoring and sampling; and 4) implementation of institutional controls. Farallon also understands that a report documenting the results of the Bay Chemical site cleanup action has not

yet been completed. Farallon was provided with the information that during the course of the cleanup action, portions of the western side of the Site were excavated (Ecology 2008d and Ecology 2008e) (Figure 3). Additional details regarding excavation depths and limits are provided in Section 3, Data Gaps.

3.0 DATA GAPS

This section presents a discussion of the data gaps identified by Ecology relating to the understanding of the distribution of COPCs in soil at Area 3 on the southern portion of the YSF property. Farallon also has included a discussion of data gaps with respect to evaluation of groundwater conditions.

3.1 SOIL QUALITY

The Agreed Order has indicated that the results of the soil sampling conducted by Ecology and EPI in 2007 identified data gaps in the RI work that needed to be addressed prior to completion of the FS and selection of cleanup alternatives for the Site. The cleanup activities performed by BNSF at the Bay Chemical site from late July through early October 2007 resulted in removal of approximately 5,543 cubic yards of soil from the western portion of the Site, based on the excavation limits and approximate depths provided to Farallon by Ecology (2008d). The excavation limits and approximate depths are depicted on Figures 3, 4, and 5. The cleanup activities consisted of excavation of the western portion of the Site that contained metals and other COPCs, including but not limited to organochlorine pesticides, PCE, DRO, and ORO. BNSF was not required to analyze soil samples collected from the Site for COPCs other than metals. Therefore, a data gap exists regarding assessment of the vertical distribution of the COPCs identified by Ecology and EPI in 2007 (Figures 3, 4, and 5).

Ecology (2008c through 2008f) has recommended that soil samples be collected at the interface of the clean fill imported to the Site and the underlying native soil to assess the potential vertical distribution of organochlorine pesticides, PCE, DRO, and ORO, where appropriate. These samples also may be used as confirmation samples to support a conclusion that no further cleanup action is necessary in the areas of the Site excavated during the BNSF cleanup excavation activities at the Bay Chemical site. Farallon understands that soil confirmation sampling data for metals from the cleanup excavation activities at the Bay Chemical site indicate no further action is necessary to address metals contamination in the western portion of the Site. Farallon has not been provided with data from the confirmation soil sampling conducted during the cleanup activities at the Bay Chemical site.

Farallon understands from discussions with Ecology (2008c) that excavation at the Bay Chemical site continued until concentrations of the target metals were below the property-specific cleanup levels established for that site. One area where excavation was halted before cleanup could be completed was in the vicinity of the former Yakima Farmers Supply waste pit that straddles the Agri-Tech and YSF property boundaries in the north-central portion of the Site (Figure 3). Excavation activities could not be performed in this area due to the documented presence of other organic contaminants that were not suitable for placement in the containment cell (Farallon 2004b). Imported clean fill was placed into the excavated areas of the Site for restoration, and asphalt pavement was replaced where necessary.

Farallon understands that monitoring well MW-5, located in Area 3 on the southern portion of the YSF property, was decommissioned during the excavation activities at the Bay Chemical

site. Monitoring wells MW-10 and MW-11 were installed by BNSF in 2008 to replace MW-5 (Figure 3).

The lateral and vertical distribution of metals, organochlorine pesticides, and VOCs at Area 3 on the southern portion of the YSF property requires further refinement outside the areas excavated during the cleanup activities at the Bay Chemical site, where concentrations of cadmium; copper; lead; 4,4-DDD; 4,4-DDE; dieldrin; aldrin; heptachlor epoxide; 1,1,-DCE; and 1,2-dichloropropane exceeding the preliminary screening levels established during the completion of the RI have been detected (Figures 4 and 5). Sampling performed by Ecology and EPI was limited to depths ranging from the ground surface to 28 inches bgs, which was inadequate to define the distribution of COPCs present in all areas tested. The metals and organochlorine pesticides are randomly distributed across the southern portion of the Site, with exceedances of preliminary screening levels having no readily distinguishable pattern. It is unlikely that a specific source area would be identified through extensive sampling in this area. However, Farallon will perform supplemental sampling to refine the understanding of the distribution of contamination to facilitate selection of an appropriate remedial alternative. Possible sources for contamination in this area may include, but may not be limited to, distribution of the COPCs caused by drainage from the former Yakima Farmers Supply waste pit that extended to this portion of the Site, windblown deposition of metals associated with operations at the Bay Chemical site, grading and filling activities performed by ANCO Industrial Park prior to occupation of the Site by YSF, grading and construction activities by YSF, and/or continued erosion of surficial soil.

3.2 GROUNDWATER QUALITY

Groundwater sampling has not been performed at the Site since 2002. Farallon will conduct supplemental groundwater monitoring and sampling to assess current groundwater quality at the Site and assess the stability of COPCs in the former Yakima Farmers Supply waste pit.

Groundwater sampling also will be performed to further assess the potential for application of monitored natural attenuation as part of a remedial alternative for groundwater at the former Yakima Farmer Supply waste pit. Farallon conducted a preliminary evaluation of groundwater geochemistry in 2002. The results indicated that groundwater conditions at the waste pit and near the pond area were anaerobic and that degradation compounds of PCE were identified at monitoring wells in these locations. The presence of the degradation compounds of PCE indicated that reductive dechlorination likely was occurring. Further investigation therefore is recommended to assess whether monitored natural attenuation or enhanced bioremediation are technically feasible remedial alternatives.

3.3 SEDIMENT QUALITY

Assessment of soil and sediment quality within the boundaries of the wetland near the southern boundary of the YSF property was not conducted during the Remedial Investigation. Based on the current understanding of the Site, the wetland includes both areas that are saturated/inundated with water year round and areas that are exposed seasonally, which are inundated with water only during times when regional irrigation practices are occurring between Spring and Fall. For

the purpose of the FS Work Plan the materials sampled from the portion of the wetland that is saturated year-round will be referred to as sediment and the materials sampled from the areas that are seasonally exposed will be referred to as soil. Farallon understands that the seasonally exposed materials may also be considered sediment if they are within the footprint of the pond and subject to sediment rather than soil cleanup standards. Assessment of soil and sediment quality in the wetland area is necessary to evaluate whether implementation of cleanup activities in this area will be necessary.

4.0 SUPPLEMENTAL SAMPLING AND MONITORING

The purpose of the supplemental monitoring and sampling at Area 3 of the Site is to address the data gaps discussed in Section 3 and provide additional information to support remedy decision-making as described in the Agreed Order. The supplemental monitoring and sampling program will provide sufficient data to further refine the conceptual site model for use in developing and evaluating potentially feasible remedial technologies for selection of a cleanup action for the Site.

The scope of work for the additional characterization effort at the Site includes the following:

- Supplemental soil sampling to define the lateral and vertical distribution of soil contamination in those portions of Area 3 of the Site that were not excavated during the cleanup action at the Bay Chemical site;
- Groundwater monitoring and sampling of the existing monitoring well network; and
- Sediment and soil sampling within the wetland area located near the southern boundary of the Site.

The scope of work described below is anticipated to be sufficient to provide the data necessary to proceed with the FS. Specific details on the sampling and analysis of soil, groundwater, and sediment are provided in the Sampling and Analysis Plan (SAP), provided in Appendix A. Quality assurance requirements for the supplemental sampling and monitoring are detailed in the Quality Assurance Project Plan, provided as Appendix B. A general description of the scope of work for the sampling activities is provided below.

4.1 FIELD PROGRAM

The monitoring and sampling field program will include supplemental soil sampling, groundwater monitoring and sampling, and sediment sampling. A copy of the Health and Safety Plan for the Site is provided as Appendix C. A summary of the scope of work for each work element is provided below.

4.1.1 Supplemental Soil Sampling

Supplemental soil sampling activities will be conducted to determine the effectiveness of the cleanup action performed at the Bay Chemical site in removing metals, organochlorine pesticides, petroleum hydrocarbons, and VOC contamination identified by Ecology and EPI during the July 2007 site investigation. These work elements include establishing a grid system over Area 3 on the southern portion of the YSF property where the extent of soil contamination is undetermined, advancing a test pit(s) within each sampling grid, and collecting soil samples for laboratory analysis for COPCs in Area 3, which include the following:

- Metals—antimony, arsenic, cadmium, copper, lead, manganese, mercury, and zinc;
- Organochlorine pesticides—aldrin; alpha chlordane; dieldrin; 4,4-DDD; 4,4-DDE; and heptachlor epoxide; and

- VOCs—PCE; 1,2-dichloropropane; and 1,1-DCE.

A grid square system will be established using 100- by 100-foot sections, replicating the grid system previously established for the 2007 Ecology site investigation. Test pits within each grid square will be completed using a backhoe. Soil samples will be collected at the interface of the clean fill placed as part of the cleanup action at the Bay Chemical site during restoration activities following the cleanup action excavation, and native soil in areas on the western border of the Site where the 2007 site investigation indicated that concentrations of COPCs were present at concentrations exceeding RI preliminary screening levels. Ecology has requested this sampling be conducted to confirm that the COPCs have been removed and/or to assess vertical distribution of the COPCs.

Soil samples will be collected between approximately 1 foot and 4 feet bgs in areas outside the limits of the Bay Chemical site cleanup excavation. These depths are considered adequate based on information provided to Farallon by Ecology (2008d) on the excavation limits and depths and the typical distribution of metals detected during the Bay Chemical site cleanup excavation. In addition, the concentrations of COPCs detected during the 2007 sampling by Ecology and EPI further support the selected sampling interval. Soil samples will be screened in the field for the presence of volatile organic vapors using a photoionization detector, and for metals using an x-ray fluorescence spectrometer. During excavation, a Test Pit Log form will be completed by a Field Geologist/Scientist for each test pit. The Test Pit Log will include lithologic descriptions of soil encountered using the Unified Soil Classification System. Additional details regarding specific sampling methods and laboratory analyses are discussed in the SAP, provided in Appendix A.

4.1.2 Groundwater Monitoring and Sampling

A single groundwater monitoring and sampling event will be conducted to establish current groundwater quality conditions and to further assess the potential for monitored natural attenuation at the waste pit. The event will consist of groundwater monitoring and sampling at monitoring wells WDOE-6, MW-1 through MW-4, MW-6, MW-7A, MW-7B, MW-10, and MW-11. Details regarding specific sampling methods and laboratory analysis are provided in the SAP (Appendix A).

4.1.3 Sediment and Soil Sampling

Assessment of sediment and soil quality in the wetland area will be conducted to evaluate whether cleanup of this area is necessary. The assessment will include collection of sediment and soil samples from the wetland area. Sediment and soil samples will be collected at six locations within the boundaries of the wetland area. Three soil samples will be collected in areas that are seasonally exposed during periods when regional irrigation is not occurring and three sediment samples will be collected in areas within the saturated portion of the wetland. The locations of the samples will be determined in the field with concurrence from Ecology.

The soil samples will be submitted for analysis of the constituents of concern for this area, which include petroleum hydrocarbons, VOCs, metals, and organochlorine pesticides. The sediment samples collected for bioassay testing and physical analysis. If sediment samples fail the

bioassay testing, chemical analysis of archived sediment samples will be conducted to identify the constituents of concern for cleanup in this area and compared to the soil results from the sample locations not inundated with water throughout the year. Details regarding the sampling activities for the wetland area are provided in the SAP (Appendix A).

5.0 FEASIBILITY STUDY TECHNICAL APPROACH

This section presents the elements that will be included in the FS for the Site in accordance with Ecology guidance and the provisions specified in WAC 173-340-350(8) and WAC 173-340-360. The objective of the FS process is to make an informed risk-based selection of a cleanup action alternative(s) most appropriate for the Site. The FS process includes identifying applicable regulatory requirements, establishing cleanup action objectives and preliminary cleanup standards that are protective of human health and the environment, identifying and evaluating potentially applicable cleanup technologies, and incorporating the cleanup technologies into cleanup action alternatives to address the contaminants and contaminated media identified at the Site. The cleanup action alternatives will then be evaluated against specific criteria pertaining to permanence, effectiveness, implementability, and cost to facilitate selection of a preferred Site remedy. Each of the components involves consideration of Site-specific data and the findings of the human health and ecological risk analysis. The following sections describe the general tasks that will be performed as part of the FS for the Site.

5.1 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

MTCA requires that cleanup actions comply with applicable state and federal laws, which are defined as "legally applicable requirements and those requirements that the department determines...are relevant and appropriate requirements" (WAC 173-340-200). The state and federal laws and regulations as well as local regulatory requirements applicable to the cleanup action alternatives identified for evaluation at the Site will be identified in the FS Report. Ecology will make the final determination as to whether the requirements have been appropriately identified and are legally applicable or relevant and appropriate.

5.2 CLEANUP STANDARDS

MTCA requires the establishment of appropriate cleanup levels and cleanup standards for a release of a hazardous substance at a site. A cleanup level is defined in MTCA as the "concentration of a hazardous substance in soil, water, air, or sediment that is determined to be protective of human health and the environment under specified exposure conditions" (WAC 173-340-200).

MTCA provides alternative methods for establishing cleanup levels. Under MTCA Method A, groundwater and soil cleanup levels are set at concentrations that are at least as stringent as those specified in Tables 720-1 and 740-1, respectively, of WAC 173-340-700 and in applicable state and federal laws. Method A is applicable to sites that may involve a relatively routine cleanup action or few hazardous substances. MTCA Method B provides for determination of cleanup levels for all media and sites as standard and site-specific cleanup levels. Under MTCA Method B, cleanup levels are established with consideration of applicable state and federal laws, and the risk equations and other requirements specified in WAC 173-340-720 through 173-340-760. Farallon does not anticipate that MTCA Method C cleanup levels will be deemed applicable to the Site. The FS report will present a discussion of appropriate cleanup standards and levels for the Site in order to facilitate comparison of potential cleanup alternatives. The preliminary

cleanup standards and level alternatives presented in the RI will be reviewed and discussed with Ecology prior to completion of the FS. The selected cleanup standards and levels for the cleanup action determined in the FS will be included in a Cleanup Action Plan for the Site.

5.3 CLEANUP ACTION ALTERNATIVES

This section describes the FS process by which applicable cleanup action alternatives will be developed and evaluated for the Site. The objective of the FS process is to develop a range of technically feasible cleanup action alternatives for detailed analysis. The process of developing cleanup action alternatives consists of three phases: development of general response actions, identification and screening of cleanup technologies and process components, and development of cleanup action alternatives.

MTCA allows for an initial screening of cleanup action alternatives, when appropriate, to reduce the number of alternatives carried to detailed analysis. MTCA stipulates that a cleanup action alternative may be eliminated from further consideration in the FS if it consists of one or both of the following:

- An alternative that does not meet the minimum requirements specified in WAC 173-340-360, including those alternatives for which costs are clearly disproportionate; and/or
- An alternative or component that is not technically feasible.

Farallon will conduct an initial screening of preliminary cleanup alternatives to determine which meet the minimum MTCA requirements for cleanup and are technically feasible to implement, and will provide an overview of the screening process and the results in the FS documentation. The cleanup action alternatives will be screened to meet cleanup action objectives to protect human health and the environment by eliminating, reducing, or otherwise controlling risks posed through each complete exposure pathway and migration route, as required by WAC 173-340-350.

5.4 CLEANUP ACTION ALTERNATIVE SELECTION

The process for selecting a cleanup action alternative for the Site is described in this section. The primary criteria for evaluating cleanup action alternatives are the minimum requirements established by MTCA. As defined in WAC 173-340-360, the selected cleanup action must meet the following minimum threshold requirements:

- Protect human health and the environment;
- Comply with the cleanup standards (WAC 173-340-700 through 173-340-760);
- Comply with applicable state and federal laws; and
- Provide for compliance monitoring (WAC 173-340-410 and WAC 173-340-720 through 173-340-760).

In addition, the selected cleanup action will:

- Use permanent solutions to the maximum extent practicable, as defined in WAC 173-340-360(3);
- Provide for a reasonable restoration time frame, as defined in WAC 173-340-360(4); and
- Consider public concerns (WAC 173-340-600).

Additional requirements will be considered in the FS during the development and evaluation of cleanup action alternatives. These requirements involve groundwater cleanup actions, cleanup actions for soil and sediment (if necessary), institutional/engineering controls, wetlands restoration, vapor intrusion, and remediation levels.

A comparative analysis of the cleanup action alternatives that meet the MTCA minimum threshold requirements will be conducted in the FS based on the following evaluation criteria:

- Protectiveness: Overall protectiveness of human health and the environment;
- Permanence: The degree to which the alternative permanently reduces the toxicity, mobility, or volume of hazardous substances;
- Cost: The costs to implement the alternative, conduct long-term monitoring and maintenance activities, and maintain institutional controls;
- Effectiveness over the long term: The degree of certainty in meeting cleanup action objectives, the reliability of the alternative, the magnitude of residual risk, and the effectiveness of controls;
- Management of short-term risks: The risk to human health and the environment associated with construction and implementation of the cleanup action alternative;
- Technical and administrative implementability: Technical feasibility of the cleanup action alternative and integration with Site operations, and degree of compliance with administrative and regulatory requirements; and
- Consideration of public concerns: Whether the community has concerns regarding the alternative and, if so, the extent to which the alternative addresses those concerns.

The comparative analysis that will be provided in the FS documentation will provide the basis for selection of a preferred cleanup action alternative. In accordance with MTCA, preference will be given to the cleanup action alternative that uses permanent solutions to the maximum extent practicable.

5.5 FEASIBILITY STUDY REPORT

A Draft FS Report presenting the components of the FS process described above will be completed in accordance with the requirements of the Agreed Order in a manner that is consistent with Ecology guidance and the provisions specified in MTCA for identifying, evaluating, and selecting cleanup actions.

6.0 SCHEDULE

The schedule for the work to be performed at the Site pertaining to completion of the FS is discussed in this section, and is based on the scheduling requirements outlined in Exhibit C of the Agreed Order. Farallon will prepare the Final FS Work Plan and provide it to Ecology within 30 days of receiving written comments from Ecology on the Revised Draft FS Work Plan. Farallon will conduct the sampling activities described in Section 4 and provide the analytical results to Ecology within 60 days of the issuance of written approval by Ecology of the Final FS Work Plan. Farallon will complete a Draft FS Report and provide it to Ecology for comment within 120 days of the issuance of written confirmation by Ecology that the remedial investigation work is complete and no further investigation to support evaluation of feasible remedial alternatives appears necessary. Farallon will revise the Draft FS Report and submit the Final FS Report to Ecology within 60 days of receipt of Ecology comments on the draft document, in accordance with the requirements of the Agreed Order.

7.0 BIBLIOGRAPHY

Farallon Consulting, L.L.C. (Farallon). 2004a. Technical Memorandum Regarding Preliminary Evaluation of Technically Feasible Remedial Alternatives. From Jeff Kaspar, Senior Project Manager. To Marv Wark, Yakima Steel Fabricators. June 9.

———. 2004b. Revised Remedial Investigation Report, Agri-Tech and Yakima Steel Fabricators, 6 and 10 1/2 East Washington Avenue, Yakima, Washington (RI Report). Prepared for Yakima Steel Fabricators. June 10.

Washington State Department of Ecology (Ecology). 2008a. E-mail Message Regarding Agri-Tech/YSF Data. From Brian Deeken, Project Manager. To Jeff Kaspar, Senior Project Manager, Farallon Consulting, L.L.C. October 8.

———. 2008b. E-mail Message Regarding Agri-Tech/YSF Data. From Brian Deeken, Project Manager. To Jeff Kaspar, Senior Project Manager, Farallon Consulting, L.L.C. October 8.

———. 2008c. E-mail Message Regarding Yakima Steel FS Work Plan. From Brian Deeken, Project Manager. To Jeff Kaspar, Senior Project Manager, Farallon Consulting, L.L.C. December 2.

———. 2008d. E-mail Message Regarding Yakima Steel FS Work Plan. From Brian Deeken, Project Manager. To Jeff Kaspar, Senior Project Manager, Farallon Consulting, L.L.C. December 8.

———. 2008e. E-mail Message Regarding Yakima Steel FS Work Plan. From Brian Deeken, Project Manager. To Jeff Kaspar, Senior Project Manager, Farallon Consulting, L.L.C. December 10.

———. 2008f. E-mail Message Regarding Test Pit Locations. From Brian Deeken, Project Manager. To Jeff Kaspar, Senior Project Manager, Farallon Consulting, L.L.C. December 11.

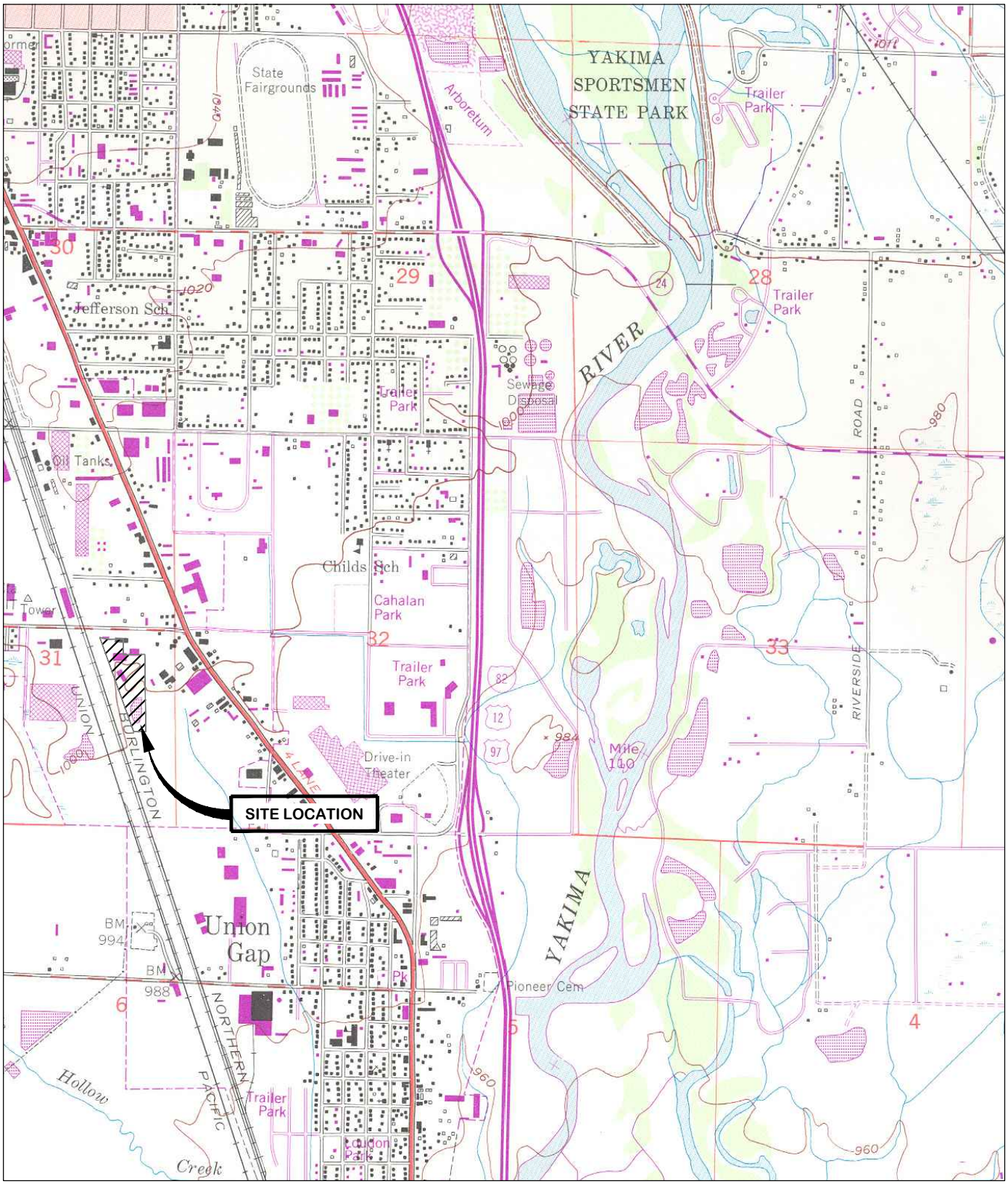
———. 2010. Letter Regarding Comments on AgriTech/Yakima Steel Fabricators Feasibility Study Work Plan. From Norman D. (Norm) Peck, Project Coordinator. To Jeff Kaspar, Farallon Consulting, L.L.C. August 2.

Washington State Office of the Attorney General. 2007. Plaintiff's and Defendant's Stipulated Findings of Fact and Conclusions of Law No. 05-2-02060-1 between Merv Wark, Sharon Wark, and Yakima Steel Fabricators, Inc. and Washington State Department of Ecology. September 28.

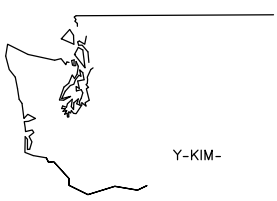
FIGURES

FEASIBILITY STUDY WORK PLAN
Agri-Tech and Yakima Steel Fabricators
6 and 10½ East Washington Avenue
Yakima, Washington

Farallon PN: 765-001



R= =R=NC=: 7.5 MINUT= USGS QUADRANGL= YAKIMA SOUTH, WASHINGTON. DAT=D 1953 AND PHOTOR=VIS=D 1981



FARALLON CONSULTING
975 5th Avenue Northwest
Issaquah, WA 98027

FIGURE 1

SITE VICINITY MAP
YSF/AGRI-TECH FS WORK PLAN
6 & 10 1/2 EAST WASHINGTON AVENUE
YAKIMA, WASHINGTON

FARALLON PN: 765-001

Drawn By: D=W	Checked By: BC	Da- :5/3/11	Disk Re- rence: 765001a

LEGEND

SITE BOUNDARY

TAX PARCEL BOUNDARY

FENCE

RAILROAD

PARCEL # 19133141010

FORMER BAY CHEMICAL PROPERTY

- ASPHALT -

PARCEL # 19133141408

AGRI-TECH BUILDING

PARCEL # 19133141409

BUILDING

EAST WASHINGTON AVENUE

CONCRETE PAD

PARCEL # 19133141005

OFFICES

FABRICATION AREA

YAKIMA STEEL FABRICATORS BUILDING

FABRICATION AND LOADING AREA

EDGE OF PAVEMENT

- ASPHALT -

- GRAVEL -

PARCEL # 19133141011

- ASPHALT -

BUILDING

BNSF RAILROAD SPUR

STEEL STORAGE AREA

- DITCH -

OLD BARB WIRE FENCE

TYPE 3 WETLANDS AREA (EXISTING POND)

- GRAVEL -

PARCEL # 19133141009

PARCEL # 19133114003

- GRAVEL -

- GRAVEL -

UNPAVED ROAD

- DITCH -

- DITCH -

PARCEL # 19133232408

PARCEL # 19133232433

CASCADE AUTO RECYCLING

PARCEL # 19133141406

PARCEL # 19133233009

0 80

APPROXIMATE SCALE IN FEET

FARALLON CONSULTING

975 5th Avenue Northwest
Issaquah, WA 98027

FIGURE 2

SITE PLAN AND TAX PARCEL LOCATIONS
YSF/AGRI-TECH FS WORK PLAN
6 & 10 1/2 EAST WASHINGTON AVENUE
YAKIMA, WASHINGTON

FARALLON PN: 765-001

Drawn By: JK	Checked By: BC	Date: 5/3/11	Disk Reference: 765001a

LEGEND

- APPROXIMATE BOUNDARY OF FORMER YAKIMA FARMERS SUPPLY WASTE PIT
- **AREA 1** FORMER YAKIMA FARMERS SUPPLY WASTE PIT LOCATION
- **AREA 2** FORMER YAKIMA FARMERS SUPPLY LIME AND SULFUR STOCKPILE LOCATIONS
- **AREA 3** POTENTIAL PETROLEUM RELEASE AREA
- SITE BOUNDARY
- TAX PARCEL BOUNDARY
- FENCE
- RAILROAD

- B-2 SOIL BORING LOCATION AGRA EARTH AND ENVIRONMENTAL INC. (1997)
- SP-27 DIRECT PUSH SOIL BORING LOCATION AGRA EARTH AND ENVIRONMENTAL INC. (1997)
- TP-4 TEST PIT LOCATION PLSA ENGINEERING (1993)
- PIT B WASHINGTON STATE DEPARTMENT OF ECOLOGY (ECOLOGY) TEST PIT (JULY 2007)
- TP-2 ENVIRONMENTAL PARTNERS, INC. TEST PIT (2007)
- M ECOLOGY SAMPLING GRID DESIGNATION
- MW-6 SHALLOW BAY CHEMICAL SITE MONITORING WELL INSTALLED BY PACIFIC GROUNDWATER GROUP (1994)
- MW-7A SHALLOW MONITORING WELL INSTALLED BY FARALLON (2002)
- MW-7B DEEP MONITORING WELL INSTALLED BY FARALLON
- MW-2 SHALLOW MONITORING WELL INSTALLED BY AGRA EARTH & ENVIRONMENTAL, INC. (1997)
- MW-4 DEEP MONITORING WELL INSTALLED BY AGRA EARTH & ENVIRONMENTAL, INC. (1997)
- MW-5 DECOMMISSIONED WELL DURING BAY CHEMICAL CLEANUP
- WDOE-6 MONITORING WELL INSTALLED BY ECOLOGY (1992)
- MW-10 BAY CHEMICAL MONITORING WELL (2009)

NOTE:

1. LOCATIONS OF ALL TEST PITS BY ECOLOGY ARE APPROXIMATED. COORDINATES PROVIDED BY ECOLOGY DID NOT PLOT IN CORRESPONDING SAMPLING GRID IN ALL CASES. FARALLON SHIFTED TEST PIT LOCATIONS TO THE APPROPRIATE SAMPLING GRID AND ESTIMATED THE TEST PIT LOCATION ON BEST AVAILABLE INFORMATION.
2. FIGURE INCLUDES INFORMATION PRESENTED IN COLOR. PHOTOCOPYING MAY NOT BE APPROPRIATE.

BAY CHEMICAL CLEANUP AREA
APPROXIMATE EXCAVATION DEPTH IN FEET BELOW GROUND SURFACE

- 0-2
- 2-4
- 4-6
- 6

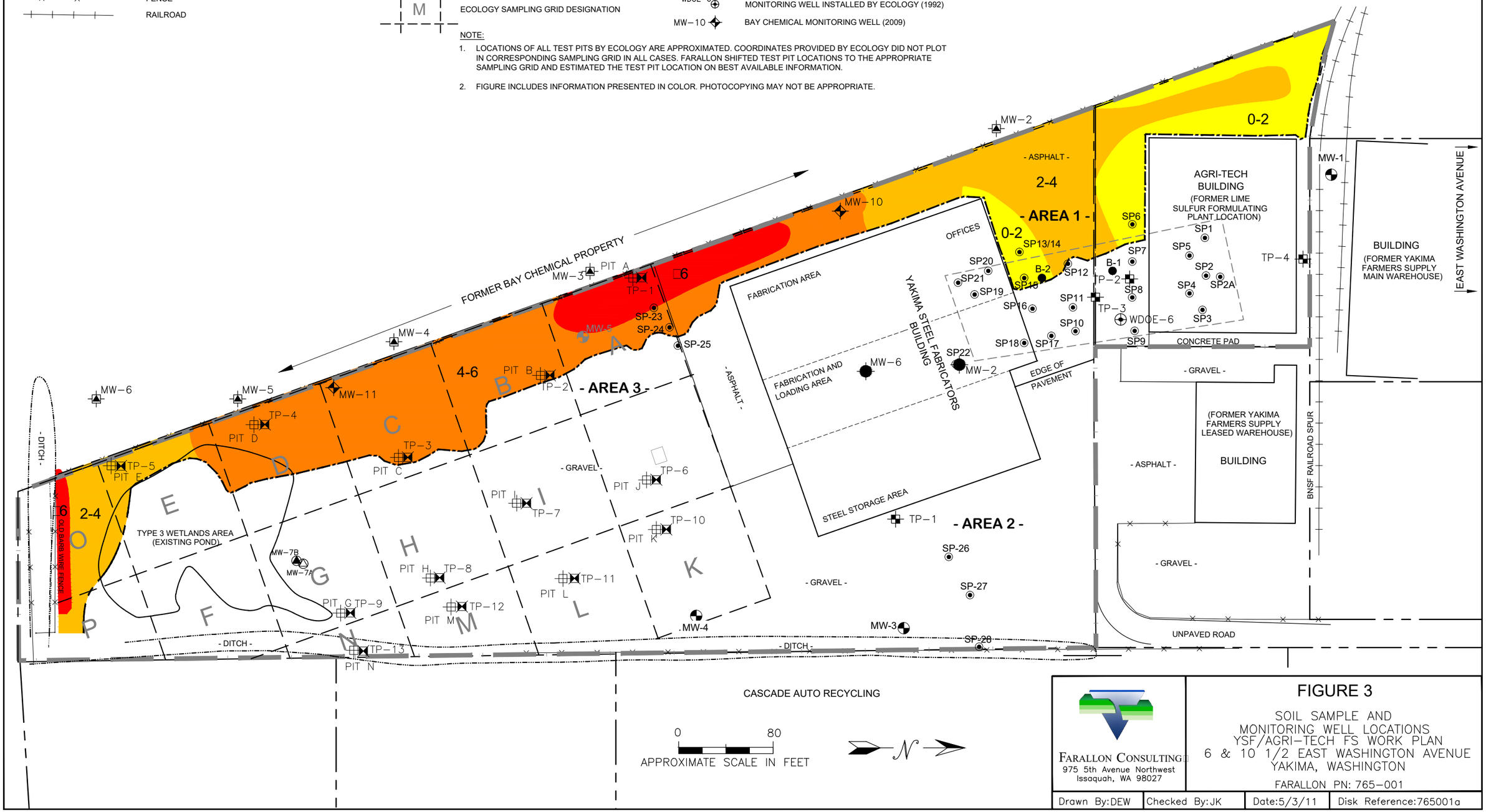


FIGURE 3

SOIL SAMPLE AND MONITORING WELL LOCATIONS
YSF/AGRI-TECH FS WORK PLAN
6 & 10 1/2 EAST WASHINGTON AVENUE
YAKIMA, WASHINGTON

FARALLON PN: 765-001

FARALLON CONSULTING
975 5th Avenue Northwest
Issaquah, WA 98027

Drawn By: DEW	Checked By: JK	Date: 5/3/11	Disk Reference: 765001a

LEGEND

- APPROXIMATE BOUNDARY OF FORMER YAKIMA FARMERS SUPPLY WASTE PIT
- **AREA 1** FORMER YAKIMA FARMERS SUPPLY WASTE PIT LOCATION
- **AREA 2** FORMER YAKIMA FARMERS SUPPLY LIME AND SULFUR STOCKPILE LOCATIONS
- **AREA 3** POTENTIAL PETROLEUM RELEASE AREA
- SITE BOUNDARY
- TAX PARCEL BOUNDARY
- FENCE
- RAILROAD

- PIT B — WASHINGTON STATE DEPARTMENT OF ECOLOGY (ECOLOGY) TEST PIT (□ULY 2007)
- TP−2 — ENVIRONMENTAL PARTNERS, INC. TEST PIT (2007)
- M — ECOLOGY SAMPLING GRID DESIGNATION

SOIL ANALYTICAL RESULTS IN MILLIGRAMS PER KILOGRAM
DEPTH IN INCHES BELOW GROUND SURFACE

BOLD = INDICATES CONCENTRATION EXCEEDS WASHINGTON STATE MODEL TOXICS CONTROL ACT CLEANUP REGULATION METHOD B CLEANUP LEVELS PRESENTED IN THE REMEDIAL INVESTIGATION REPORT (FARALLON 2004)

□ = INDICATES CONCENTRATIONS NOT DETECTED AT OR ABOVE THE STATED LABORATORY PRACTICAL QUANTITATION LIMIT

NA = NOT ANALY□ED

S□ = ANTIMONY
As = ARSENIC
Cd = CADMIUM
Cr = CHROMIUM
Cu = COPPER
P□ = LEAD
Mn = MANGANESE
Hg = MERCURY
Ni = NICKEL
Ag = SILVER
Tl = THALLIUM
□n = □INC

BAY CHEMICAL CLEANUP AREA
APPROXIMATE EXCAVATION DEPTH IN FEET BELOW GROUND SURFACE

- 0-2
- 2-4
- 4-6
- □6

NOTE:

1. LOCATIONS OF ALL TEST PITS BY ECOLOGY ARE APPROXIMATED. COORDINATES PROVIDED BY ECOLOGY DID NOT PLOT IN CORRESPONDING SAMPLING GRID IN ALL CASES. FARALLON SHIFTED TEST PIT LOCATIONS TO THE APPROPRIATE SAMPLING GRID AND ESTIMATED THE TEST PIT LOCATION ON BEST AVAILABLE INFORMATION.
2. FIGURE INCLUDES INFORMATION PRESENTED IN COLOR. PHOTOCOPYING MAY NOT BE APPROPRIATE.

DEPTH	S□	As	Cd	Cr	Cu	P□	Mn	Hg	Ni	Ag	Tl	□n
0	NA	2.9	**15.3**	NA	57.9	762	515	NA	NA	NA	NA	3,100

DEPTH	S□	As	Cd	Cr	Cu	P□	Mn	Hg	Ni	Ag	Tl	□n
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

DEPTH	S□	As	Cd	Cr	Cu	P□	Mn	Hg	Ni	Ag	Tl	□n
24"	NA	□5.0	**330**	NA	1,820	**22,500**	**12,500**	NA	NA	NA	NA	**123,000**

DEPTH	S□	As	Cd	Cr	Cu	P□	Mn	Hg	Ni	Ag	Tl	□n
26"	**65**	□5.0	**310**	490	2,000	**27,000**	NA	**14**	110	43	39	**140,000**

DEPTH	S□	As	Cd	Cr	Cu	P□	Mn	Hg	Ni	Ag	Tl	□n
6"	NA	13	**7.6**	NA	944	674	645	NA	NA	NA	NA	2,200

DEPTH	S□	As	Cd	Cr	Cu	P□	Mn	Hg	Ni	Ag	Tl	□n
28"	□3.0	□5.0	2.0	6.7	35	300	NA	0.09	18	□5.0	□10	150

DEPTH	S□	As	Cd	Cr	Cu	P□	Mn	Hg	Ni	Ag	Tl	□n
6"	NA	13.0	**4.22**	NA	136	290	524	NA	NA	NA	NA	1,200

DEPTH	S□	As	Cd	Cr	Cu	P□	Mn	Hg	Ni	Ag	Tl	□n
16"	□3.0	□5.0	**6.9**	16	51	630	NA	0.26	18	□5.0	□10	2,100

DEPTH	S□	As	Cd	Cr	Cu	P□	Mn	Hg	Ni	Ag	Tl	□n
24"	NA	11.9	**5.38**	NA	79.8	439	569	NA	NA	NA	NA	1,710

DEPTH	S□	As	Cd	Cr	Cu	P□	Mn	Hg	Ni	Ag	Tl	□n
24"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

DEPTH	S□	As	Cd	Cr	Cu	P□	Mn	Hg	Ni	Ag	Tl	□n
24"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

DEPTH	S□	As	Cd	Cr	Cu	P□	Mn	Hg	Ni	Ag	Tl	□n
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

DEPTH	S□	As	Cd	Cr	Cu	P□	Mn	Hg	Ni	Ag	Tl	□n
24"	NA	12.5	1.1	NA	62.0	409	369	NA	NA	NA	NA	465

DEPTH	S□	As	Cd	Cr	Cu	P□	Mn	Hg	Ni	Ag	Tl	□n
6"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

DEPTH	S□	As	Cd	Cr	Cu	P□	Mn	Hg	Ni	Ag	Tl	□n
18"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

DEPTH	S□	As	Cd	Cr	Cu	P□	Mn	Hg	Ni	Ag	Tl	□n
0	NA	1.5	□0.10	NA	77.4	5.67	160	NA	NA	NA	NA	69

DEPTH	S□	As	Cd	Cr	Cu	P□	Mn	Hg	Ni	Ag	Tl	□n
0	□3.0	□5.0	1.2	8.6	21	31	NA	0.04	21	□5.0	□10	99

DEPTH	S□	As	Cd	Cr	Cu	P□	Mn	Hg	Ni	Ag	Tl	□n
0.5"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

DEPTH	S□	As	Cd	Cr	Cu	P□	Mn	Hg	Ni	Ag	Tl	□n
12"	□0.3	□5.0	**2.9**	15	82	**2,800**	NA	0.09	22	□5.0	□10	1,700

DEPTH	S□	As	Cd	Cr	Cu	P□	Mn	Hg	Ni	Ag	Tl	□n
12"	□3.0	□5.0	1.3	15	22	170	NA	0.23	20	□5.0	□10	310

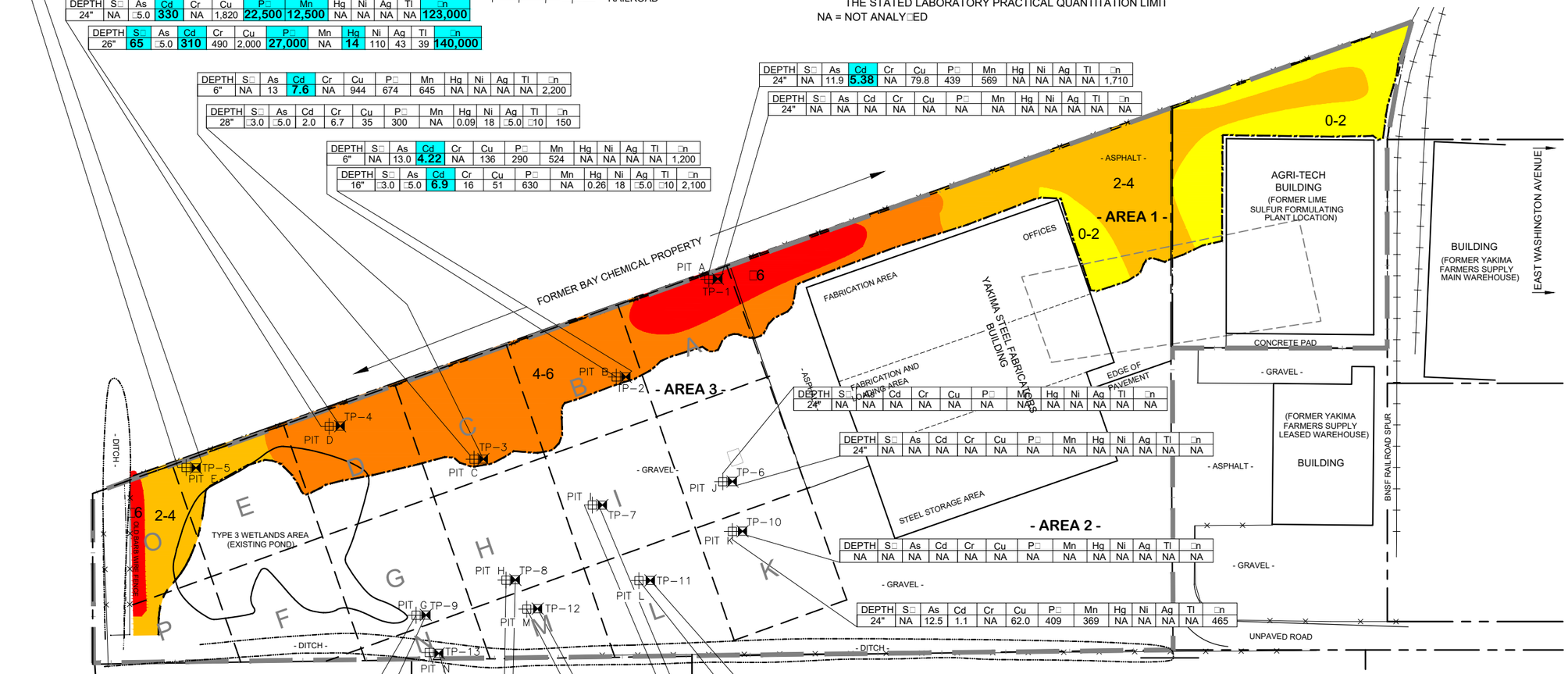
DEPTH	S□	As	Cd	Cr	Cu	P□	Mn	Hg	Ni	Ag	Tl	□n
12"	NA	6.17	0.67	NA	30.4	212	336	NA	NA	NA	NA	369

DEPTH	S□	As	Cd	Cr	Cu	P□	Mn	Hg	Ni	Ag	Tl	□n
18"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

DEPTH	S□	As	Cd	Cr	Cu	P□	Mn	Hg	Ni	Ag	Tl	□n
18"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

DEPTH	S□	As	Cd	Cr	Cu	P□	Mn	Hg	Ni	Ag	Tl	□n
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

DEPTH	S□	As	Cd	Cr	Cu	P□	Mn	Hg	Ni	Ag	Tl	□n
0	NA	8.12	**4.3**	NA	**5,560**	433	2,270	NA	NA	NA	NA	995



FARALLON CONSULTING
975 5th Avenue Northwest
Issaquah, WA 98027

FIGURE 4

CONCENTRATIONS OF METALS IN SOIL
YSF/AGRI-TECH FS WORK PLAN
6 & 10 1/2 EAST WASHINGTON AVENUE
YAKIMA, WASHINGTON

FARALLON PN: 765-001

Drawn By: DEW	Checked By: JK	Date: 5/3/11	Disk Reference: 765001a

LEGEND

- APPROXIMATE BOUNDARY OF FORMER YAKIMA FARMERS SUPPLY WASTE PIT
- **AREA 1** FORMER YAKIMA FARMERS SUPPLY WASTE PIT LOCATION
- **AREA 2** FORMER YAKIMA FARMER SUPPLY LIME AND SULFUR STOCKPILE LOCATIONS
- **AREA 3** POTENTIAL PETROLEUM RELEASE AREA
- SITE BOUNDARY
- TAX PARCEL BOUNDARY
- FENCE
- RAILROAD

PIT B — WASHINGTON STATE DEPARTMENT OF ECOLOGY (ECOLOGY) TEST PIT (□ULY 2007)

TP−2 — ENVIRONMENTAL PARTNERS, INC. TEST PIT (2007)

M — ECOLOGY SAMPLING GRID DESIGNATION

SOIL ANALYTICAL RESULTS IN MILLIGRAMS PER KILOGRAM
DEPTH IN INCHES BELOW GROUND SURFACE

BOLD = INDICATES CONCENTRATION EXCEEDS WASHINGTON STATE MODEL TOXICS CONTROL ACT CLEANUP REGULATION METHOD B CLEANUP LEVELS PRESENTED IN THE REMEDIAL INVESTIGATION REPORT (FARALLON 2004)

□ = INDICATES CONCENTRATIONS NOT DETECTED AT OR ABOVE THE STATED LABORATORY PRACTICAL QUANTITATION LIMIT

NA = NOT ANALY□ED

BAY CHEMICAL CLEANUP AREA
APPROXIMATE EXCAVATION DEPTH IN FEET BELOW GROUND SURFACE

- 0-2
- 2-4
- 4-6
- □6

NOTE:

1. LOCATIONS OF ALL TEST PITS BY ECOLOGY ARE APPROXIMATED. COORDINATES PROVIDED BY ECOLOGY DID NOT PLOT IN CORRESPONDING SAMPLING GRID IN ALL CASES. FARALLON SHIFTED TEST PIT LOCATIONS TO THE APPROPRIATE SAMPLING GRID AND ESTIMATED THE TEST PIT LOCATION ON BEST AVAILABLE INFORMATION.
2. FIGURE INCLUDES INFORMATION PRESENTED IN COLOR. PHOTOCOPYING MAY NOT BE APPROPRIATE.

DEPTH	ALDRIN	ALPHA CHLORDANE	4,4-DDD	4,4-DDE	DIELDRIN	HEPTACHLOR EPOXIDE
0	□0.00096	□0.00096	□0.0019	0.004	□0.0019	□0.00096

DEPTH	ALDRIN	ALPHA CHLORDANE	4,4-DDD	4,4-DDE	DIELDRIN	HEPTACHLOR EPOXIDE
NA	NA	NA	NA	NA	NA	NA

DEPTH	ALDRIN	ALPHA CHLORDANE	4,4-DDD	4,4-DDE	DIELDRIN	HEPTACHLOR EPOXIDE
24"	□0.0048	□0.012	□0.0097	0.014	**0.018**	□0.014

DEPTH	ALDRIN	ALPHA CHLORDANE	4,4-DDD	4,4-DDE	DIELDRIN	HEPTACHLOR EPOXIDE
26"	**<0.01**	NA	□0.01	0.02	**0.03**	□0.01

DEPTH	ALDRIN	ALPHA CHLORDANE	4,4-DDD	4,4-DDE	DIELDRIN	HEPTACHLOR EPOXIDE
6"	□0.0049	□0.0049	□0.0098	□0.0098	**<0.0098**	□0.0049

DEPTH	ALDRIN	ALPHA CHLORDANE	4,4-DDD	4,4-DDE	DIELDRIN	HEPTACHLOR EPOXIDE
28"	NA	NA	NA	NA	NA	NA

DEPTH	ALDRIN	ALPHA CHLORDANE	4,4-DDD	4,4-DDE	DIELDRIN	HEPTACHLOR EPOXIDE
6"	□0.00097	□0.00097	□0.0019	0.0033	□0.0019	□0.00097

DEPTH	ALDRIN	ALPHA CHLORDANE	4,4-DDD	4,4-DDE	DIELDRIN	HEPTACHLOR EPOXIDE
16"	NA	NA	NA	NA	NA	NA

DEPTH	ALDRIN	ALPHA CHLORDANE	4,4-DDD	4,4-DDE	DIELDRIN	HEPTACHLOR EPOXIDE
24"	**<0.020**	**0.820**	□0.0039	0.059	**<0.0056**	**<0.020**

DEPTH	ALDRIN	ALPHA CHLORDANE	4,4-DDD	4,4-DDE	DIELDRIN	HEPTACHLOR EPOXIDE
24"	NA	NA	NA	NA	NA	NA

DEPTH	ALDRIN	ALPHA CHLORDANE	4,4-DDD	4,4-DDE	DIELDRIN	HEPTACHLOR EPOXIDE
24"	**0.043**	0.190	□0.039	0.022	**0.250**	**<0.019**

DEPTH	ALDRIN	ALPHA CHLORDANE	4,4-DDD	4,4-DDE	DIELDRIN	HEPTACHLOR EPOXIDE
24"	**0.02**	NA	□0.01	0.02	**0.17**	□0.01

DEPTH	ALDRIN	ALPHA CHLORDANE	4,4-DDD	4,4-DDE	DIELDRIN	HEPTACHLOR EPOXIDE
NA	NA	NA	NA	NA	NA	NA

DEPTH	ALDRIN	ALPHA CHLORDANE	4,4-DDD	4,4-DDE	DIELDRIN	HEPTACHLOR EPOXIDE
24"	□0.0020	0.0094	□0.0040	0.0055	**<0.0040**	□0.0020

DEPTH	ALDRIN	ALPHA CHLORDANE	4,4-DDD	4,4-DDE	DIELDRIN	HEPTACHLOR EPOXIDE
18"	**<0.01**	NA	□0.01	0.06	□0.01	□0.01

DEPTH	ALDRIN	ALPHA CHLORDANE	4,4-DDD	4,4-DDE	DIELDRIN	HEPTACHLOR EPOXIDE
6"	□0.00098	□0.011	**0.400**	**1.200**	**<0.039**	□0.020

DEPTH	ALDRIN	ALPHA CHLORDANE	4,4-DDD	4,4-DDE	DIELDRIN	HEPTACHLOR EPOXIDE
0	□0.0098	□0.0026	□0.0020	0.014	**0.017**	□0.00098

DEPTH	ALDRIN	ALPHA CHLORDANE	4,4-DDD	4,4-DDE	DIELDRIN	HEPTACHLOR EPOXIDE
0	**<0.01**	□0.01	□0.01	□0.01	**<0.01**	□0.01

DEPTH	ALDRIN	ALPHA CHLORDANE	4,4-DDD	4,4-DDE	DIELDRIN	HEPTACHLOR EPOXIDE
6"	□0.0010	□0.0010	□0.0020	0.09	□0.0020	□0.0010

DEPTH	ALDRIN	ALPHA CHLORDANE	4,4-DDD	4,4-DDE	DIELDRIN	HEPTACHLOR EPOXIDE
12"	**<0.01**	NA	□0.01	0.02	**0.01**	□0.01

DEPTH	ALDRIN	ALPHA CHLORDANE	4,4-DDD	4,4-DDE	DIELDRIN	HEPTACHLOR EPOXIDE
12"	**<0.01**	NA	□0.01	□0.01	**<0.01**	□0.01

DEPTH	ALDRIN	ALPHA CHLORDANE	4,4-DDD	4,4-DDE	DIELDRIN	HEPTACHLOR EPOXIDE
0	□0.0048	0.043	□0.0096	0.0060	**<0.0096**	□0.0048

DEPTH	ALDRIN	ALPHA CHLORDANE	4,4-DDD	4,4-DDE	DIELDRIN	HEPTACHLOR EPOXIDE
18"	**<0.01**	NA	□0.01	□0.01	**0.09**	□0.01

DEPTH	ALDRIN	ALPHA CHLORDANE	4,4-DDD	4,4-DDE	DIELDRIN	HEPTACHLOR EPOXIDE
18"	□0.0050	□0.0050	□0.0099	□0.0099	**<0.0099**	**<0.025**

DEPTH	ALDRIN	ALPHA CHLORDANE	4,4-DDD	4,4-DDE	DIELDRIN	HEPTACHLOR EPOXIDE
NA	NA	NA	NA	NA	NA	NA

DEPTH	ALDRIN	ALPHA CHLORDANE	4,4-DDD	4,4-DDE	DIELDRIN	HEPTACHLOR EPOXIDE
0	□0.0049	□0.0049	□0.0098	0.011	**<0.0098**	□0.013

FORMER BAY CHEMICAL PROPERTY
PIT A
TP−1
□6
4-6
PIT B
TP−2
- AREA 3 -
TP−4
PIT D
TP−3
PIT C
TP−5
PIT E
TP−6
PIT J
PIT I
TP−7
TP−10
PIT K
PIT H
TP−8
TP−11
PIT L
PIT G
TP−9
PIT M
TP−12
PIT F
TP−13
PIT N
- DITCH -
6 OLD BARB WIRE FENCE
2-4
TYPE 3 WETLANDS AREA (EXISTING POND)
- GRAVEL -
- ASPHALT -
- AREA 1 -
0-2
2-4
OFFICES
FABRICATION AREA
YAKIMA STEEL FABRICATION BUILDING
FABRICATION AND WELDING AREA
EDGE OF PAVEMENT
AGRI-TECH BUILDING
(FORMER LIME SULFUR FORMULATING PLANT LOCATION)
BUILDING
(FORMER YAKIMA FARMERS SUPPLY MAIN WAREHOUSE)
EAST WASHINGTON AVENUE
CONCRETE PAD
- GRAVEL -
(FORMER YAKIMA FARMERS SUPPLY LEASED WAREHOUSE)
BUILDING
BNSF RAILROAD SPUR
STEEL STORAGE AREA
- AREA 2 -
UNPAVED ROAD
CASCADE AUTO RECYCLING

0 100
APPROXIMATE SCALE IN FEET

FARALLON CONSULTING
975 5th Avenue Northwest
Issaquah, WA 98027

FIGURE 5

CONCENTRATIONS OF ORGANOCHLORINE PESTICIDES
YSF/AGRI-TECH FS WORK PLAN
6 & 10 1/2 EAST WASHINGTON AVENUE
YAKIMA, WASHINGTON

FARALLON PN: 765-001

Drawn By: DEW	Checked By: JK	Date: 5/3/11	Disk Reference: 765001a

TABLES

FEASIBILITY STUDY WORK PLAN
Agri-Tech and Yakima Steel Fabricators
6 and 10½ East Washington Avenue
Yakima, Washington

Farallon PN: 765-001

Table 1
July 2007 Soil Analytical Results for Petroleum Hydrocarbons and cPAHs
Agri-Tech and Yakima Steel Fabricators
Yakima, Washington
Farallon PN: 765-001

Test Pit Identification	Sampled By	Sample Grid	Sample Date	Approximate Sample Depth (feet bgs)	Analytical Results (milligrams per kilogram)								
					TPH[1,3]	cPAHs[2,3]							
					ORO	Dibenzo(a,h) anthracene	Benzo (b) fluoranthene	Chrysene	Benzo (a) anthracene	Indeno (1,2,3-cd) pyrene	Benzo(k) fluoranthene	Benzo (a) pyrene	Total cPAHs
Pit B	Ecology	B	07/09/07	0.5	**114,000**	<0.0099	<0.0099	<0.0099	<0.0099	<0.0099	<0.0099	0.015	<0.1
Pit H	Ecology	H	07/09/07	0.5	1,800	<0.010	0.060	0.052	0.038	0.024	0.063	0.058	**0.295**
TP-2	EPI	B	07/09/07	1.25	570	--	--	--	--	--	--	--	--
TP-8	EPI	H	07/09/07	1.0	560	--	--	--	--	--	--	--	--
Preliminary Screening Level					**2,000** [4]	**0.1** [5]	**0.1** [5]	**0.1** [5]	**0.1** [5]	**0.1** [5]	**0.1** [5]	**0.1** [5]	**0.1** [5]

NOTES:

Results in **bold** denote concentrations at or above the Preliminary Screening Level indicated.

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

- denotes sample not analyzed.

[1] Analyzed by Northwest Method NWTPH-Dx.

[2] Analyzed by U.S. Environmental Protection Agency Method SW8270D. Only cPAHs are tabulated.

[3] Compound was not retained as a COPC following completion of the June 2004 Revised Remedial Investigation Report.

[4] Preliminary screening level as identified in the June 2004 Revised Remedial Investigation Report based on Site-specific MTCA Method B cleanup

[5] Cleanup levels based on toxicity equivalency factor method using cleanup level of 0.1 milligram per kilogram (mg/kg) for benzo(a)pyrene. Total cPAHs must be less than 0.1 mg/kg in accordance with Section 708(8) of Chapter 173-340 of the Washington Administrative Code.

COPC = constituent of potential concern

cPAHs = carcinogenic polycyclic aromatic hydrocarbons

Ecology = Washington State Department of Ecology

EPI = Environmental Partners, Incorporated

MTCA = Washington State Model Toxics Control Act Cleanup Regulation

ORO = total petroleum hydrocarbons as oil-range organics

Table 2
July 2007 Soil Analytical Results for Metals
Agri-Tech and Yakima Steel Fabricators
Yakima, Washington
Farallon PN: 765-001

Test Pit Identification	Sampled By	Sample Grid	Sample Date	Approximate Sample Depth (feet bgs)	Analytical Results (milligrams per kilogram)											
					Antimony [1,3]	Arsenic [1,3]	Cadmium [1,4]	Chromium [1,3]	Copper [1,3]	Lead [1,3]	Manganese [1,3]	Mercury [2,4]	Nickel [1,3]	Silver [1,3]	Thallium [1,3]	Zinc [1,4]
Pit A	Ecology	A	07/09/07	2.0	-	11.9	**5.38**	-	79.8	439	569	-	-	-	-	1,710
Pit B	Ecology	B	07/09/07	0.5	-	13.0	**4.22**	-	136	290	524	-	-	-	-	1,200
Pit C	Ecology	C	07/09/07	0.5	-	13.0	**7.6**	-	944	674	645	-	-	-	-	2,200
Pit D	Ecology	D	07/09/07	2.0	-	**55**	**330**	-	1,820	**22,500**	**12,500**	-	-	-	-	**123,000**
Pit E	Ecology	E	07/09/07	0.0	-	2.9	**15.3**	-	57.9	762	515 J	-	-	-	-	3,100
Pit K	Ecology	K	07/09/07	2.0	-	12.5	1.1	-	62.0	409	369	-	-	-	-	465
Pit L	Ecology	L	07/09/07	1.0	-	6.17	0.67	-	30.4	212	336	-	-	-	-	369
Pit M	Ecology	M	07/09/07	0.0	-	8.12	**4.3**	-	**5,560**	433	2,270	-	-	-	-	995
Pit N	Ecology	N	07/09/07	0.0	-	1.5	<0.10	-	77.4 J	5.67	160	-	-	-	-	69
TP-2	EPI	B	07/09/07	1.25	<3.0	<5.0	**6.9**	16	51	630	-	0.26	18	<5.0	<10	2,100
TP-3	EPI	C	07/09/07	2.25	<3.0	<5.0	2.0	6.7	35	300	-	0.09	18	<5.0	<10	150
TP-4	EPI	D	07/09/07	2.0	**65**	<5.0	**310**	490	2,000	**27,000**	-	**14**	110	43	39	**140,000**
TP-8	EPI	H	07/09/07	1.0	<3.0	<5.0	**2.9**	15	82	**2,800**	-	0.09	22	<5.0	<10	1,700
TP-11	EPI	L	07/09/07	1.0	<3.0	<5.0	1.3	15	22	170	-	0.23	20	<5.0	<10	310
TP-13	EPI	N	07/09/07	0.0	<3.0	<5.0	1.2	8.6	21	31	-	0.04	21	<5.0	<10	99
Preliminary Screening Level					**32** [5]	**20** [5]	**2.0** [5]	**2,000** [5]	**2,960** [5]	**1,000** [5]	**11,000** [6]	**2.0** [5]	**NE**	**400** [5]	**NE**	**24,000** [5]

NOTES:

Results in **bold** denote concentrations at or above the Preliminary Screening Level indicated.

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

- denotes sample not analyzed.

[1] Analyzed by U.S. Environmental Protection Agency (EPA) Method 200 Series or 6010.

[2] Analyzed by EPA Method 7471.

[3] Constituent was not retained as a COPC following completion of the June 2004 Revised Remedial Investigation Report.

[4] Identified and retained as COPC in June 2004 Revised Remedial Investigation Report.

[5] Preliminary screening level as identified in June 2004 Revised Remedial Investigation Report based on MTCA Method B cleanup levels.

[6] Washington State Department of Ecology Cleanup Levels and Risk Calculations under MTCA, Version 3.1 Standard Method B Formula Values for Soil (Unrestricted Land Use) - Direct Contact (Ingestion Only) and Leaching Pathway, https://fortress.wa.gov/ecy/clarc/Reporting/ChemicalQuery.aspx

bgs = below ground surface

COPC = constituent of potential concern

Ecology = Washington State Department of Ecology

EPI = Environmental Partners, Incorporated

J = The analyte was positively identified. The associated numerical result is an estimate.

MTCA = Washington State Model Toxics Control Act Cleanup Regulation

NE = not established

Table 3
July 2007 Soil Analytical Results for Pesticides
Agri-Tech and Yakima Steel Fabricators
Yakima, Washington
Farallon PN: 765-001

Test Pit Identification	Sampled By	Sample Grid	Sample Date	Approximate Sample Depth (feet bgs)	Analytical Results (milligrams per kilogram) [1]												
					Aldrin [2]	Alpha Chlordane [3]	Chlordane [2]	4,4'-DDD [3]	4,4'-DDE [3]	4,4'-DDT [2]	Dieldrin [3]	Endosulfan Sulfate [2]	Endrin [3]	Heptachlor Epoxide [3]	Endrin Aldehyde [2]	Gamma Chlordane [2]	Heptachlor [3]
Pit A	Ecology	A	07/09/07	2.0	**<0.020**	**0.820 P**	--	<0.0039	0.059 P	0.26	**<0.0056**	<0.064	<0.0039	**<0.020**	<0.0039	0.82 P	0.043
Pit B	Ecology	B	07/09/07	0.5	<0.00097	<0.00097	--	<0.0019	0.0033	0.011 P	<0.0019	<0.0019	<0.0019	<0.00097	<0.0019	<0.00097	<0.00097
Pit C	Ecology	C	07/09/07	0.5	<0.0049	<0.0049	--	<0.0098	<0.0098	0.036	**<0.0098**	<0.0098	<0.0098	<0.0049	<0.0098	<0.0049	<0.0049
Pit D	Ecology	D	07/09/07	2.0	<0.0048	<0.012	--	<0.0097	0.014 P	0.058 P	**0.018**	<0.0097	<0.0097	<0.014	<0.0097	<0.0016	<0.0048
Pit E	Ecology	E	07/09/07	0.0	<0.00096	<0.00096	--	<0.0019	0.004 P	0.0035	<0.0019	<0.0019	<0.0019	<0.00096	<0.0019	<0.00096	<0.00096
Pit G	Ecology	G	07/09/07	0.5	<0.00098	<0.011	--	**0.400**	**1.20**	0.240	**<0.039**	<0.039	<0.039	<0.020	<0.039	<0.020	<0.020
Pit H	Ecology	H	07/09/07	0.5	<0.0010	<0.0010	--	<0.0020	0.09	0.110	<0.0020	<0.0020	<0.0020	<0.0010	<0.0020	<0.0010	<0.0010
Pit I	Ecology	I	07/09/07	1.5	<0.0050	<0.0050	--	<0.0099	<0.0099	0.067	**<0.0099**	<0.0099	<0.0099	**<0.025**	<0.0099	<0.026	<0.0050
Pit J	Ecology	J	07/09/07	2.0	**0.043**	0.190 P	--	<0.039	0.022 P	0.130	**0.250**	<0.039	<0.039	**<0.019**	<0.039	0.190	<0.019
Pit K	Ecology	K	07/09/07	2.0	<0.0020	0.0094	--	<0.0040	0.0055	0.016	**<0.0040**	<0.0040	<0.0040	<0.0020	<0.0040	0.0086	<0.0020
Pit L	Ecology	L	07/09/07	1.0	<0.0048	0.043 P	--	<0.0096	0.0060 J	0.049	**<0.0096**	<0.0096	<0.0096	<0.0048	<0.0096	0.034 P	<0.0048
Pit M	Ecology	M	07/09/07	0.0	<0.0049	<0.0049	--	<0.0098	0.011	0.026 P	**<0.0098**	<0.00989	<0.0098	<0.013	<0.0098	<0.0049	<0.0049
Pit N	Ecology	N	07/09/07	0.0	<0.00098	<0.0026	--	<0.0020	0.014	0.013	**0.017**	<0.0020	<0.0020	<0.00098	<0.0020	0.0016	<0.00098
TP-4	EPI	D	07/09/07	2.0	**<0.01**	--	<0.02	<0.01	0.02	0.08	**0.03**	<0.01	<0.01	<0.01	<0.01	--	<0.01
TP-6	EPI	J	07/09/07	2.0	**0.02**	--	0.16	<0.01	0.02	0.05	**0.17**	<0.01	<0.01	<0.01	<0.01	--	<0.01
TP-7	EPI	I	07/09/07	1.5	**<0.01**	--	<0.02	<0.01	<0.01	0.08	**0.09**	<0.01	0.02	<0.01	1.9	--	<0.01
TP-8	EPI	H	07/09/07	1.0	**<0.01**	--	<0.02	<0.01	0.02	0.04	**0.01**	<0.01	<0.01	<0.01	<0.01	--	<0.01
TP-9	EPI	G	07/09/07	1.5	**<0.01**	--	<0.02	<0.01	0.06	0.04	**<0.01**	<0.01	<0.01	<0.01	<0.01	--	<0.01
TP-11	EPI	L	07/09/07	1.0	**<0.01**	--	0.13	<0.01	<0.01	0.07	**<0.01**	<0.01	<0.01	<0.01	<0.01	--	<0.01
TP-13	EPI	N	07/09/07	0.0	**<0.01**	--	<0.02	<0.01	<0.01	<0.01	**<0.01**	<0.01	<0.01	<0.01	<0.01	--	<0.01
Preliminary Screening Level					**0.00503** [4]	**0.258** [4]	**2.9** [4]	**0.335** [4]	**0.446** [4]	**3.485** [4]	**0.0028** [4]	**4.301** [4]	**0.0404** [4]	**0.0161** [4]	**NE**	**NE**	**0.22** [4]

NOTES:

Results in **bold** denote concentrations at or above the Preliminary Screening Level indicated.

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

- denotes sample not analyzed.

[1] Analyzed by U.S. Environmental Protection Agency Method 8081.

[2] Compound was not retained as a COPC following completion of the June 2004 Revised Remedial Investigation.

[3] Identified and retained as a COPC in the June 2004 Revised Remedial Investigation Report.

[4] The preliminary screening level as identified in the June 2004 Revised Remedial Investigation Report. The screening level is based on MTCA Method B cleanup levels protective of groundwater.

bgs = below ground surface

COPC = constituent of potential concern

Ecology = Washington State Department of Ecology

EPI = Environmental Partners, Incorporated

J = estimated concentration when the value is less than laboratory-established reporting limits

MTCA = Washington State Model Toxics Control Act Cleanup Regulation

NE = not established in Cleanup Levels and Risk Calculations database

P = The analyte was detected on both chromatographic columns, but the quantified values differ by ≥40 percent relative percent difference with no obvious chromatographic interference.

Table 4
July 2007 Soil Analytical Results for Volatile Organic Compounds
Agri-Tech and Yakima Steel Fabricators
Yakima, Washington
Farallon PN: 765-001

Test Pit Identification	Sampled By	Sample Grid	Sample Date	Approximate Sample Depth (feet bgs)	Analytical Results (milligrams per kilogram) [1]																		
					Benzene [2]	Ethylbenzene [2]	m,p-Xylene [2]	o-Xylene [2]	Toluene [2]	Naphthalene [2]	n-Butylbenzene [2]	Sec-Butylbenzene [2]	Isopropylbenzene [2]	Methylene Chloride [2]	4-Methyl-2-Pentanone [2]	n-Propylbenzene [2]	Acetone [2]	1,2,4-Trimethylbenzene [2]	1,3,5-Trimethylbenzene [2]	1,2-Dichloropropane [3]	Chloroform [2]	PCE [3]	1,1-DCE [2]
Pit B	Ecology	B	07/09/07	0.5	0.0015	0.011	0.048	0.0370	0.010	0.032	0.0071	0.0028	0.0033	0.0047	0.020	0.015	0.174	0.208	0.062	**<0.0032**	<0.0016	**0.101**	**<0.0016**
Pit H	Ecology	H	07/09/07	0.5	<0.0017	0.00019	0.00089	<0.00087	<0.00087	<0.0017	<0.0017	<0.0017	<0.00087	<0.002	<0.0035	<0.00087	0.057	<0.0017	<0.00087	<0.0017	0.00025	0.00038	**<0.00087**
TP-8	EPI	H	07/09/07	1.0	<0.010	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.010	<0.050	<0.010	<0.010	**<0.010**	<0.010	<0.010	**<0.010**
Preliminary Screening Level					**NE**	**6.048** [5]	**9.144** [5]	**9.144** [5]	**7.271** [5]	**1,600** [4]	**NE**	**NE**	**NE**	**1,300** [4]	**NE**	**NE**	**3.21** [5]	**NE**	**NE**	**0.0031** [5]	**164** [5]	**0.053** [5]	**0.0005** [5]

NOTES:

Results in **bold** denote concentrations at or above the Preliminary Screening Level indicated.

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

- denotes sample not analyzed.

[1] Analyzed by U.S. Environmental Protection Agency Method 8260.

[2] Compound was not retained as a COPC following completion of the June 2004 Revised Remedial Investigation Report.

[3] Identified and retained as a COPC in the June 2004 Revised Remedial Investigation Report.

[4] Washington State Department of Ecology Cleanup Levels and Risk Calculations under MTCA, Version 3.1 Standard Method B Formula Values for Soil (Unrestricted Land Use) - Direct Contact (Ingestion Only) and Leaching Pathway, https://fortress.wa.gov/ecy/clarc/Reporting/ChemicalQuery.aspx

[5] Preliminary screening level as identified in the June 2004 Revised Remedial Investigation Report. Screening level is based on MTCA Method B cleanup levels protective of groundwater.

1,1-DCE = 1,1-dichloroethene

bgs = below ground surface

COPC = constituent of potential concern

Ecology = Washington State Department of Ecology

EPI = Environmental Partners, Incorporated

MTCA = Washington State Model Toxics Control Act Cleanup Regulation

NE = not established

PCE = tetrachloroethene

APPENDIX A
SAMPLING AND ANALYSIS PLAN

FEASIBILITY STUDY WORK PLAN
Agri-Tech and Yakima Steel Fabricators
6 and 10½ East Washington Avenue
Yakima, Washington

Farallon PN: 765-001

FARALLON consulting

975 5th Avenue Northwest, Issaquah, Washington 98027
Tel: (425) 295-0800 Fax: (425) 295-0850
www.farallonconsulting.com

SAMPLING AND ANALYSIS PLAN

APPENDIX A OF THE FEASIBILITY STUDY WORK PLAN

AGRI-TECH & YAKIMA STEEL FABRICATORS, INC.
6 AND 10½ EAST WASHINGTON AVENUE
YAKIMA, WASHINGTON

Submitted by:
Farallon Consulting, L.L.C.
975 5th Avenue Northwest
Issaquah, Washington 98027

Farallon PN: 765-001

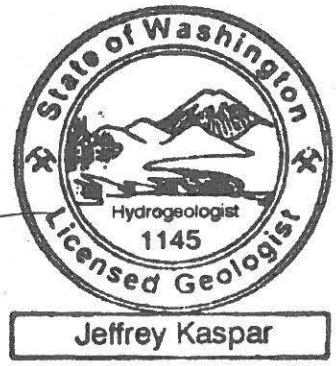
For:
Yakima Steel Fabricators, Inc.
6 East Washington Avenue
Yakima, Washington

May 3, 2011

Prepared by:

Brett T. Carp
Environmental Scientist

Reviewed by:



Jeffrey Kaspar, L.G., L.H.G.
Senior Project Manager

TABLE OF CONTENTS

FIGURES

ATTACHMENT

1.0 INTRODUCTION

Farallon Consulting, L.L.C. (Farallon) has prepared this Sampling and Analysis Plan (SAP) as part of the Feasibility Study (FS) Work Plan for the Yakima Steel Fabricators, Inc. (YSF) and Agri-Tech, Inc. (Agri-Tech) facilities located at 6 and 10½ East Washington Avenue in Yakima, Washington (herein referred to as the Site). The SAP has been prepared in accordance with the Washington State Model Toxics Control Act Cleanup Regulation (MTCA), as established in Chapter 173-340 of the Washington Administrative Code. The scope of work has been developed to meet the requirements set forth under Agreed Order No. DE 6091 dated October 27, 2008 entered into by the Washington State Department of Ecology (Ecology) and YSF.

1.1 PURPOSE

The purpose of a SAP is to define the specific requirements for sample collection and analytical activities to ensure that they are conducted in accordance with technically acceptable protocols and that the results meet the data quality objectives. A SAP presents site-specific protocols pertaining to sampling equipment and procedures and sample handling and analysis. Sampling objectives, sample locations, and measurement frequencies also are described. The SAP further provides a basis for conducting field activities and a mechanism for complying with quality assurance requirements.

The specific purposes of this SAP are to:

- Provide the basis for conducting and documenting the field activities to address the data gaps described in Section 3 of the FS Work Plan;
- Describe the sample locations, sample quantities, analytical methods, and documentation protocols for the sampling program; and
- Describe the equipment, procedures, and methodology to be used for soil, groundwater, and sediment sample collection and analysis.

1.2 ORGANIZATION

The SAP includes a description of the performance and confirmation monitoring activities for soil and groundwater and is organized as follows:

- **Section 2—Soil Sampling and Analysis**: This section describes the sampling locations and frequency, sample identification, sample collection and handling procedures, and analytical procedures for the soil sampling activities. The quality assurance/quality control (QA/QC) procedures for the soil sampling activities are discussed in the Quality Assurance Project Plan (QAPP) (Appendix B of the FS Work Plan).
- **Section 3—Groundwater Sampling and Analysis**: This section describes the sampling locations and frequency, sample identification, sample collection and handling procedures, and analytical procedures for the groundwater monitoring and sampling component of the FS Work Plan. The QA/QC procedures for the groundwater monitoring and sampling are included in the QAPP (Appendix B of the FS Work Plan).

- **Section 4—Wetland Area Soil and Sediment Sampling:** This Section describes the sampling locations and frequency, sample identification, sample collection and handling procedures, bioassay testing, and physical/chemical analytical procedures that will be completed in the wetland area. The QA/QC procedures for the sampling are included in the QAPP (Appendix B of the FS Work Plan).
- **Section 5—Management of Investigation-Derived Waste:** This section summarizes the handling and disposal procedures for waste soil and wastewater generated during the sampling and decontamination activities.
- **Section 6—Field Documentation**: This section presents a summary of the field documentation for the sampling activities.

2.0 SOIL SAMPLING AND ANALYSIS

The supplemental soil sampling activities will address the two data gaps relating to the understanding of the distribution of constituents of potential concern (COPCs) at the Site. The first data gap involves assessment of concentrations of COPCs on the western portion of Area 3 of the Site that may remain following the cleanup action performed at the Bay Chemical site in 2008. The soil samples collected may be used as confirmation samples if concentrations of COPCs are below the preliminary cleanup levels that will be established during completion of the FS. The second data gap involves further assessment of the distribution of COPCs identified in soil samples collected in the central and eastern portions of Area 3 by Ecology and Environmental Partners, Inc. of Issaquah, Washington (EPI) in July 2007. The soil samples collected will be used to refine the understanding of the distribution of COPCs and evaluate whether cleanup is required. The following sections describe the soil sampling locations and the procedures to address these data gaps.

2.1 WESTERN PORTION OF AREA 3

Soil samples will be collected from test pits to be excavated proximate to the sampling locations completed by Ecology and/or EPI that contained concentrations of one or more COPCs exceeding the preliminary screening levels set forth in the *Revised Remedial Investigation Report, Agri-Tech and Yakima Steel Fabricators, 6 and 10 1/2 East Washington Avenue, Yakima, Washington* dated June 10, 2004, prepared by Farallon (Revised RI Report) or where the laboratory practical quantitation limit (PQL) was greater than the preliminary screening level (Figure A-1). This includes the areas proximate to test pits A/TP-1, B/TP-2, C/TP-3, and D/TP-4 (Figure A-1). Soil samples from the lateral and vertical limits of the Bay Chemical site excavation were analyzed for metals but no other COPCs. The COPCs detected during the July 2007 Ecology and EPI sampling event included tetrachloroethene (PCE) at test pit B/TP-2; alpha chlordane at test pit A/TP-1; and dieldrin at test pit D/TP-4. In addition, COPCs that were not detected above the laboratory PQL but where the laboratory PQL was not sufficient to meet the preliminary cleanup level included 1,2-dichloropropane and 1,1-dichlorethene at test pit B/TP-2; aldrin, dieldrin, and heptachlor epoxide at test pit A/TP-1; dieldrin at test pit C/TP-3; and aldrin at test pit D/TP-4.

Elevated concentrations of total petroleum hydrocarbons as oil-range organics (ORO) were detected at a depth of 6 inches below ground surface (bgs). However, a sample collected from approximately 26 inches bgs contained concentrations of ORO below the preliminary soil screening level of 2,000 milligrams per kilogram (mg/kg) established in the Revised RI Report. The soil in this area requires no further investigation for petroleum compounds. Additional characterization of the soil at and below the interface of the fill from the Bay Chemical site cleanup excavation and native soil will be performed to assess whether concentrations of COPCs other than metals remain in this portion of the Site.

A minimum of three test pits will be excavated within each sampling grid requiring further characterization. Soil samples from each test pit will be collected from the interface of the fill from the Bay Chemical site cleanup excavation and native soil, and from approximately 1 foot

below the interface. In areas where soil was not excavated during the Bay Chemical site cleanup action did not excavate soil, test pits will be excavated to a depth of up to 4 feet bgs. Soil samples will be collected and analyzed at a frequency as described in Section 2.2.

Soil within each test pit will be screened for evidence of contaminants. Farallon will note changes in color, stained soil, unusual odors, photoionization detector (PID) readings, and changes in soil types. These data will be used to identify soil samples for laboratory analysis. A minimum of one soil sample per test pit location in the Bay Chemical site cleanup area will be analyzed for organochlorine pesticides. Soil samples from sampling grid B will also be analyzed for volatile organic compounds. Additional details on the specific sampling protocols follow in Sections 2.3 through 2.5.

2.2 CENTRAL AND EASTERN PORTIONS OF AREA 3

Soil samples will be collected from the 100- by 100-foot sampling grid squares from which Ecology and/or EPI identified concentrations of COPCs exceeding the preliminary screening levels established in the Revised RI Report or where the laboratory PQLs were not sufficiently low to determine whether a COPC exceeds the preliminary screening level. This includes sampling grids G through N. The COPCs in these areas are primarily organochlorine pesticides.

Concentrations of total carcinogenic polycyclic aromatic hydrocarbons (cPAHs) above the MTCA Method A cleanup level of 0.1 mg/kg were detected in a near-surface soil sample collected by Ecology at an oil-stained area in sampling grid H. Concentrations of cPAHs are not expected to be extensive and will not be analyzed at all sampling locations unless evidence of oil staining is observed. The distribution of cPAHs typically is limited to the immediate area of oil staining. Farallon recommends that oil-stained areas be addressed during cleanup, if necessary, and that the focus of the sampling to be performed not include testing of oil-stained surficial soil associated with minor releases from forklifts and cranes used by YSF. Farallon understands that the current business owner has improved housekeeping practices on the southern portion of the Site and for equipment used, further reducing the likelihood of inclusion of cPAHs or petroleum hydrocarbons as constituents of concern during the cleanup action.

During the investigation of the oil-stained area at sampling grid H, Ecology and EPI also analyzed soil for the presence of volatile organic compounds (VOCs). The laboratory PQLs for the compounds 1,1-dichloroethene and 1,2-dichloropropane were greater than the preliminary screening levels. Neither of these compounds is associated with releases of motor oil. Due to the absence of a suspected source of these compounds, testing at sampling grid H will not include analysis of VOCs unless field observations and screening indicate that a source of VOCs other than surficial oil staining is present.

Concentrations of metals will be assessed to confirm that the Bay Chemical site cleanup action was sufficient and no further action is required. A single anomalous concentration of copper was detected at sampling grid M. The source and distribution of copper will be further assessed during the sampling program.

The organochlorine pesticides detected were also identified in the former Yakima Farmers Supply waste pit. The distribution of these pesticides appears random. An exception is sampling grid G that includes an area where YSF previously had accepted fill material believed to be clean fill. When tested, the fill contained detectable concentrations of 4,4-DDD; 4,4-DDE; and 4,4-DDT. Although the clean fill was removed by the party that provided it, confirmation sampling was not performed. The July 2007 sampling results at sampling grid G indicate that residual fill material likely is still present in this area. The sampling program will identify the distribution of this fill to facilitate cleanup. Soil sampling in sampling grids G through N will focus on assessing the presence or absence of organochlorine pesticides and their distribution to facilitate determination of an appropriate cleanup approach, if required.

A minimum of three test pits will be excavated within each sampling grid square requiring further characterization. An x-ray fluorescence spectrometer (XRF) unit will be used to screen discrete soil samples collected from the following depth intervals for metals:

- Zero to 6 inches bgs;
- Six to 12 inches bgs;
- Twelve to 24 inches bgs;
- Twenty-four to 36 inches bgs; and
- Thirty-six to 48 inches bgs.

Soil within each test pit will be screened for other evidence of contaminants. Farallon will note changes in color, stained soil, unusual odors, PID readings, and changes in soil types. These data will be used to identify soil samples for laboratory analysis. A minimum of two soil samples per test pit location will be analyzed for metals and organochlorine pesticides. Two soil samples per test pit from sampling grid H will also be analyzed for VOCs. Additional detail on the specific sampling protocols follows.

2.3 SOIL SAMPLE IDENTIFICATION

Each soil sample collected from the test pits will have a unique sample identifier. The number will include a prefix identifying the grid square "A" and the test pit number, the date, and the depth interval at which the sample was collected.

For example, a soil sample collected from Test Pit 1 in Grid Square A on December 15, 2010 at a depth interval of 5 to 5.5 feet bgs would be identified as ATP1-121510-5/5.5. The sample identification will be placed on the sample label, the Field Report form, and the Chain of Custody form.

2.4 SOIL SAMPLE COLLECTION AND HANDLING PROCEDURES

Test pits will be excavated, and soil samples will be collected using a backhoe or a track hoe. Health and safety procedures for soil sampling and collection are provided in the Health and

Safety Plan (HASP) which is included as Appendix C of the FS Work Plan. The samples will be handled in accordance with the procedures described below:

- Soil samples will be collected directly from the sidewalls or bottom of each test pit using a plunger-type soil sampler at depths less than 48 inches bgs in accordance with U.S. Environmental Protection Agency (EPA) Method 5035A protocols. Soil samples will be collected from the bucket of the backhoe or track hoe using either stainless steel sampling equipment or dedicated plastic sample equipment once sampling depths exceed 48 inches bgs. Non-dedicated sampling equipment will be decontaminated between uses, as appropriate.
- Information logged during test pit excavation activities will include at a minimum: global positioning system coordinates, sample depth, Unified Soil Classification System descriptions, soil moisture and occurrence of groundwater, physical indications of contamination such as odors or staining, and field-screening results using a PID or XRF unit.
- The sample will be transferred immediately into a laboratory-supplied sample container, with care taken to minimize disturbance. Care will be taken not to handle the seal or lid of the container when the sample is placed into the container. Containers will be filled to eliminate headspace, and the seals/lids will be secured. Custody seals will be placed on each container. Soil samples collected for analysis of metals and organochlorine pesticides will be placed in a 4-ounce glass jar with a Teflon-lined cap and no preservative. Soil samples collected for analysis of VOCs will be collected using EPA Method 5035A protocols.
- The sample container will be labeled with the media, date, time sampled, sample identification and number, project name, project number, and sampler's initials.
- The sample will be logged on a Chain of Custody form and placed into a cooler at approximately 4 degrees Celsius for transport to the laboratory under chain-of-custody protocols within 24 hours of sample collection.
- Waste soil will be placed back into each test pit following sample collection.
- Disposable sampling, health and safety supplies, and equipment will be discarded in an appropriate waste dumpster at the Site.
- The test pit locations will be plotted on a scaled site map using the global positioning system coordinates. A measuring tape or other measuring device also will be used to estimate test pit locations. Both methods will be compared, and the test pits will be plotted accordingly.

2.5 ANALYTICAL PROCEDURES

Select soil samples from the following sampling grids will be analyzed for the following COPCs:

- Organochlorine pesticides from sampling grids A, C, D, and G through N by EPA Method 608/8081.

- Antimony, arsenic, cadmium, copper, lead, manganese, mercury, and zinc from sampling grids A through E, H, and M by EPA Method 6000/7000 series modified.
- Soil samples found by laboratory analysis to contain greater than 1,000 mg/kg lead will be submitted for analysis following extraction using the Toxicity Characteristic Leaching Procedure (TCLP), EPA Method 131. This determination will be based on the results of the total metals analysis.
- VOCs from sampling grids B and H by EPA Method 8260B.

Farallon will provide the laboratory with the PQLs that are necessary to evaluate whether concentrations of COPCs are present at or above the preliminary screening levels.

3.0 GROUNDWATER SAMPLING AND ANALYSIS

The supplemental groundwater sampling and monitoring activities will be conducted to establish current groundwater conditions and to assess whether monitored natural attenuation may be a potential remedial alternative for groundwater at the former Yakima Farmer Supply waste pit area. Health and safety procedures for the groundwater sampling and monitoring activities are provided in the HASP which is included as Appendix C of the FS Work Plan. The following sections present the procedures that will be followed in conducting the sampling and monitoring activities.

3.1 GROUNDWATER SAMPLE LOCATIONS

The groundwater sampling and analysis program will include monitoring wells MW-1 through MW-4, MW-6, MW-7A, MW-7B, WDOE-6, and monitoring wells MW-10 and MW-11 (Figure A-2). Monitoring wells MW-10 and MW-11 were installed on the Site by BNSF as replacements for monitoring well MW-5. Monitoring well MW-5 was decommissioned during the cleanup activities at the Bay Chemical site (Figure A-2).

3.2 GROUNDWATER SAMPLE IDENTIFICATION

Groundwater samples collected from monitoring wells at the Site will be assigned a unique sample number. The number will include the well identification (e.g., MW2) and the sample date (e.g., 060110).

For example, a groundwater sample collected from groundwater monitoring well MW-2 sampled on December 15, 2010 would be numbered MW2-121510. The sample identification will be placed on the sample label, the Field Report form, and the Chain of Custody form. Groundwater samples will be collected and handled in accordance with the procedures described below.

3.3 GROUNDWATER SAMPLE COLLECTION AND HANDLING PROCEDURES

Groundwater samples will be collected and handled in accordance with the procedures described below:

- The locking well cap will be removed from each monitoring well, and the groundwater level will be allowed to equilibrate to atmospheric pressure.
- The depth-to-groundwater will be measured from the surveyed location at each monitoring well casing to the nearest 0.01 foot using an electronic water-level measuring device. Groundwater level measurements at the on-Site monitoring wells will be taken within a 2-hour period. The depth to the monitoring well bottom also will be measured to evaluate siltation of the monitoring wells. Reusable equipment will be decontaminated between uses.
- Each monitoring well will be purged at a low-flow rate using a pumping device (centrifugal, bladder, or peristaltic) with the intake placed approximately 2 to 3 feet below the water table. Temperature, pH, conductivity, and dissolved oxygen will be

monitored during purging to determine when stabilization of these parameters occurs. Oxidation-reduction potential also will be measured as a component of the monitored natural attenuation evaluation. These water quality measurements will be taken using a flow-through cell during purging of the monitoring wells.

- Groundwater samples will be collected following stabilization of temperature, pH, conductivity, and dissolved oxygen. The samples will be collected directly from the low-flow pump outlet. If the monitoring well is completely dewatered during purging, samples will be collected after sufficient recharge has occurred to allow filling of the sample containers.
- Water samples will be transferred immediately into laboratory-supplied sample containers, with care taken to minimize turbulence. Care will be taken to not handle the seal or lid of the container when the sample is placed into the container. The containers will be filled to eliminate headspace, and the seal/lid will be secured.
- The sample container will be labeled with the medium, date, time sampled, well identification and number, project name, project number, sampler's initials, and preservative(s), if any.
- Information will be logged on a Chain of Custody form, and the sample will be placed into a cooler maintained at approximately 4 degrees Celsius for transport to the laboratory.
- Chain-of-custody protocols will be maintained during sample transport and submittal to the laboratory.
- One QA/QC sample (a rinsate blank) will be collected for this sampling event. A trip blank also will be included with the samples collected and submitted for analysis if necessary.
- Purge water will be placed into a labeled container on the Site pending receipt of waste profiling results.
- Disposable sampling and health and safety supplies and equipment will be disposed of in an appropriate waste dumpster at the Site.
- Well caps and monuments will be secured following sampling. Damaged or defective well caps or monuments will be noted and scheduled for replacement, if necessary.

A Well Purging and Sampling Data form will be used to record the depth to groundwater, well purging information, and other pertinent hydrologic measurements and supplementary information collected during groundwater performance and confirmation sampling at each monitoring well. The form will be completed by the Field Scientist at the time of sample collection. These forms will be maintained in the project file. A copy of the Well Purging and Sampling Data form is included in Attachment A.

3.4 ANALYTICAL PROCEDURES

Analytical testing of groundwater samples will include laboratory analysis of groundwater samples for the COPCs, other general water quality parameters, and field measurements taken at the time of sample collection. Groundwater samples will be submitted to an Ecology-certified analytical laboratory for analysis on a standard 5- to 10-working-day turnaround or within the applicable holding time for the requested analysis. Groundwater samples will be submitted to the laboratory within 24 hours of collection.

Groundwater samples from monitoring wells WDOE-6, MW-1 through MW-4, MW-6, MW-7A, MW-7B, MW-10, and MW-11 will be analyzed for:

- VOCs by EPA Method 8260B (two 40-milliliter containers with hydrochloric acid preservative);
- Organochlorine pesticides by EPA Method 608/8081 (one 1-liter amber glass container with no preservative); and
- Total and dissolved metals (antimony, arsenic, cadmium, copper, lead, manganese, mercury, and zinc) by EPA Method 6000/7000 series modified (two 500-milliliter plastic containers with nitric acid preservative; dissolved metals samples will be filtered in the field).

In addition to the analysis for the COPCs, groundwater samples collected from the monitoring wells will include field measurement of the following parameters:

- Temperature;
- pH;
- Conductivity;
- Dissolved oxygen; and
- Oxidation-reduction potential.

Groundwater samples collected from monitoring wells MW-1, MW-2, MW-6, MW-7A, and WDOE-6 will also be analyzed for the following water quality parameters:

- Alkalinity by EPA Method 310.1 (500-milliliter plastic container with no preservative);
- Sulfate by EPA Method 300.0 (500-milliliter plastic container with no preservative);
- Nitrate by EPA Method 300.0 (500-milliliter plastic container with sulfuric acid preservative);
- Total organic carbon by EPA Method 415.1 (500-milliliter plastic container with sulfuric acid preservative);
- Chloride by EPA Method 300.0 (500-milliliter plastic container with no preservative);
- Ferrous iron measured directly in the field using a Hach test kit; and

- Methane, ethane, and ethene by gas chromatograph equipped with a flame-ionization detector (40-milliliter container with hydrochloric acid preservative).

These supplementary measurements and analytical results will be used to assess geochemistry in and outside the waste pit, assess the dispersion characteristics of the dissolved-phase plume(s), and assess whether monitored natural attenuation may be a potential remedial alternative for the waste pit area.

4.0 WETLAND AREA SOIL AND SEDIMENT SAMPLING

Assessment of soil and sediment quality within the boundaries of the wetland area located near the southern boundary of the YSF property has not been conducted during the Remedial Investigation. The wetland area includes both areas that are seasonally dry during periods when regional irrigation is not occurring and areas that are saturated/inundated year round. For the purpose of the FS Work Plan the materials sampled from the portion of the wetland that is saturated year-round will be referred to as sediment and the materials sampled from the areas that are seasonally exposed will be referred to as soil. Farallon will conduct an assessment of sediment and soil quality in the wetland area to evaluate whether cleanup of this area of the Site is necessary. The assessment will include a combination of bioassay testing, physical analysis, and chemical analysis. The following sections present the procedures that will be followed in conducting the soil and sediment sampling activities.

4.1 SOIL AND SEDIMENT SAMPLE LOCATIONS

Soil and sediment samples from the wetland area will be collected at six locations within the wetland area. Three soil samples will be collected in areas that are seasonally exposed during periods when regional irrigation is not occurring and three sediment samples will be collected in areas that are saturated year round within the pond. The locations will be selected in the field with the concurrence of Ecology and may include areas from grid squares E, D, F, G, O, and/or P (Figure A-1). Soil samples will be collected at two depth intervals including 0 to 4 inches bgs and 1 to 3 feet bgs. Sediment samples will be collected from a single depth interval of 0 to 4 inches bgs.

4.2 SAMPLE IDENTIFICATION

Each soil and sediment sample collected from the wetland area will have a unique sample identifier. The number will include a prefix identifying the grid square, the sample identifier "WetSoil," or "WetSed" and the date the sample was collected.

For example, a sediment sample collected from Grid Square E on December 15, 2011 would be identified as E-WetSed-121511. The sample identification will be placed on the sample label, the Field Report form, and the Chain of Custody form.

4.3 SOIL AND SEDIMENT SAMPLE COLLECTION AND HANDLING PROCEDURES

Soil samples within the wetland area will be collected using a backhoe or trackhoe and will follow the same procedure described in Section 2.4. Sediment samples within the wetland area will be collected using a hand-held drive sampler. The general procedure will be to use a hand-held drive sampler to collect the sample in a 2-inch-diameter brass liner. Sediment samples will be transferred to an appropriate laboratory-supplied container.

Sediments and soil samples from within the wetland area will be described in accordance with the USCS, and notations of unusual odor, discoloration, sheen, or other evidence of potential

contamination will be recorded. Split samples will be collected at each sampling location and depth interval for future chemical analysis if necessary.

4.4 ANALYTICAL PROCEDURES

The soil samples will be submitted for laboratory analysis of the following COPCs:

- Organochlorine pesticides by EPA Method 8081A;
- Antimony, arsenic, cadmium, copper, lead, manganese, mercury, and zinc by EPA Method 6000/7000 series modified;
- VOCs by EPA Method 8260B; and
- Petroleum hydrocarbons by Northwest Method NWTPH-HCID using a silica gel cleanup. If gasoline, diesel, or oil-range organics are identified, they will be quantified using the appropriate Northwest petroleum hydrocarbon analytical methodology.

The sediment samples will be submitted for the following laboratory bioassay tests and physical analysis:

- Amphipod mortality (*Hyalella azteca*);
- Midge larvae mortality (*Chironomus tentans*);
- Midge larvae growth (*Chironomus tentans*);
- Microtox®100% porewater extract (*Virio fischeri*);
- Grain size;
- Total solids;
- Total volatile solids; and
- Total organic carbon.

If necessary, archived sediment samples will be submitted for laboratory analysis of the following COPCs:

- Organochlorine pesticides by EPA Method 8081A;
- Antimony, arsenic, cadmium, copper, lead, manganese, and zinc by EPA Method 6000/7000 series modified;
- VOCs by EPA Method 8260B; and
- Petroleum hydrocarbons by Northwest Method NWTPH-HCID using a silica gel cleanup. If gasoline, diesel, or oil-range organics are identified, they will be quantified using the appropriate Northwest petroleum hydrocarbon analytical methodology.

5.0 MANAGEMENT OF INVESTIGATION-DERIVED WASTE

Wastewater will be generated by the groundwater sampling and equipment decontamination activities. Because the wastewater and other products generated during the supplemental sampling and monitoring activities may be contaminated, they will be containerized and disposed of properly upon receipt of analytical results.

Wastewater will be segregated as suspected clean and contaminated and stored in 55-gallon drums on the Site. No wastewater will remain on the Site longer than 90 days after generation. Wastewater generated during the sampling and monitoring activities will be documented on a Waste Inventory form.

Waste profiles will be developed using groundwater analytical data collected during the monitoring activities. An appropriate disposal option will be selected based on the analytical data. Waste profiles and manifests will be provided to the generator for approval prior to transport of the materials off the Site. The waste profiles will be provided to the selected treatment, storage, and disposal facility. Wastewater will be removed by a licensed transporter using labeled U.S. Department of Transportation-approved containers. Documentation for wastewater will be maintained in the project file.

Disposable personal protective clothing (e.g., Tyvek suits, rubber gloves, boot covers) and disposable sampling devices (e.g., plastic scoops, bailers) will be cleaned, placed into plastic garbage bags, and disposed of as nonhazardous waste.

6.0 FIELD DOCUMENTATION

Documentation of field activities will be included on Field Report forms, Log of Test Pit forms, Well Purging and Sampling Data forms, Waste Inventory Tracking Sheets, sample and waste material labels, and Chain of Custody forms. Documentation generated during the field program will be retained in the project file and included in the reports prepared, as appropriate.

6.1 FIELD REPORT FORM

Field personnel will be required to keep a daily log of field activities on a Field Report form. Field notes will be as descriptive and inclusive as possible so as to allow an independent party to reconstruct the sampling situation from the recorded information. Language will be objective, factual, and free of inappropriate terminology. A summary of each day's events will be completed on a Field Report form. At a minimum, field documentation will include the date, job number, project identification and location, weather conditions, sample collection data, personnel present and their responsibilities, field equipment used, and any activities performed in a manner other than as specified in the SAP or the FS Work Plan. In addition, if other forms or documents are completed or used (e.g., well-head survey, maps), they will be cited in and attached to the Field Report form. Field personnel will sign the Field Report form. A copy of the Field Report form is provided in Attachment A.

6.2 LOG OF TEST PIT FORM

A Log of Test Pit form will be prepared by the Field Scientist for each test pit excavated during soil sampling activities. The log will include hydrologic conditions, lithologic descriptions using the Unified Soil Classification System, and information on the potential presence of contamination. A copy of the Log of Test Pit form is provided in Attachment A.

6.3 WELL PURGING AND SAMPLING DATA FORM

A Well Purging and Sampling Data form will be used to record the depth to groundwater, well purging information, and other pertinent hydrologic measurements and supplementary information collected during groundwater performance and confirmation sampling at each monitoring well. The form will be completed by the Field Scientist at the time of sample collection. These forms will be maintained in the project file. A copy of the Well Purging and Sampling Data form is included in Attachment A.

6.4 WASTE INVENTORY TRACKING SHEET

A Waste Inventory Tracking Sheet will be used to document and track wastes generated during the supplemental sampling and monitoring activities. This sheet will include information on the type and origin of waste, sample container, date generated, date removed from the Site, transporter, and disposal location. A copy of the Waste Inventory Tracking Sheet is included in Attachment A.

6.5 SAMPLE LABEL

Sample labels will be completed in indelible ink and affixed to the corresponding sample container immediately prior to sample collection. The label will indicate the medium, date, time sampled, sample identification and number, project name, project number, sampler's initials, and analyte preservative(s), if any.

6.6 WASTE MATERIAL LABEL

Waste material labels will be completed in indelible ink and affixed to the corresponding waste container immediately upon filling. The label will include the job number and name, the address of the property where the waste was generated, contents of the container, operation, date, consultant's name and telephone number, and sampler's initials.

6.7 CHAIN-OF-CUSTODY FORM

The protocols to be followed whenever samples are collected, transferred, stored, analyzed, or destroyed have been established to create an accurate written record that traces possession and handling of a sample from the moment of its collection through analysis and reporting of analytical values. This written record, the Chain of Custody form, will be completed by the field sampling team at the time a sample is obtained.

Samples submitted to the analytical laboratory are accompanied by the Chain of Custody form. This form is checked for accuracy and completeness, signed, and dated by the laboratory sample custodian accepting the sample. At the laboratory, each sample is assigned a unique sequential laboratory identification number that is stamped or written on the Chain of Custody form.

Samples are held in the Sample Control Room in accordance with internal chain-of-custody protocols under appropriate storage conditions (e.g., ambient, refrigeration, frozen). The laboratory Project Manager assigned to a particular client is responsible for tracking the status of the samples throughout the laboratory. Samples signed out of the Sample Control Room are recorded in a sample control logbook by the analyst who will prepare the samples for analysis.

The Chain of Custody form includes the site name, sample identification number (assigned by the sampler in the field), sample date, sample location, and type of analysis required (if any). Whenever a sample is transferred from one party to another, both parties sign the Chain of Custody form and record the date and time of the transfer. Adherence to these protocols ensures sample integrity from collection through analysis.

FIGURES

SAMPLING AND ANALYSIS PLAN
Agri-Tech & Yakima Steel Fabricators
6 and 10½ East Washington Avenue
Yakima, Washington

Farallon PN: 765-001

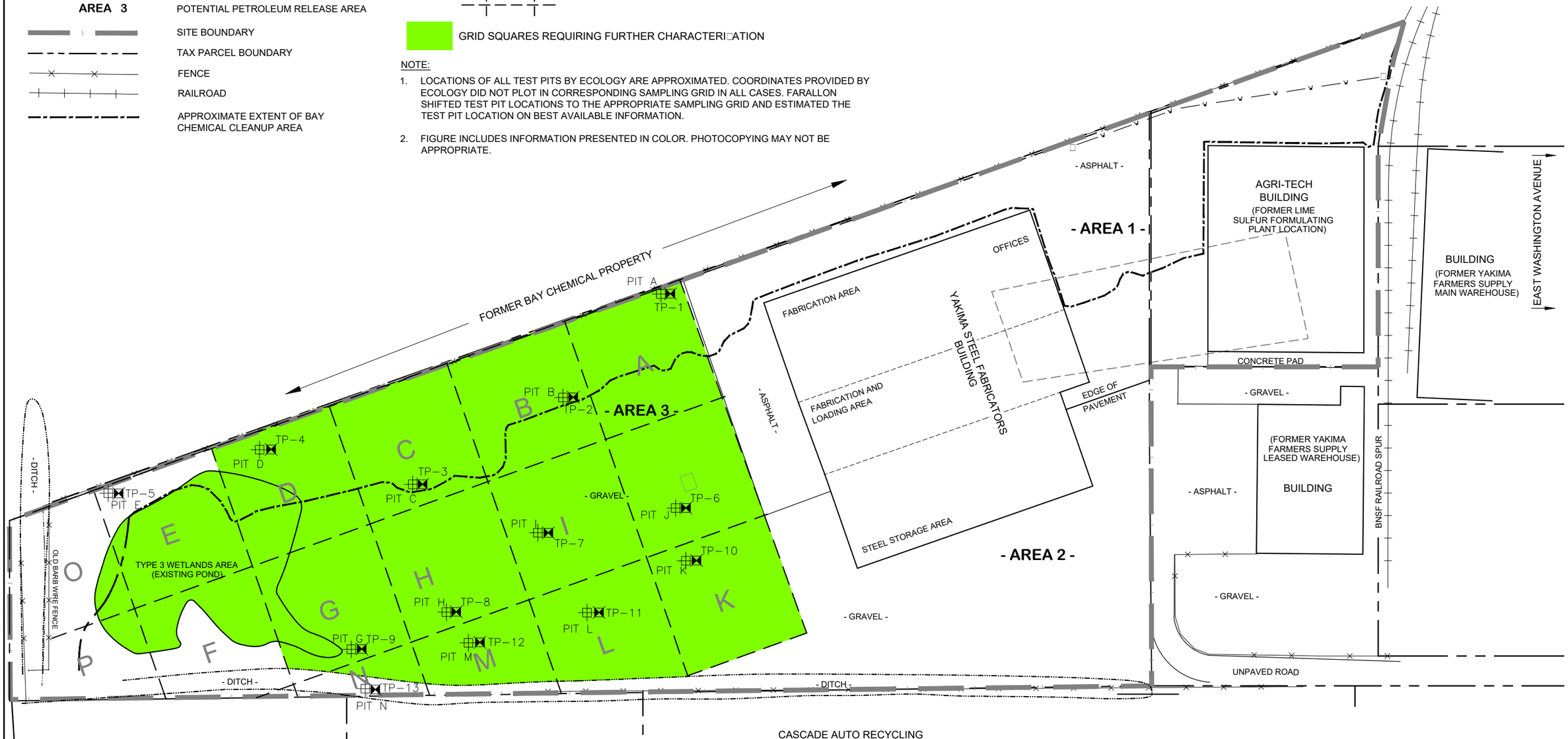
LEGEND

- APPROXIMATE BOUNDARY OF FORMER YAKIMA FARMERS SUPPLY WASTE PIT
- **AREA 1** FORMER YAKIMA FARMERS SUPPLY WASTE PIT LOCATION
- **AREA 2** FORMER YAKIMA FARMER SUPPLY LIME AND SULFUR STOCKPILE LOCATIONS
- **AREA 3** POTENTIAL PETROLEUM RELEASE AREA
- SITE BOUNDARY
- TAX PARCEL BOUNDARY
- FENCE
- RAILROAD
- APPROXIMATE EXTENT OF BAY CHEMICAL CLEANUP AREA

- PIT B — WASHINGTON STATE DEPARTMENT OF ECOLOGY (ECOLOGY) TEST PIT (JULY 2007)
- TP–2 — ENVIRONMENTAL PARTNERS, INC. TEST PIT (2007)
- M — ECOLOGY SAMPLING GRID DESIGNATION
- GRID SQUARES REQUIRING FURTHER CHARACTERIZATION

NOTE:

1. LOCATIONS OF ALL TEST PITS BY ECOLOGY ARE APPROXIMATED. COORDINATES PROVIDED BY ECOLOGY DID NOT PLOT IN CORRESPONDING SAMPLING GRID IN ALL CASES. FARALLON SHIFTED TEST PIT LOCATIONS TO THE APPROPRIATE SAMPLING GRID AND ESTIMATED THE TEST PIT LOCATION ON BEST AVAILABLE INFORMATION.
2. FIGURE INCLUDES INFORMATION PRESENTED IN COLOR. PHOTOCOPYING MAY NOT BE APPROPRIATE.



0 80
APPROXIMATE SCALE IN FEET

N

FARALLON CONSULTING
975 5th Avenue Northwest
Issaquah, WA 98027

FIGURE A-1

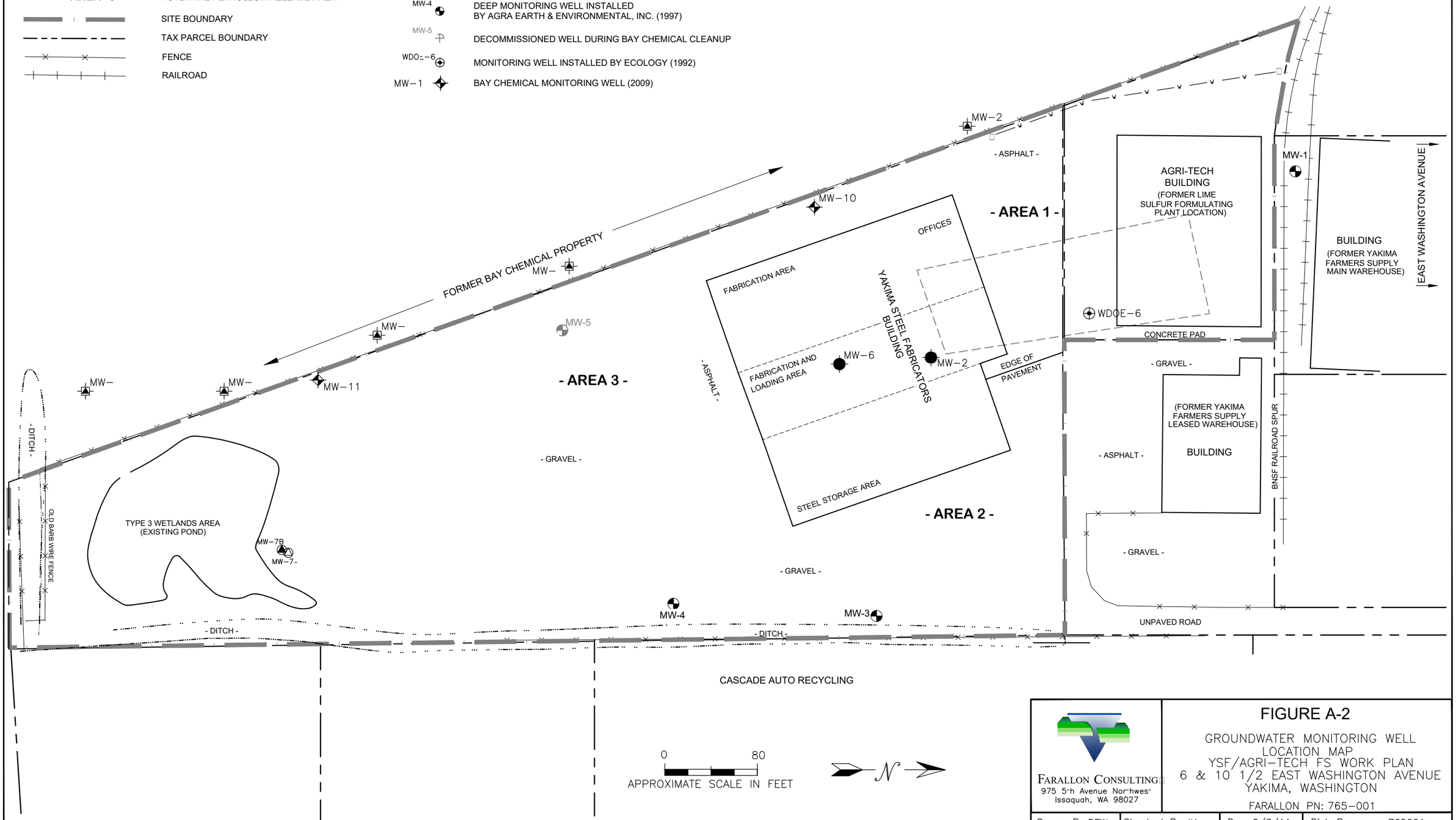
GRID MAP
YSF/AGRI-TECH FS WORK PLAN
6 & 10 1/2 EAST WASHINGTON AVENUE
YAKIMA, WASHINGTON

FARALLON PN: 765–001

Drawn By: DEW	Checked By: JK	Date: 5/3/11	Disk Reference: 765001a

LEGEND

- APPROXIMATE BOUNDARY OF FORMER YAKIMA FARMERS SUPPLY WASTE PIT
- **AREA 1** FORMER YAKIMA FARMERS SUPPLY WASTE PIT LOCATION
- **AREA 2** FORMER YAKIMA FARMER SUPPLY LIME AND SULFUR STOCKPILE LOCATIONS
- **AREA 3** POTENTIAL PETROLEUM RELEASE AREA
- SITE BOUNDARY
- TAX PARCEL BOUNDARY
- FENCE
- RAILROAD
- MW-6 SHALLOW BAY CHEMICAL SITE MONITORING WELL INSTALLED BY PACIFIC GROUNDWATER GROUP (1994)
- MW-7 SHALLOW MONITORING WELL INSTALLED BY FARALLON (2002)
- MW-7B DEEP MONITORING WELL INSTALLED BY FARALLON
- MW-2 SHALLOW MONITORING WELL INSTALLED BY AGRA EARTH & ENVIRONMENTAL, INC. (1997)
- MW-4 DEEP MONITORING WELL INSTALLED BY AGRA EARTH & ENVIRONMENTAL, INC. (1997)
- MW-5 DECOMMISSIONED WELL DURING BAY CHEMICAL CLEANUP
- WDOE-6 MONITORING WELL INSTALLED BY ECOLOGY (1992)
- MW-1 BAY CHEMICAL MONITORING WELL (2009)



FARALLON CONSULTING
975 5th Avenue Northwest
Issaquah, WA 98027

FIGURE A-2

GROUNDWATER MONITORING WELL LOCATION MAP
YSF/AGRI-TECH FS WORK PLAN
6 & 10 1/2 EAST WASHINGTON AVENUE
YAKIMA, WASHINGTON

FARALLON PN: 765-001

Drawn By: DEW	Checked By: JK	Date: 5/3/11	Disk Reference: 765001a

ATTACHMENT A
FORMS

SAMPLING AND ANALYSIS PLAN
Agri-Tech & Yakima Steel Fabricators
6 and 10½ East Washington Avenue
Yakima, Washington

Farallon PN: 765-001

FARALLON
consulting

FIELD REPORT

Page ___ of ___

Date: _____ **Project #:** _____ **Task #:** _____

Project: _____ **Site Address:** _____

Client: _____ **Contractor:** _____

Weather: _____ **Temp:** _____

Equipment Used: _____

Hours: _____ _____ **Mileage:** _____ **Project Manager:** _____

Contractor *Staff*

Prepared By: _____ **Reviewed By:** _____

Comments:

FARALLON
consulting

FIELD REPORT (continued)

Page ___ of ___

Project: _____ **Date:** _____ **Project #:** _____ **Task #:**_____

FARALLON CONSULTING
320 3rd Avenue NE
Issaquah, WA 98027

Log of Test Pit:

Client:
Project:
Location:

Farallon PN:

Logged By:

Date/Time Started:
Date/Time Completed:
Equipment:
Excavating Company:
Excavating Foreman:
Excavating Method:

Sampler Type:
Depth of Water (ft bgs):
Total Excavation Depth (ft bgs):

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	PID (ppm)	Sample ID	Sample Analyzed
0						
5						
10						
15						

LOW FLOW WELL PURGING AND SAMPLING DATA

		WELL NO:
DATE:	PROJECT NAME:	PROJECT NO:
WEATHER CONDITIONS:		
WELL DIAMETER (IN.) ☐ 1 ☐ 2 ☐ 4 ☐ 6 ☐ OTHER		
SAMPLE TYPE: ☐ GROUNDWATER ☐ WASTEWATER ☐ SURFACE WATER ☐ OTHER		
WELL DEPTH (TOC) FT.	DEPTH TO WATER BEFORE PURGING (TOC) FT.	
LENGTH OF WATER FT.	CALCULATED ONE WELL VOLUME[1]: GAL.	
DEPTH OF SAMPLE POINT FT.	ESTIMATED VOLUME PURGED GAL.	
EQUIP. DECON. ☐ ALCONOX WASH ☐ LIQUINOX WASH ☐ DIST/DEION 1 RINSE ☐ DIST/DEION 2 RINSE ☐ OTHER		
CONTAINER PRESERVATION: ☐ LAB PRESERVED ☐ FIELD PRESERVED		
WATER ANALYZER:	PUMP TYPE:	TUBING:

ACTUAL TIME (min)	FLOW RATE (ml/min)	DEPTH TO WATER (feet)	TEMP ☐ °F ☐ °C	SPECIFIC CONDUCT.	pH	DISS. OXYGEN (mg/l)	TURBIDITY (NTU)	ORP (mV)	REMARKS
			(+/- 0.1°)	(+/- 3%)	(+/- 0.1)	(+/- 10%)	(NA)	(+/- 10 mV)	(EVIDENT ODOR, COLOR, PID)
	INITIAL		--	--	--	--	--	--	

DEPTH TO WATER AFTER PURGING (TOC) FT.	SAMPLE FILTERED ☐ YES ☐ NO SIZE _____
NOTES:	SAMPLE TIME: ID#
	DUPLICATE ☐ TIME: ID#:
	EQUIP. BLANK: ☐ TIME: ID#:
	PREPARED BY:

[1] A 1 FOOT LENGTH OF WATER = 0.05 GAL IN 1" DIA. PIPE 0.17 GAL IN 2" DIA PIPE 0.65 GAL IN 4" DIA PIPE 1.5 GAL IN 6" DIA PIPE

DRUM INVENTORY

Date: _____

Site Name/Location: _____ Farallon PN: _____ Field Staff: _____

# of Soil Drums	How Full	**# of Decon Water Drums**	How Full	**# of Groundwater Drums**	How Full
Total:		**Total:**		**Total:**	

Location of Drums (sketch or describe):

For PM	Date Removed:
Disposal Location:	
Transporter:	

APPENDIX B
QUALITY ASSURANCE PROJECT PLAN

FEASIBILITY STUDY WORK PLAN
Agri-Tech and Yakima Steel Fabricators
6 and 10½ East Washington Avenue
Yakima, Washington

Farallon PN: 765-001

FARALLON consulting

975 5th Avenue Northwest, Issaquah, Washington 98027
Tel: (425) 295-0800 Fax: (425) 295-0850
www.farallonconsulting.com

QUALITY ASSURANCE PROJECT PLAN

APPENDIX B OF THE FEASIBILITY STUDY WORK PLAN

AGRI-TECH & YAKIMA STEEL FABRICATORS, INC.
6 AND 10½ EAST WASHINGTON AVENUE
YAKIMA, WASHINGTON

Submitted by:
Farallon Consulting, L.L.C.
975 5th Avenue Northwest
Issaquah, Washington 98027

Farallon PN: 765-001

For:
Yakima Steel Fabricators, Inc.
6 East Washington Avenue
Yakima, Washington

May 3, 2011

Prepared by:

Brett T. Carp
Environmental Scientist

Reviewed by:

Jeffrey Kaspar, L.G., L.H.G.
Senior Project Manager

State of Washington Hydrogeologist 1145 Licensed Geologist
Jeffrey Kaspar

CONTENTS

1.0 INTRODUCTION

Farallon Consulting, L.L.C. (Farallon) has prepared this Quality Assurance Project Plan (QAPP) on behalf of Yakima Steel Fabricators, Inc. (YSF) and Agri-Tech, Inc. (Agri-Tech) for the YSF and Agri-Tech facilities located at 6 and 10½ East Washington Avenue in Yakima, Washington (herein referred to as the Site). This QAPP is part of the Feasibility Study Work Plan (FS Work Plan) and has been developed to provide specific requirements for quality assurance/quality control (QA/QC) procedures during pending investigation activities at the Site. The overall objective of the Feasibility Study (FS) for the Site is to develop and evaluate technically feasible cleanup alternatives to enable selection of a cleanup action in accordance with Section 360 of Chapter 173-340 of the Washington Administrative Code (WAC 173-340-360).

The FS is being conducted to meet the requirements of Agreed Order No. DE 6091 (Agreed Order) entered into by the Washington State Department of Ecology (Ecology) and YSF with an effective date of October 27, 2008 pursuant to the authority of the Washington State Model Toxics Control Act, as established in Section 050(1) of Chapter 70.105D of the Revised Code of Washington. This QAPP has been prepared in accordance with the Washington State Model Toxics Control Act Cleanup Regulation (MTCA), as established in WAC 173-340-350. As stated in Ecology's *Guidelines for Preparation of Quality Assurance Project Plans for Environmental Studies* (Ecology Publication No. 01-03-003, February 2001) the purpose of this QAPP is to:

- Assist the project manager and project team to focus on the factors affecting data quality during the planning stage of the project;
- Facilitate communication among field, laboratory, and management staff as the project progresses;
- Document the planning, implementation, and assessment procedures for QA/QC activities for the cleanup action;
- Ensure that the data quality objectives (DQOs) are achieved; and
- Provide a record of the project to facilitate final report preparation.

The DQOs for the project include both qualitative and quantitative objectives, which define the appropriate type of data, and specify the tolerable levels of potential decision errors that will be used as a basis for establishing the quality and quantity of data needed to support the cleanup action. To ensure that the DQOs are achieved, this QAPP details aspects of sample collection and analysis including analytical methods, QA/QC procedures, and data quality reviews. This QAPP describes both quantitative and qualitative measures of data to ensure that the DQOs are achieved.

1.1 SITE DESCRIPTION AND BACKGROUND

A summary of the Site and Site historical operations and previous environmental investigations conducted at the Site by Farallon and others are presented in Section 2 of the FS Work Plan. The

results of the remedial investigation conducted at the Site are summarized in the Revised Remedial Investigation Report dated June 10, 2004, prepared by Farallon (Revised RI Report).

The Revised RI Report documents that concentrations of hazardous substances exceeding the preliminary screening levels established for the Site were detected in soil and groundwater. The preliminary screening levels for the constituents of potential concern (COPCs) identified in the Revised RI Report were established as MTCA Method B soil cleanup levels protective of a potable groundwater source (WAC 173-340-747).

1.2 PROJECT OBJECTIVES

The purpose of the work described in this FS Work Plan is to provide the framework for developing and evaluating appropriate cleanup alternatives for use in selecting a cleanup action for the Site. As mandated by Ecology in the Agreed Order, the FS Work Plan also includes an additional remedial investigation component. The purpose of the additional site investigation work is to address data gaps pertaining to the distribution of COPCs at Area 3 of the YSF property as discussed in Section 3 of the FS Work Plan. In addition to addressing the data gaps identified by Ecology, Farallon will perform groundwater monitoring and sampling to evaluate current groundwater conditions and facilitate evaluation of potential technically feasible remedial alternatives for groundwater.

2.0 PROJECT ORGANIZATION

The project organization for completion of the FS, including identification of key personnel and their responsibilities, is described below.

The FS will be conducted on behalf of YSF and Agri-Tech. Farallon has been contracted by YSF and Agri-Tech to plan and execute the FS. The project contact for YSF is:

Mr. John Gehlsen
6 East Washington Avenue
Yakima, Washington 98101
Telephone: (509) 575-1570
Fax: (509) 453-3697

The Project Manager and primary contact for Farallon is Mr. Jeffrey Kasper, L.G., L.H.G., Senior Project Manager. The QA/QC Officer is Mr. Brett T. Carp, Project Scientist. The technical advisor for the cleanup action is Mr. Clifford T. Schmitt, L.G., L.H.G., Principal Hydrogeologist. The document control clerk is Ms. Beth Roberts, Office Administrator. The contact information for Farallon is:

Farallon Consulting, L.L.C.
975 5th Avenue Northwest
Issaquah, Washington 98027
Telephone: (425) 295-0800
Fax: (425) 295-0850

Ecology has jurisdiction over the FS and the work will be conducted under the Agreed Order. The Project Manager for Ecology is:

Ms. Brianne Plath
Washington State Department of Ecology
Central Regional Office
15 West Yakima Avenue, Suite 200
Yakima, Washington 98902-3452
Telephone: (509) 454-7835
Fax: (509) 575-2809

2.1 RESPONSIBILITIES OF KEY PERSONNEL

The responsibilities of the key personnel involved in the FS are described in the sections below.

2.1.1 Project Manager

The Project Manager has overall responsibility for developing the QAPP, monitoring the quality of the technical and managerial aspects of the project, and implementing the QAPP and corresponding corrective measures, where necessary.

2.1.2 Project QA/QC Officer

The QA/QC Officer has the responsibility to monitor and verify that the work is performed in accordance with the FS Work Plan, including the Sampling and Analysis Plan (SAP) (Appendix A of the FS Work Plan) and the QAPP, and other applicable procedures. The QA/QC Officer also has the responsibility to assess the effectiveness of the QA/QC program, and to recommend modifications to the program, when applicable. The QA/QC Officer is responsible for ensuring that the personnel assigned to the project are trained relative to the requirements of the QA/QC program, and for reviewing and verifying the disposition of nonconformance and corrective action reports.

2.1.3 Project Staff

Members of the project staff are responsible for understanding and implementing the QA/QC program as it relates to the cleanup action project objectives.

2.1.4 Regulatory Agency

Ecology will be the lead regulatory agency. The FS is being conducted under the Agreed Order and in accordance with WAC 173-340-350.

3.0 DATA QUALITY OBJECTIVES

The DQOs for this project will be used to develop and implement procedures to ensure that the data collected are of sufficient quality to adequately address the objectives of the FS at the Site, as defined in the FS Work Plan. Observations and measurements will be made and recorded in such a manner as to yield results representative of the media and conditions observed and/or measured. Representativeness will be achieved through strict adherence to the SAP, provided in Appendix A of the FS Work Plan. Goals for representativeness will be met by ensuring that sampling locations are selected properly, that a sufficient number of samples are collected, and that field-screening and laboratory analyses are conducted properly.

The quality of the laboratory data will be assessed on the bases of precision, accuracy, representativeness, completeness, and comparability. Definitions of these parameters and the applicable QC procedures are described in Sections 3.1 through 3.5 below. Quantitative DQOs for applicable parameters (e.g., precision, accuracy, completeness) are provided following each definition. Laboratory DQOs have been established by the analytical laboratory, and are specified in the analytical laboratory's Quality Assurance Plan, which is kept on file at the Farallon office.

3.1 PRECISION

Precision measures the reproducibility of measurements under a given set of conditions. Specifically, it is a quantitative measure of the variability of two or more measurements compared to their average values. Precision is calculated from results of duplicate sample analyses. Precision is quantitatively expressed as the relative percent difference (RPD), and is calculated as follows:

$$RPD = \frac{(C_1 - C_2)}{(C_1 + C_2)/2} \times 100$$

Where:

RPD = relative percent difference

C_1 = larger of the two duplicate results (i.e., the highest detected concentration)

C_2 = smaller of the two duplicate results (i.e., the lowest detected concentration)

Quantitative RPD criteria for laboratory duplicate results have been developed by the U.S. Environmental Protection Agency (EPA) for inorganic chemical analysis. The criteria are ± 20 percent for water samples and ± 35 percent for soil samples. There are no specific RPD criteria for organic chemical analyses.

3.2 ACCURACY

Accuracy is a measure of the closeness (bias) of the measured value to the true value. The accuracy of chemical analytical results is assessed by "spiking" samples in the laboratory with known standards (a surrogate or matrix spike [MS] of known concentration), and determining the

percent recovery. Accuracy is measured as the percent recovery (%R), and is calculated as follows:

$$\%R = \frac{(M_{sa} - M_{ua})}{C_{sa}} x\ 100$$

Where:

%R = percent recovery

M_{sa} = measured concentration in spiked aliquot

M_{ua} = measured concentration in unspiked aliquot

C_{sa} = actual concentration of spike added

Laboratory matrix spike and surrogate analyses will be carried out at the analytical laboratory in accordance with EPA SW-846 requirements for organic and inorganic chemical analyses. The frequency for both matrix spikes and matrix spike duplicates will be one each per batch of 20 samples or less for both soil and groundwater samples. Quantitative percent recovery criteria have been developed by EPA for laboratory matrix spikes for inorganic analysis. The criteria are 75 to 125 percent when the sample concentration exceeds the spike concentration by a factor of four or more. There are no specific accuracy criteria for organic analyses. Where EPA and Ecology have not provided data validation guidelines, laboratory-derived control limits will be used to assess surrogate recovery and matrix spike results.

The accuracy of sample results can be affected also by introduction of contaminants to the sample during collection, handling, and/or analysis. Contamination of the sample can occur because of improperly cleaned sampling equipment, exposure of the samples to chemical concentrations in the field or during transport to the laboratory, or exposure to chemical concentrations in the laboratory. To ascertain that the samples collected are not contaminated, laboratory method blank samples will be analyzed.

3.2.1 Laboratory Method Blanks

The laboratory will run method blanks at a minimum frequency of 5 percent, or one per batch, to assess potential contamination of the sample at the laboratory.

3.2.2 Trip Blanks

Laboratory-supplied trip blanks will accompany each shipment containing samples from the field to the analytical laboratory for analysis of volatile organic compounds by EPA Method 8260B to assess the integrity of the sample containers during transport.

3.2.3 Duplicate Samples

Duplicate samples will be used to measure field variability and sampling consistency. Duplicate samples will be obtained using identical sampling protocols for the appropriate medium sampled. The duplicate sample will be submitted to the laboratory with a "blind" sample identifier such that the laboratory cannot recognize the sample as a duplicate. The collection of the duplicate

sample and the selected "blind" identifier will be stated in the field documentation for sample collection.

3.3 REPRESENTATIVENESS

Representativeness is a qualitative assessment of how closely the measured results reflect the actual concentration or distribution of the constituent concentrations in the matrix sampled. The sampling plan design, sample collection techniques, sample handling protocols, sample analysis methods, and data review procedures have been developed to ensure that the results obtained are representative of Site conditions. These issues are addressed in detail in the SAP (Appendix A of the FS Work Plan), and in this document.

3.4 COMPLETENESS

Completeness is defined as the percentage of measurements judged to be valid. Results will be considered valid if they are not rejected during data validation (see Section 6, Data Management, Reduction, Review, and Reporting). Completeness (C) is calculated as follows:

$$C = \frac{(Number\ of\ Valid\ Measurements)}{(Total\ Number\ of\ Measurements)} x\ 100$$

The target completeness goal for the FS will be 95 percent for a given analysis.

3.5 COMPARABILITY

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. The use of standard EPA, Ecology, ASTM International, and American Petroleum Institute methods and procedures for both sample collection and laboratory analysis will make the data collected comparable to both internal and other data generated.

4.0 DATA COLLECTION APPROACH

Procedures that will be used to collect, preserve, transport, and store samples are described in the SAP (Appendix A of the FS Work Plan). The sampling protocols will be performed in accordance with generally accepted environmental practices, and will meet or exceed current regulatory standards and guidelines. Sampling procedures may be modified, if necessary, to comply with amendments to current regulations, methods, or guidelines.

5.0 ANALYTICAL PROCEDURES

Chemical and physical analyses to be conducted during this project are discussed in the SAP (Appendix A of the FS Work Plan). Container types, holding times, analytical methods, practical quantitation limits, and method detection limits will be in accordance with current regulatory guidelines, and will be modified, if necessary, to comply with amendments to current regulations, methods, or guidelines.

OnSite Environmental Inc. of Redmond, Washington (OnSite) has been selected as the laboratory to conduct the analysis of the samples collected for the FS. OnSite will conduct analyses for the COPCs on soil and groundwater samples collected during the execution of the supplemental monitoring and sampling effort of the FS. OnSite is accredited by Ecology, and meets the QA/QC requirements of Ecology and EPA. The contact for OnSite is:

Mr. David Baumeister
OnSite Environmental Inc.
14648 Northeast 95th Street
Redmond, Washington 98052
Telephone: (425) 883-3881

A copy of the Laboratory Quality Assurance Manual from OnSite is on file at Farallon for review and reference, and will be followed by the laboratory throughout the FS. Ecology will have access to laboratory personnel, equipment, and records pertaining to sample collection, transportation, and analysis. The specific analytical methods, sample preservation methods, and container requirements are defined in the SAP (Appendix A of the FS Work Plan).

6.0 DATA MANAGEMENT, REDUCTION, REVIEW, AND REPORTING

This section outlines the procedures to be followed for the inventory, control, storage, and retrieval of data collected throughout the FS. The procedures contained in the QAPP are designed to ensure that the integrity of the collected data is maintained for subsequent use. Moreover, project-tracking data (e.g., schedules, progress reports) will be maintained to monitor, manage, and document the progress of the FS.

6.1 DATA TYPES

A variety of data will be generated by the FS, including laboratory analytical data and manually recorded field data. Laboratory analytical data will be transmitted to Farallon as an electronic file, which will facilitate subsequent validation and analysis of these data while avoiding transcription errors that may occur with computer data entry.

6.2 DATA TRANSFER

Procedures for controlling the receipt and distribution of incoming data packages to Farallon and outgoing data reports from Farallon are outlined in the sections below.

6.2.1 Receipt of Data and Reports

Incoming data packages such as those from field personnel, laboratories (e.g., groundwater and soil analytical data) will be filed by project task, subject heading, and date. If distribution is required, the appropriate number of copies will be made and distributed to appropriate persons or agencies.

6.2.2 Outgoing Data and Reports

A transmittal sheet will be attached to all outgoing project data and reports. A copy of each transmittal sheet will be kept in the administrative and project files. The Project Manager and QA/QC Officer will review all outgoing reports and maps.

6.3 DATA INVENTORY

Procedures for the filing, storage, and retrieval of project data and reports are discussed below.

6.3.1 Document Filing and Storage

As previously discussed, project files and raw data files will be maintained at Farallon's office. Files will be organized by project tasks or subject heading, and maintained by the document control clerk. Hard copy project files will be archived for a minimum of 3 years after completion of the project. Electronic copies of files will be maintained in a project directory, and backed up on a daily, weekly, and monthly basis.

6.3.2 Access to Project Files

Access to project files will be controlled and limited to YSF and its authorized representatives, Ecology, and Farallon personnel. When a hard copy file is removed, a sign-out procedure will be used to track custody of the file. If a document is to be used for an extended period, a copy of the document will be produced, and the original will be returned to the project file. Electronic access to final reports, tables, and figures will be write-protected in the project directory.

6.4 DATA REDUCTION AND ANALYSIS

The Project Manager and QA/QC Officer are responsible for data review and validation. Data validation parameters are outlined in Section 3, Data Quality Objectives. The particular type of analyses and presentation method selected for any given data set will depend on the type, quantity, quality, and prospective use of the data. The analysis of project data will require data reduction for preparation of tables, charts, and maps. To ensure that data are accurately transferred during the reduction process, two data reviews will be performed: one by the QA/QC Officer or Project Manager, and another by the Project Principal prior to issuing the documents. Any incorrect transfers of data will be highlighted and corrected.

6.4.1 Data Reporting Formats

Physical and chemical characterization information developed in connection with the FS will be presented in the formats described below:

6.4.1.1 Maps

Plan maps needed to illustrate results of the FS will be assembled or prepared. The maps may include but are not limited to plan maps of the Site showing sampling locations and chemical concentrations and groundwater elevation contour maps.

6.4.1.2 Summary Tables and Plots

Laboratory reports will be sorted according to various parameters to summarize gathered information for easier assimilation and presentation. Groundwater and soil sampling and analysis data will be sorted several ways, including by sample number, constituent, and date of sample collection. The sorting parameters will be chosen based on determination of the most appropriate format, and the utility of that format in demonstrating the physical and chemical characteristics of interest. Summary tables of chemical concentrations in soil and groundwater will be generated.

6.4.1.3 Cross-Sections

Cross-sections or vertical profiles may be generated from field data to display Site stratigraphy or other aspects of the FS.

7.0 QUALITY CONTROL PROCEDURES

This section provides a description of the QC procedures for both field activities and laboratory analysis. The field QC procedures include standard operating procedures for sample collection and handling, equipment calibration, and field quality control samples.

7.1 FIELD QUALITY CONTROL

Field QC samples (e.g., field duplicate samples) to be collected during this project are described in the SAP (Appendix A of the FS Work Plan). The purpose of these samples is discussed in Section 3, Data Quality Objectives. Standard operating procedures also will be implemented during field-screening activities. The procedural basis for these field data collection activities will be documented on the Field Report forms, as described in Section 5 of the SAP (Appendix A of the FS Work Plan). Any deviation from established protocols will be documented on the Field Report forms.

7.2 LABORATORY QUALITY CONTROL

Analytical laboratory QA/QC procedures are provided in the laboratory Quality Assurance Plan that is on file at the Farallon office.

7.3 DATA QUALITY CONTROL

All data generated by OnSite will undergo two levels of QA/QC evaluation: one by the laboratory and one by Farallon. As specified in OnSite's laboratory Quality Assurance Plan, the laboratory will perform initial data reduction, evaluation, and reporting. The analytical data will then be validated at the Farallon office under supervision of the QA/QC Officer. The following types of QC information will be reviewed, as appropriate:

- Method deviations;
- Sample transport conditions (temperature and integrity);
- Sample extraction and holding times;
- Method reporting limits;
- Blank samples;
- Duplicate samples;
- Surrogate recoveries;
- Percent completeness; and
- RPD (precision).

Farallon will review field records and the results of field observations and measurements to ensure that procedures were properly performed and documented. The following elements will be included in the review of field procedures:

- Completeness and legibility of field logs;
- Preparation and frequency of field QC samples;
- Equipment calibration and maintenance; and
- Chain of Custody forms.

7.4 DATA ASSESSMENT PROCEDURES

The Project Manager and QA/QC Officer are responsible for data review and validation. Upon receipt of each data package from the laboratory, calculations for precision, accuracy, and completeness will be performed using the equations presented in Section 3, Data Quality Objectives. Results will be compared to quantitative DQOs, where established, or qualitative DQOs. Data validation parameters also are outlined in Section 3, Data Quality Objectives.

8.0 PERFORMANCE AND SYSTEM AUDITS

Performance audits will be completed for both sampling and analysis work. Field performance will be monitored through regular review of field notebooks, field measurements, and Chain of Custody forms. The Project Manager and/or the QA/QC Officer also may perform periodic on-Site review of work in progress.

Accreditation of the analytical laboratory by Ecology for each analytical method demonstrates the laboratory's ability to properly perform the requested methods. Therefore, a system audit of OnSite will not be conducted.

The Project Manager and/or QA/QC Officer will frequently oversee communication with the analytical laboratory while samples are being processed and analyzed at the laboratory. This oversight will allow Farallon to assess progress toward meeting the DQOs, and to take corrective measures if problems arise.

The analytical laboratory will be responsible for identifying and correcting (as appropriate) any deviation from performance standards as discussed in the laboratory Quality Assurance Plan. During sample analysis, the laboratory will communicate to the Project Manager or the QA/QC Officer any deviation to the performance standard, and the appropriate corrective measure(s). Corrective action is discussed in Section 10.

9.0 PREVENTIVE MAINTENANCE

Operation and maintenance manuals will accompany the field parameter analysis and measurement equipment. Included in these manuals will be procedures for calibration, operation, and troubleshooting. Maintenance activities will be documented in the project Field Report forms and/or equipment logbooks. A schedule of preventive maintenance activities also will be maintained. In addition, spare parts and tools will be included in each equipment storage case to minimize equipment downtime.

10.0 CORRECTIVE ACTION

Corrective actions will be the joint responsibility of the Project Manager and the QA/QC Officer. Corrective procedures may include:

- Identifying the source of a discrepancy or violation;
- Reanalyzing samples if holding-time criteria permit;
- Resampling and analyzing;
- Remeasuring a parameter;
- Evaluating and amending sampling and analytical procedures; and/or
- Qualifying data to calculate the level of uncertainty.

During field sampling operations, the Project Manager and field team members will be responsible for identifying and correcting a protocol that may compromise the quality of the data. Corrective actions taken will be documented in the field notes.

11.0 QUALITY ASSURANCE REPORTS

The Feasibility Study Report will include a QA section, which will summarize the data quality of the deliverables that are generated during the project. This summary will include at a minimum:

- An assessment of data accuracy and completeness;
- The results of performance and/or system audits; and
- Identification of significant QA problems and the impact on the DQOs.

APPENDIX C
HEALTH AND SAFETY PLAN

FEASIBILITY STUDY WORK PLAN
Agri-Tech and Yakima Steel Fabricators
6 and 10½ East Washington Avenue
Yakima, Washington

Farallon PN: 765-001

FARALLON consulting

975 5th Avenue Northwest, Issaquah, Washington 98027
Tel: (425) 295-0800 Fax: (425) 295-0850
www.farallonconsulting.com

HEALTH AND SAFETY PLAN

APPENDIX C OF THE FEASIBILITY STUDY WORK PLAN

AGRI-TECH & YAKIMA STEEL FABRICATORS, INC.
6 AND 10½ EAST WASHINGTON AVENUE
YAKIMA, WASHINGTON

Submitted by:
Farallon Consulting, L.L.C.
975 5th Avenue Northwest
Issaquah, Washington 98027

Farallon PN: 765-001

For:
Yakima Steel Fabricators, Inc.
6 East Washington Avenue
Yakima, Washington

May 3, 2011

HEALTH AND SAFETY PLAN
REVIEW AND APPROVAL

Client: Yakima Steel Fabricators
Facility Name: Yakima Steel Fabricators
Project Name: FS Work Plan
Project Number: 765-001
Start Date: May 9, 2011
End Date: November 30, 2011

Plan Expiration Date: November 30, 2011 (*Last day of expected field work or no longer than 6 months*).

APPROVED BY:

Jeff Kaspar
Project Manager
Signature — *Date*: 5/3/11

Richard McManus
Office Health and Safety Coordinator
Signature — *Date*: 5/3/11

Brett T. Carp
Site Health and Safety Officer
Signature — *Date*: 5/3/11

Clifford T. Schmitt
Principal-in-Charge
Signature — *Date*: 5/3/2011

This Health and Safety Plan (HASP) was written for the use of Farallon Consulting, L.L.C. (Farallon) and its employees. It may be used also by trained and experienced Farallon subcontractors as a guidance document. However, Farallon does not guarantee the health or safety of any person entering this Site.

Due to the potentially hazardous nature of the site and the activities occurring thereon, it is not possible to discover, evaluate, or provide protection for all possible hazards that may be encountered. Strict adherence to the health and safety guidelines set forth herein will reduce, but does not eliminate, the potential for injury. The health and safety guidelines in this HASP were prepared specifically for this site, its conditions, purposes, dates of field work, and personnel, and must be amended if conditions change.

Farallon claims no responsibility for the use of this HASP by others. This HASP will provide useful information to subcontractors and will assist them in developing their own HASP, but it should not be construed as a substitute for their own HASP. Subcontractors should sign this HASP (see *Health and Safety Plan Acknowledgment and Agreement Form*, Attachment 1) as an acknowledgement of hazard information and as notice that this HASP does not satisfy their requirement to develop their own HASP.

CONTENTS

ATTACHMENTS

1.0 SCOPE OF WORK

This Health and Safety Plan (HASP) was prepared for the use of Farallon personnel while performing the additional characterization activities at the Site. The purpose of the additional characterization is to address the data gaps discussed in Section 3 of the Revised Feasibility Study Work Plan dated April 15, 2010 (FS Work Plan). The work is being conducted to meet the requirements of Agreed Order No. DE 6091 entered into by the Washington State Department of Ecology (Ecology) and Yakima Steel Fabricators, Inc., (YSF) pursuant to the authority of the Washington State Model Toxics Control Act, as established in Section 050(1) of Chapter 70.105D of the Revised Code of Washington, with an effective date of October 27, 2008.

The scope of work for the additional characterization effort at the Site includes supplemental groundwater monitoring and sampling of the existing monitoring well network and supplemental soil sampling to define the lateral and vertical distribution of soil contamination in Area 3 of the Site. The tasks will be conducted in a manner consistent with the methods and assumptions outlined in the FS Work Plan.

2.0 BACKGROUND INFORMATION

The Site includes the YSF property (Yakima County Tax Parcel No. 19133141009) and the Agri-Tech property (Yakima County Tax Parcel No. 19133141409). The Site is located in the northeast corner of the southeast quarter of Section 31, Township 13 North, Range 19 East of the Willamette Meridian. The approximate latitude and longitude of the Site is North 46 degrees, 34 minutes latitude, West 120 degrees, 29 minutes longitude. The Site is approximately 7.23 acres in area and located in an area of Yakima zoned for light industrial use. Site topography is relatively flat, with less than 5 feet of relief across the approximately 7.23-acre area. The Site slopes very slightly to the southeast, following the regional topographic trend of the Ahtanum Valley. The current Site grade is the result of fill and grading activities conducted in the late 1970s.

The YSF property includes a single-story steel-framed, aluminum-sided building measuring approximately 225 by 225 feet that is subdivided into three areas. The western portion of the YSF building was constructed in 1980, and currently is used for steel fabrication and business offices. The central portion of the building is used for steel fabrication and loading of finished product, and the eastern portion is used for steel storage. The floors of the central and eastern portions of the building are paved with asphalt; the floor of the western portion of the building is paved with concrete. The exterior areas immediately north, south, and west of the YSF building are paved with asphalt. The remaining areas of the YSF property are unpaved. A pond classified by the Yakima County Assessor's Office as a potential wetland is located near the southern boundary of the YSF property.

The Agri-Tech property includes a 20,625-square-foot single-story, cinder block slab-on-grade building measuring approximately 164 by 124 feet that was constructed in 1982. The building was constructed by Team Research Engineering Corporation, which owned the property prior to its purchase by Agri-Tech in 1989. The interior of the building consists of a concrete floor slab. The northern, southern, and western areas immediately surrounding the building are asphalt-paved. A concrete slab is present along the eastern portion of the building extending to the property boundary.

A remedial investigation (RI) was completed at the Site on behalf of Agri-Tech and YSF in June 2004 pursuant to Ecology Agreed Order No. DE 97TC-C154 issued for the Site on October 6, 1997. Results from the RI were summarized in the Revised Remedial Investigation Report dated June 10, 2004, prepared by Farallon (RI Report). The RI Report documents that concentrations of hazardous substances exceeding the preliminary screening levels established for the Site were detected in soil and groundwater. The preliminary screening levels for the constituents of potential concern (COPCs) identified in the RI Report were established as MTCA Method B soil cleanup levels protective of a potable groundwater source (WAC 173-340-747).

Agreed Order No. DE 6091 was issued in October 2008 to complete an FS and address the data gaps in the RI identified by Ecology following supplemental site investigation work completed by Ecology in July 2007 in Area 3 of the Site, located on the southern portion of the YSF

property. This HASP was prepared for the use of Farallon personnel while performing the additional characterization activities at the Site as part of the FS.

3.0 DRUG AND ALCOHOL POLICY

It is Farallon's policy to maintain a drug-free workplace. Farallon has a responsibility to all of its staff members to provide a safe and inoffensive work environment, and a responsibility to its clients to provide accurate and consistent service. For these reasons, Farallon prohibits the following behavior by staff members in the field:

- Use of tobacco in any form by any person at any time in sensitive or hazardous areas that may pose a health and safety or environmental risk. The Site Health and Safety Officer (SHSO) may designate an area away from hazards that is safe for tobacco use;
- Possession or consumption of alcohol, or being under the influence of alcohol during field activities;
- Abuse of prescription and/or over-the-counter drugs in such a manner as to negatively impact performance or field safety; and
- Possession, use, sale, or being under the influence of illicit drugs while in the field or during any work hours.

Violation of any of the above codes of conduct is grounds for immediate removal from the project site and discipline in accordance with Farallon company policy. If an incident occurs as a result of an employee's actions, drug and alcohol testing will be performed in accordance with Farallon company policy.

4.0 WEAPONS POLICY

Farallon employees, contractors, subcontractors, and their employees working at the site are to ensure that they do not bring weapons onto the work site. Weapons include but are not limited to guns, knives, and explosives. Tools that are used during the course of field events, including but not limited to box knives, are exempt from this weapons policy. All vehicles and persons can be subjected to search while working at the property.

Failure to comply with the weapons policy can result in disciplinary action for the individual(s) involved in accordance with Farallon company policy.

5.0 INCIDENT PREPAREDNESS AND RESPONSE

Farallon employees and subcontractors working on site must be prepared to respond appropriately to an incident involving injury, illness, death, spills, or utility breaches. This section outlines the degree of preparedness required for employees at a work site, and describes the actions to be taken in the event of a health and safety incident.

5.1 HEALTH AND SAFETY PREPAREDNESS

All individuals working at the site are required to be familiar with the contents of this HASP. Additionally, the items on the following health and safety preparedness list should be reviewed prior to the commencement of work and during daily health and safety meetings:

- The directions to the hospital (provided in Attachment 2);
- The locations of first aid kits, personal eye washes, and fire extinguishers;
- The locations of the keys to site vehicles; and
- Hand sign language providing for the immediate stoppage of work (such as a horizontal hand movement in front of the neck).

Additional topics for daily health and safety meetings are included in Attachment 3, Potential Topics for Daily Health and Safety Meeting. Participation in daily health and safety meetings should be documented in the Daily Health and Safety Briefing Log (Attachment 4).

5.2 INJURY OR ILLNESS

If an injury or illness occurs, the following actions should be taken, regardless of the severity of the injury or illness:

- Stop work.
- Determine whether emergency response staff (e.g., fire, ambulance) are necessary. If so, dial 911 on a cell phone or the closest available telephone. Describe the location of the injured person and provide other details as requested. If an individual requires non-emergency medical care at a hospital, follow the directions to the nearest hospital, which are provided in Attachment 2. IF EMERGENCY MEDICAL CARE IS NEEDED CALL 911.
- Administer first aid to the individual immediately, using the first aid kit provided in the site vehicle. Use the bloodborne pathogens kit and personal eyewash, as needed.
- Notify the SHSO immediately. The SHSO is responsible for preparing and submitting an Incident Report form to Farallon's Health and Safety Coordinator (HSC) within 24 hours of the incident, and for notifying the employee's supervisor and the Principal in Charge. The Incident Report form is provided in Attachment 5.

- ***All incidents must be reported to the HSC within 24 hours; however, the actual investigation need not be completed within 24 hours.*** **A telephone message that includes the date, time, and general incident circumstances should be left at one of the following numbers if the HSC cannot be reached directly:**
    - HSC work phone: (425) 295-0800
    - HSC cell phone: (425) 466-1032
    - If the HSC cannot be located contact the Principal-in-Charge.
- The SHSO will assume responsibility during a medical emergency until emergency response personnel arrive at the site.

5.3 REPORTING PROCEDURES FOR MINOR CUTS, SCRATCHES, BRUISES, ETC.

Every occupational illness or injury is to be reported immediately by the employee to the SHSO. The SHSO is to complete the Incident Report form provided in Attachment 5, and report the incident to the HSC.

5.4 NEAR MISSES

A near miss is defined as an incident in which no personal injury is sustained and no property damage is incurred, but where injury and/or property damage could have occurred under slightly different timing or location.

In the event of a near miss, the following actions are to be taken:

- Stop work.
- Report the near miss to an SHSO immediately.
- The SHSO is to report the near miss to the HSC and complete the Near Miss Report form in Attachment 6.
- Resume work upon satisfactory resolution of the near-miss condition and documentation of the corrective action(s) taken by the SHSO.

5.5 MEDICAL INCIDENTS NOT REQUIRING AMBULANCE SERVICE

Medical incidents not requiring ambulance services include injuries and conditions such as minor lacerations, and sprains. In the event of an injury, an illness, or a condition that does not require ambulance service, the following actions are to be taken:

- Stop work.
- Administer first aid as necessary to stabilize the individual for transport to the hospital.
- The SHSO is to facilitate prompt transportation of the individual to the hospital. Directions to the nearest hospital are provided in Attachment 2.

- A representative of Farallon or the subcontractor is to drive the individual to the medical facility and remain at the facility until the individual is able to return to the jobsite, or arrangements for further care have been established.
- If the driver is not familiar with the route to the hospital, a second person who is familiar with the route is to accompany the driver and the injured employee to the hospital.
- If it is necessary for the SHSO to accompany the injured employee to a medical facility, provisions must be made for another employee who is trained and certified in first aid to act as the temporary SHSO before work at the jobsite can resume.
- If the injured employee is able to return to the jobsite the same day, he/she is to bring a statement from the doctor that provides the following information:
  - Date of incident
  - Employee's name
  - Diagnosis
  - Date he/she is able to return to work, and whether regular or light duty
  - Date he/she is to return to the doctor for a follow-up appointment, if necessary
  - Signature and address of doctor
- The SHSO is to complete the Incident Report form provided in Attachment 5, and report the incident to the HSC.
- If the injured employee is unable to return to the jobsite the same day, the employee who transported him/her should bring the statement from the doctor back to the jobsite. The information on this statement should be reported to the HSC immediately.

5.6 EMERGENCY CASES REQUIRING AMBULANCE SERVICE

In the event of an injury or illness that requires emergency response and transport to a hospital by ambulance the following actions should be taken:

- **Dial 911** to request ambulance service.
- Notify the SHSO.
- Administer first aid until the ambulance service arrives.
- One designated company representative should accompany the injured employee to the medical facility and remain there until final diagnosis, treatment plan, and other relevant information has been obtained.
- The SHSO is to complete the Incident Report form provided in Attachment 5, and report the incident to the HSC immediately.

5.7 EMPLOYEE DEATH, OR HOSPITALIZATION OF THREE OR MORE EMPLOYEES

The procedures outlined in Section 6.2 should be followed in the event of an employee injury or illness. If an employee fatality occurs, the HSC, local emergency personnel and the coroner must be notified **immediately**. **The HSC will initiate the required State of Washington Department of Labor and Industries and Occupational Safety and Health Administration (OSHA) notifications within 8 hours of a fatality or the hospitalization of three or more employees.**

5.8 RESPONSE TO SPILLS OR UTILITY BREACHES

The location of underground utilities (e.g., product, sewer, telephone, fiber optic) and facilities (e.g., USTs, septic tanks, utility vaults) is to be noted prior to commencement of intrusive subsurface work activities. Use the public and private locate services as required and complete the Utility Clearance Log (Attachment 7). If a utility line or tank is breached or a spill or release occurs, the event is to be documented on the Incident Report form provided in Attachment 5 as soon as possible. The date, time, name of the person(s) involved, actions taken, and discussions with other affected parties are to be included. The SHSO, Project Manager (PM) and client are to be notified immediately. The PM is to notify the regulatory authority and/or utility company, as necessary.

In the event of a spill or release, the following actions should be taken:

1. Stay upwind of the spill or release.
2. Don appropriate personal protective equipment (PPE).
3. Turn off equipment and other sources of ignition.
4. Turn off pumps and shut valves to stop the flow or leak.
5. Plug the leak or collect drippings, when possible.
6. Use sorbent pads to collect the product and impede its flow, if possible.
7. Dial 911 or telephone the local fire department immediately if a fire or another emergency situation develops.
8. Inform the Farallon PM of the situation.
9. Determine whether the client would like Farallon to repair the damage or would rather use an emergency repair contractor.
10. Advise the client of spill discharge notification requirements, and establish who will complete and submit the required forms. ***Do not report or submit information to an agency without the client's consent.*** Document each interaction with the client and regulators, and note in writing names, titles, authorizations, refusals, decisions, and commitments to any action.

11. Do not transport or approve transportation of contaminated soils or product until proper manifests have been completed and approved. Be aware that soil and/or product may meet criteria for hazardous waste.
12. Do not sign manifests as a generator of wastes. Contact the PM to discuss waste transportation.

5.9 NOTIFICATIONS

A spill or release requires completion of an Incident Report form (provided in Attachment 5) per Farallon's Health and Safety program. **The PM must involve the client and/or generator in the incident reporting process. The client and/or generator is under obligation to report the incident to the appropriate government agency(ies). If the spill extends into waterways, the Coast Guard and the National Response Center must be notified immediately by the client or with his permission (800 424-8802).**

5.10 SHUTOFF VALVES AND/OR SWITCHES FOR UTILITIES AND PRODUCTS

Before starting work, locate and list below the location of utility and product line shutoff valves and switches on the project site. Review the location of shutoff valves and switches with field personnel before beginning work.

The shutoff valves and/or switches for electrical, natural gas, gasoline, water lines, etc. will be determined prior to conducting field activities at the Site. There are no known underground gas or gasoline lines at the Site.

6.0 EMERGENCY RESPONSE AND EVACUATION PLAN

Farallon personnel and subcontractors working on site are to be aware of site-specific emergency and evacuation procedures, including alarm systems and evacuation plans and routes. If an incident occurs that requires emergency response, such as a fire or spill, **CALL 911 and request assistance**. Farallon staff, subcontractors, and/or others working in an area where an emergency occurs are to evacuate to a safe location away from the incident area, preferably upwind, and take attendance.

For this project the emergency evacuation gathering location is the northern entrance of the site adjacent to Washington Avenue.

If the emergency causes the route to be obstructed, Farallon personnel and subcontractors are to move to an open area upwind of the hazard area, and remain there until instructed by emergency response personnel (e.g., police, fire, ambulance personnel, paramedics) to do otherwise.

Subcontractors have the responsibility to account for their own employees and provide requested information to emergency response personnel immediately upon request. Farallon staff, subcontractors, and/or contractors may not reenter the scene of the emergency without specific approval from emergency response personnel.

7.0 LOCAL EMERGENCY CONTACT NAMES AND TELEPHONE NUMBERS

Local emergency response personnel can be contacted at the following numbers. Directions and a map to the hospital are included in Attachment 2.

Emergency Contact	Name and Location	Telephone No.
Hospital	Yakima Regional Medical 110 South 9th Avenue Yakima, Washington 98902	(509) 575-5000
Police	Union Gap Police Department 1800 Rainier Place Union Gap, Washington 98903	(509) 248-0430 Or **911**
Fire	Union Gap Fire Department 107 West Ahtanum Road Union Gap, Washington 98903	(509) 452-6706 Or **911**
National Response Center		**1-800-424-8802**
Washington State Department of Ecology		**(360) 407-6300**
Poison Control		**1-800-424-5555**

8.0 PROJECT PERSONNEL AND RELEVANT INFORMATION

Questions about this project that are posed by neighbors, the press, or other interested parties should be directed to the Principal in Charge at Farallon: (425) 295-0800.

Yakima Steel Fabricators, Inc. 765-001	General Project Responsibilities	Field Personnel Training Dates			Medical Surveillance Date
		40-Hour HAZWOPER	8-Hour Refresher	CPR/ First Aid	
Site Health and Safety Officer Brett T. Carp Office: (425) 295-0800	Implement this HASP. Has authority to stop work. Perform air quality tasks. Take charge of all incidents. Review subcontractor's HASP.	3/4/2005	1/2011	11/2010	11/2010
Farallon Personnel TBD Office (425) 295-0800	Be familiar with HASP requirements and the Farallon Accident Prevention Program and Hazardous Waste Operations Program				
Subcontractor Project Manager TBD Office:	Oversee work of own staff. Ensure that their own HASP is site-specific.				
Subcontractor Personnel TBD	Be familiar with HASP requirements				
Principal-in-Charge Clifford T. Schmitt Office: (425) 295-0800 Cell: (425) 765-3365	Provide immediate support upon notice of any incident.	NA	NA	NA	NA
Health and Safety Coordinator Richard McManus Office (425) 295-0800 Cell: (425) 466-1032	Provide support in implementing HASP. Provide immediate support upon notice of any incident.	NA	NA	NA	NA
YFS Site John Gehlsen Office: (509) 575-1570	Provide known analytical data from work performed by others. Provide notice of site hazards. Provide access to site. Provide information regarding available emergency supplies at the site.	NA	NA	NA	NA

9.0 POTENTIAL AIRBORNE CONTAMINANTS

The potential airborne contaminants of concern in the immediate vicinity at the site are listed in the table on the following page. The table should be reviewed, and any questions directed to the SHSO.

POTENTIAL AIRBORNE CHEMICALS ON SITE FOR THIS PROJECT
REVIEW THIS TABLE AND CONTACT THE SHSO WITH ANY QUESTION

Chemical (or Class)	OSHA PEL ACGIH TLV	Other Pertinent Limits	Properties	Routes of Exposure or Irritation	Acute Health Effects	Chronic Health Effects/ Target Organs
Tetrachloroethene (Perchloroethylene)	PEL - 100 ppm TLV - 25 ppm	PEL Ceiling - 200 ppm TLV STEL – 100 ppm IDLH - 150 ppm NIOSH considers this compound to be a carcinogen	Colorless liquid with a mild, chloroform-like odor	Inhalation; skin absorption; ingestion; eye contact	Irritation to eyes, skin, nose, throat, respiratory system; nausea; flush face, neck; vertigo (an illusion of movement); dizziness; lack of coordination; headache; skin erythema (redness)	Somnolence (sleepiness, unnatural drowsiness); liver damage; potential occupational liver carcinogen. **Target Organs:** Eyes, skin, respiratory system, liver, kidneys, CNS
Vinyl chloride	PEL - 1 ppm TLV - 1 ppm	NIOSH considers this material to be a carcinogen	Liquid with a pleasant odor at high concentrations	Inhalation; dermal; eye contact	Weakness; abdominal pain; pallor or cyanosis of extremities; liquid—frostbite	Gastrointestinal bleeding; enlarged liver; potential occupational liver carcinogen; damage to CNS, blood, respiratory system, lymphatic system
Organochlorine Pesticides (Endrin)	PEL – 0.1 mg/m^3 [skin]	IDLH – 2 mg/m^3	Colorless to tan, crystalline solid with a mild, chemical odor	Inhalation; skin absorption; ingestion; contact	Epileptiform convulsions; stupor; headache; dizziness; abdominal discomfort; nausea; vomiting; insomnia; aggressiveness; confusion; drowsiness; lassitude; anorexia;	Liver Damage/ Central Nervous System; Liver

NOTES:
ACGIH = American Conference of Governmental Industrial Hygienists
AIHA = American Industrial Hygiene Association
AIHA WEEL = AIHA-set workplace environmental exposure limits
C = ceiling limit
CNS = central nervous system
CVS = cardiovascular system
IDLH = immediately dangerous to life or health
mg/m^3 = milligrams per cubic meter
NIOSH = National Institute for Occupation Safety and Health
OSHA = Occupation Safety and Health Administration
PEL = permissible exposure limit
ppm = parts per million
RBC = red blood cells
REL = recommended exposure limit set by National Institute for Occupational Safety and Health (NIOSH)
Skin = skin absorption
STEL = short-term exposure limit
TLV = threshold limit value set by ACGIH
TWA = time-weighted average

10.0 POTENTIAL SITE HAZARDS AND APPROPRIATE PRECAUTIONS

The following tables list potential hazards and appropriate precautions associated with planned field work:

10.1 TEST PIT EXCAVATION ACTIVITIES

Job Steps	Personal Protective Equipment	Potential Hazard	Critical Actions
Clear excavation locations.	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, ear plugs or ear muffs, work gloves.	Traffic hazards, overhead and underground installations, product releases, property damage, dealer inconvenience.	• Refer to Utility Clearance Log. • Coordinate with facility contact (or designee) to minimize potential conflicts. • Review proposed locations against available construction drawings and known utilities, tanks, product lines, etc. • Mark out the proposed excavation locations. • Call the underground utility locating service for public line location clearance. Obtain a list of utilities being contacted. If necessary, coordinate private line locator for private property.
Set up necessary traffic control.	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, ear plugs or ear muffs, work gloves.	Being struck by vehicle during placement. Vehicle accident as a result of improper traffic control equipment placement.	• Use buddy system to place traffic control. • Implement traffic control plan as required.
Set up exclusion zone(s) and stockpile area and establish work areas/heavy equipment pathways.	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, ear plugs or ear muffs, work gloves.	Injury or exposure to public or other onsite personnel. Slip or fall hazards. Onsite vehicular accident with heavy equipment.	• Implement exclusion zone set-up instructions. • Establish clear walking paths between work stations.

Job Steps	Personal Protective Equipment	Potential Hazard	Critical Actions
Hand digging/post-holing where necessary to expose and protect underground installations as needed.	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, ear plugs or ear muffs, work gloves. Respirator with organic vapor cartridges, chemical-resistant gloves, chemical-resistant apron as required.	Damage to lines and associated physical hazards or property damage. Back strain. Injury or vehicle damage from falling into a hole.	• Use hand tools whenever possible. • Use proper lifting techniques. • Barricade or cover holes until job has been completed.
Assist with set up of heavy equipment.	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, ear plugs or ear muffs, work gloves.	Damage caused by heavy equipment while accessing set-up location. Being struck by equipment.	• Verify a clear pathway to excavation and stockpiling locations. • Provide hand signals and guidance to driver as needed to place rig. • Visually inspect equipment (fire extinguisher on board, no oil or other fluid leaks, cabling and associated equipment in good condition, pressurized hoses secured with whip-checks or adequate substitute, jacks in good condition). • Maintain eye contact with operator.
Commence excavation.	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, ear plugs or ear muffs, work gloves. Respirator with organic vapor cartridges, chemical-resistant gloves, chemical-resistant apron as required.	Heat or cold exposure. Exposure to chemical hazards. Hitting an underground or overhead utility. Flammable or oxygen-deficient atmosphere from accumulated vapors. Trip or fall. Side wall cave-in. Equipment failure. Noise.	• Monitor weather conditions and take breaks as needed for cold or hot weather. Conduct air monitoring as presented in Attachment 8. Include Lower Explosive Limit (LEL) and oxygen (O_2) monitoring. If >10% LEL or O_2 <19.5%, discontinue work or ventilate area with explosion-proof equipment. • Maintain required excavation set-backs for workers and equipment. Monitor condition of side walls and surrounding ground conditions. • Keep work area clear of tripping or slipping hazards. Perform periodic visual inspections of heavy equipment and keep equipment a minimum of 5 feet from excavation edge, or one foot away from the edge for every foot of depth, if greater than 5 feet deep. • Perform necessary soil classification. Slope or bench walls, or shore excavation to prevent cave-in. Keep all spoils > 2 feet from excavation edge. Keep excavation entry controlled and equipped with required ladders and crosswalks.

Job Steps	Personal Protective Equipment	Potential Hazard	Critical Actions
Collect samples in accordance with sampling plan.	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, ear plugs or ear muffs, work gloves. Respirator with organic vapor cartridges, chemical-resistant gloves, chemical-resistant apron as required.	Cave-in of side wall if entering excavation. Injury from heavy equipment. Exposure to site contaminants.	• Stay out of excavation whenever possible (collect samples from backhoe bucket). • Use agreed-upon hand signals with heavy equipment operators. • Monitor air around excavation in accordance with the protocol presented in Attachment 8.
Store excavated materials according to site-specific requirements.	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, ear plugs or ear muffs, work gloves. Respirator with organic vapor cartridges, chemical-resistant gloves, chemical-resistant apron as required.	Exposure to public. Traffic hazard, obstruction, or inconvenience to business operation. Improper storage or disposal.	• Have necessary storage containment and labeling available onsite. • Place materials in isolated location away from traffic and other site functions. • Stockpile excavated materials on suitable plastic or in appropriately designed container. Cover with plastic, and barricade access to waste in accordance with local regulations. • Coordinate proper disposal offsite, where applicable.
Backfill excavation.	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, ear plugs or ear muffs, work gloves. Respirator with organic vapor cartridges, chemical-resistant gloves, chemical-resistant apron as required.	Being struck by heavy equipment. Side wall collapse. Damage or accidents resulting from subsequent subsidence.	• Use agreed-upon hand signals with heavy equipment operators. • Compact soils to meet specifications. • Maintain eye contact with equipment operators.
Clean site. Demobilize.	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, ear plugs or ear muffs, work gloves.	Traffic. Safety hazard left on site. Lifting hazards.	• Use buddy system to remove traffic control, as necessary. • Leave site clear of refuse and debris. • Notify business personnel of departure. • Use proper lifting techniques or use mechanical assistance.
Package and deliver samples to laboratory.		Back strain. Traffic accidents	• Handle and pack bottles carefully (e.g., bubble wrap bags). • Use proper lifting techniques. • Apply safe driving practices

Job Steps	Personal Protective Equipment	Potential Hazard	Critical Actions
General			
Typical work.	Steel-toed and -shank shoes, hard hat, safety glasses with side shields, hearing protection, reflective safety vest, and leather gloves for non-chemical aspects of the work. If equipment contamination is suspected, wear chemical-resistant gloves during decontamination of equipment.	Weather-related incidents: automobile accidents, slips or falls.	• Check weather reports daily. Project visits are not to be performed during inclement weather. Sampling may be performed during light rain mist. Wear raincoats. • Drive at the speed limit or less as needed to keep safe distance from vehicle in front. Avoid short stops.
No eating, drinking, or smoking on-site. No contact lenses to be worn on-site. No facial hair that would interfere with respirator fit.			
A safety meeting will be held each day, even if only one person is working on the project on any given day.			• Topics are always to include the work scheduled for that day, and restatement of hazards and the means to avoid them. Other topics may include sampling in general, and advances in technology and how they may be applied to the project. Use the *Daily Health and Safety Briefing Log* provided in Attachment 4 to log the topics discussed.

10.2 MONITORING WELL SAMPLING/GAUGING

Job Steps	Personal Protective Equipment	Potential Hazard	Critical Actions
Mobilize with equipment/supplies suitable for sampling.	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, ear plugs or ear muffs, work gloves.	Vehicle accident. Lifting hazards. Delay or unsafe performance of work due to lack of necessary equipment on site. Cross-contamination of wells.	Follow safe driving procedures. Use proper lifting techniques. Review work plan to determine equipment/supply needs. Verity that all sampling/gauging equipment has been decontaminated. Bring ice for sample storage. Review the HASP. Gather the necessary PPE.
Set up necessary traffic control.	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, ear plugs or ear muffs, work gloves.	Struck by vehicle during placement. Vehicle accident as a result of improper traffic-control equipment placement.	Use buddy system for placing traffic control. Refer to the traffic control plan section of the HASP (which may include specific requirements based on encroachment permit).
Set up exclusion zone(s).	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, ear plugs or ear muffs, work gloves.	Struck by vehicle. Slip or fall hazards to workers.	Face incoming traffic. Implement exclusion zone setup instructions of the HASP (e.g., barricades, caution tape, cones). Set up work area free of trip hazards.
Gauge water levels and product thickness (where applicable) in wells.	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, ear plugs or ear muffs, work gloves. Respirator with organic vapor cartridges, chemical-resistant gloves, chemical-resistant apron as required.	Back strain. Inhalation of, or dermal exposure to, chemical hazards. Repetitive motion.	Wear required PPE. Initiate air quality monitoring in accordance with the HASP. Maintain a safe distance from wellhead. Bend at knees rather than at waist.

Job Steps	Personal Protective Equipment	Potential Hazard	Critical Actions
Purge well(s) and collect purge water.	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, ear plugs or ear muffs, work gloves. Respirator with organic vapor cartridges, chemical-resistant gloves, chemical-resistant apron as required.	Cross-contamination. Back strain. Inhalation of, or dermal exposure to, chemical hazards. Slip or fall. Contaminated water spill.	Decontaminate purging equipment between each sampling location. Use proper lifting techniques. Use PPE and conduct monitoring in accordance with the HASP. Keep work area clear of tripping or slipping hazards. Store purge water in appropriate containers.
Collect samples in accordance with sampling plan.	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, ear plugs or ear muffs, work gloves. Respirator with organic vapor cartridges, chemical-resistant gloves, chemical-resistant apron as required.	Cross-contamination. Back strain. Inhalation of, or dermal exposure to, chemical hazards. Slip or fall. Improper labeling or storage. Injury from broken sample bottle (e.g., cut, or acid burn).	Decontaminate sampling equipment between each well (unless disposable equipment). Use proper lifting techniques. Use PPE in accordance with the HASP. Label samples in accordance with sampling plan. Keep samples stored in suitable containers, at correct temperature, and away from work area. Handle bottles carefully.
Dispose of or store purge water on site.	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, ear plugs or ear muffs, work gloves. Respirator with organic vapor cartridges, chemical-resistant gloves, chemical-resistant apron as required.	Back strain. Exposure to contaminants. Damage or injury from improper use of on-site treatment system equipment. Improper storage or disposal.	Use suitable equipment to transport water (e.g., pumps, drum dollies). Wear PPE in accordance with the HASP. Review any necessary instructions for use of on-site treatment systems. Label storage containers properly and locate in an isolated area away from traffic and other site functions. Coordinate off-site disposal, where applicable.
Clean site/demobilize	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, ear plugs or ear muffs, work gloves.	Traffic. Safety hazard left on site. Lifting hazard.	Use buddy system to remove traffic control, as necessary. Leave site clear of refuse and debris. Notify business personnel of departure, and of any purge water left on site. Use proper lifting techniques.
Package and deliver samples to laboratory.		Bottle breakage. Back strain.	Handle and pack bottles carefully (e.g., bubble wrap bags). Use proper lifting techniques.

11.0 WASTE CHARACTERISTICS

Waste anticipated to be generated on the project site:

Type(s): ☒ Liquid ☐ Solid ☐ Sludge ☐ Other_____

The approximate volume for each anticipated waste stream:

Waste: Purge and Decon Water Approximate Volume: Two 55-gallon drums

Waste: Approximate Volume:

Waste: Approximate Volume:

Characteristics:

☐ Corrosive ☐ Flammable/Ignitable ☐ Radioactive ☒ Toxic

☐ Reactive ☐ Unknown ☐ Other *(specify)* _____

12.0 TRAFFIC CONTROL

Work on this project site will be performed in areas of uncontrolled traffic access. Traffic control/warning devices will be placed around the work area to prevent undesirable interface between pedestrian and automotive traffic and project workers and equipment. These devices may include:

- Cones;
- Tubular markers;
- Barricades;
- Temporary fencing; and
- Barricade tape.

The traffic control/warning devices will be placed around the work in such a way that traffic access is inhibited (i.e. place cones less than 8 feet apart so cars cannot easily drive through work area without moving a cone). Barricade tape or temporary fencing will be used to inhibit access to the work area in locations where pedestrians will be encountered.

ATTACHMENT 1
HEALTH AND SAFETY PLAN ACKNOWLEDGEMENT AND AGREEMENT FORM

HEALTH AND SAFETY PLAN
Yakima Steel Fabricators, Inc.
6 and 10 ½ East Washington Avenue
Yakima, Washington

Farallon PN: 765-001

HEALTH AND SAFETY PLAN ACKNOWLEDGMENT AND AGREEMENT FORM

(All Farallon and subcontractor personnel must sign)

This Health and Safety Plan (HASP) has been developed for the purpose of informing Farallon employees of the hazards they are likely to encounter on the project site, and the precautions they should take to avoid those hazards. Subcontractors and other parties at the site must develop their own HASP to address the hazards faced by their own employees. Farallon will make a copy of this HASP available to subcontractors and other interested parties to fully disclose hazards we may be aware of, and to satisfy Farallon's responsibilities under the Occupational Safety and Health Administration (OSHA) Hazard Communication standard. Similarly, subcontractors and others on site are required to inform Farallon of any hazards they are aware of or that their work on site might possibly pose to Farallon employees, including but not limited to Material Safety Data Sheets for chemicals brought on site. This plan should NOT be understood by contractors to provide information pertaining to all of the hazards that a contractor's employees may be exposed to as a result of their work.

All parties conducting site activities are required to coordinate their activities and practices with the project Site Health and Safety Officer (SHSO). Your signature below affirms that you have read and understand the hazards discussed in this HASP, and that you understand that subcontractors and other parties working on site must develop their own HASP for their employees. Your signature also affirms that you understand that you could be prohibited by the SHSO or other Farallon personnel from working on this project for not complying with any aspect of this HASP.

Name	Title	Signature	Company	Date

ATTACHMENT 2
DIRECTIONS TO HOSPITAL

HEALTH AND SAFETY PLAN
Yakima Steel Fabricators, Inc.
6 and 10 ½ East Washington Avenue
Yakima, Washington

Farallon PN: 765-001

MAPQUEST.

Trip to 6 E Washington Ave

Yakima, WA 98903-1617
3.23 miles - about 8 minutes

Notes

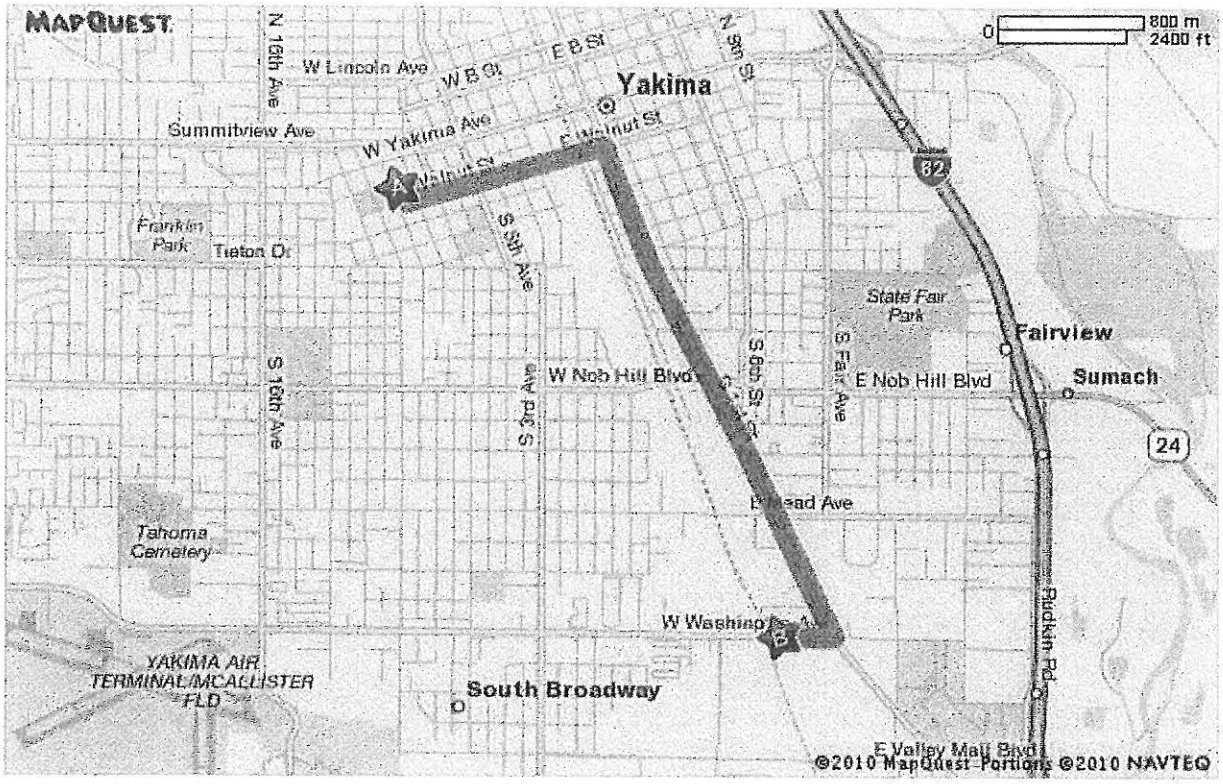
Yakima Regional Med & Cardiac - (509) 575-5000
110 S 9th Ave, Yakima, WA 98902

START	1. Start out going **SOUTHEAST** on **S 9TH AVE** toward **W WALNUT ST**.	go 0.1 mi
	2. Turn **LEFT** onto **W WALNUT ST**.	go 0.7 mi
	3. Turn **RIGHT** onto **S 1ST ST**.	go 2.2 mi
	4. Turn **RIGHT** onto **E WASHINGTON AVE**.	go 0.2 mi
END	5. **6 E WASHINGTON AVE** is on the **LEFT**.	go 0.0 mi

6 E Washington Ave, Yakima, WA 98903-1617

Total Travel Estimate : 3.23 miles - about 8 minutes

Route Map Hide



ATTACHMENT 3
POTENTIAL TOPICS FOR DAILY HEALTH AND SAFETY MEETING

HEALTH AND SAFETY PLAN
Yakima Steel Fabricators, Inc.
6 and 10 ½ East Washington Avenue
Yakima, Washington

Farallon PN: 765-001

POTENTIAL TOPICS FOR DAILY HEALTH AND SAFETY MEETING

- ☐ Emergency response plan, emergency vehicle (full of fuel) and muster point
- ☐ Route to medical aid (hospital or other facility)
- ☐ Work hours. Is night work planned?
- ☐ Hand signals around heavy equipment
- ☐ Traffic control
- ☐ Pertinent legislation and regulations
- ☐ Above- and below-ground utilities (energized or de-energized)
- ☐ Material Safety Data Sheets
- ☐ Reporting an incident: to whom, what, why, and when to report
- ☐ Fire extinguisher and first aid kit locations
- ☐ Excavations, trenching, sloping, and shoring
- ☐ Personal protective equipment and training
- ☐ Safety equipment and training
- ☐ Emergency telephone location(s) and telephone numbers (in addition to 911)
- ☐ Eye wash stations and washroom locations
- ☐ Energy lock-out/tag-out procedures. Location of "kill switches," etc.
- ☐ Weather restrictions
- ☐ Site security. Site hazards. Is special waste present?
- ☐ Traffic and people movement
- ☐ Working around machinery (both static and mobile)
- ☐ Sources of ignition, static electricity, etc.
- ☐ Stings, bites, large animals, and other nature-related injuries and conditions
- ☐ Working above grade
- ☐ Working at isolated sites
- ☐ Decontamination procedures (for both personnel and equipment)
- ☐ How to prevent falls, trips, sprains, and lifting injuries
- ☐ Right to refuse unsafe work
- ☐ Adjacent property issues (e.g., residence, business, school, daycare center)

ATTACHMENT 4
DAILY HEALTH AND SAFETY BRIEFING LOG

HEALTH AND SAFETY PLAN
Yakima Steel Fabricators, Inc.
6 and 10 ½ East Washington Avenue
Yakima, Washington

Farallon PN: 765-001

DAILY HEALTH AND SAFETY BRIEFING LOG

Date	
Start Time	
Issues Discussed	
1.	
2.	
3.	
4.	
5.	
Attendees	
Print Name	**Signature**
Meeting Conducted by	
Name (Site Health and Safety Coordinator)	**Signature**

ATTACHMENT 5
INCIDENT REPORT FORM

HEALTH AND SAFETY PLAN
Yakima Steel Fabricators, Inc.
6 and 10 ½ East Washington Avenue
Yakima, Washington

Farallon PN: 765-001

INCIDENT REPORT

NEAR MISS, ACCIDENTAL INJURY, OCCUPATIONAL ILLNESS, OR WORK PLACE INCIDENT

INCIDENT TYPE **(TO BE COMPLETED BY HEALTH AND SAFETY COORDINATOR)** | **INCIDENT DATE**

- ☐ FATALITY
- ☐ LOST WORKDAY (LW)
- ☐ LW RESTRICTED DUTY
- ☐ OSHA MEDICAL OR ILLNESS WITHOUT LW
- ☐ FIRST AID
- ☐ INDUSTRIAL NON-RECORDABLE
- ☐ NON-INDUSTRIAL
- ☐ OFF-THE-JOB INJURY
- ☐ MOTOR VEHICLE ACCIDENT
- ☐ FIRE
- ☐ SPILL/LEAK
- ☐ PRODUCT INTEGRITY
- ☐ EQUIPMENT
- ☐ BUSINESS INTERRUPTION
- ☐ GENERAL LIABILITY
- ☐ CRIMINAL ACTIVITY
- ☐ NOTICE OF VIOLATION
- ☐ NEAR MISS

This report must be completed by the employee or Health and Safety Coordinator immediately upon learning of the incident. The completed report must be reviewed and signed by a Farallon Principal within 24 hours of the incident, even if employee is not available to review and sign. Employee or employee's doctor must submit a copy of the doctor's report, and any subsequent exams, to Richard McManus at Farallon within 24 hours of the initial exam. After hours or weekends, telephone Mr. McManus via cell phone: (425) 466-1032.

EMPLOYEE INFORMATION

LAST NAME	FIRST NAME AND MIDDLE INITIAL	TITLE	DATE OF BIRTH

EMPLOYMENT STATUS ☐ FULL-TIME ☐ PART-TIME ☐ HOURLY-AS-NEEDED | LENGTH OF EMPLOYMENT

DATE OF INJURY OR ONSET OF ILLNESS (MM/DD/YYYY) | TIME OF EVENT OR EXPOSURE ☐ AM ☐ PM

INJURY OR ILLNESS INFORMATION

EXACT LOCATION OF INCIDENT (GEOGRAPHICAL LOCATION, FLOOR, BUILDING, ETC.)

COUNTY | ON EMPLOYER'S PREMISES? ☐ YES ☐ NO

COMPLETE DESCRIPTION OF INCIDENT; INCLUDE SPECIFIC ACTIVITY AT TIME OF INCIDENT (e.g., Lifting, Pushing, Walking)

DESCRIBE THE EQUIPMENT, MATERIALS, OR CHEMICALS THAT DIRECTLY HARMED THE EMPLOYEE (e.g., the machine that the employee struck or that struck the employee; the vapor inhaled; the material swallowed; what the employee was lifting or pulling)

DESCRIBE THE SPECIFIC INJURY OR ILLNESS (e.g., cut, strain, fracture, skin rash)

BODY PART(S) AFFECTED (e.g., back, left wrist, right eye)

DATE EMPLOYER NOTIFIED | TO WHOM REPORTED

MEDICAL PROVIDER INFORMATION (e.g., hospital, doctor, clinic)

NAME AND ADDRESS OF MEDICAL CARE PROVIDER | TELEPHONE NO.

TREATED IN EMERGENCY ROOM? ☐ NO ☐ YES | HOSPITALIZED OVERNIGHT AS INPATIENT? ☐ NO ☐ YES

INCIDENT REPORT, CONTINUED

SEVERITY OF INJURY OR ILLNESS	TIME LOSS (Check all that apply)	PHASE OF WORKDAY
☐ NO TREATMENT REQUIRED	☐ NO TIME LOSS	☐ PERFORMING NORMAL WORK DUTIES
☐ FIRST AID ONLY	☐ RETURN TO WORK THE NEXT DAY	☐ MEAL PERIOD
☐ MEDICAL TREATMENT	☐ RESTRICTED ACTIVITY:	☐ REST PERIOD
☐ FATALITY (ENTER DATE):	BEGIN DATE	☐ ENTERING/LEAVING
	RETURN DATE	☐ CHRONIC EXPOSURE
	☐ LOST WORKDAY, NOT AT WORK:	☐ OTHER (SPECIFY):
	BEGIN DATE	
	RETURN DATE	

MOTOR VEHICLE ACCIDENT		PROFESSIONAL DRIVER? ☐ YES ☐ NO	
TOTAL YEARS DRIVING	COMPANY VEHICLE? ☐ YES ☐ NO	VEHICLE TYPE	
NO. OF VEHICLES TOWED	NO. OF INJURIES	NO. OF FATALITIES	

THIRD PARTY INCIDENTS		
NAME OF OWNER	ADDRESS	TELEPHONE NO.
DESCRIPTION OF DAMAGE		
INSURANCE INFORMATION		
WITNESS NAME	ADDRESS	PHONE NO.
WITNESS NAME	ADDRESS	PHONE NO.

REVIEWED BY			
NAME (PRINT)	SIGNATURE	TITLE	DATE

ATTACHMENT 6
NEAR MISS REPORT FORM

HEALTH AND SAFETY PLAN
Yakima Steel Fabricators, Inc.
6 and 10 ½ East Washington Avenue
Yakima, Washington

Farallon PN: 765-001

NEAR MISS REPORT

This report is to be filled out by any employee involved in or witnessing a near miss. A near miss is an incident that did not result in any personal injury, property damage, or work interruption. It is a very important indicator of potentially harmful future accident.

Project No. _____ Project Name _____

Project Address _____

Date of incident: _____ Time:_____ ☐ AM ☐ PM

Exact location of incident _____

_____

Description of incident or potential hazard _____

_____

_____

_____

_____

_____

_____

Corrective action taken _____

_____

_____

_____

_____

_____

Employee Signature _____ Date _____

Printed Name _____

Supervisor Signature _____ Date _____

Printed Name _____

ATTACHMENT 7
UTILITY CLEARANCE LOGS

HEALTH AND SAFETY PLAN
Yakima Steel Fabricators, Inc.
6 and 10 ½ East Washington Avenue
Yakima, Washington

Farallon PN: 765-001

UTILITY CLEARANCE LOG

Project Name: _____ **Project Number:** _____

Location: _____ **Date of Work:** _____

Instructions. This log must be completed by a Farallon staff member **before** any Farallon-directed excavation (e.g., test pit excavation) or drilling operation.

DRILLING OR EXCAVATION WORK MAY NOT COMMENCE UNTIL UTILITY LOCATES HAVE BEEN COMPLETED
(See the One-Call Utility Locate Request Procedure on the following page)

Farallon is responsible for having underground utilities and structures located and marked when drilling or directing test pit excavation operations. Any drilling or excavation within 2 feet of a marked utility must be done with hand tools.

Owners of underground utilities are required by law to mark underground facilities on public and private property. Owners of underground utilities are **not required** to mark existing service laterals or appurtenances. Utility owners in Washington are required to subscribe to the One-Call service.

Private utility locate services must be hired to locate service laterals and other buried utilities (e.g., on-site electric distribution lines, irrigation pipes) on private property.

Re-mark after 10 days or maintain as appropriate.

Utility Locate Checklist

☐ Attach map showing drilling and/or excavation sites and known utilities

☐ Attach copy of One-Call Utility Notification Ticket (http://www.searchandstatus.com/)

One-Call Utility Notification Ticket Number: _____

☐ Attach copy of Side Sewer Card (available for City of Seattle; check municipality for availability)

☐ Attach copy of Private Locate Receipt

☐ Photograph all excavation and/or drilling locations and download to project file

☐ Review utilities with Site Contact:

Name: _____ Phone: _____

Utilities and Structures

Utility Type	Utility Name	Public Utilities Marked (Y/N)	Private Utilities/Laterals Marked (Y/N)	Marking Method (Flags, paint on pavement, wooden stakes, etc.)
Petroleum product lines				
Natural gas line				
Water line				
Sewer line				
Storm drain				
Telephone cable				
Electric power line				
Product tank				
Septic tank/drain field				
Other				

Farallon Consulting, L.L.C.

Field Team Leader: _____ Date: _____

Electric = **RED**	*Gas-Oil-Steam =* **YELLOW**	*Comm-CATV =* **ORANGE**	*Water =* **BLUE/PURPLE**	*Sewer =* **GREEN**	*Temp Survey =* **PINK**

ONE-CALL UTILITY LOCATE REQUEST PROCEDURE

THE ONE-CALL UTILITY NOTIFICATION CENTER REQUIRES 48 HOURS NOTICE TO MARK UTILITIES BEFORE YOU CAN DIG OR DRILL

Washington: 1-800-424-5555
Oregon: 1-800-332-2344

Washington state law states that "before commencing **any** excavation," the excavator or driller must provide notice to all owners of underground utilities by use of the One-Call locator service, and that the excavator or driller shall not dig or drill until all known utilities are marked. To fully comply with the law, you **must** take the following steps:

1. **Call before you dig or drill:** Notify the One-Call Utility Notification Center (OCUNC) a minimum of 48 hours (two full business days) before digging or drilling. Provide the following **required** information:
    a. Your name and phone number, company name and mailing address, and Farallon Account Number 25999.
    b. The type of work being done.
    c. Who the work is being done for.
    d. The county and city where the work is being done.
    e. The address or street where the work is being done.
    f. Marking Instructions: "Generally locate entire site including rights-of-way and easements"

    Provide the following information if applicable or requested:
    a. The name and phone number of an alternate contact person.
    b. If the work is being done within 10 feet of any overhead power lines.
    c. The nearest cross street.
    d. The distance and direction of the work site from the intersection.
    e. Township, range, section, and quarter section of the work site.

2. **Record the utilities that will be notified:** OCUNC will tell you the utilities that are on or adjacent to the site, based on their database. Record the name(s) of the utility on the reverse side of this form.

3. **After the 48-hour waiting period, confirm that the utility locations have been marked:** Before digging or drilling, walk the site and confirm that the utility companies have marked the utility locations in the field.

4. **If a locate appears to be missing:** If a utility locate appears to be missing and the utility company has not notified you that there are no utilities in the area, call OCUNC and:
    a. **Provide the OCUNC locate number.**
    b. **Clearly state which utility has not been marked. The call is being recorded.**
    c. **Ask for a contact person at that utility.**
    d. **Call the contact person for the missing utility locate:** Determine why there is no utility locate in the field.
    e. **Record the reason(s) for the missing locate(s):** There are valid reasons that locates do not appear in the field (e.g., there are no utilities located on the site or the utility has been abandoned). However, IF THEY ARE LATE, **YOU MUST WAIT** TO DRILL OR DIG. If the utility fails to mark a locate within the required 48 hours (two full business days), the utility is liable for delay costs.

5. **Hand dig within 2 feet of a marked utility:** When digging or drilling within 2 feet of any marked utility, the utility must be exposed first by using hand tools.

Electric = **RED**	*Gas-Oil-Steam =* **YELLOW**	*Comm-CATV =* **ORANGE**	*Water =* **BLUE/PURPLE**	*Sewer =* **GREEN**	*Temp Survey =* **PINK**

ATTACHMENT 8
AIR MONITORING TABLE AND FORMS

HEALTH AND SAFETY PLAN
Yakima Steel Fabricators, Inc.
6 and 10 ½ East Washington Avenue
Yakima, Washington

Farallon PN: 765-001

ACTION LEVEL TABLE FOR AIR MONITORING

The Air Monitoring table (following page) presents protocol for monitoring ambient air for constituents of concern and other parameters that may affect worker safety. Please note the following with respect to use of this table:

- The Level for Respirator Use indicates the concentration at which a respirator must be donned. It does not require that the job stop. The respirator is a piece of equipment that is to be used while determining why a concentration has reached that level. Implement engineering controls such as water mist, spray foam, plastic cover, etc. to reduce the concentration.

- The Level for Work Stoppage indicates the concentration at which work on the job must stop. Determine why a concentration has reached that level, and how it can be decreased. Site evacuation is not necessary at this level. Stopping work does not imply that the concentration level will decrease. Implement engineering controls to reduce the concentration; resume work when it is safe to do so.

- These values can be modified under particular site conditions and with specific knowledge of the contaminant(s). Should such conditions arise, contact Farallon's Health and Safety Officer, Richard McManus at (425) 295-0800.

AIR MONITORING

Chemical (or Class)	Monitoring Equipment	Task	Monitoring Frequency and Location	Level for Respirator Use	Level for Work Stoppage
Volatile Organic Vapors	Flame ionization detector (FID)/ photoionization detector (PID) as appropriate for chemicals of concern. Read manual to determine. Draeger Tube for vinyl chloride (Model 1/a; Part Number 67 28031). Draeger Tube for benzene (Model 0.5/a).	From start of mobilization to completion and demobilization.	Sampling should be continuous during the project while disturbing potentially contaminated soil, uncovering and/or removing tanks and piping, or drilling —at least every 15 minutes in the breathing zone. Sample at the exclusion zone boundaries every 30 minutes. Continuously sample during each soil and groundwater sampling interval. If 10 parts per million (ppm) in breathing zone, collect a Draeger Tube for benzene and/or vinyl chloride (depending upon contaminants of concern).	20 ppm above background sustained in breathing zone for 2 minutes, and no benzene and/or vinyl chloride tube discoloration. If a color change appears on the tube for benzene or vinyl chloride at 10 ppm on FID/PID, don respirator. If no Draeger Tube is available, the level for respirator use is to be 5 ppm.	50 ppm above background in breathing zone and no vinyl chloride or benzene tube discoloration. Stop work if tube indicates > 1 ppm for benzene or vinyl chloride. If no Draeger Tube is available, stop work at 25 ppm.

AIR MONITORING EQUIPMENT CALIBRATION/CHECK LOG

Date	Instrument/ Model No.	Serial No.	Battery Check OK?	Zero Adjust OK?	Calibration Gas (ppm)	Reading (ppm)	Leak Check	Performed By	Comments

AIR MONITORING LOG

Date	Time	Location	Source/Area/ Breathing Zone	Instrument	Concentration/Units	Sampled by