

1.0 INTRODUCTION

The Boeing Auburn Remedial Investigation (RI) Report presents available historical data and data collected during the RI to define the nature and extent of contamination associated with releases from The Boeing Company's (Boeing) Auburn Fabrication Division Plant (Boeing Auburn Plant). The purpose of the RI is to adequately characterize contaminant releases and provide sufficient information to develop and evaluate cleanup action alternatives. The RI was performed in general accordance with the Model Toxics Control Act (MTCA) regulation (Chapter 173-340 of the Washington Administrative Code [WAC]) administered by the Washington State Department of Ecology (Ecology) and RCRA regulations for Corrective Action (WAC 173-303-64610 through 173-303-64630).

The Boeing Auburn Plant is located at 700 15th Street Southwest (SW), Auburn, Washington (State Dangerous Waste Identification [ID] Number WAD041337130). The location and current extent of property that Boeing owns as part of the Boeing Auburn Plant is shown on the vicinity map (Figure 1-1).

MTCA has specific definitions to describe areas affected by contamination (WAC 173-340-200). In order to clarify discussion in this document, the following terms and definitions are used to describe the Boeing Auburn Plant, property formerly owned by Boeing, and the extent of contamination:

- Boeing Property includes property currently owned by Boeing. Specifically, this does not include properties formerly owned by Boeing including Prologis (formerly AMB Corporation [AMB]), Safeway distribution center, YMCA, Junior Achievement (JA), and Puget Sound Energy (PSE) properties
- Boeing Auburn Facility (Facility) includes properties owned by parties to the Agreed Order. This includes property currently owned by Boeing and property owned by Prologis (formerly AMB; Figure 1-2)
- Site includes all contiguous property affected by releases of hazardous substances that originated at the Facility. The approximate extent of the current Site is shown on Figure 1-3. The Site boundary will change over time as additional data is gathered and areas are remediated.

The Facility is currently undergoing Resource Conservation and Recovery Act (RCRA) corrective action as required by Agreed Order No. 01HWTRNR-3345, dated May 15, 2002 (Ecology 2002a) and the currently effective, First Amended Agreed Order (Agreed Order), dated April 7, 2006 (Ecology 2006b). The Agreed Order includes a requirement to conduct an RI of Facility contamination impacts both within the Facility and at downgradient properties. The Facility, and all downgradient properties where Facility contamination impacts are present, are collectively referred to as the Site. Commercial, industrial, and municipal stakeholders who have had involvement with the investigation of the Site are shown on Figure 1-4.

Attachment 2 of the Agreed Order classifies investigation areas as either Solid Waste Management Units (SWMUs) or Areas of Concern (AOCs). These SWMUs and AOCs were identified in the RCRA

Facility Assessment (RFA; Tetra Tech 1998). SWMUs and AOCs are subdivided in Attachment 2 of the Agreed Order into three main categories, identified as columns, based on the extent of additional field investigations required for characterization. For Column IA SWMUs and AOCs, both soil and groundwater investigations are required. For Column IB SWMUs and AOCs, only investigation of groundwater is required. No additional investigation is required for Column II SWMUs and AOCs; therefore, no additional investigation was performed at these locations. A number of SWMU and AOC descriptions are clarified in this report based on additional investigation activities and review of historical documents. In addition, based on RI investigations, three AOCs (AOC A-13 through AOC A-15) were added and are defined and discussed in this report. A summary of SWMUs and AOCs and their associated column designations is presented in Table 1-1. All Facility SWMUs and AOCs are shown on Figure 1-5.

RI work was conducted in accordance with the RI work plan (Geomatrix 2003b), which was finalized in October 2003, and various supplemental RI work plans. RI fieldwork commenced in November 2003 with the installation of a number of RI monitoring wells. The final RI monitoring wells were installed in October 2015. Interim Site-wide groundwater sampling began in June 2005 according to an Ecology-approved plan (LAI 2005e). The interim groundwater sampling plan was updated throughout the investigation with Ecology approval and the current interim groundwater sampling plan is the Phase VII interim groundwater monitoring plan (LAI 2016k).

In addition to the RI work, remedial actions were conducted at the north end of the Facility within an area designated as Area 1 (including the former Boeing Building 17-05). Area 1 comprises 41.9 acres. Expedited investigations were conducted to accommodate the sale of Area 1 to AMB on December 16, 2005. Area 1 activities are summarized in Section 2.2.1 and described in additional detail in Section 7.0 and Appendix A.

The first draft of the RI report was submitted in September 2005 (LAI 2005a). Ecology provided comments on the draft report in August 2007 (Ecology 2007a). A revised draft RI report was submitted in December 2007 (LAI 2007c). Ecology provided comments in April 2008 (Ecology 2008). Additional RI work was conducted and a second revised draft RI Report was submitted in April 2009 (LAI 2009d). Ecology provided comments in June 2009 (Ecology 2009b). Ecology's comments on the 2nd Revised RI Report identified an off-Boeing property groundwater quality data gap, which led to a series of additional investigation activities. A series of interim investigation reports were prepared and submitted to Ecology. This RI Report is intended to summarize all RI work that has been completed at the Site including SWMU and AOC investigations at the Facility and downgradient groundwater contamination off Boeing property.

1.1 Objectives

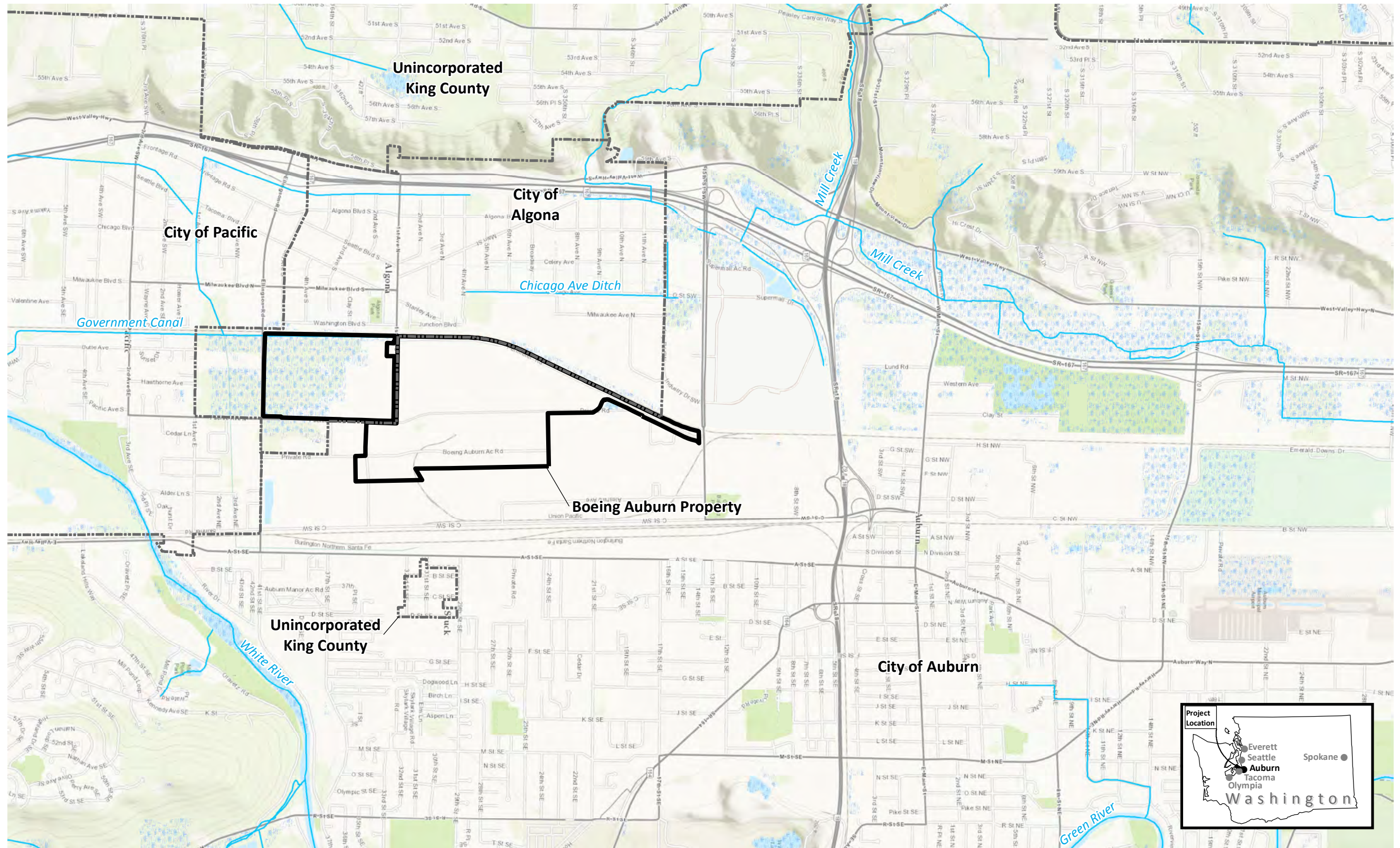
The RI objectives are as follows:

- Collect sufficient data to identify and characterize potential releases of hazardous constituents from Column IA and Column IB SWMUs and AOCs
- Document Site characterization activities and the magnitude and extent of impacts related to the release of hazardous substances
- Collect, develop, and evaluate sufficient information to select cleanup action alternatives.

1.2 Report Organization

This report contains 13 sections as described below:

- Section 1.0 introduces the purpose of the RI, provides definitions for important terminology, defines the objectives of the RI, and lays out the organization of this report.
- Section 2.0 provides background information with respect to Facility history and use. A timeline of RI activities is provided as well as information related to ongoing remediation activities.
- Section 3.0 discusses investigation methods and procedures.
- Section 4.0 provides information regarding the geology and hydrogeology of the Site. A discussion of Site groundwater geochemistry and conditions for natural attenuation is also provided.
- Section 5.0 describes the Site conceptual model; discusses ecological evaluation; and describes development of screening levels and identification of indicator hazardous substances (IHS).
- Section 6.0 discusses the Facility investigation including available soil and groundwater information for Column IA and IB SWMUs and AOCs.
- Section 7.0 presents an overview of the interim remedial action (IRA) performed at Area 1 and discusses the impact on current conditions.
- Section 8.0 provides information on the Site-wide groundwater quality evaluation.
- Section 9.0 provides information on the Site-wide surface water quality evaluation.
- Section 10.0 provides information on the Site-wide air quality evaluation.
- Section 11.0 presents a discussion and summary of results and provided recommendations of SWMUs and AOCs to be carried forward to the FS.
- Section 12.0 describes the appropriate use of this report.
- Section 13.0 provides a list of report references.

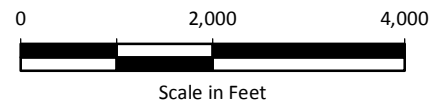


Legend

- Boeing Property
- City Limits
- Waterways
- Water Bodies
- Wetland Areas

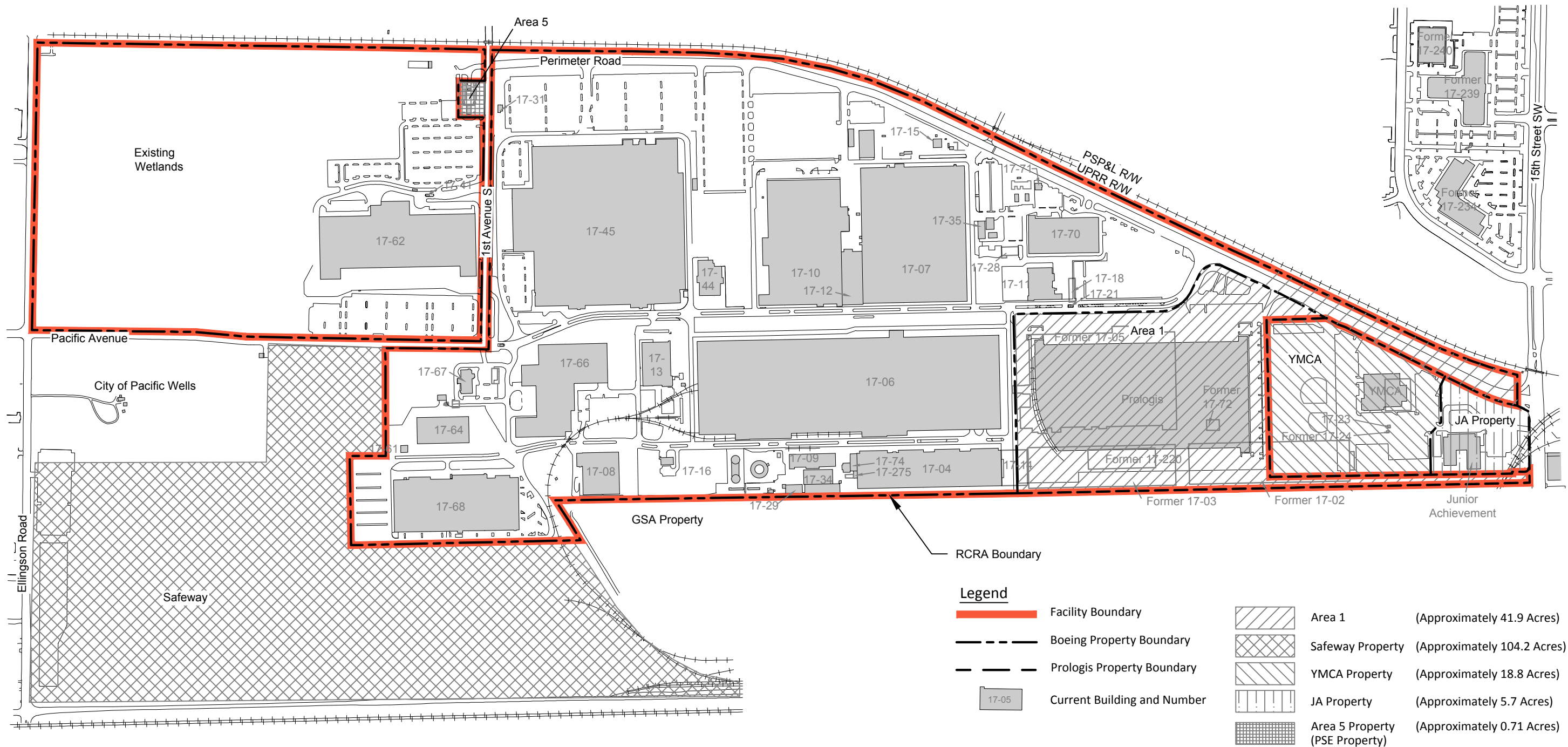
Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.



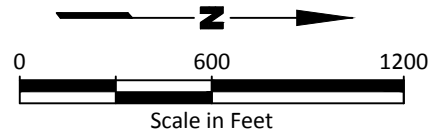
Data Source: Esri World Topo Map

Boeing Auburn Remedial Investigation Auburn, Washington	Vicinity Map	Figure 1-1
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Note

- Former Building Numbers 17-234, 17-239 and 17-240 are currently owned by Fana.
- Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

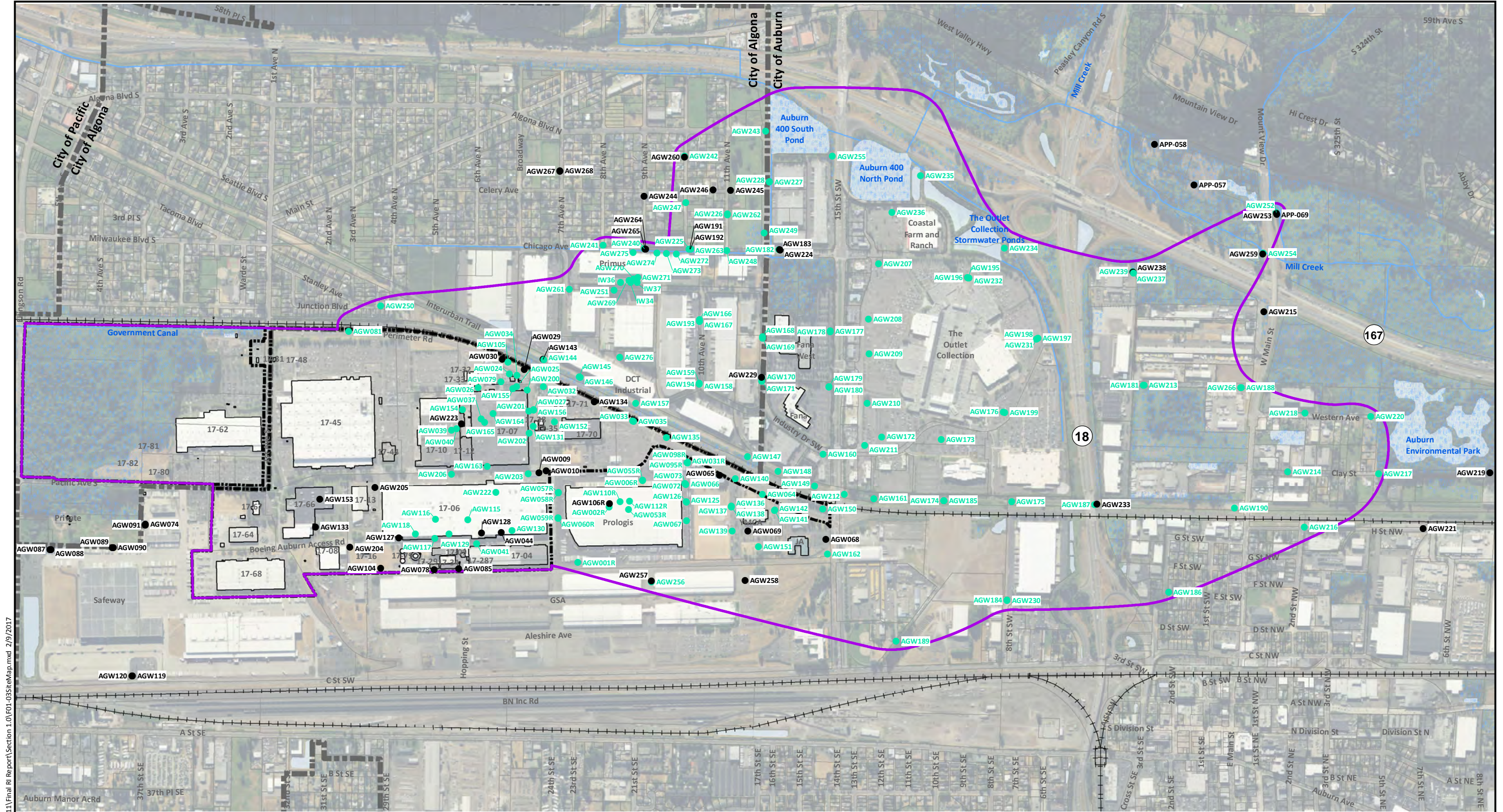


Base map source: Geomatrix 2003

Boeing Auburn
Remedial Investigation
Auburn, Washington

Facility Map

**Figure
1-2**

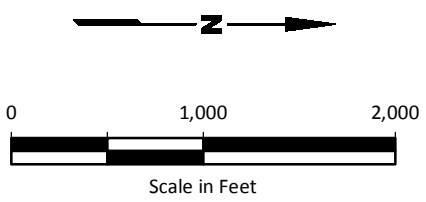


Notes

1. Detections of trichloroethene (TCE), cis-1,2-Dichloroethene (cDCE), and vinyl chloride (VC) determined based on most recent data as of December 2015.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Legend

- Well with no Detections of TCE, cDCE, or VC
- Well with Detections of TCE, cDCE, or VC
- City Limits
- Boeing Property
- Approximate Extent of Site
- Wetland Areas
- Water Bodies
- Waterways



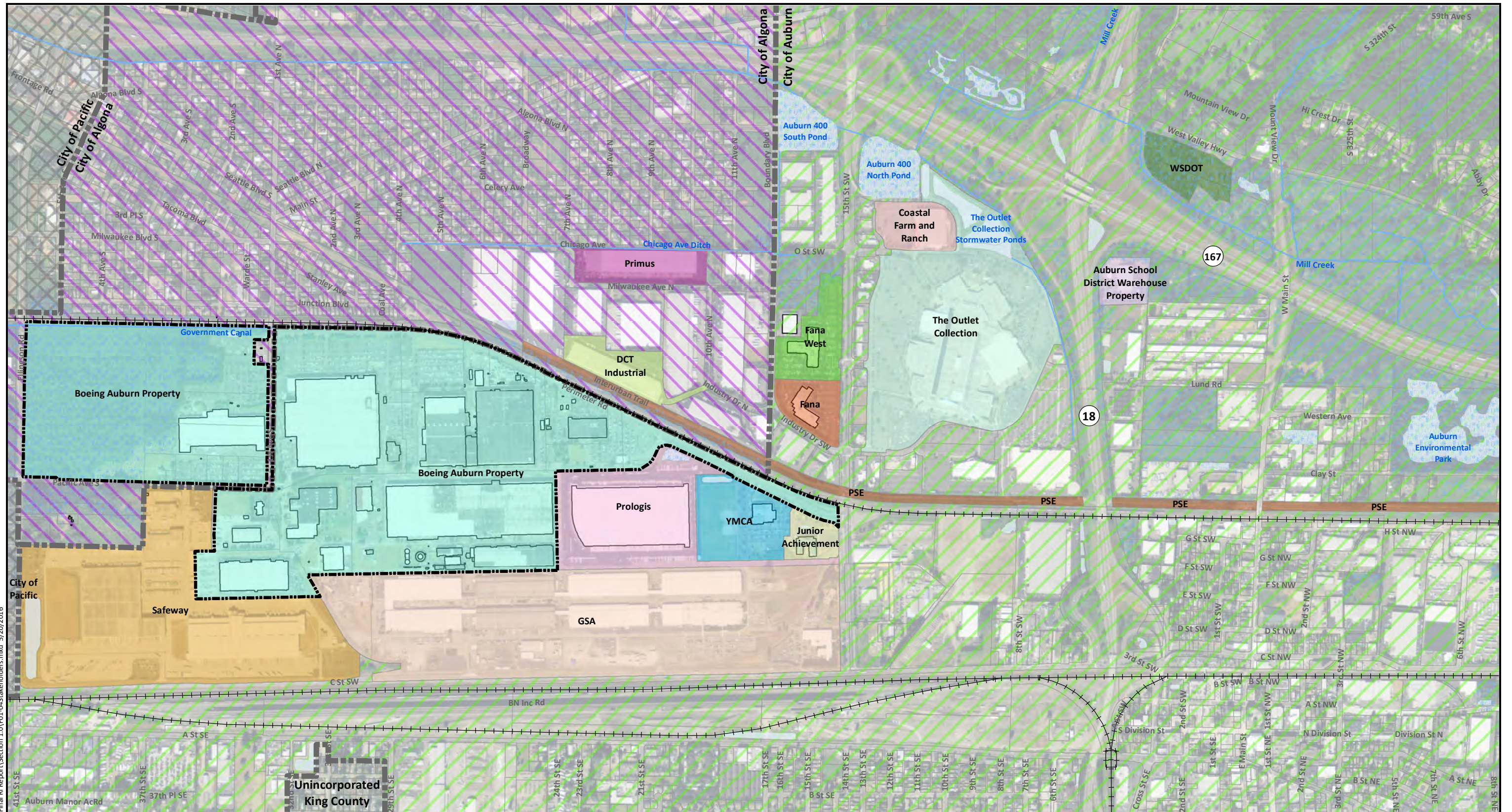
Base Map Source: Geometrix 2003; Parcel Data Source: King County 2015; Aerial Photo Source: Esri World Imagery.

Boeing Auburn Remedial Investigation Auburn, Washington	Site Map	Figure 1-3
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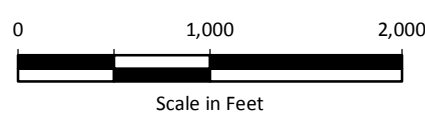
- | | | | |
|---|--------------------|-----------------------|---------------|
| Boeing Auburn Property | DCT Industrial | Primus | City Limits |
| City of Algona | Fana | Prologis | Wetland Areas |
| City of Auburn | Fana West | Safeway | Water Bodies |
| City of Pacific | GSA | The Outlet Collection | Waterways |
| Auburn School District Warehouse Property | Junior Achievement | WSDOT | |
| Coastal Farm and Ranch | PSE | YMCA | |

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.



Base Map Source: Geometrix 2003; Parcel Data Source: King County 2015; Aerial Photo Source: Esri World Imagery.

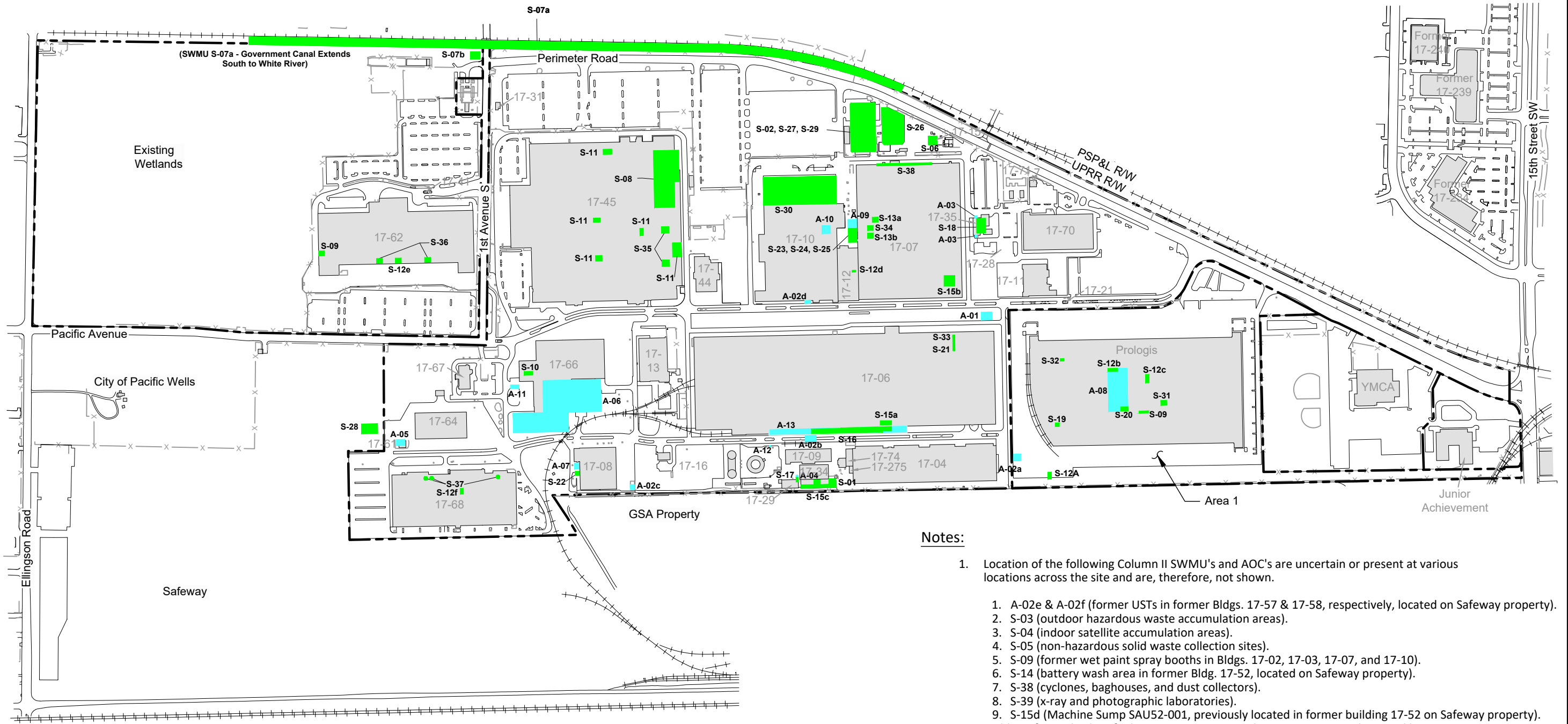


Boeing Auburn
Remedial Investigation
Auburn, Washington

**Commercial, Industrial, and
Municipal Stakeholders**

Figure
1-4



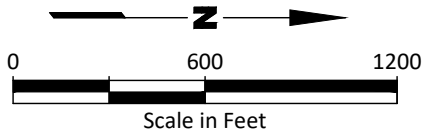


Notes:

1. Location of the following Column II SWMU's and AOC's are uncertain or present at various locations across the site and are, therefore, not shown.
 1. A-02e & A-02f (former USTs in former Bldgs. 17-57 & 17-58, respectively, located on Safeway property).
 2. S-03 (outdoor hazardous waste accumulation areas).
 3. S-04 (indoor satellite accumulation areas).
 4. S-05 (non-hazardous solid waste collection sites).
 5. S-09 (former wet paint spray booths in Bldgs. 17-02, 17-03, 17-07, and 17-10).
 6. S-14 (battery wash area in former Bldg. 17-52, located on Safeway property).
 7. S-38 (cyclones, baghouses, and dust collectors).
 8. S-39 (x-ray and photographic laboratories).
 9. S-15d (Machine Sump SAU52-001, previously located in former building 17-52 on Safeway property).
2. Buildings formerly identified as 17-234, 17-239, and 17-240 are currently owned by Fana.
3. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Legend

- S-28 Solid Waste Management Unit (SWMU)
- A-05 Area of Concern (AOC)
- 17-68 Current Building and Number
- Property Boundary



Base map source: Geomatrix 2003

Table 1-1
Solid Waste Management Units and Areas of Concern
Boeing Auburn Remedial Investigation
Auburn, Washington

Column IA SWMUs and AOCs	
SWMU/AOC	Description
S-06	17-15 Rinsewater Treatment Plant
S-12d	17-12 Former Vapor Degreaser; Former Metal Fabrication and Finishing
S-15a (a)	17-06 Machine Sump: SAU06-12 (see attachment 7 of Agreed Order)
S-15b (a)	17-07 Machine Sumps: SAU07-024, -025,-028,-029 (see attachment 7 of Agreed Order)
S-15c (b)	17-34 Chip Shed Sumps: SAU34-001 through -004 (see attachment 7 of Agreed Order)
S-15d (c)	17-52 Machine Sump: SAU52-001 (see attachment 7 of Agreed Order)
S-16 (d)	17-06 Active Aluminum Chip Briquetter and Chip Conveyance System
S-17 (e)	17-29 Titanium Chip Bailer (shed and sump)
S-18 (b)	17-35 Miscellaneous sumps at chip shed
A-01	17-06 Former USTs TAU-01 and TAU-02
A-02c	17-08 Former UST (TAU-16) Diesel Product Storage
A-02d	17-10 Former UST (TAU-6) Diesel Product Storage Tank
A-03 (f)	17-35 Former unregistered Waste Oil Tanks
A-09	17-07 Acid Scrubber Drain line Leak; Machine Fabrication
A-12 (g)	Fuel Oil Spill; Southwest of Building 17-09
A-13 (h)	17-06 Petroleum Hydrocarbon Soil and Groundwater Contamination

Column IB SWMUs and AOCs	
SWMU/AOC	Description
S-11	17-45 Aqueous Degreaser; Formerly Vapor Degreaser
S-12a	17-03 Former Vapor Degreaser; Former Metal Fabrication and Finishing
S-12b	17-05 Former Vapor Degreaser (VD-01); Process Assembly, Metal Bonds and Composite Parts
S-12c	17-05 Former Vapor Degreaser (VD-02); Process Assembly, Metal Bonds and Composite Parts
S-12f	17-68 Former Vapor Degreaser
S-13a/S-13b (i)	17-07 Former Vapor Degreasers; Machine Fabrication
S-19	17-05 Former Waste Oil Tank (TAU-22); Process Assembly, Metal Bonds, and Composite Parts
S-30	Former Debris Pile and burn pit
A-02a	17-03 Former USTs (TAU-7 and TAU-8)
A-02b	17-06 Former UST (TAU-23) Jet Fuel product storage
A-04 (e)	17-29 Former Underground Bailer Tank; PS300, cutting oil and solvents
A-05	17-64 Unleaded Gasoline UST (TAU-32); Transportation Building Fuel Island
A-06	Excavations for the expansion of 17-66
A-07	17-08 Former Methyl Ethyl Ketone UST (TAU-18)
A-08	17-05 Former Metalbond Tank Line; Process Assembly, Metal Bonds and Composite Parts
A-10	17-10 G&L Post Mill; Tooling/Tool Fabrication
A-14 (j)	Site-wide Groundwater
A-15 (k)	Site-wide Surface Water

Column II SWMUs and AOCs	
SWMU/AOC	Description
S-01	17-34 Permitted Container Storage Area
S-02	17-32 and 17-33, regulated Waste Material Staging Area
S-03	Outdoor Hazardous Waste Accumulation Areas
S-04	Indoor Stellite Accumulation Areas
S-05	Nonhazardous Solid Waste Collection Sites
S-07a	Government Canal
S-07b	Storm Water Treatment Facility
S-08	17-45 Active Wet Paint Spray Booths; Sheet Metal Center
S-09	17-62 Former Wet Paint Spray Booths
S-10	17-66 Paint Storage Room, Mixing Area, and Testing Booth
S-12e	17-62 Former Vapor Degreasers (2); Welded Duct Facility

Table 1-1
Solid Waste Management Units and Areas of Concern
Boeing Auburn Remedial Investigation
Auburn, Washington

Column II SWMUs and AOCs (Continued)	
S-14	17-52 Battery Wash Area
S-20	17-05 Former Waste Holding Tank (WHT-02)
S-21	17-06 Former Waste Holding Tank (WHT-01)
S-22	17-08 Former Acid Waste Holding Tank (TAU-21)
S-23	17-07 Former Alkaline Waste Holding Tank
S-24	17-07 Former Cyanide Waste Holding Tank
S-25	17-07 Former Acid Waste Holding Tank
S-26	Former North Lagoon
S-27	Former South Lagoon
S-28	Former Waste Pile Sludge Delisting
S-29	Former Landfill
S-31	17-05 Alodine Waste Holding Tank (WHT-01)
S-32	17-05 Waste Holding Tank (WHT-03)
S-33	17-06 Waste Holding Tanks (WHT-02 through 05); Skin and Spar Fabrication
S-34	17-07 Tank Line Waste Holding Tanks (WHT-01 through 04)
S-35	17-45 Tank Line Waste Holding Tanks (WHT-01 through 03); Sheet Metal Center
S-36	17-62 Tank Line Waste Holding Tanks (WHT-01 through 04); Welded Duct Facility
S-37	17-68 Tank Line Waste Holding Tanks (WHT-01 through 05); Emergent Manufacturing Facility
S-38	Cyclones, Baghouses, and Dust Collectors
S-39	X-ray and Photographic Laboratories
A-02e	17-57 Former USTs (TAU-12, TAU-13) Heating Oil Tanks
A-02f	17-58 Former UST (TAU-10) PS300 Product Storage Tank
A-11	17-66 Methyl Phenyl Ketone UST

Notes:

- (a) The Agreed Order lists S-15 as machine sumps and included a number that needed additional investigation. These sumps were further defined in this report for clarity. SAU06-12 was defined as S-15a. SAU07-025 was defined as S-15b. Machine sumps at building 17-34 were defined as S-15c.
- (b) The Agreed Order lists S-18 as miscellaneous sumps at chip sheds 17-34 and 17-35. For clarity, these sumps were divided and Building 17-34 machine sumps were assigned as SWMU S-15c and Building 17-35 sumps were assigned as SWMU S-18.
- (c) The Agreed Order lists SAU52-001 as S-14 in Attachment 7. This sump has been renamed S-15d for clarity.
- (d) The Agreed Order did not include the chip conveyance system in the definition of this SWMU.
- (e) The definition of S-17 originally included the shed, sump and tank; however, further investigation indicates that the tank is AOC A-04. Definitions for the SWMU and AOC were updated accordingly.
- (f) The Agreed Order lists A-03 as including both 17-29 and 17-35 former unregistered waste oil tanks; however, there were no unregistered waste oil tanks in Building 17-29.
- (g) The Agreed Order lists the location of the fuel oil spill as unknown, further investigation indicates that the spill occurred southwest of Building 17-09.
- (h) The Agreed Order does not include A-13. This is a new AOC that has been added for the purposes of petroleum hydrocarbon soil and groundwater investigation in Building 17-06. This new AOC encompasses the areas investigation for SWMU S-15a and S-16.
- (i) The Agreed Order lists S-13 as active vapor degreaser; however, there were two degreasers (further differentiated as a and b); both have been removed.
- (j) The Agreed Order does not include A-14. This is a new AOC that has been added for the purposes of investigation and cleanup of Site-wide groundwater.
- (k) The Agreed Order does not include A-15. This is a new AOC that has been added for the purposes of investigation and cleanup of Site-wide surface water.

1. Source for categorization of SWMUs and AOCs is Attachment 2 of the Agreed Order.

Abbreviations/Acronyms:

- AOC = area of concern
- SWMU = solid waste management unit
- UST = underground storage tank