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March 17, 2021
DAT-2021-009

Li Ma
Department of Ecology
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Bellevue, WA 98008-5452

Subject: Response to Ecology's February 1, 2021 Comments on the Draft Feasibility Study and Draft Supplemental Feasibility Study Reports
Boeing Auburn Facility
Agreed Order No. 01HWTRNR-3345

Dear Mr. Ma:

Thank you for your February 1, 2021 letter providing comments on the draft Feasibility Study (FS) and draft Supplemental Feasibility Study (SFS) reports for the Boeing Auburn Facility submitted by The Boeing Company (Boeing) pursuant to Agreed Order No. 01HWTRNR-3345 (AO).

As you are aware, Boeing has invoked informal dispute resolution pursuant to the AO related to cleanup levels at the Boeing Auburn Site (Site), as indicated in Boeing's February 12, 2021 email (Boeing 2021). Boeing also disagrees with some of the comments provided by the Washington State Department of Ecology (Ecology) on the FS and SFS, and those disagreements are addressed in the enclosed documents. This letter, along with Attachments A and B, provide specific information and background explanations for the items under dispute (i.e., cleanup levels) and provides clarifications or responses to pertinent general comments made by Ecology.

Boeing notes that these disagreements and the disputed issues do not change the remedies selected for the Areas of Concern (AOCs) at the Site, which have been agreed upon by both Ecology and Boeing. Ecology agreed to the remedies for AOC A-01, A-09, and A-13, as proposed in the FS. For AOC A-14, Alternative D1 (Site-wide Monitored Natural Attenuation [MNA]) was the selected remedy in the FS and SFS. Ecology's February 1 comments include that Alternative D6 (Enhanced *in situ* bioremediation at the Algona Focus Area and MNA) should be the preferred remedy. While Boeing believes Alternative D1 is the appropriate remedy, Boeing is willing to implement Alternative D6 as the final remedy for AOC A-14. A summary of the final remedies selected for the Site AOCs are as follows:

- AOC A-01 (Former underground storage tanks [USTs] northwest of Building 17-06): Excavation of soil contamination, emplacement of oxidative *in situ* treatment in the backfill, and supplemental MNA, as necessary.
- AOC A-09 (Building 17-07 Acid Scrubber Drain Line Leak): Future excavation of soil contamination and monitored containment until that time.
- AOC A-13 (Building 17-06 [east side] Petroleum Hydrocarbon Contamination): No cleanup action is required.
- AOC A-14 (Site-wide trichloroethene [TCE] and vinyl chloride [VC] Groundwater Contamination and TCE in limited soil areas at the Facility): Enhanced *in situ* Bioremediation at the Algona Focus Area and MNA.

Ecology and Boeing have agreed on the remedies for each AOC, and the remaining issues under dispute or disagreement do not change the remedy selection. Consequently, Boeing and Ecology have agreed that the draft FS and SFS documents do not need to be updated or revised (Ecology 2021).

The information and explanation of items under dispute (i.e., cleanup levels) are provided in Attachment A to this letter. Ecology has not provided sufficient rationale to justify disagreement with points made by Boeing related to cleanup levels in the FS and SFS. Boeing reiterates and provides additional supporting documentation for proposed cleanup levels in Attachment A. Items under dispute need to be resolved prior to preparation of the draft cleanup action plan (dCAP).

Many of Ecology's comments request specific text changes to the FS and SFS reports (Tables 1 and 2 in Ecology's comment letter). These comments will not be specifically addressed, since the reports are not being updated. Ecology also provided other "general comments" on the FS and SFS, some of which Boeing disagrees with. While these do not affect the selection of remedies in the FS, they are pertinent to the CAP implementation. Boeing's responses to the applicable general comments received from Ecology are provided in Attachment B to this letter.

Thank you for the opportunity to provide this response to comments and the ongoing collaboration between Boeing and Ecology. We look forward to additional discussions with you to address the comments to the FS and SFS as we move closer to implementation of the selected remedies at the Boeing Auburn Site.

Please contact me if you have any questions.

Sincerely,

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REFERENCES

Boeing. 2021. Email Re: Boeing Auburn - Clarification on Ecology's Feb 1, 2021 Comments on FS and SFS. From Debbie Taege, The Boeing Company, to Li Ma, Washington State Department of Ecology. February 12.

Ecology. 2021. Email Re: Boeing Auburn - Clarification on Ecology's Feb 1, 2021 Comments on FS and SFS. From Li Ma, Washington State Department of Ecology, to Debbie Taege, The Boeing Company. February 10.

ATTACHMENTS

Attachment A: Application of Appropriate Cleanup Levels
Attachment B: Response to General Comments

ATTACHMENT A

Application of Appropriate Cleanup Levels

Attachment A – Application of Appropriate Cleanup Levels

This Attachment specifically addresses the topic of cleanup levels discussed in the Washington State Department of Ecology's (Ecology's) February 1, 2021 letter regarding the draft Feasibility Study (FS) and draft Supplemental Feasibility Study (SFS) for the Boeing Auburn Site (Site). The following discusses the two main areas of dispute with respect to Ecology's comments on the application of certain cleanup levels.

I. Surface Water Quality Standards Should Not be Applied as Groundwater Cleanup Levels

The Boeing Company (Boeing) disagrees with Ecology's comments indicating that groundwater cleanup levels should be based on surface water quality standards (SWQS). While the regulations provide that groundwater cleanup levels must be protective of surface water beneficial uses, they do not require that groundwater cleanup levels be equal to SWQS.[1] SWQS should not be applied to groundwater throughout the Site. Rather, they only apply at the point where groundwater flows to surface water.[2] Ecology has not provided sufficient rationale for disagreement with the technical and legal discussion (Section 3.2.2 of the draft FS report) and legal position (Appendix B of the draft FS report) provided by Boeing. Boeing reiterates the main regulatory, policy, and legal principles that demonstrate it is inappropriate and unnecessary to apply SWQS as groundwater cleanup levels:

- Ecology's method for applying SWQS applicable or relevant and appropriate requirements (ARARs) to groundwater throughout the Site is not consistent with the Model Toxics Control Act (MTCA) regulations. The MTCA procedures for SWQS ARARs require application at the point where groundwater flows into the surface water body, **NOT** in upgradient groundwater.
- The Clean Water Act (CWA; from which SWQS are derived) is, by design, a surface water statute; it is not an applicable law on which to base groundwater cleanup levels.
- Applying SWQS to groundwater does not increase protection of human health or the environment because there is already a regulatory requirement to achieve the SWQS in surface water regardless of the groundwater cleanup level.
- Groundwater does not need to meet SWQS throughout the Site in order to protect surface water beneficial uses because contaminant concentrations in upgradient groundwater attenuate as they flow from their source to where groundwater flows to surface water.

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[1] Washington Administrative Code (WAC) 173-340-720(1)(c) requires that "Ground water cleanup levels shall be established at concentrations that do not directly or indirectly cause violations of surface water, sediments, soil, or air cleanup standards established under this chapter or other applicable state and federal laws." This language does not require that groundwater cleanup levels be equal to surface water quality standards (SWQS).

[2] WAC 173-340-700(6)(a) states that "In addition to establishing minimum requirements for cleanup standards, applicable state and federal laws may also impose certain technical and procedural requirements..." WAC 173-201A(5)(b), which is the applicable or relevant and appropriate requirement (ARAR) upon which Ecology is basing its groundwater proposed cleanup level (pCUL), includes the following technical and procedural requirements for the use of the numerical human health criteria values found in Table 240: "All waters shall maintain a level of water quality **when entering downstream waters** [emphasis added] that provides for the attainment and maintenance of the water quality standards of those downstream waters…"

II. Surface Water Quality Standards Do Not Apply to Stormwater Features (specifically Chicago Avenue ditch and Auburn 400 stormwater basins)

Boeing disagrees with Ecology's comments asserting that SWQS apply to the Chicago Avenue ditch and the Auburn 400 basins. Ecology's rationale, as discussed below, is insufficient to support its conclusion that SWQS would apply to these stormwater features. Ecology has not provided sufficient rationale to refute Boeing's technical and legal discussion (Section 3.2.3 of the draft FS and Section 1.3.1 of the draft SFS) and legal position (Appendix B of the draft FS report). Boeing reiterates its previous statements on this issue and provides additional discussion below and supporting documentation for the main regulatory, policy and legal principles that demonstrate it is inappropriate to apply SWQS to these stormwater features.

SWQS criteria protective of drinking water and fish consumption are not applicable to stormwater conveyances, treatment, and control structures (including the Chicago Avenue ditch and the Auburn 400 north and south stormwater basins). Ecology's regulations support this conclusion. WAC 173-201A-260(3)(f) provides that human-created features used to remove and contain pollution are not subject to the numeric criteria for waters of the state. This regulation does not state that the features must have been intended for or created for that pollution removal/containment purpose, but only that the features serve that purpose. As some Ecology water quality staff have correctly concluded,[3] clearly the basins, and the ditch that channels stormwater to the basins, serve that pollution removal/containment purpose. It is also clear from the City of Algona's stormwater base map that the Chicago Avenue ditch is a stormwater conveyance feature (a "stormline" on the map, see Figure A-1, attached). The Chicago Avenue ditch and the Auburn 400 basins are defined, per Ecology guidance, as stormwater features.[4] Construction plans for the Auburn 400 basins identify these specifically as "sediment collection basins" (see Figure A-2, attached).

Ecology's rationale, that this is "all one interconnected surface water system," is not accurate or pertinent to the decision of whether SWQS apply to these features. The available evidence, and the function of the features, show they serve the purpose of removal/containment of stormwater and are not simply to convey water, as discussed in WAC 173-201A-260(3)(f)(ii). The basins are not designed for conveyance; they receive and settle stormwater, which is a classic stormwater treatment practice to remove and contain pollutants in stormwater. Also, the ditch was designated by the local government as a stormwater feature.

In addition to Ecology's water quality regulation demonstrating that these are stormwater features to which SWQS do not apply, the MTCA regulation also supports the conclusion that SWQS should not apply to these stormwater features. WAC 173-340-730(1)(c) provides that "the department does not expect that cleanup standards will be applied to stormwater runoff that is in the process of being conveyed to a treatment system." While these regulations make clear that SWQS do not apply to these stormwater features, Boeing understands that the waters must be managed to meet subsections (i)(A) and (B) of WAC 173-201A-206(3)(f) and Boeing commits to doing so. Boeing will

[3] *See* December 14, 2016 Email Re: Maps for Robin Neal Conf. call Fri. 12/9; from Vincent McGowan, Ecology, to Rachel McCrea, Ecology.

[4] Ecology. 2017. Stormwater and Combined Sewer Data Version 2.2. Washington State Department of Ecology. Environmental Information Management Website: https://apps.ecology.wa.gov/eim/help/HelpDocuments. September.

continue to monitor the Chicago Avenue ditch and the Auburn 400 basins to ensure that concentrations do not exceed health standards set by the Washington State Department of Health so that subpart A is met. In addition, Boeing will also continue to monitor locations in Mill Creek to ensure that discharges from these systems meet downgradient surface water quality standards to ensure compliance with subpart B.

Furthermore, the groundwater discharges to these stormwater features do not represent risks to human health or the environment under existing Site conditions. Application of SWQS to these stormwater features is unnecessary for the protection of the drinking water pathway (no one is currently, or will in the future, drink water from these stormwater features). Application of SWQS to these stormwater features is unnecessary for the protection of aquatic organisms and human consumption thereof (stormwater features were not designed as aquatic habitat nor were they designed for or represent reasonable or attractive recreational fishing/shellfish harvesting areas). Additionally, contaminant concentrations in the Chicago Ave ditch and the Auburn 400 basins do not exceed health criteria based on reasonable exposure scenarios (direct contact, incidental ingestion, and inhalation) that were reviewed and approved by both Ecology and the Washington State Department of Health (WDOH; LAI 2013; WDOH 2013, 2014). Contaminants that may enter these stormwater features from groundwater do not currently result in concentrations that exceed SWQS at downgradient monitoring points from the Auburn 400 basin stormwater outfall to the wetlands that discharge to Mill Creek. Boeing will continue to monitor concentrations in the wetland downgradient of the stormwater discharge point to ensure concentrations are not detected above SWQS.

REFERENCES

LAI. 2013. Memorandum: Screening Levels for Yard and Ditch Surface Water, Boeing Auburn Plant, Auburn, Washington. From Chip Halbert and Jennifer Wynkoop, Landau Associates, Inc., to James Bet, The Boeing Company. December 13.

WDOH. 2013. Letter Health Consultation, Boeing Commercial Airplane Fabrication Division, Auburn Plant, Exposures to Surface Water in Chicago Avenue Ditch and Government Canal, Algona, King County, Washington. March 28. edited by PhD Rhonda S. Kaetzel, DABT. Olympia, WA.

WDOH. 2014. Letter Health Consultation, Boeing Commercial Airplane Fabrication Division, Auburn Plant Exposures to Surface Water Seasonal Sampling 2013, Algona, King County, Washington. August 15. Washington State Department of Health. August 15.

ATTACHMENTS

Figure A-1: Algona Stormwater System Map
Figure A-2: Auburn 400 Construction Plans

FIGURE A-1

Algona Stormwater System Map

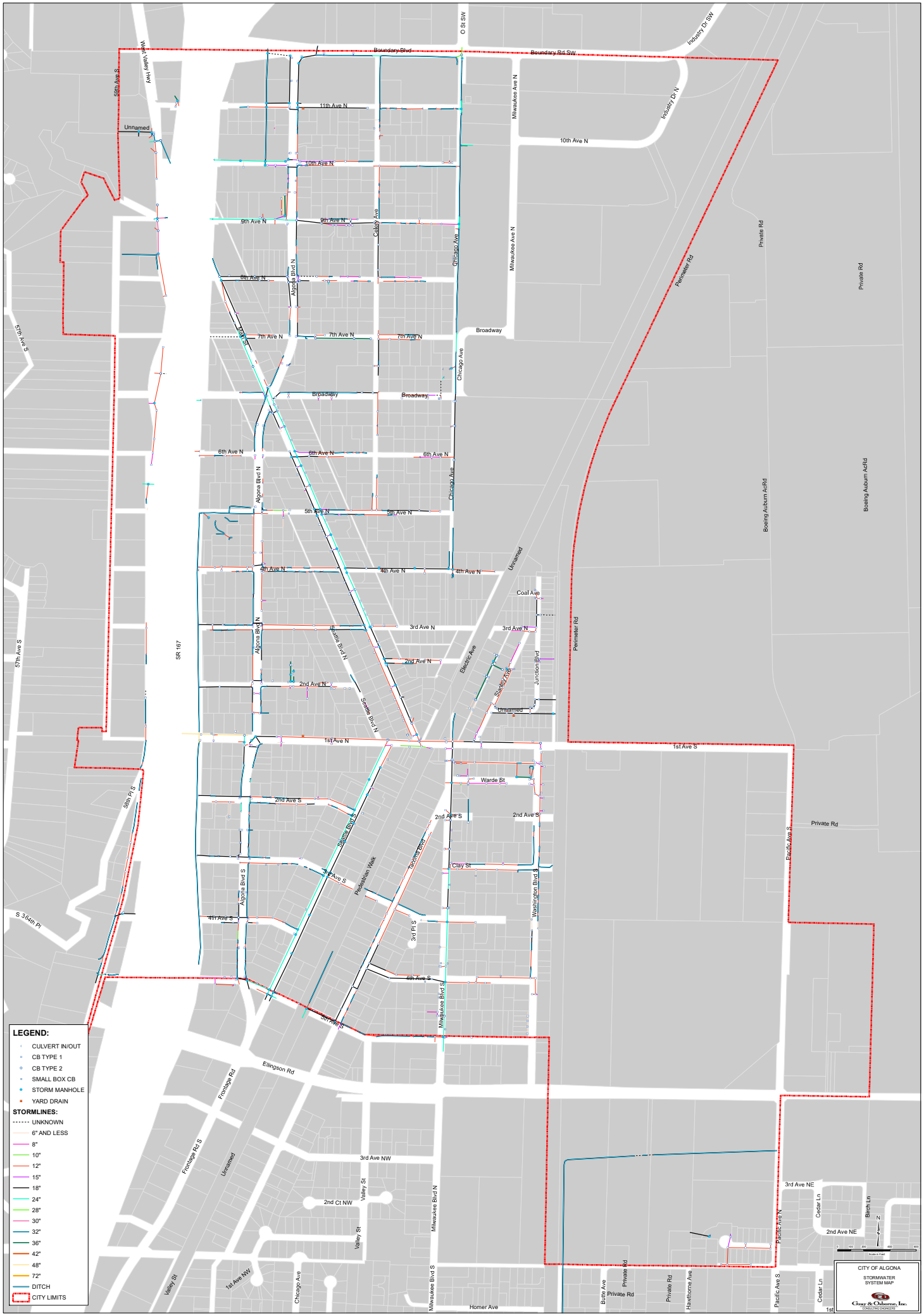
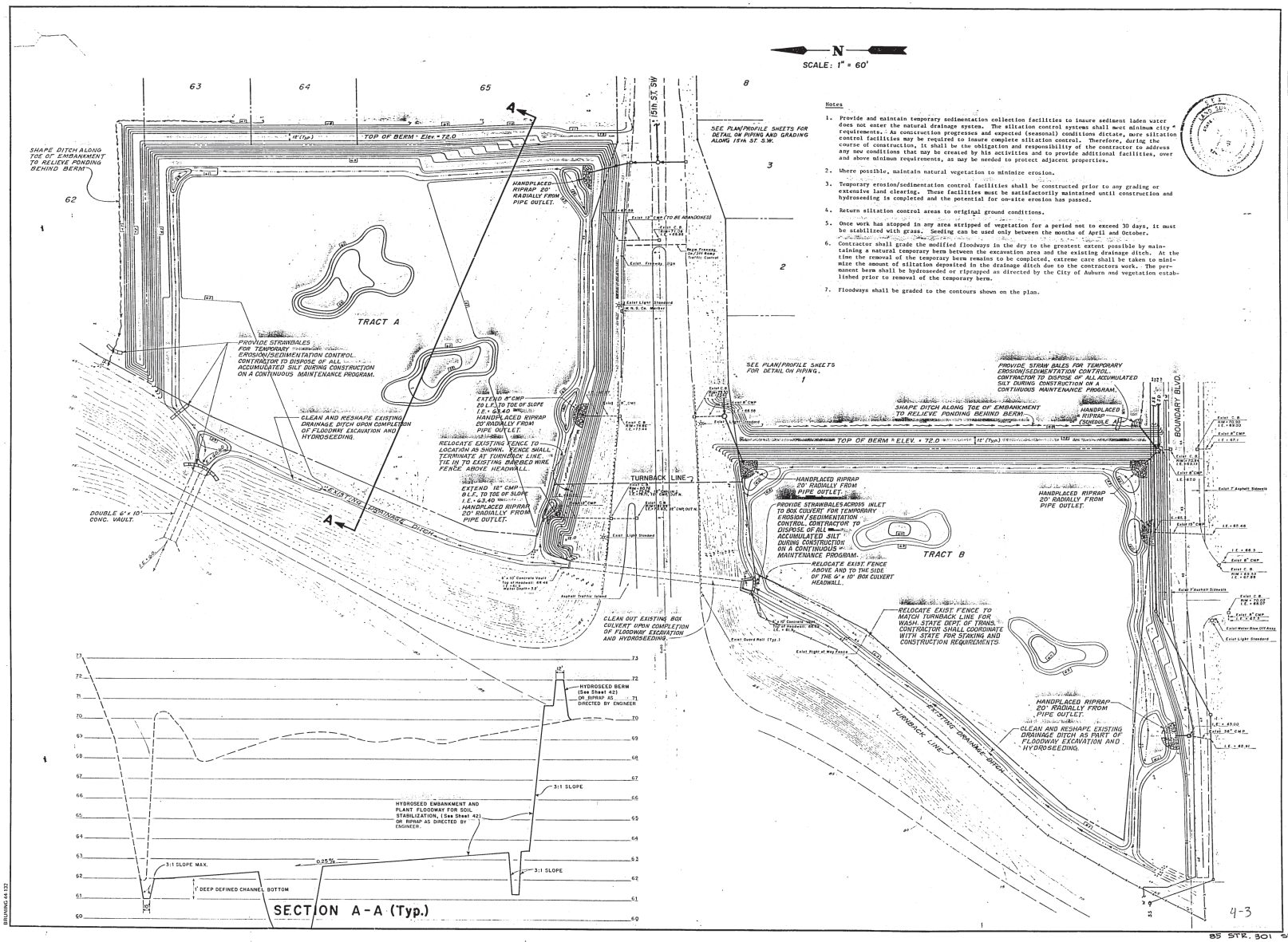

LEGEND:
CULVERT IN/OUT
CB TYPE 1
CB TYPE 2
SMALL BOX CB
STORM MANHOLE
YARD DRAIN
STORMLINES:
UNKNOWN
6" AND LESS
8"
10"
12"
15"
18"
24"
28"
30"
32"
36"
42"
48"
72"
DITCH
CITY LIMITS
CITY OF ALGONA
STORMWATER SYSTEM MAP
Gray & Osborne, Inc.
CONSULTING ENGINEERS
Boundary Blvd
Boundary Rd SW
Industry Dr SW
Industry Dr N
O St SW
Milwaukee Ave N
Perimeter Rd
Private Rd
Boeing Auburn AcRd
11th Ave N
10th Ave N
9th Ave N
8th Ave N
7th Ave N
6th Ave N
5th Ave N
4th Ave N
3rd Ave N
2nd Ave N
1st Ave N
Broadway
Calgary Ave
Chicago Ave
Algona Blvd N
Seattle Blvd N
Electric Ave
Stanley Ave
Junction Blvd
Coal Ave
Unnamed
SR 167
57th Ave S
58th Ave S
58th Pl S
S 364th Pl
Warde St
2nd Ave S
1st Ave S
Clay St
Algona Blvd S
Seattle Blvd S
Pedestrian Walk
Rodeo Blvd
Washington Blvd S
3rd Pl S
4th Ave S
5th Ave S
Milwaukee Blvd S
Pacific Ave S
Ellingson Rd
Frontage Rd
Frontage Rd S
3rd Ave NW
2nd Ct NW
Valley St
1st Ave NW
Milwaukee Blvd N
Chicago Ave
Homer Ave
3rd Ave NE
2nd Ave NE
Cedar Ln
Birch Ln
Pacific Ave N
Butte Ave
Hawthorne Ave

FIGURE A-2

Auburn 400 Construction Plans



Notes

1. Provide and maintain temporary sedimentation collection facilities to insure sediment laden water does not enter the natural drainage system. The siltation control systems shall meet minimum city requirements. As construction progresses and expected (seasonal) conditions dictate, more siltation control facilities may be required to insure complete siltation control. Therefore, during the course of construction, it shall be the obligation and responsibility of the contractor to address any new conditions that may be created by his activities and to provide additional facilities, over and above minimum requirements, as may be needed to protect adjacent properties.
2. Where possible, maintain natural vegetation to minimize erosion.
3. Temporary erosion/sedimentation control facilities shall be constructed prior to any grading or extensive land clearing. These facilities must be satisfactorily maintained until construction and hydroseeding is completed and the potential for on-site erosion has passed.
4. Return siltation control areas to original ground conditions.
5. Once work has stopped in any area stripped of vegetation for a period not to exceed 30 days, it must be stabilized with grass. Seeding can be used only between the months of April and October.
6. Contractor shall grade the modified floodways in the dry to the greatest extent possible by maintaining a natural temporary berm between the excavation area and the existing drainage ditch. At the time the removal of the temporary berm remains to be completed, extreme care shall be taken to minimize the amount of siltation deposited in the drainage ditch due to the contractors work. The permanent berm shall be hydroseeded or riprapped as directed by the City of Auburn and vegetation established prior to removal of the temporary berm.
7. Floodways shall be graded to the contours shown on the plan.

REVISIONS

NO.	DESCRIPTION/DATE	BY
1	1-28-83	RDG

SPARKS, NEVADA · LAS VEGAS, NEVADA · SEATTLE, WASHINGTON
SPI incorporated ENGINEERS/PLANNERS

CITY OF AUBURN
CITY OF ALGONA
L. I. D. No. 327
L. I. D. No. 82-1
FLOODWAY MODIFICATIONS
AUBURN WASHINGTON

JOB NO. 1-357-003-811
DESIGNED RDG
DRAWN JHD/JB
COMP.
CHECKED JJW
DATE FEBRUARY 1983

29
OF 44 SHEETS

85 STR. 301 SHT. 29 OF 46

BRUNING 44-122

ATTACHMENT B

Response to General Comments

Attachment B – Response to General Comments

This attachment provides responses to general comments provided in the Washington State Department of Ecology's (Ecology's) February 1, 2021 letter regarding the draft Feasibility Study (FS) and draft Supplemental Feasibility Study (SFS) for the Boeing Auburn Site (Site). Although The Boeing Company (Boeing) and Ecology have agreed on remedy selection, and have also agreed to not revise the FS and SFS reports based on Ecology comments, Boeing provides responses or clarifications to Ecology's relevant general comments for consistency in future communications, including the parties' efforts to develop a draft cleanup action plan (dCAP). Each of the topics below correspond to a general comment header on pages 6 through 11 of Ecology's comment letter.

In addition, in informal comments, Ecology asked for clarification on the areas where environmental covenants and institutional controls will be applied for the Boeing Auburn Facility (Facility) areas of concern ([AOCs]; AOC A-01, AOC A-09, and AOC A-13). A general outline of the AOCs (as shown in the FS) is attached (See Figure B-1). Boeing will modify this figure and propose areas for implementation of institutional controls and/or environmental covenants for specific soil areas associated with AOCs on property owned by Boeing as part of the dCAP.[1] If implementation of environmental covenants is proposed on other portions of the Facility not owned by Boeing, they will be contingent on approval from the property owners. Ecology will be responsible for enforcing the implementation of environmental controls and institutional controls on property owned by other potentially liable parties to the Agreed Order (AO).

Remediation Objectives

Ecology provided specific comments on remediation objectives for the focus areas evaluated in the SFS (Attachment A of Ecology's comments). Pertaining to the Algona focus area, Ecology states that there is a need to protect potential exposure pathways, including the vapor intrusion pathway and the pathway to stormwater features. The vapor intrusion pathway was thoroughly evaluated as part of the remedial investigation and based on the results of indoor air testing, vapor intrusion of trichloroethene and vinyl chloride into houses is not occurring. Consequently, addressing the vapor intrusion pathway should not be considered a remediation objective for the Algona focus area. Boeing will continue to monitor groundwater concentrations in residential Algona. Boeing will work with Ecology to develop a plan if concentrations increase significantly, in the future, and present a potential threat to indoor air based on site-specific conditions. In addition, concentrations of chlorinated volatile organic compounds (CVOCs) in the stormwater features should not be a remediation objective for the Algona focus area, as further discussed in Attachment A of this letter.

Back Diffusion

Boeing disagrees with Ecology's comment that "back diffusion is not a predominant factor" at this

[1] Institutional controls required as part of the proposed cleanup action will be described in the dCAP (Washington Administrative Code 173-340-380(1)(a)(vi).

Site because it is a "predominantly coarse, alluvial sands and gravels aquifer." Ecology also states: "the importance of back diffusion related to plume characteristics depends on the site geology, hydrogeology and amount of organic content in the aquifer formation." Although the Site aquifer is primarily coarse sands and gravels, there are interbedded fine-grained soils throughout the Site (silt lenses and silty sands and gravels). These fine-grained soils can clearly be identified in Site boring logs (e.g., boring log AGW202). Numerous studies show that even thin clay and silt layers in a primarily sand or gravel aquifer can cause plume persistence from back diffusion (Chapman and Parker 2005; Parker et al. 2008; Seyedabbasi et al. 2012). These fine-grained soils provide storage for contaminant mass which diffuses back over time into the more conductive sands and gravels. Matrix back diffusion results not only from partitioning of CVOC mass to soil organic carbon, but also from mass diffusion into the pore volume of the finer-grained units. This concept of back-diffusion is an important factor for understanding the results of the long-term monitoring as part of the cleanup action.

Back diffusion results from contaminant sorption onto fine-grained silts and clays and diffusions into the pore spaces within the fine-grained silts and clays in the aquifer matrix during the early stages of plume expansion, followed by slow release of contaminant mass stored within the finer-grained units of the plume during late stages. This process of contaminant storage in lower permeability zones during plume expansion and subsequent back diffusion of that mass into the more conductive zones as the plume attenuates, has been widely studied and demonstrated to be a principal cause of CVOC plume longevity regardless of the remedial alternative selected (Sale and Newell 2011; Stroo and Ward 2010). In heterogeneous aquifers (like the Site aquifer), back-diffusion is the primary cause of the late-stage persistence of low-level CVOC concentrations. Because of back diffusion, low-level CVOC concentrations continue to persist throughout the Site long after the original release and depletion of the original source area.

SFS Pilot Test Summary

Boeing agrees that there are discrete preferential flow paths that caused pilot study bioremediation-based treatment to reach more than 400 feet downgradient of the injection wells in some locations. However, effective *in situ* bioremediation is achieved closer to injection wells where enhanced aquifer conditions are more uniformly achieved through the bulk of the aquifer, and where these changes persist over an extended period. Based on the area where pilot test monitoring demonstrated relatively uniform coverage and persistent treatment, the conceptual treatment area assumed in the SFS extends up to 400 ft downgradient of the injection rows.

Preliminary Design and Cost Estimates

Ecology comments on preliminary design and cost estimates do not change the selected cleanup alternatives of the FS/SFS and these reports are not being updated to include Ecology comments. However, there are some points that Boeing will incorporate during preparation of the dCAP based on Ecology comments.

- Per Ecology's comment, Boeing agrees that three injections (rather than five) will likely be sufficient for the Algona Focus Area.

- Per Ecology's comment, Boeing agrees that reducing the number of wells and frequency of long-term groundwater sampling is appropriate.

In addition, Ecology provided a question about the difference in cost between the Property Boundary Focus area and the Algona Focus Area. For clarification, the primary difference in cost is due to the Property Boundary Focus Area injection being implemented in all three groundwater zones (due to extent of contamination in all three zones in this area), whereas the Algona Focus Area injection would be implemented only in the shallow and top of the intermediate groundwater zones (due to the extent of contamination primarily in the shallow zone in this area).

Reasonable Restoration Time Frame Evaluation

Ecology comments that the surface water quality standards (SWQS) restoration time frame of approximately 100 years should not be presumed unreasonable. However, Ecology does not provide sufficient rationale for why the agency believes this restoration time frame is reasonable. Moreover, scientific literature (ESTCP 2016) concludes that achieving CVOC concentrations at chlorinated solvent cleanup sites as low as the SWQS is generally impracticable for feasible treatment technologies in any reasonable timeframe. The MTCA regulations provide for such situations. WAC 173-340-720(8)(c) provides that where it is not practicable to meet cleanup levels throughout the Site in a reasonable restoration time frame, Ecology may approve the implementation of a conditional point of compliance (CPOC) at the Site. As stated in the FS, if SWQS are applied as cleanup levels for groundwater, resulting in an estimated restoration timeframe of approximately 100 years, Boeing will request that Ecology approve the use of a CPOC.

REFERENCES

Chapman, S.W., and B.L. Parker. 2005. *Plume Persistence Due to Aquitard Back Diffusion Following Dense Non-Aqueous Phase Liquid Source Removal or Isolation*. *Water Resources Research* 41 (No. 12).

ESTCP. 2016. *Development of an Expanded, High-Reliability Cost and Performance Database for In-Situ Remediation Technologies*; ESTCP Project ER-201120. US Department of Defense Environmental Security Technology Certification. March.

Parker, B.L., S.W Chapman, and M.A. Guilbeault. 2008. Abstract: *Plume persistence caused by back diffusion from thin clay layers in a sand aquifer following TCe source-zone hydraulic isolation. Journal of Contaminant Hydrology* 102 (2008) 86-104.

Sale, T., and C. Newell. 2011. Decision Guide: *A Guide for Selecting Remedies for Subsurface Releases of Chlorinated Solvents*. Publication No. ESTCP Project ER-200530. Department of Defense Environmental Security Technology Certification Program (ESTCP). March.

Seyedabbasi, M., C.J. Newell, D.T. Adamson, and T.C. Sale. 2012. *Relative Contribution of DNAPL Dissolution and Matrix Diffusion to the Long-Term Persistence of Chlorinated Solvent Source Zones*. *J Contam Hydrol* 134-135.

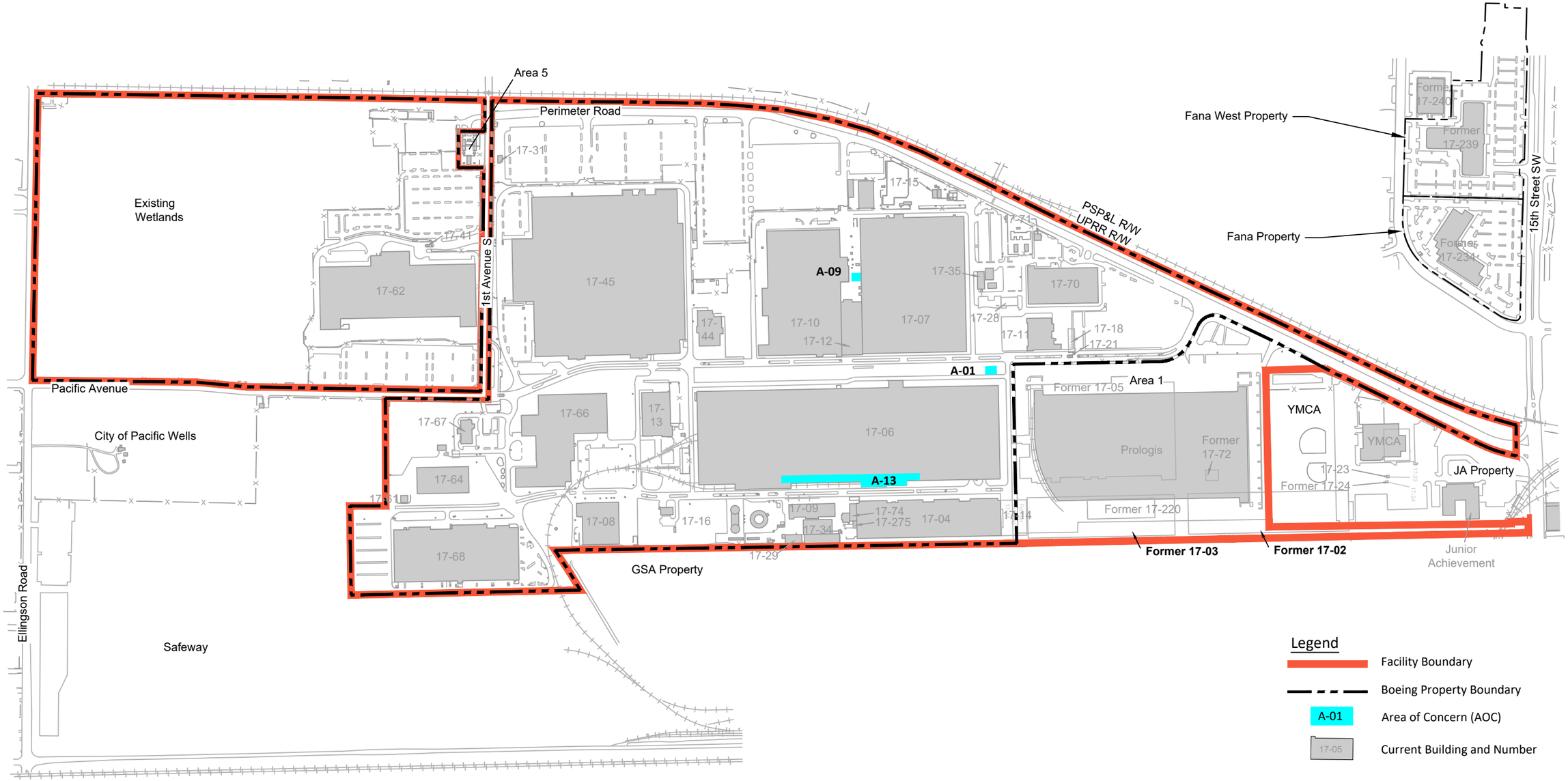
Stroo, H. and C. Ward. 2010. *In Situ Remediation of Chlorinated Solvent Plumes*, *SERDP ESTCP Environmental Remediation Technology*. New York, NY: Springer-Verlag New York.

ATTACHMENTS

Figure B-1: Facility Areas of Concern Carried Forward to the Feasibility Study

FIGURE B-1

Facility Areas of Concern Carried Forward to the Feasibility Study



Notes

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

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0 600 1200

Scale in Feet

Base map source: Geomatrix 2003

LANDAU ASSOCIATES

Boeing Auburn
Feasibility Study
Auburn, Washington

Facility Areas of Concern Carried Forward to the Feasibility Study

Figure
B-1