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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Southwest Region Office
PO Box 47775 • Olympia, Washington 98504-7775 • 360-407-6300

June 21, 2023

Catherine Tamaro
Hidden Hills 2001 LP
3236 78th Avenue SE, Ste 202
Mercer Island, WA 98040
ctamaro@mindspring.com

Re: Opinion on the Proposed Cleanup of a Property associated with the Asarco Tacoma Smelter Site

- **Property Name:** Hidden Hills Apartments
- **Property Address:** 3313 72nd Avenue Ct W, University Place, Pierce County, WA 98466
- **Facility/Site ID:** 6959438
- **Cleanup Site ID:** 1543
- **VCP Project No.:** SW1807

Dear Catherine Tamaro:

The Washington State Department of Ecology (Ecology) received your request for an opinion on your proposed independent cleanup of a Property associated with the Asarco Tacoma Smelter Site (Asarco Site). This letter provides our opinion. We are providing this opinion under the authority of the Model Toxics Control Act (MTCA),[1] chapter 70A.305 Revised Code of Washington (RCW).

Issues Presented and Opinion

Ecology has determined that no further remedial action will likely be necessary at the Property to clean up contamination associated with the Asarco Site.

Ecology has determined that further remedial action will likely still be necessary elsewhere at the Asarco Site, but no further remediation will be necessary for the Property.

This opinion is based on an analysis of whether the remedial action meets the substantive requirements of MTCA, chapter 70A.305 RCW, and its implementing regulations, Washington

[1] https://app.leg.wa.gov/RCW/default.aspx?cite=70A.305.

Administrative Code (WAC) chapter 173-340[2] (collectively "substantive requirements of MTCA"). The analysis is provided below.

Property and Asarco Site Descriptions

This opinion applies only to the Property described below within Asarco Site. This opinion does not apply to any other sites that may affect the Property. Any such sites, if known, are identified separately below.

1. Property Description

The Property includes the following tax parcel (acres) in Pierce County, which was affected by the Asarco Site and will be addressed by your cleanup:

- 0220104174 (16.79 acres)

Enclosure A includes a legal description of the Property and details of the Property as currently known to Ecology.

2. Asarco Site Description

The Asarco Site is defined by the nature and extent of contamination associated with the following releases:

- Arsenic into the Soil.
- Lead into the Soil.

Those releases have affected more than one parcel of real property, including the parcel identified above.

Enclosure B includes a detailed description and diagram of the Asarco Site, as currently known to Ecology.

3. Identification of Other Sites that may affect the Property

A parcel of real property can be affected by multiple sites. At this time, we have no information that the Property is affected by other sites.

[2] https://apps.leg.wa.gov/WAC/default.aspx?cite=173-340

Basis for the Opinion

This opinion is based on the information contained in the following documents:

1. Carapace Environmental Services, LLC (Carapace), *Draft Cleanup Action Plan, Hidden Hills Apartments, 3313 72nd Avenue Court West, University Place, Washington*, April 4, 2023.

You can request these documents by filing a records request.[3] For help making a request, contact the Public Records Officer at publicrecordsofficer@ecy.wa.gov or call 360-407-6040. Before making a request, check whether the documents are available on Ecology's Cleanup Site Search web page.[4]

This opinion is void if any of the information contained in those documents is materially false or misleading.

Analysis of the Cleanup

1. Cleanup of the Property located within the Asarco Site.

Ecology has concluded that, upon completion of your proposed cleanup, **no further remedial action** will likely be necessary at the Property to clean up contamination associated with the Asarco Site. That conclusion is based on the following analysis:

a. Characterization of the Asarco Site.

The Asarco Site is described in **Enclosure B**.

Hidden Hills Apartment property (Property) is located west of Interstate 5 and south of State Route 16 in a residential area of University Place, Washington (Figure 1). The Property is situated on one, 16.79- acre Pierce County parcel. Residential developments border the Property to the west, south, and north, and Fircrest Golf Club to the east.

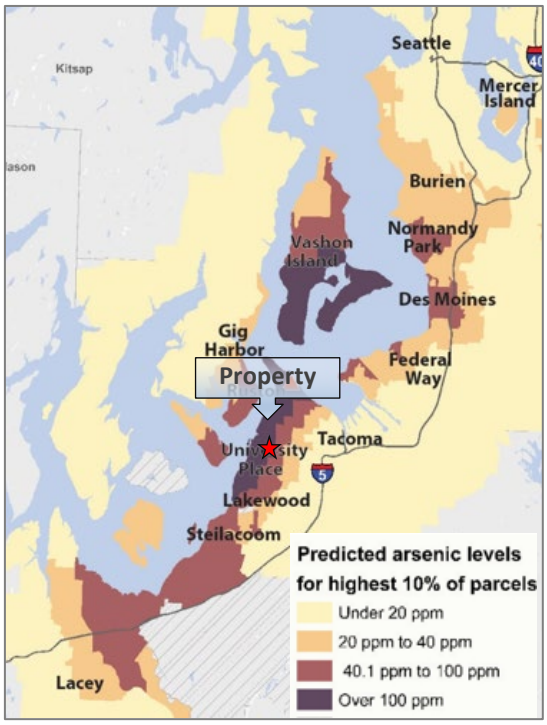

Figure 1. Vicinity Map

The Property is a multi-family residential apartment complex, less than five miles from

[3] https://ecology.wa.gov/About-us/Accountability-transparency/Public-records-requests
[4] https://apps.ecology.wa.gov/gsp/Sitepage.aspx?csid=1543

Tacoma, Washington. Most of the Property is developed with apartment buildings, parking, and landscaped areas. The southern part of the Property includes an undeveloped, steeply slopped, and forested area.

For more information about the Property, refer to **Enclosure A.**

Environmental Partners Inc. (EPI) conducted soil characterization in 1999 and 2000. This characterization event was prior to the development of the *TSP Model Remedies Guidance*[5] (TSPMRG). EPI collected 257 samples from 0 to 6 inches below ground surface (bgs). EPI collected enough samples; however, they did not collect deeper soil samples and did not analyze the samples for lead.

Hidden Hills 2001 LP (HH) plans improvements to the Property in the future. As part of the planned improvements, HH contracted Carapace to conduct supplemental characterization of the Tacoma Smelter Plume (TSP) contamination on the Property.

Carapace divided the Property into five decisions units (DUs) based on the topography, contamination level, and the future use of the five areas (Figure 2). In June 2022, Carapace collected 68 additional soil samples at five depth intervals from the five decision units. They collected additional samples from 0 to 6 inches in several units to analyze the samples for lead. Carapace collected additional deeper samples in the locations where arsenic exceeded twice the cleanup level of 40 mg/kg for arsenic. Duff was not present on the Property.

- **DU1 –** The northern developed area encompassing 5.6 acres. Carapace collected addiitonal 10 samples from 6 to 12 inches bgs; one sample from 12 to 18 inches bgs; and five samples from 18 to 24 inches bgs. Collectively, EPI and Carapace collected 117 soil samples from 0 to 6 inches bgs in this unit.

- **DU2 –** The central developed area encompassing 1.5 acres. Carapace collected additional four samples from 6 to 12 inches bgs; and one sample from 12 to 18 inches bgs. Altogether, EPI and Carapace collected 23 samples from 0 to 6 inches bgs in this unit.

- **DU3 –** The southern developed area encompassing 3.5 acres. EPI collected 63 samples from 0 to 6 inches bgs. Carapace collected three additional samples from 6 to 12 inches bgs.

- **DU4** – The eastern developed area encompassing 2.2 acres. Carapace collected adidional four samples from 6 to 12 inches bgs; and three samples from 18 to 24

[5] https://apps.ecology.wa.gov/publications/documents/1909101.pdf

inches bgs. Altogether, EPI and Carapace collected 21 samples from 0 to 6 inches bgs in this unit.

- **DU5** – The southern undeveloped area encompassing 3.4 acres. EPI collected 51 samples from 0 to 6 inches bgs. Carapace collected four samples from 6 to 12 inches bgs. In addition, they collected deeper samples to satisfy the requirements of the Terrestrial Ecological Evaluation (TEE). This decision unit is the steeply-sloped forested area that will remain undeveloped. Carapace collected four additional samples from 18 to 24 inches bgs and four samples from 24 to 36 inches bgs.

Figure 2. Approximate Locations of Characterization Samples. Numbers in Bold Yellow Represent Arsenic Concentrations. Not all the samples collected during the 1999 and 2000 characterization events could be mapped.

Carapace submitted all the samples to Friedman & Bruya Inc. laboratory in Seattle, Washington for arsenic and lead analysis with Environmental Protection Agency (EPA) Method 6020B.

Soil Sampling Results

Table 1 displays the characterization sampling summary on the Property sorted by decision units. **Enclosure C** contains the comprehensive results of the characterization sampling on the Property.

Entire Property

Samples collected from 0 to 6 inches bgs: Arsenic exceeded the MTCA Method A cleanup level of 20 milligrams per kilogram (mg/kg) in 138 samples (Figure 3). Ninety samples exceeded the maximum allowable concentration for a single soil sample or twice the cleanup level for arsenic (40 mg/kg). The arsenic concentrations ranged from 0.8 mg/kg to 300 mg/kg. The average arsenic concentration was 35 mg/kg. None of the samples exceeded the MTCA Method A cleanup level of 250 mg/kg for lead. Lead concentrations ranged from 5.03 mg/kg to 248 mg/kg. The average lead concentration was 46.41 mg/kg.

Samples collected from 6 to 12 inches bgs: Eleven samples exceeded the cleanup level of 20 mg/kg for arsenic. Six samples exceeded the maximum allowable concentration for a single soil sample or twice the cleanup level for arsenic (40 mg/kg). The arsenic concentrations ranged from 2.31 mg/kg to 158 mg/kg. The average arsenic concentration was 27.1 mg/kg. None of the lead concentrations in this depth interval exceeded the cleanup level of 250 mg/kg. Lead concentrations ranged from 2.86 mg/kg to 91.5 mg/kg. The average lead concentration was 21.6 mg/kg.

Samples collected from 12 to 18 inches bgs: One of the samples exceeded the MTCA Method A cleanup level of 20 mg/kg for arsenic, but it did not exceed twice the cleanup level of 20 mg/kg. The arsenic concentrations ranged from 11.9 mg/kg to 27.7 mg/kg. The average arsenic concentration was 19.8 mg/kg. None of the samples exceeded the MTCA Method A cleanup level of 250 mg/kg for lead. Lead concentrations ranged from 6.19 mg/kg to 35 mg/kg. The average lead concentration was 20.6 mg/kg.

Samples collected from 18 to 24 inches bgs: Four of the samples exceeded the MTCA Method A cleanup level of 20 mg/kg for arsenic. None of the samples exceeded twice the cleanup level of 20 mg/kg. The arsenic concentrations ranged from 3.62 mg/kg to 29.1 mg/kg. The average arsenic concentration was 15.4 mg/kg. None of the samples exceeded the MTCA Method A cleanup level of 250 mg/kg for lead. Lead concentrations ranged from 3.52 mg/kg to 57.7 mg/kg. The average lead concentration was 16.6 mg/kg.

Samples collected from 24 to 36 inches bgs: None of the samples exceeded the MTCA Method A cleanup level of 20 mg/kg for arsenic. The arsenic concentrations ranged from 3.17 mg/kg to 18.1 mg/kg. The average arsenic concentration was 12.6 mg/kg. None of the samples exceeded the MTCA Method A cleanup level of 250 mg/kg for lead. Lead concentrations ranged from 4.02 mg/kg to 36.7 mg/kg. The average lead concentration was 25.3 mg/kg.

Table 1. Summary of the Characterization Sampling on the Property Sorted by Decision Unit

DU	Depth (inches)	Arsenic (mg/kg)			Lead (mg/kg)		
		Minimum	Maximum	Average	Minimum	Maximum	Average
DU1	0-6	0.8	**180**	**30**	5.03	65.1	35.55
	6-12	2.31	**57.7**	19.46	2.86	46.7	16.22
	12-18		**27.7**			35	
	18-24	3.62	16.6	9.57	3.52	17.5	10.33
DU2	0-6	0.8	**130**	**28.3**	6.67	89.2	29.42
	6-12	5.15	**21.6**	10.09	4.54	8.51	6.79
	12-18		11.9			6.19	
DU3	0-6	0.8	**230**	18.3		Not Analyzed	
	6-12	2.34	19.9	13.7	3.87	21	13.5
DU4	0-6	**22.7**	**300**	**79**	19.3	248	59
	6-12	10.3	**74.4**	**34**	10.4	49.5	23.9
	18-24	8.44	**25.4**	16.81	7.13	10.8	9.54
DU5	0-6	0.8	**220**	**54**		Not Analyzed	
	6-12	**23.7**	**158**	**66**	25	91.5	53.8
	18-24	8.45	**29.1**	**21.5**	8.91	57.7	29.9
	24-36	3.17	18.1	12.6	4.02	36.7	25.3
MTCA Cleanup Level			40	20		500	250

Bold values represent concentrations above the MTCA Method A cleanup level.

Bold red values represent concentrations twice the MTCA Method A cleanup level.

b. Establishment of Cleanup Standards for the Asarco Site.

Ecology has determined the cleanup levels and points of compliance established for the Asarco Site will likely meet the substantive requirements of MTCA.

As part of the Interim Action Plan for the Asarco Tacoma Smelter Site (June 2012) (IAP), Ecology completed a terrestrial ecological evaluation for properties with only Tacoma Smelter Plume contamination. Ecology determined the MTCA Method A cleanup levels for both arsenic and lead were protective of both human health and the environment. The MTCA Method A cleanup levels for soil are as follows:

- Arsenic is 20 mg/kg.
- Lead is 250 mg/kg.

The IAP determined that the soil and duff cleanup levels are protective of human health and the environment for properties within the Asarco Tacoma Smelter Site are the following:

- Average arsenic detected in the soil is less than 20 mg/kg.
- Average lead detected in the soil is less than 250 mg/kg.
- Duff composite sample is less than 20 mg/kg for arsenic.
- Duff composite sample is less than 250 mg/kg for lead.
- No single soil sample has arsenic above 40 mg/kg.
- No single soil sample has lead above 500 mg/kg.

c. Selection of Cleanup for the Property.

Ecology has determined the cleanup you proposed for the Property will likely meet the substantive requirements of MTCA and the IAP. Your proposed cleanup meets the minimum cleanup requirements and will not exacerbate conditions or preclude reasonable cleanup alternatives elsewhere at the Asarco Site.

Ecology proposed four model remedies in the IAP:

- Excavation and removal.
- Mixing.
- Capping in place.

- Consolidation and capping.

EPI decided to use hot spot excavation and removal, mixing, engineered and institutional controls on the Property.

Property Cleanup: EPI will conduct the cleanup on the Property in conjunction with its future redevelopment or renovation. On April 4, 2023, on behalf of EPI, Carapace developed a Cleanup Action Plan (CAP) for the Property. Because the redevelopment plans are still unknown, the CAP was limited in scope, describing the potential three model remedies that may be used on the Property. The CAP described the use of three selected model remedies: soil excavation and removal, soil mixing, engineered and institutional controls to remediate the TSP contamination on the Property. Ecology based this opinion letter on the information provided in this CAP.

The Property cleanup will proceed as follows:

- **DU1 through DU4–** This area, which is currently residential housing will be remediated during future redevelopment activities. EPI will remediate the four decision units by hot spot removal and soil mixing. The hot spot areas, defined as areas where arsenic exceeded twice the cleanup level of 20 mg/kg, will be at least 10 feet wide by 10 feet long. The soil mixing will be conducted to a depth of at least 12 inches bgs and deeper in areas where average arsenic was above the cleanup level of 20 mg/kg in the 0 to 6 inches bgs or where arsenic exceeded twice the cleanup level of 20 mg/kg.

- **DU5 –** This area consists of steep slopes, mature and native vegetation. This decision unit may remain forested and un-remediated, or may be developed in the future, depending on local permit requirements. Twenty-four samples exceeded twice the cleanup level of 20 mg/kg for arsenic in the 0 to 6 inches bgs and three in the 6 ton 12 inches bgs. The average arsenic concentration was also above the cleanup level of 20 mg/kg in both depth intervals (54 and 23 mg/kg, respectively).

For the protection of habitat and wildlife in DU5: If local regulations prohibit development in DU5, the owner will contract a biologist to conduct Net Environmental Benefit Analysis (NEBA) in this area.

Ecology conducted a site visit to the Property and determined the DU5 as potentially qualifying as Especially Valuable Habitat (EVH) per Tacoma Smelter Plume Model Remedies Guidance.[6] Assessed as EVH, this area could use NEBA to weigh the benefits of

[6] https://apps.ecology.wa.gov/publications/SummaryPages/1909101.html

active remediation versus no remediation. Typical soil remediation involves disturbance to soil and removal of vegetation.

Removing valuable habitat is likely to cause significant ecological damage and it would take decades to recover. If the results of the NEBA show that this decision unit qualifies as EVH and that there are no signs of arsenic uptake in wildlife and biota, this unit may stay un-remediated.

For the protection of human life in DU5: EPI will implement institutional and engineering controls:

- They will install a fence separating DU5 from the remainder of the Property. Ecology will inspect the installed fence prior to the issuance of an NFA determination.

- Install at least two Dirt Alert signs by the fence separating DU1 from DU2 according to Ecology's specifications. Ecology will inspect the installed fence and the signs prior to the issuance of an NFA.

    - File an environmental covenant with the appropriate local jurisdiction. Send a copy of the draft covenant to the local jurisdiction with Ecology's contact information. The covenant will include restrictions on intrusive activities in areas where arsenic concentrations remain above the MTCA cleanup levels in DU5 or in other areas under existing buildings if the buildings are not demolished. Ecology will review the draft covenant. Ecology will not approve the covenant unless the local jurisdiction has been consulted.

    - Upon Ecology's approval, obtain the signatures of all grantors of the covenant.

    - Submit the signed covenant to Ecology for signatures as the grantee.

    - Record the signed covenant in every county where the real property subject to the covenant is located. For detailed recording instructions, please refer to chapter 65.04 RCW.

Return the original signed and recorded covenant to Ecology and a copy to each person who signed the covenant or holding a recorded interest in the subject property.

Confirmational Sampling

Two model remedies may be used on the Property at the same time. If EPI decides to use hot spot excavation and removal, the consultant will sample the bottom of the excavated areas and the backfill soil. If soil mixing is also used, the consultant will collect confirmational samples following soil mixing in all mixed areas. They will collect soil samples at six-inch depth intervals throughout the mixing depth. All the soil sampling will be done in accordance with the methodology outlined in the 2019 Tacoma Smelter Plume Model Remedies Guidance.[7] The consultant will submit the samples to an analytical laboratory for arsenic and lead analysis.

If any of the samples exceeds twice the cleanup level of 20 mg/kg for arsenic or 250 mg/kg for lead or if the average concentrations exceed 20 mg/kg for arsenic or 250 mg/kg for lead, the contractor will conduct additional round of soil excavation or mixing. The consultant will resample the mixed areas as described above.

As a reminder, in accordance with WAC 173-340-840(5) and Ecology Toxics Cleanup Program Policy 840[8] (Data Submittal Requirements), data generated for Independent Remedial Actions shall be submitted **simultaneously** in both a written and electronic format. For additional information regarding electronic format requirements, see Ecology's Environmental Information Monitoring (EIM) database web page.[9].

Be advised that according to the policy, any reports containing sampling data that are submitted for Ecology review are considered incomplete until the electronic data has been entered. Please ensure that data generated during on-site activities is submitted pursuant to this policy.

Data must be submitted to Ecology in this format for Ecology to issue an NFA determination. Please be sure to submit all soil data collected to date, as well as any future data, in this format.

2. Cleanup of the Asarco Site as a Whole.

Ecology has concluded that **further remedial action** will still be necessary elsewhere within the ASARCO Site (Asarco Tacoma Smelter Site) upon completion of your proposed cleanup. In other words, while your proposed cleanup may constitute the final action for the Property, it will constitute only an **"interim action"** for the Asarco Site as a whole.

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[7] https://apps.ecology.wa.gov/publications/SummaryPages/1909101.html
[8] https://apps.ecology.wa.gov/publications/SummaryPages/1609050.html.
[9] http://www.ecy.wa.gov/eim

Limitations of the Opinion

1. Opinion does not Settle Liability with the State.

Liable persons are strictly liable, jointly and severally, for all remedial action costs and for all natural resource damages resulting from the release or releases of hazardous substances at the Property. This opinion **does not**:

- Change the boundaries of the Asarco Site.
- Resolve or alter a person's liability to the state.
- Protect liable persons from contribution claims by third parties.

To settle liability with the state and obtain protection from contribution claims, a person must enter into a consent decree with Ecology under RCW 70A.305.040(4).

2. Opinion does not Constitute a Determination of Substantial Equivalence.

To recover remedial action costs from other liable persons under MTCA, one must demonstrate that the action is the substantial equivalent of an Ecology-conducted or Ecology-supervised action. This opinion does not determine whether the action you performed is substantially equivalent. Courts make that determination.
See RCW 70A.305.080 and WAC 173-340-545.

3. Opinion is Limited to Proposed Cleanup.

This letter does not provide an opinion on whether further remedial action will actually be necessary at the Property upon completion of your proposed cleanup. To obtain such an opinion, you must submit a report to Ecology upon completion of your cleanup and request an opinion under the Voluntary Cleanup Program (VCP).

4. State is Immune from Liability.

The state, Ecology, and its officers and employees are immune from all liability, and no cause of action of any nature may arise from any act or omission in providing this opinion.
See RCW 70A.305.170(6).

Contact Information

Thank you for choosing to clean up your Property under the VCP. As you conduct your cleanup, please do not hesitate to request additional services. We look forward to working with you.

For more information about the VCP and the cleanup process, please visit our Voluntary Cleanup Program web page.[10] If you have any questions about this opinion, please contact me at 360-489-4569 or marian.abbett@ecy.wa.gov.

Sincerely,

Marian L. Abbett, P.E.
Unit Supervisor
Toxics Cleanup Program
Southwest Region Office

EB/js

Enclosures: A – Legal and General Property Descriptions
B –Asarco Tacoma Smelter Site Description
C – Property Soil Characterization Results

cc by email: David Swindale, Pierce County, dswindale@city ofup.com
Jerome Lambiotte, Ecology, jerome.lambiotte@ecy.wa.gov
Ecology Site File

[10] http://www.ecy.wa.gov/vcp.

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Enclosure A

Legal and General Property Descriptions

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Legal Property Description

Parcel 022010417: Section 10 Township 20 Range 02 Quarter 43 : PARCEL "A" DBLR 2001-06-29-5001 DESC AS FOLL COM AT NE COR OF SW OF SE OF SEC 10 TH S 88 DEG 55 MIN 19 SEC W 271.09 FT ALG N LI SD SW OF SE TO POB TH S 53 DEG 38 MIN 50 SEC E 17.73 FT TO BEG OF C TO L HAVING A RAD PT WHICH BEARS N 36 DEG 21 MIN 10 SEC E 100 FT TH ALG ARC OF SD CURVE 74.60 FT THRU A C/A OF 42 DEG 44 MIN 40 SEC TH N 83 DEG 36 MIN 30 SEC E 10.83 FT TH S 77 DEG 56 MIN 44 SEC E 16.39 FT TO BEG OF C TO L HAVING RAD PT WHICH BEARS N 12 DEG 03 MIN 16 SEC E 100 FT TH ALG ARC OF SD CURVE 19.22 FT THRU C/A OF 11 DEG 00 MIN 38 SEC TH S 88 DEG 57 MIN 22 SEC E 76.97 FT TH N 40 DEG 52 MIN 25 SEC E 7.82 FT TH S 82 DEG 55 MIN 50 SEC E 64.13 FT TH S 25 DEG 41 MIN 13 SEC E 18.05 FT TH S 51 DEG 47 MIN 20 SEC E 21.12 FT TH S 02 DEG 23 MIN 45 SEC E 269.37 FT TH S 78 DEG 22 MIN 09 SEC E 102.91 FT TH N 87 DEG 46 MIN 24 SEC E 157.94 FT TH S 01 DEG 11 MIN 05 SEC E 52.69 FT TH S 34 DEG 08 MIN 10 SEC E 105.02 FT TH S 01 DEG 16 MIN 24 SEC E 159.81 FT TO S LI OF NW OF SE OF SE SD SEC 10 TH S 88 DEG 50 MIN 56 SEC W 360.14 FT ALG SD S LI TO SW COR SD SUBDIV TH S 0 DEG 15 MIN 38 SEC E 318.21 FT ALG E LI SD SW OF SE SEC 10 TH S 88 DEG 54 MIN 52 SEC W 644.58 FT TO E LI MORRISON RD TH N 0 DEG 09 MIN 50 SEC E 880.23 FT ALG SD E LI TO A PT 100 FT S OF N LI SD SW OF SE OF SEC 10 TH N 11 DEG 25 MIN 24 SEC E 102.52 FT TO SD N LI TH N 88 DEG 55 MIN 19 SEC E 346.20 FT TO POB TOG/W EASE OF REC OUT OF 4-041 & 4-002 SEG N 0164BL 09-05-01BL

General Property Description

The Property is a multi-family residential apartment complex in University Place, Pierce County, less than five miles from Tacoma. Access to the Property may be gained from Morrison Road West, which forms the western boundary. Rights-of-way located within the parcel boundaries include 72nd Avenue Court West, 71st Avenue Court West, 31st Street Court West, and 32nd Street Court West.

Ground surfaces within the Property are paved with asphalt, landscaped, or covered with vegetation. Property uses in the vicinity are primarily residential or undeveloped. The buildings are 1- or 2-story wood-frame structures enclosing between 2,025 and 5,700 square feet of space each.

The Property elevation is approximately 350 feet above mean sea level. Topographic gradient across the Property is toward the northeast. Shallow soil conditions encountered at the Property consist of very fine sandy loam.

The nearest surface water bodies are located in the Adriana Hess Wetland Park, adjacent to the north, and Paradise Pond, located to the east. The inferred hydrogeologic gradient is northeast, toward the wetland. Groundwater has not been encountered.

Enclosure B

Asarco Tacoma Smelter Site Description

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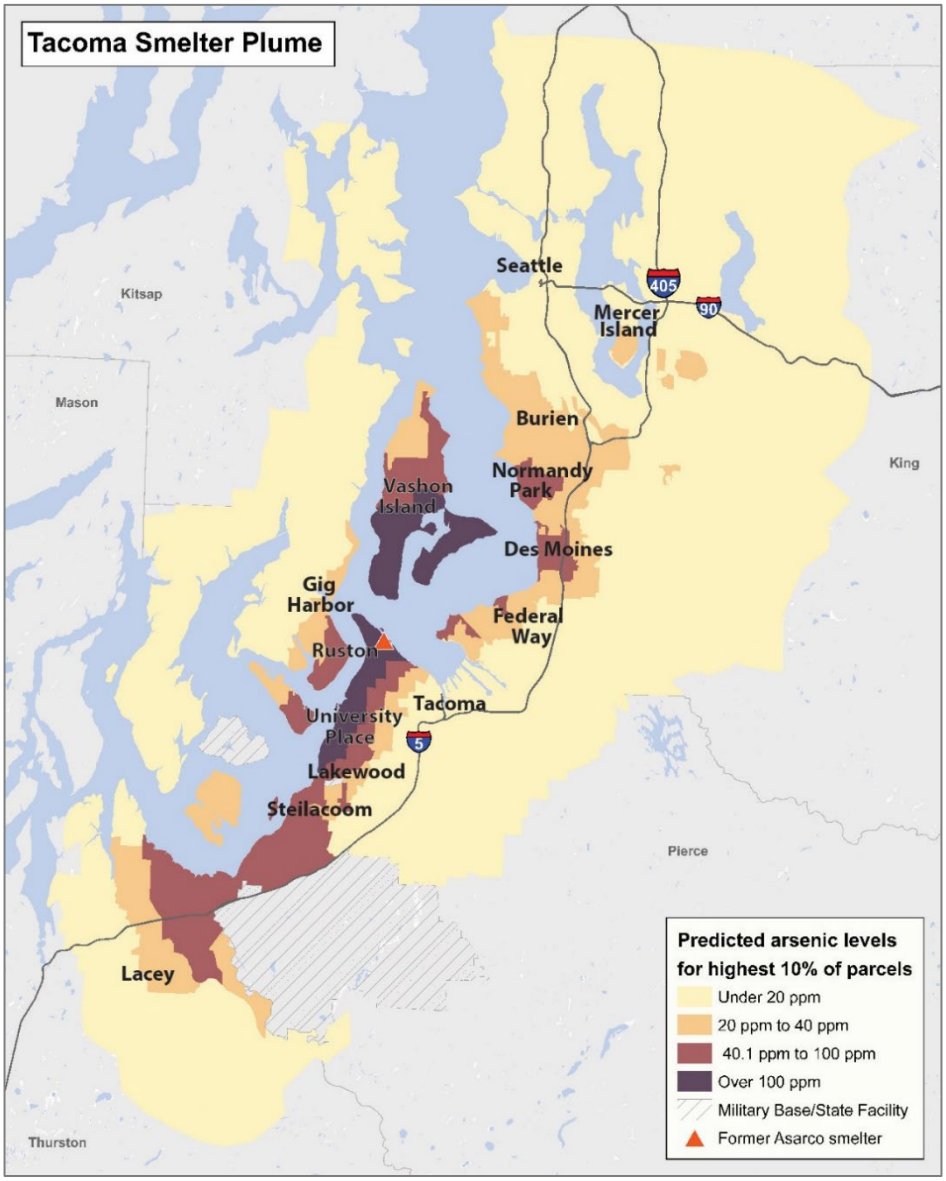
Asarco Tacoma Smelter Site



An interactive color map can be found at: https://dirtalert.info/

For almost 100 years, the Asarco Company operated a copper smelter in Tacoma. Air pollution from the smelter settled on the surface soil over a vast region—more than 1,000 square miles of the Puget Sound basin. Elevated levels of contamination are found as far south as the Nisqually Ridge and as far north as Seattle (West Seattle). Additionally, elevated levels of contamination are found as far west as the Kitsap Peninsula and as far east as Kent and Bellevue. Arsenic, lead, cadmium, and other heavy metals are still in the soil as a result of this pollution. The area has elevated levels of arsenic, lead, and cadmium in the soil due to air emissions from the Asarco smelter.

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Enclosure C

Property Soil Characterization Results

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Characterization Sampling Results

Location	Sample Date	Sample ID	Depth (inches)	Arsenic (mg/kg)	Lead (mg/kg)
146	EPI, 2000	146	0-6	0.8	NA
151	EPI, 2000	151	0-6	0.8	NA
152	EPI, 2000	152	0-6	0.8	NA
178	EPI, 2000	178	0-6	0.8	NA
145	EPI, 2000	145	0-6	0.8	NA
150	EPI, 2000	150	0-6	0.8	NA
143	EPI, 2000	143	0-6	0.8	NA
158	EPI, 2000	158	0-6	0.8	NA
164	EPI, 2000	164	0-6	0.8	NA
240	EPI, 2000	240	0-6	0.8	NA
165	EPI, 2000	165	0-6	0.8	NA
175	EPI, 2000	175	0-6	0.8	NA
176	EPI, 2000	176	0-6	0.8	NA
161	EPI, 2000	161	0-6	1.4	NA
162	EPI, 2000	162	0-6	1.9	NA
174	EPI, 2000	174	0-6	2	NA
121	EPI, 2000	121	0-6	2	NA
148	EPI, 2000	148	0-6	2.3	NA
153	EPI, 2000	153	0-6	2.4	NA
173	EPI, 2000	173	0-6	2.6	NA
147	EPI, 2000	147	0-6	3.5	NA
241	EPI, 2000	241	0-6	3.6	NA
179	EPI, 2000	179	0-6	3.6	NA
125	EPI, 2000	125	0-6	3.7	NA
SS-06	7/13/22	SS-06:0.5	0-6	3.85	5.03
163	EPI, 2000	163	0-6	3.9	NA
244	EPI, 2000	244	0-6	3.9	NA
128	EPI, 2000	128	0-6	4.1	NA
SS-02	7/13/22	SS-02:0.5	0-6	4.79	7.69
127	EPI, 2000	127	0-6	5.1	NA
171	EPI, 2000	171	0-6	5.6	NA
169	EPI, 2000	169	0-6	5.9	NA
139	EPI, 2000	139	0-6	6.3	NA
149	EPI, 2000	149	0-6	6.4	NA
168	EPI, 2000	168	0-6	6.5	NA
SS-01	7/13/22	SS-01:0.5	0-6	6.59	6.74
160	EPI, 2000	160	0-6	6.6	NA
170	EPI, 2000	170	0-6	6.6	NA
142	EPI, 2000	142	0-6	7.3	NA
242	EPI, 2000	242	0-6	7.4	NA
132	EPI, 2000	132	0-6	7.6	NA
141	EPI, 2000	141	0-6	7.7	NA

Location	Sample Date	Sample ID	Depth (inches)	Arsenic (mg/kg)	Lead (mg/kg)
136	EPI, 2000	136	0-6	7.8	NA
129	EPI, 2000	129	0-6	7.9	NA
131	EPI, 2000	131	0-6	8.9	NA
166	EPI, 2000	166	0-6	9	NA
137	EPI, 2000	137	0-6	9.4	NA
138	EPI, 2000	138	0-6	9.6	NA
70	EPI, 2000	70	0-6	11	NA
63	EPI, 2000	63	0-6	12	NA
167	EPI, 2000	167	0-6	13	NA
20	EPI, 2000	20	0-6	13	NA
251	EPI, 2000	251	0-6	14	NA
18	EPI, 2000	18	0-6	14	NA
130	EPI, 2000	130	0-6	14	NA
135	EPI, 2000	135	0-6	15	NA
134	EPI, 2000	134	0-6	15	NA
155	EPI, 2000	155	0-6	17	NA
126	EPI, 2000	126	0-6	17	NA
65	EPI, 2000	65	0-6	17	NA
15	EPI, 2000	15	0-6	18	NA
12	EPI, 2000	12	0-6	18	NA
19	EPI, 2000	19	0-6	18	NA
22	EPI, 2000	22	0-6	19	NA
17	EPI, 2000	17	0-6	20	NA
29	EPI, 2000	29	0-6	20	NA
243	EPI, 2000	243	0-6	**21**	NA
11	EPI, 2000	11	0-6	**21**	NA
156	EPI, 2000	156	0-6	**22**	NA
159	EPI, 2000	159	0-6	**22**	NA
57	EPI, 2000	57	0-6	**22**	NA
133	EPI, 2000	133	0-6	**22**	NA
58	EPI, 2000	58	0-6	**23**	NA
SS-10	7/14/22	SS-10:0.5	0-6	**23.1**	15.5
172	EPI, 2000	172	0-6	**24**	NA
21	EPI, 2000	21	0-6	**24**	NA
25	EPI, 2000	25	0-6	**26**	NA
23	EPI, 2000	23	0-6	**26**	NA
16	EPI, 2000	16	0-6	**27**	NA
245	EPI, 2000	245	0-6	**27**	NA
64	EPI, 2000	64	0-6	**27**	NA
154	EPI, 2000	154	0-6	**31**	NA
250	EPI, 2000	250	0-6	**34**	NA
14	EPI, 2000	14	0-6	**38**	NA
SS-03	7/13/22	SS-03:0.5	0-6	**43.3**	37.5
252	EPI, 2000	252	0-6	**44**	NA

Location	Sample Date	Sample ID	Depth (inches)	Arsenic (mg/kg)	Lead (mg/kg)
144	EPI, 2000	144	0-6	**45**	NA
254	EPI, 2000	254	0-6	**45**	NA
13	EPI, 2000	13	0-6	**46**	NA
80	EPI, 2000	80	0-6	**47**	NA
249	EPI, 2000	249	0-6	**49**	NA
253	EPI, 2000	253	0-6	**49**	NA
10	EPI, 2000	10	0-6	**50**	NA
255	EPI, 2000	255	0-6	**55**	NA
256	EPI, 2000	256	0-6	**58**	NA
247	EPI, 2000	247	0-6	**59**	NA
71	EPI, 2000	71	0-6	**61**	NA
248	EPI, 2000	248	0-6	**61**	NA
SS-07	7/13/22	SS-07:0.5	0-6	**63.9**	57.7
31	EPI, 2000	31	0-6	**64**	NA
30	EPI, 2000	30	0-6	**69**	NA
SS-09	7/14/22	SS-09:0.5	0-6	**70.3**	50.0
SS-08	7/14/22	SS-08:0.5	0-6	**71.3**	45.4
79	EPI, 2000	79	0-6	**74**	NA
28	EPI, 2000	28	0-6	**80**	NA
177	EPI, 2000	177	0-6	**80**	NA
140	EPI, 2000	140	0-6	**82**	NA
SS-05	7/13/22	SS-05:0.5	0-6	**86.9**	65.1
SS-04	7/13/22	f	0-6	**87.3**	64.8
257	EPI, 2000	257	0-6	**99**	NA
26	EPI, 2000	26	0-6	**100**	NA
246	EPI, 2000	246	0-6	**110**	NA
157	EPI, 2000	157	0-6	**120**	NA
24	EPI, 2000	24	0-6	**120**	NA
75	EPI, 2000	75	0-6	**130**	NA
27	EPI, 2000	27	0-6	**180**	NA
78	EPI, 2000	78	0-6	**180**	NA
SS-03	7/13/22	SS-03:1.5	12-18	**27.7**	35.0
SS-04	7/13/22	SS-04:2.0	18-24	3.62	3.52
SS-05	7/13/22	SS-05:2.0	18-24	11.9	14.5
SS-07	7/13/22	SS-07:2.0	18-24	9.61	9.16
SS-08	7/14/22	SS-08:2.0	18-24	16.6	17.5
SS-09	7/14/22	SS-09:2.0	18-24	6.13	6.97
SS-06	7/13/22	SS-06:1.0	6-12	2.31	2.86
SS-10	7/14/22	SS-10:1.0	6-12	3.88	3.71
SS-02	7/13/22	SS-02:1.0	6-12	3.70	4.62
SS-04	7/13/22	SS-04:1.0	6-12	12.6	6.33
SS-01	7/13/22	SS-01:1.0	6-12	9.2	9.09
SS-05	7/13/22	SS-05:1.0	6-12	15.2	11.5
SS-08	7/14/22	SS-08:1.0	6-12	**23.6**	14.0

Location	Sample Date	Sample ID	Depth (inches)	Arsenic (mg/kg)	Lead (mg/kg)
SS-09	7/14/22	SS-09:1.0	6-12	**22.9**	20.0
SS-07	7/13/22	SS-07:1.0	6-12	**57.7**	43.4
SS-03	7/13/22	SS-03:1.0	6-12	**43.5**	46.7
222	7/14/22	SS-14:0.5	0-6	4.34	6.67
233	7/14/22	SS-13:0.5	0-6	**21.0**	8.80
220	7/14/22	SS-11:0.5	0-6	**26.5**	13.0
103	7/14/22	SS-12:0.5	0-6	**109**	89.2
238	EPI, 2000	222	0-6	0.8	NA
221	EPI, 2000	233	0-6	0.8	NA
223	EPI, 2000	220	0-6	0.8	NA
219	EPI, 2000	103	0-6	0.9	NA
183	EPI, 2000	238	0-6	1.5	NA
SS-14	EPI, 2000	221	0-6	2.1	NA
239	EPI, 2000	223	0-6	2.1	NA
187	EPI, 2000	219	0-6	2.8	NA
189	EPI, 2000	183	0-6	3.3	NA
53	EPI, 2000	239	0-6	5	NA
52	EPI, 2000	187	0-6	6.6	NA
114	EPI, 2000	189	0-6	13	NA
113	EPI, 2000	53	0-6	14	NA
SS-13	EPI, 2000	52	0-6	16	NA
49	EPI, 2000	114	0-6	18	NA
50	EPI, 2000	113	0-6	20	NA
181	EPI, 2000	49	0-6	**22**	NA
188	EPI, 2000	50	0-6	**23**	NA
SS-11	EPI, 2000	181	0-6	**25**	NA
51	EPI, 2000	188	0-6	**26**	NA
182	EPI, 2000	51	0-6	**28**	NA
184	EPI, 2000	182	0-6	**31**	NA
186	EPI, 2000	184	0-6	**34**	NA
180	EPI, 2000	186	0-6	**45**	NA
120	EPI, 2000	180	0-6	**55**	NA
48	EPI, 2000	120	0-6	**62**	NA
SS-12	EPI, 2000	48	0-6	**74**	NA
54	EPI, 2000	54	0-6	**110**	NA
185	EPI, 2000	185	0-6	**130**	NA
SS-12	7/14/22	SS-12:1.5	12-18	11.9	6.19
SS-11	7/14/22	SS-11:1.0	6-12	7.54	7.93
SS-12	7/14/22	SS-12:1.0	6-12	**21.6**	6.17
SS-13	7/14/22	SS-13:1.0	6-12	6.08	4.54
SS-14	7/14/22	SS-14:1.0	6-12	5.15	8.51
SS-15	7/14/22	SS-15:1.0	6-12	2.34	3.87
SS-16	7/15/22	SS-16:1.0	6-12	19.0	15.5
SS-17	7/14/22	SS-17:1.0	6-12	19.9	21.0

Location	Sample Date	Sample ID	Depth (inches)	Arsenic (mg/kg)	Lead (mg/kg)
229	EPI, 2000	229	0-6	0.8	NA
100	EPI, 2000	100	0-6	0.8	NA
101	EPI, 2000	101	0-6	0.8	NA
225	EPI, 2000	225	0-6	0.8	NA
227	EPI, 2000	227	0-6	0.8	NA
98	EPI, 2000	98	0-6	0.8	NA
96	EPI, 2000	96	0-6	0.8	NA
95	EPI, 2000	95	0-6	0.8	NA
94	EPI, 2000	94	0-6	0.8	NA
93	EPI, 2000	93	0-6	0.8	NA
84	EPI, 2000	84	0-6	0.8	NA
83	EPI, 2000	83	0-6	0.8	NA
89	EPI, 2000	89	0-6	1.1	NA
87	EPI, 2000	87	0-6	1.4	NA
119	EPI, 2000	119	0-6	1.5	NA
86	EPI, 2000	86	0-6	1.7	NA
97	EPI, 2000	97	0-6	1.9	NA
99	EPI, 2000	99	0-6	2.4	NA
105	EPI, 2000	105	0-6	2.5	NA
226	EPI, 2000	226	0-6	2.5	NA
118	EPI, 2000	118	0-6	2.6	NA
123	EPI, 2000	123	0-6	2.8	NA
102	EPI, 2000	102	0-6	3	NA
218	EPI, 2000	218	0-6	3.1	NA
108	EPI, 2000	108	0-6	3.2	NA
124	EPI, 2000	124	0-6	3.5	NA
224	EPI, 2000	224	0-6	4	NA
104	EPI, 2000	104	0-6	4.1	NA
228	EPI, 2000	228	0-6	4.2	NA
110	EPI, 2000	110	0-6	4.4	NA
88	EPI, 2000	88	0-6	5.6	NA
107	EPI, 2000	107	0-6	5.7	NA
112	EPI, 2000	112	0-6	6.5	NA
122	EPI, 2000	122	0-6	6.7	NA
111	EPI, 2000	111	0-6	7.1	NA
115	EPI, 2000	115	0-6	7.2	NA
106	EPI, 2000	106	0-6	7.6	NA
117	EPI, 2000	117	0-6	8.4	NA
109	EPI, 2000	109	0-6	9.3	NA
116	EPI, 2000	116	0-6	12	NA
7	EPI, 2000	7	0-6	12	NA
55	EPI, 2000	55	0-6	12	NA
62	EPI, 2000	62	0-6	12	NA
85	EPI, 2000	85	0-6	13	NA

Location	Sample Date	Sample ID	Depth (inches)	Arsenic (mg/kg)	Lead (mg/kg)
8	EPI, 2000	8	0-6	14	NA
9	EPI, 2000	9	0-6	14	NA
56	EPI, 2000	56	0-6	17	NA
6	EPI, 2000	6	0-6	17	NA
47	EPI, 2000	47	0-6	17	NA
46	EPI, 2000	46	0-6	17	NA
3	EPI, 2000	3	0-6	18	NA
1	EPI, 2000	1	0-6	**26**	NA
42	EPI, 2000	42	0-6	**30**	NA
5	EPI, 2000	5	0-6	**33**	NA
4	EPI, 2000	4	0-6	**39**	NA
236	EPI, 2000	236	0-6	**48**	NA
230	EPI, 2000	230	0-6	**48**	NA
41	EPI, 2000	41	0-6	**52**	NA
234	EPI, 2000	234	0-6	**59**	NA
232	EPI, 2000	232	0-6	**66**	NA
235	EPI, 2000	235	0-6	**85**	NA
44	EPI, 2000	44	0-6	**140**	NA
237	EPI, 2000	237	0-6	**230**	NA
SS-29	7/14/22	SS-29:0.5	0-6	**26.3**	19.3
SS-27	7/14/22	SS-27:0.5	0-6	**28.4**	20.7
SS-20	7/14/22	SS-20:0.5	0-6	**41.1**	27.9
SS-24	7/14/22	SS-24:0.5	0-6	**43.2**	31.8
SS-31	7/15/22	SS-31:0.5	0-6	**22.7**	34.9
SS-30	7/15/22	SS-30:0.5	0-6	**43.8**	36.8
SS-28	7/14/22	SS-28:0.5	0-6	**47.0**	36.8
SS-19	7/15/22	SS-19:0.5	0-6	**48.0**	39.4
SS-18	7/14/22	SS-18:0.5	0-6	**61.0**	41.0
SS-22	7/14/22	SS-22:0.5	0-6	**58.4**	44.8
SS-23	7/15/22	SS-23:0.5	0-6	**126**	75.3
SS-25	7/14/22	SS-25:0.5	0-6	**102**	83.9
SS-26	7/14/22	SS-26:0.5	0-6	**122**	85.7
SS-21	7/14/22	SS-21:0.5	0-6	**300**	248
82	EPI, 2000	82	0-6	**41**	NA
34	EPI, 2000	34	0-6	**49**	NA
32	EPI, 2000	32	0-6	**50**	NA
39	EPI, 2000	39	0-6	**57**	NA
33	EPI, 2000	33	0-6	**91**	NA
35	EPI, 2000	35	0-6	**150**	NA
36	EPI, 2000	36	0-6	**150**	NA
SS-19	7/15/22	SS-19:2.0	18-24	**25.4**	10.8
SS-23	7/15/22	SS-23:2.0	18-24	16.6	10.7
SS-30	7/15/22	SS-30:2.0	18-24	8.44	7.13
SS-19	7/15/22	SS-19:1.0	6-12	**37.0**	18.2

Location	Sample Date	Sample ID	Depth (inches)	Arsenic (mg/kg)	Lead (mg/kg)
SS-23	7/15/22	SS-23:1.0	6-12	**74.4**	49.5
SS-30	7/15/22	SS-30:1.0	6-12	10.3	10.4
SS-31	7/15/22	SS-31:1.0	6-12	14.2	17.3
90	EPI, 2000	90	0-6	0.8	NA
91	EPI, 2000	91	0-6	0.8	NA
92	EPI, 2000	92	0-6	0.8	NA
190	EPI, 2000	190	0-6	0.8	NA
195	EPI, 2000	195	0-6	0.8	NA
208	EPI, 2000	208	0-6	0.8	NA
209	EPI, 2000	209	0-6	0.8	NA
211	EPI, 2000	211	0-6	0.8	NA
207	EPI, 2000	207	0-6	1.1	NA
198	EPI, 2000	198	0-6	2	NA
210	EPI, 2000	210	0-6	2.4	NA
201	EPI, 2000	201	0-6	3.2	NA
214	EPI, 2000	214	0-6	3.7	NA
72	EPI, 2000	72	0-6	11	NA
194	EPI, 2000	194	0-6	12	NA
206	EPI, 2000	206	0-6	12	NA
61	EPI, 2000	61	0-6	13	NA
45	EPI, 2000	45	0-6	14	NA
59	EPI, 2000	59	0-6	19	NA
217	EPI, 2000	217	0-6	**24**	NA
69	EPI, 2000	69	0-6	**28**	NA
68	EPI, 2000	68	0-6	**31**	NA
192	EPI, 2000	192	0-6	**32**	NA
2	EPI, 2000	2	0-6	**37**	NA
37	EPI, 2000	37	0-6	**37**	NA
216	EPI, 2000	216	0-6	**37**	NA
202	EPI, 2000	202	0-6	**38**	NA
191	EPI, 2000	191	0-6	**43**	NA
73	EPI, 2000	73	0-6	**48**	NA
193	EPI, 2000	193	0-6	**53**	NA
81	EPI, 2000	81	0-6	**54**	NA
204	EPI, 2000	204	0-6	**62**	NA
203	EPI, 2000	203	0-6	**64**	NA
196	EPI, 2000	196	0-6	**70**	NA
38	EPI, 2000	38	0-6	**75**	NA
212	EPI, 2000	212	0-6	**75**	NA
215	EPI, 2000	215	0-6	**77**	NA
40	EPI, 2000	40	0-6	**81**	NA
43	EPI, 2000	43	0-6	**86**	NA
199	EPI, 2000	199	0-6	**93**	NA
76	EPI, 2000	76	0-6	**99**	NA

Location	Sample Date	Sample ID	Depth (inches)	Arsenic (mg/kg)	Lead (mg/kg)
77	EPI, 2000	77	0-6	**100**	NA
197	EPI, 2000	197	0-6	**100**	NA
200	EPI, 2000	200	0-6	**100**	NA
60	EPI, 2000	60	0-6	**110**	NA
205	EPI, 2000	205	0-6	**110**	NA
231	EPI, 2000	231	0-6	**110**	NA
66	EPI, 2000	66	0-6	**170**	NA
67	EPI, 2000	67	0-6	**170**	NA
74	EPI, 2000	74	0-6	**220**	NA
213	EPI, 2000	213	0-6	**220**	NA
SS-32	7/15/22	SS-32:2.0	18-24	**29.1**	22.1
SS-33	7/15/22	SS-33:2.0	18-24	**27.4**	57.7
SS-34	7/15/22	SS-34:2.0	18-24	8.45	8.91
SS-35	7/15/22	SS-35:2.0	18-24	**21.1**	30.8
SS-32	7/15/22	SS-32:3.0	24-36	14.9	5.0
SS-33	7/15/22	SS-33:3.0	24-36	14.2	33.7
SS-34	7/15/22	SS-34:3.0	24-36	8.45	4.02
SS-35	7/15/22	SS-35:3.0	24-36	18.1	26.6
SS-32	7/15/22	SS-32:1.0	6-12	**158**	91.5
SS-33	7/15/22	SS-33:1.0	6-12	**41.9**	71.1
SS-34	7/15/22	SS-34:1.0	6-12	**40.6**	25.0
SS-35	7/15/22	SS-35:1.0	6-12	**23.7**	27.4

Bold values represent concentrations above the MTCA Method A cleanup level for unrestricted land use.

Bold red values represent concentrations that are twice the MTCA Method A cleanup level for unrestricted land use.

NA – not analyzed.