

CSID 1944

## SITE HAZARD ASSESSMENT

### WORKSHEET 1

#### Summary Score Sheet

#### **SITE INFORMATION:**

##### **Boeing Isaacson Property**

8625 E. Marginal Way South  
Tukwila, King County, WA 98108

Section/Township/Range: Sec 33/T24N/R04E

Latitude: 47° 31' 29.75" Longitude: 122° 18' 12.11"

Ecology Facility Site ID No.: ~~1138721~~ - FSID 2218

*Site scored/ranked for the August 20, 2008 update*

July 31, 2008 (Minor edit made 08/15/08, did not affect pathway scores or site ranking)

#### **Background/Site Description**

The Boeing Isaacson Property (BIP) site is a 9.7-acre industrial property located at 8625 East Marginal Way South, Tukwila, King County, Washington. The property is bounded to the north by the Jorgensen Forge/Steel Company property, to the east by a major boulevard (East Marginal Way South), to the south by the (Boeing) Thompson Building, and to the west by the Lower Duwamish Waterway (LDW) at approximate river mile 3.7 – 3.8. It is situated in an area of extensive dredge and fill activities which occurred during the re-channeling of the Duwamish Waterway in the early 1900's. A portion of the former river channel formed Slip 5 near the southern limits of the site. Development surrounding the site vicinity historically was primarily industrial; and it is now becoming more "mixed-use" with residential, park, marina and other such public use.

The Bissell Lumber Company (BLC) operated a lumber mill south of Slip 5 from at least 1929 until 1949. In 1941, the U.S. Navy began construction and operation of a steel melting, forging, and fabricating facility at the site. In the 1950's, the Isaacson Steel Company acquired the U.S. Navy property and enlarged it throughout the 1950's - 60's, presumably incorporating the area previously used by BLC. Portions of Slip 5 were filled with dredge materials (consisting of silty sands with significant amounts of slag, fire bricks, and miscellaneous construction materials) from 1935 through the mid-1960's as industrial operations on the property expanded.

The Boeing Company purchased the Isaacson Property in 1984 as part of a plan to expand the Thompson Building. Due diligence activities resulted in a number of environmental investigations and interim remedial activities in the mid- to late-1980's.

#### **Environmental Investigations/Sampling**

Environmental investigations and remedial actions to address elevated concentrations of arsenic in site soils and groundwater were conducted at the site during 1983–1991. Dames and Moore (Boeing's

consultant) and Wicks (Isaacson's consultant) conducted site investigations in 1983 which documented elevated arsenic concentrations in both soil and groundwater samples in several areas of the site. Initial areas of study included collection of soil, groundwater, sludge, and slag samples near the former Isaacson Building Bays 11 and 14. The occurrence of slag at the site adds concern that other metals may be present as potential chemicals of concern (COCs).

Isaacson excavated and removed approximately 500 cubic yards of arsenic-contaminated soils in 1983, after which Ecology issued a conditional no further action (NFA) determination for the site, with an attached deed restriction and groundwater monitoring requirement as a precondition.

In 1984, Boeing purchased the site property to construct additional office and manufacturing facility space. Results of groundwater monitoring completed during 1985 – 1987 by Boeing consultant, Landau Associates (Landau) preliminarily indicated that the site was unlikely to contribute significant arsenic to cause exceedance of the chronic water quality criterion in the Duwamish Waterway.

In 1988, Landau collected additional soil samples through borings at 44 locations, eight of which were completed as monitoring wells, on the site prior to the Isaacson building demolition and new Boeing construction. Arsenic was detected in soil samples, at depths of up to 15 feet, at concentrations in excess of 1,000 milligrams/kilogram (mg/kg, or ppm). This was significantly in excess of the Model Toxics Control Act (MTCA) Method A Soil Cleanup Level for Industrial Properties for arsenic at that time of 200 ppm (it is currently a tenth *less* at 20 ppm). The majority of the arsenic exceedances occurred at depths between 4 to 12 feet along an east-west transect near the northern portion of the site. Arsenic in groundwater has been detected in several monitoring wells at concentrations greater than its applicable MTCA Method A cleanup level for groundwater.

This resulted in 4,800 cubic yards of soils being excavated from areas on the site identified as the Courtyard and Bay 13. Over 3,000 cubic yards of the excavated soil, with arsenic concentrations ranging from 400 to 5,000 ppm, were transported offsite to Arlington, OR. The remaining soils, where the arsenic levels were determined by sampling to be acceptable, were returned to the site.

Boeing conducted extensive soil sampling from over 90 test pits in late 1989/early 1990 which identified large quantities of arsenic-contaminated soil that were still present at the site. Based on subsequent investigation work by Landau and Parametrix, there was an estimated 20,000 to 40,000 cubic yards of soil warranting remediation. Between August and November 1991 approximately 35,000 tons (22,750 cubic yards) of soil were excavated and treated on site using a chemical and physical stabilization process, and placed back in the ground beneath a polyethylene cap and asphalt cover.

Extensive sidewall sampling was conducted throughout the excavation process, and showed arsenic soil concentrations in excess of the 200 ppm standard, in effect at that time, remained along the north wall of the remedial excavation, ranging from 200 up to approximately 2,000 ppm. Further soil removal would have compromised the integrity of the existing storm drain line and institutional controls were put in place to prohibit access to this area of the site.

All treated soils were placed back into excavated areas, compacted, and capped with a polyethylene liner and asphalt cap. The cap was extended to cover all remaining areas of the site not covered by buildings.

COCs associated with the BIP site documented in soil and/or groundwater samples during these studies (based on their respective MTCA Method A Cleanup levels and/or Sediment Management Standards) include: arsenic in soil and groundwater; and lead, silver, and zinc in groundwater.

The site was listed on the Ecology Confirmed and Suspected Contaminated Sites List with an entry date of April 6, 2000, into the Voluntary Cleanup Program. Following issue of an Ecology Opinion Letter and subsequent lack of satisfactory progress this status was rescinded in October 2007. The site then was given a site status of Awaiting Site Hazard Assessment (SHA). An SHA site visit was made on July 1, 2008, to confirm environmental features of the site regarding containment features such as paving and buildings.

**SPECIAL CONSIDERATIONS (include limitations in site file data or data which cannot be accommodated in the model, but which are important in evaluating the risk associated with the site, or any other factor(s) over-riding a decision of no further action for the site):**

In scoring this site under the Washington Ranking Method (WARM) guidelines, the maximum scoring value will be given for containment in the surface route, although the vast majority of the site is covered by pavement, asphalt, and buildings. This is based on the apparent hydraulic connection of contaminated groundwater under the site and the LDW, based on sediments of adjacent site properties being contaminated with COCs associated with upland soil and groundwater contamination.

The air route will not be scored as the documented contamination would be scored through the particulate pathway, and the significant amount of contaminated soils at the site is greater than two feet depth.

**ROUTE SCORES:**

Surface Water/Human Health:	<u>30.5</u>	Surface Water/Environmental.:	<u>62.0</u>
Air/Human Health:	<u>NS</u>	Air/Environmental:	<u>NS</u>
Groundwater/Human Health:	<u>17.9</u>		

**OVERALL RANK: 2**

WORKSHEET 2  
Route Documentation

1. **SURFACE WATER ROUTE**

- a. List those substances to be considered for scoring: Source: 1-3  
Arsenic, lead, silver and zinc
- b. Explain basis for choice of substance(s) to be used in scoring.  
These substances were detected on-site in either surface/subsurface soil and/or groundwater samples in significant concentrations with respect to their MTCA Method A Cleanup Levels and are potentially available to this route of concern.
- c. List those management units to be considered for scoring: Source 1-3,5  
Surface and subsurface soils and groundwater.
- d. Explain basis for choice of unit to be used in scoring:  
The contaminating substances were detected on-site in either surface or subsurface soil and groundwater samples in significant concentrations.

2. **GROUNDWATER ROUTE**

- a. List those substances to be considered for scoring: Source: 1-3  
Arsenic, lead, silver, zinc
- b. Explain basis for choice of substance(s) to be used in scoring:  
These substances were detected on-site in either surface/subsurface soil and/or groundwater samples in significant concentrations with respect to their MTCA Method A Cleanup Levels and are potentially available to this route of concern.
- c. List those management units to be considered for scoring: Source: 1-3,5  
Surface and subsurface soils and groundwater.
- d. Explain basis for choice of unit to be used in scoring:  
The contaminating substances were detected on-site in surface or subsurface soil and groundwater samples in significant concentrations.

WORKSHEET 4  
Surface Water Route

**1.0 SUBSTANCE CHARACTERISTICS**

<b>1.1 Human Toxicity</b>										
Substance		Drinking Water Standard (µg/L)	Value	Acute Toxicity (mg/ kg-bw)	Value	Chronic Toxicity (mg/kg/day)	Value	Carcinogenicity		Value
								WOE	PF*	
1	Arsenic	10	8	763 (rat)	5	0.001 (RfD)	5	A=1	1.75 = 7	7
2	Lead	15	6	ND	-	0.001 (NOAEL)	10	ND	ND	-
3	Silver	100	6	ND	-	0.003	3	ND	ND	-
4	Zinc	4000	2	ND	-	0.2	1	ND	ND	-

\* Potency Factor

Source: 1-3,5

**Highest Value: 10**  
(Max = 10)

**Plus 2 Bonus Points? 2**

**Final Toxicity Value: 12**  
(Max = 12)

<b>1.2 Environmental Toxicity ( ) Freshwater (X) Marine</b>					
Substance		Acute Water Quality Criteria		Non-Human Mammalian Acute Toxicity	
		(µg/L)	Value	(mg/kg)	Value
1	Arsenic	69	6	-	-
2	Lead	300	4	-	-
3	Silver	2.9	8		
4	Zinc	10	6	-	-

Source: 1-3,5

**Highest Value: 8**  
(Max = 10)

<b>1.3 Substance Quantity</b>	
Explain Basis: Unknown, use default value = 1	Source: <u>1,6</u> <b>Value: 1</b> (Max = 10)

## 2.0 MIGRATION POTENTIAL

		Source	Value
	<b>Containment:</b> Maximum value of 10 points scored.		
2.1	<b>Explain basis:</b> Site is adjacent, and most likely hydraulically connected, to surface water as shown by adjacent sediments being contaminated with COCs associated with upland soil and groundwater contaminants in adjacent properties.	1-4,6	<u>10</u> (Max = 10)
2.2	<b>Surface Soil Permeability:</b> Piped to, adjacent to surface water	1-3	<u>7</u> (Max = 7)
2.3	<b>Total Annual Precipitation:</b> 34.8"	7	<u>3</u> (Max = 5)
2.4	<b>Max 2yr/24hr Precipitation:</b> 2.0" – 2.5"	6	<u>3</u> (Max = 5)
2.5	<b>Flood Plain:</b> Not in flood plain	1-4	<u>0</u> (Max = 2)
2.6	<b>Terrain Slope:</b> Ditched/piped/culverted (stormwater drains) = 3	1-4	<u>3</u> (Max = 5)

## 3.0 TARGETS

		Source	Value
3.1	<b>Distance to Surface Water:</b> <1000 feet (adjacent to site)	4,10	<u>10</u> (Max = 10)
3.2	<b>Population Served within 2 miles (see WARM Scoring Manual Regarding Direction):</b> 0	8,9	<u>0</u> (Max = 75)
3.3	<b>Area Irrigated by surface water within 2 miles :</b> $(0.75) * \sqrt{\# \text{ acres}} = 0.75 * \sqrt{0} = 0$	8,9	<u>0</u> (Max = 30)
3.4	<b>Distance to Nearest Fishery Resource:</b> <1000 feet (adjacent to site)	4,10	<u>12</u> (Max = 12)
3.5	<b>Distance to, and Name(s) of, Nearest Sensitive Environment(s):</b> fishery resource, <1000 feet	4,10	<u>12</u> (Max = 12)

## 4.0 RELEASE

<b>Explain Basis:</b> No sediment data documenting contamination by site COCs.	Source: 1-3 <b>Value: 0</b> (Max = 5)
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**WORKSHEET 6**  
Groundwater Route

**1.0 SUBSTANCE CHARACTERISTICS**

<b>1.1 Human Toxicity</b>										
Substance		Drinking Water Standard (µg/L)	Value	Acute Toxicity (mg/ kg-bw)	Value	Chronic Toxicity (mg/kg/day)	Value	Carcinogenicity		Value
								WOE	PF*	
1	Arsenic	10	8	763	5	0.001 (RfD)	5	A=1	1.75 = 7	7
2	Lead	15	6	ND	-	0.001 (NOAEL)	10	ND	ND	-
3	Silver	100	6	ND	-	0.003	5	ND	ND	-
4	Zinc	4000	2	ND	-	0.2	3	ND	ND	-

\* Potency Factor

Source: 1-3,5

**Highest Value: 10**

(Max = 10)

**Plus 2 Bonus Points? 2**

**Final Toxicity Value: 12**

(Max = 12)

<b>1.2 Mobility (use numbers to refer to above listed substances)</b>	
Cations/Anions [Coefficient of Aqueous Migration (K)]	OR Solubility (mg/L)
1= K > 1.0 = 3	1=
2= K is 0.1 to 1.0 = 2	2=
3= K > 1.0 = 3	3=
4= K > 1.0 = 3	4=

Source: 1-3,6

**Value: 3**

(Max = 3)

<b>1.3 Substance Quantity:</b>	
Explain basis: : Unknown, use default value = 1	Source: <u>1-3,6</u> <b>Value: 1</b> (Max=10)

**2.0 MIGRATION POTENTIAL**

		Source	Value
2.1	<b>Containment (explain basis):</b> Contaminated area capped, scored as a landfill: i) liner present (1); ii) Low permeability cover (1); No leachate collection system (2)	1-4,6	<u>4</u> (Max = 10)
2.2	<b>Net precipitation:</b> 24.6" - 5.9" = 18.7"	7	<u>2</u> (Max = 5)
2.3	<b>Subsurface hydraulic conductivity:</b> Silty sands/sandy gravels	1-3	<u>3</u> (Max = 4)
2.4	<b>Vertical depth to groundwater:</b> Obs. release to groundwater = 0'	1-3	<u>8</u> (Max = 8)

**1.0 TARGETS**

		Source	Value
3.1	<b>Groundwater usage:</b> Groundwater not used, but usable	8,9	<u>2</u> (Max = 10)
3.2	<b>Distance to nearest drinking water well:</b> >10,000 feet	8,9	<u>0</u> (Max = 5)
3.3	<b>Population served within 2 miles:</b> √ 0	8,9	<u>0</u> (Max = 100)
3.4	<b>Area irrigated by (groundwater) wells within 2 miles:</b> (0.75)*√0 acres = 0	8,9	<u>0</u> (Max = 50)

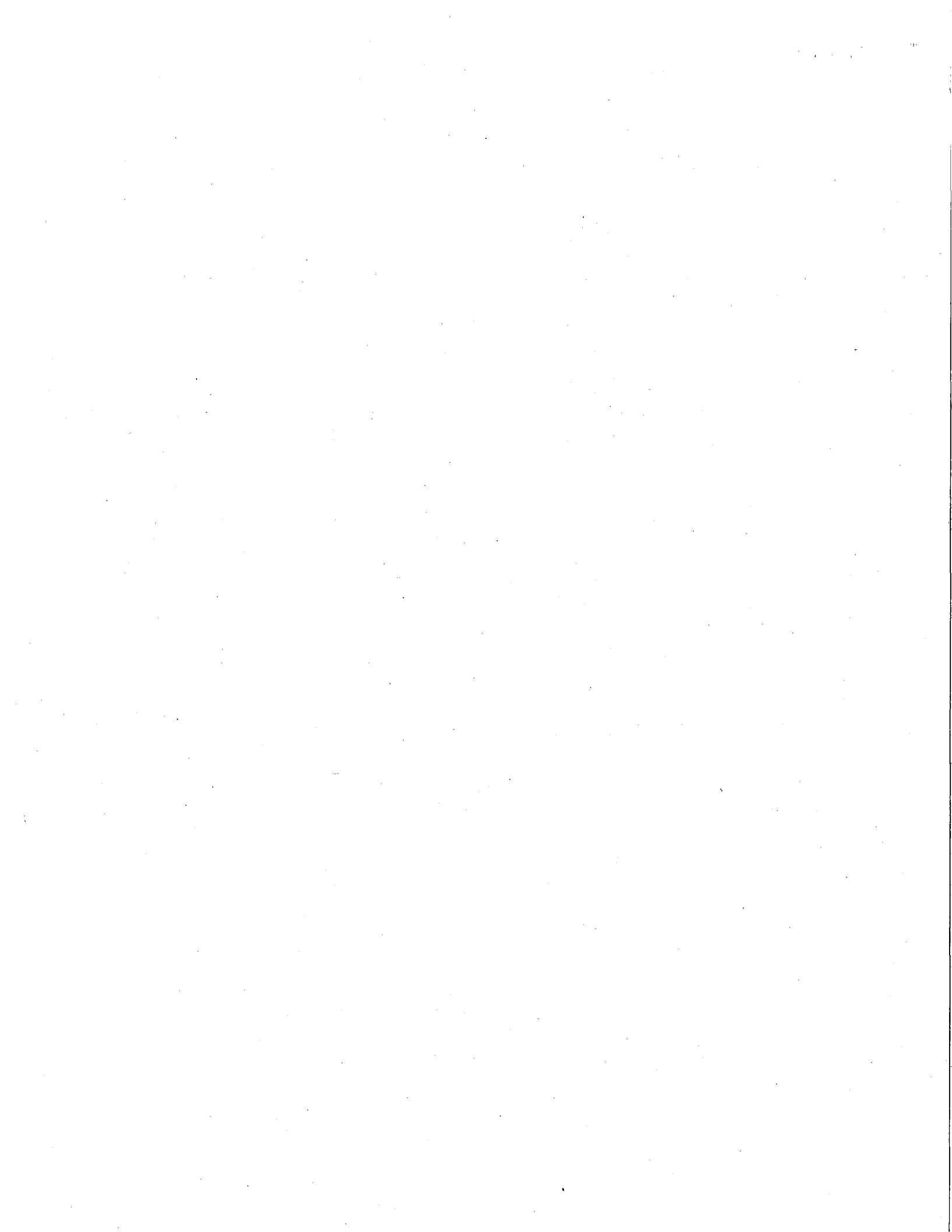
**2.0 RELEASE**

		Source	Value
	<b>Explain basis for scoring a release to groundwater:</b> Confirmed by presence of several contaminants in groundwater.	1-3	<u>5</u> (Max = 5)



## SOURCES USED IN SCORING

1. Conceptual Proposal for No Further Action Determination at the Boeing Isaacson Property, Environmental Resources Management, April 2000.
2. Comprehensive Data Summary Report, Boeing Isaacson Site, Environmental Resources Management, August, 2002
3. Lower Duwamish Waterway Early Action Area 6, Draft Summary of Existing Information and Identification of Data Gaps, Science Applications International Corporation, February 2008.
4. SHA Site Visit, Michael Spencer, Maura O'Brien, WA Ecology, July 1, 2008.
5. Washington State Department of Ecology, Toxicology Database for Use in Washington Ranking Method Scoring, January 1992
6. Washington State Department of Ecology, WARM Scoring Manual, April 1992.
7. Washington Climate – Net Rainfall Table
8. Washington State Department of Ecology, Water Rights Application System (WRATS) printout for two-mile radius of site.
9. Washington Department of Health, Sentry Internet Database printout for public water supplies.
10. U.S.G.S. Topo map for site area.
11. Lanau Associates, March 11, 2008, Tables 1 and 3 – Groundwater Arsenic Analytical Data, Boeing Isaacson, from Kathryn Lewis, Boeing Environmental Affairs, letter communication dated March 10, 2008.



CSID 1944

**SITE HAZARD ASSESSMENT**  
**WORKSHEET 1**  
**Summary Score Sheet**

**SITE INFORMATION:**

**Boeing Isaacson Thompson**  
8541 E. Marginal Way South  
Tukwila, King County, WA 98108

Section/Township/Range: Sec 33/T24N/R04E  
Latitude: 47° 31' 25.56" Longitude: 122° 18' 10.44"

Ecology Facility Site ID No.: 2218

*Site scored/ranked for the August 20, 2008 update*  
July 31, 2008

**Background/Site Description**

The Boeing Isaacson Thompson (BIT) site is a 19.35-acre industrial property located at 8541 East Marginal Way South in the City of Tukwila, King County, Washington. The property is bounded to the north by the Boeing Isaacson Property site, to the east by a major boulevard (East Marginal Way South), to the south by the Insurance Auto Auctions Inc site (aka the former PACCAR/Kenworth Truck site), and to the west by the Lower Duwamish Waterway (LDW) at approximate river mile 3.8 – 3.9. The nearshore sediments area of the LDW in this vicinity is termed the Early Action Area 6 (EAA 6). The BIT site is situated in an area of extensive dredge and fill activities which occurred during the re-channeling of the Duwamish Waterway in the early 1900's. A portion of the former river channel formed Slip 5 on the northern portion of the site. Development surrounding the site vicinity historically was primarily industrial; and now it is becoming more "mixed-use" with residential, park, marina and other such public use.

The Bissell Lumber Company (BLC) operated a lumber mill south of Slip 5 from at least 1929 until 1949. In 1941, the U.S. Navy began construction and operation of a steel melting, forging, and fabricating facility at the site. In the 1950's, the Isaacson Steel Company acquired the U.S. Navy property and enlarged it throughout the 1950's – 60's, presumably incorporating the area previously used by BLC. Portions of Slip 5 were filled with dredge materials (consisting of silty sands with significant amounts of slag, fire bricks, and miscellaneous construction materials) from 1935 through the mid-1960's as industrial operations on the property expanded.

**Environmental Investigations/Sampling**

The Boeing Company purchased the Isaacson Property in 1984 as part of a plan to expand the Thompson Building. Due diligence activities resulted in a number of environmental investigations and interim remedial activities in the mid- to late-1980's. Although extensive soil remediation has been conducted at this and the adjacent Boeing Isaacson Property site to the north, according to the

February 2008 SAIC report on data gaps in the LDW EAA 6, arsenic-contaminated soils remain, and groundwater contamination by arsenic has been confirmed in several monitoring wells. Arsenic has been detected at concentrations above Sediment Quality Standard (SQS) and Cleanup Screening Level (CSL) values in EEA-6 sediments. The BIT site is considered a potential ongoing source of sediment recontamination. The chemical of concern (COC) associated with the BIT site documented in both soil and groundwater samples (based on its MTCA Method A and B Cleanup levels) is arsenic. The estimated source of the arsenic is the former site and slip 5 filling with slag. The occurrence of slag at the site adds the potential for other metals to be present as COCs at this site.

The site was listed on the Washington Department of Ecology (Ecology) Confirmed and Suspected Contaminated Sites List with an effective entry date of March 1, 1988, and a site status of Awaiting Site Hazard Assessment (SHA). A site drive-by visit was made on July 1, 2008, to confirm environmental features of the site regarding containment features such as paving and buildings.

**SPECIAL CONSIDERATIONS (include limitations in site file data or data which cannot be accommodated in the model, but which are important in evaluating the risk associated with the site, or any other factor(s) over-riding a decision of no further action for the site):**

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The air route will not be scored as the documented contamination would be scored through the particulate pathway, and the significant amount of contaminated soils at the site is greater than two feet depth.

**ROUTE SCORES:**

Surface Water/Human Health:	<u>28.2</u>	Surface Water/Environmental.:	<u>56.3</u>
Air/Human Health:	<u>NS</u>	Air/Environmental:	<u>NS</u>
Groundwater/Human Health:	<u>19.4</u>		

**OVERALL RANK:** 2