

SITE HAZARD ASSESSMENT

Worksheet 1

Summary Score Sheet

SITE INFORMATION:

Blaser Die Casting Co

5700 3rd Ave S

Seattle, King County, WA 98108

Cleanup Site ID: 1588

Facility/Site ID: 7118747

Section: 20

Latitude: 47.55165

Township: 24N

Longitude: -122.33048

Range: 4E

Tax/Parcel ID: 1722801495

Site scored/ranked for the Hazardous Sites List Publication: August 2015

SITE DESCRIPTION:

The Blaser Die Casting Co site (Site) is a former die casting business located in Seattle, King County, Washington. The 0.89-acre property is located approximately 2,100 feet from the Lower Duwamish Waterway (LDW), and zoned for industrial (IG2 U/85) use.

Adjacent properties include Capital Industries, a metal fabrication business, to the south, office buildings and single family residences to the west and north, and Seattle Design Center to the east of the Site.

The Site is currently operated as a leased property by Orcas Foley LLC.

Former Site uses include melting and pouring zinc into molds. Machine oil was used for lubrication of machinery at the Site. The building on the property is currently leased, and is not operated by Blaser Die Casting.

This Site is one of four subsites of the West of Fourth cleanup site (Cleanup Site ID [CSID] 12260), listed for commingled groundwater plumes in the Georgetown area of Seattle. The three other subsites are Capital Industries Inc (CSID 4527/FSID 11598755, 5801 3rd Avenue South, tax parcels 1722801620 and 1722802255), Burlington Environmental LLC Georgetown (CSID 2622/FSID 47779679, 734 South Lucile Street, tax parcels 5084400124 and 1722800206), and Art Brass Plating Inc Seattle (CSID 3548/FSID 88531932, 5516 3rd Avenue South, tax parcel 5263300240). In the West of Fourth documents, the Burlington Environmental LLC Georgetown site is also referred to by an alternate name, Philip Services Corporation (PSC). Separate remedial investigations were conducted at each subsite, however all four sites are now undergoing cleanup under one agreed order. Locations of all four sites are shown on the attached map for CSID 12260.

SITE BACKGROUND:

A summary of prior operations/tenants at the subject property is presented below.

<u>From</u>	<u>To</u>	<u>Operator/Tenant</u>	<u>Activity</u>
	1996	Scougal Rubber Corporation	
1996	2014	Orcas Foley LLC	Blaser Tool and Mold Co.

SITE CONTAMINATION:

In 2005 the Blaser Die Casting Co site was reported to Washington State Department of Ecology (Ecology) and placed on the CSCSL list with ID number 1588.

Remedial Investigation (RI) activities have been ongoing at the PSC site (CSID 2622) since 1988, to characterize the extent of solvent impacted media, and the investigation extended to surrounding properties. In 2002, soil, air, and groundwater sampling was conducted at the BDC property. A groundwater sample collected near the southwest corner of the Blaser Die Casting building reportedly contained concentrations of trichloroethylene (TCE) and vinyl chloride above the Method B screening levels used in the PSC RI. Potential contaminants of concern at the BDC site are TCE, cis-1,2-dichloroethylene (cis-1,2-DCE), trans-1,2-dichloroethylene (trans-1,2-DCE), 1,1-dichloroethylene (1,1-DCE), vinyl chloride, tetrachloroethylene (PCE), 1,4-dioxane, iron, and manganese.

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In 2003, vapor intrusion mitigation was performed at residences located adjacent to the Site. Either sub-slab membrane systems, or hybrid sub-slab membrane and depressurization systems were installed at four neighboring sites.

A potential source of impacted soil was identified near Blaser Die Casting, beneath the southwest corner of the onsite building. Further information regarding the source of this soil was not available for review. Analytical results from indoor air samples collected on the Blaser property identified concentrations of TCE above the MTCA Method B cleanup level. Site groundwater in this area contained concentrations of TCE, cis-1,2-DCE, and vinyl chloride above the MTCA Method A cleanup levels.

In 2008, a sub-slab depressurization system was installed at the Site. Follow-up testing as of December 2014 indicates that the system is functioning properly.

PAST REMEDIATION ACTIVITIES:

In 2008, approximately 1,200 tons of impacted soil and 7,250 gallons of impacted groundwater were removed from beneath the southwest corner of the Blaser Die Casting building. Excavation reportedly continued until confirmation samples indicated that soil with detections of TCE, 1,1-dichloroethene, cis-1,2-dichloroethene, trans-1,2-dichloroethene, vinyl chloride, and PCE above the MTCA Method B cleanup levels had been removed, or where utility lines prevented further excavation. The excavation was approximately 8 feet deep.

After excavation, TCE was reportedly detected in soil samples collected from the excavation at concentrations above the MTCA Method A cleanup level. A passive vapor control system was installed in the excavation. Cis-1,2-DCE and PCE were detected in shallow (3 to 9 feet bgs) soil samples collected south of Mead Street at concentrations above the MTCA Method A cleanup levels. TCE, 1,4-dioxane, vinyl chloride, iron, manganese, and PCE have been detected in groundwater at the site at concentrations above their respective MTCA Method A cleanup levels, though some of these impacts are expected to be the result of migration from upgradient areas of the West of 4th Site.

A RI was conducted at the site under enforcement order DE #5479, and was conditionally approved by Ecology in 2012.

CURRENT SITE CONDITIONS:

TCE, 1,4-dioxane, cis-1,2-DCE, vinyl chloride, iron, manganese, and PCE are present in Site groundwater. TCE-impacted soil may be present at the BDC property, however vapor intrusion is not expected to be an issue at the Site due to installation of the sub-slab depressurization system.

The approximate depth to groundwater is 10 feet below ground surface, with groundwater flowing to the southwest (based on area groundwater elevations and surface topography). Subsurface soils are expected to be sand and silt (based on soil borings).

SPECIAL CONSIDERATIONS:

Checked boxes indicate routes applicable for Washington Ranking Method (WARM) scoring

☒ **Surface Water**

Release is expected to have occurred to subsurface soils, however groundwater at the Site has been documented to have interaction with surface water in the LDW.

☒ **Air**

Site groundwater contains concentrations of VOCs above their respective MTCA Method A cleanup levels, and has the potential be transported via the air route. Mitigation measures implemented at the Site are expected to decrease the likelihood of vapor intrusion via the air route.

☒ **Groundwater**

Site groundwater contains concentrations of VOCs above their respective MTCA Method A cleanup levels.

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Summary Score Sheet

This Site is part of the larger West of Fourth site (CSID 12260) which includes multiple areas of groundwater affected by solvents, including potentially commingled plumes.

ROUTE SCORES:

Surface Water/ Human Health:	17.3	Surface Water/ Environment:	21.2
Air/ Human Health:	4.0	Air/ Environment:	1.0
Groundwater/ Human Health:	35.1		

Overall Rank: 5

REFERENCES:

- 1 Ecology and Environment, Inc., 2009, Lower Duwamish Waterway River Mile 1.2-1.7 East (Saint Gobain to Glacier Northwest) Summary of Existing Information and Identification of Data Gaps Final Report. Prepared for Washington Department of Ecology. February 2009.
 - 2 King County GIS Center iMAP application, Property Information, Groundwater Program, and Sensitive Areas mapsets. Accessed December 2014.
<http://www.kingcounty.gov/operations/GIS/Maps/iMAP.aspx>
 - 3 Missouri Census Data Center, Circular Area Profiles - 2010 census data around a point location. <http://mcdc.missouri.edu/websas/caps10c.html>. Accessed December 2014.
 - 4 National Climatic Data Center 2011 Local Climatological Data for Seattle, Seattle Tacoma Airport. <http://www1.ncdc.noaa.gov/pub/orders/IPS-90B1F39F-6CFA-4A6B-AA82-5ED1FF897CCC.pdf>
 - 5 Pacific Groundwater Group, 2008, Blaser Office Post-Mitigation Plan 5700 3rd Avenue South, Seattle, Washington. May 29, 2008.
 - 6 Pacific Groundwater Group, 2009, Letter Re: 128 South Mead Street, Revised Indoor Air Sampling, Winter 2008/2009. February 27, 2009.
 - 7 Pacific Groundwater Group, 2012, Blaser Die Casting Revised Remedial Investigation Report. Prepared for Blaser Die Casting. August 2, 2012.
 - 8 Pacific Groundwater Group, 2014, Letter Re: Progress Report for July through September 2014 (Q3) Blaser Die Casting, Seattle, WA. December 19, 2014.
 - 9 WARM Scoring Manual
 - 10 WARM Toxicological Database
 - 11 Washington Department of Transportation 24-hour Isopleth Maps, January 2006 update.
<http://www.wsdot.wa.gov/publications/fulltext/Hydraulics/Wa24hrIsoplethMaps.pdf>
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SITE HAZARD ASSESSMENT

Worksheet 2

Route Documentation

Cleanup Site ID: 1588

Blaser Die Casting Co

Facility/Site ID: 7118747

1. SURFACE WATER ROUTE

List those substances to be considered for scoring:

TCE, 1,4-dioxane, vinyl chloride, PCE, and cis-1,2-DCE

Explain the basis for choice of substances to be used in scoring:

Prior detection in Site groundwater at concentrations above the MTCA Method A cleanup levels

List those management units to be considered for scoring:

Surface water (LDW)

Explain basis for choice of unit to be used in scoring:

Potential for impacted groundwater to discharge to surface water

2. AIR ROUTE

List those substances to be considered for scoring:

TCE, 1,4-dioxane, vinyl chloride, PCE, and cis-1,2-DCE

Explain the basis for choice of substances to be used in scoring:

Prior detection in Site groundwater at concentrations above the MTCA Method A cleanup levels

List those management units to be considered for scoring:

Vapor

Explain basis for choice of unit to be used in scoring:

Potential for vapor transport

3. GROUNDWATER ROUTE

List those substances to be considered for scoring:

TCE, 1,4-dioxane, vinyl chloride, PCE, and cis-1,2-DCE

Explain the basis for choice of substances to be used in scoring:

Prior detection in Site groundwater at concentrations above the MTCA Method A cleanup levels

List those management units to be considered for scoring:

Groundwater

Explain basis for choice of unit to be used in scoring:

Presence in Site groundwater

Worksheet 4
Surface Water Route

CSID: 1588

Site Name: Blaser Die Casting Co

1.0 Substance Characteristics

1.1 Human Toxicity

Substance	Drinking Water Standard Value	Acute Toxicity Value	Chronic Toxicity Value	Carcinogenicity Value
Tetrachloroethylene	8	5	3	4
Trichloroethylene	8	3	X	4
Vinyl Chloride	8	5	X	7
1,4-dioxane	X	1	X	4
Cis-1,2-dichloroethylene	6	X	3	X

Highest Value 8

Bonus Points? 2

Human Health Toxicity Value

1.2 Environmental Toxicity

Substance	Acute Water Quality Criteria		Non-human Mammalian Acute Toxicity	
	ug/L	Value	mg/kg	Value
Tetrachloroethylene	10200	2	800	5
Trichloroethylene	2000	2	2402	3
Vinyl Chloride	X	X	500	5
1,4-dioxane	X	X	5700	1
Cis-1,2-dichloroethylene	224000	2	X	X

Environmental Toxicity Value

1.3 Substance Quantity

Amount: Approximately 450 square feet

Basis: Estimated extent of impacted soil

Substance Quantity Value

2.0 Migration Potential

2.1 Containment

Containment Value

Explain Basis: Impacted groundwater is suspected to discharge to the LDW

2.2 Surface Soil Permeability

Soil Permeability Value

Sand and silt

2.3 Total Annual Precipitation

Total Precipitation Value

37 inches

2.4 Max 2-yr/24-hour Precipitation

2YR/24HR Precipitation Value

2.4 inches

2.5 Floodplain

Floodplain Value

Not in a floodplain

2.6 Terrain Slope

Slope Value

<2% slope

Worksheet 4
Surface Water Route

CSID: 1588

Site Name: Blaser Die Casting Co

3.0 Targets

3.1 Distance to Surface Water

2,100 feet to the LDW

Surface Water Distance Value

3.2 Population Served within 2 miles

people

Population Value

3.3 Area Irrigated within 2 miles

acres

Irrigation Value

3.4 Distance to Nearest Fishery Resource

2,100 feet to the Lower Duwamish Waterway

Fishery Value

3.5 Distance to and Name of Nearest Sensitive Environment

2,100 feet to the Lower Duwamish Waterway

Sensitive Environment Value

4.0 Release

Explain basis for scoring a release to surface water

No confirmed release to surface water

Release to Surface Water Value

Pathway Scoring - Surface Water Route, Human Health Pathway

$$SW_H = (SUB_{SH} * 40/175) * [(MIG_S * 25/24) + REL_S + (TAR_{SH} * 30/115)] / 24$$

Where:

SUB_{SH} = (Human Toxicity Value + 3) * (Containment + 1) + Substance Quantity

MIG_S = Soil Permeability + Annual Precip + Rainfall Frequency + Floodplain + Slope

REL_S = Release to Surface Water

TAR_{SH} = Distance to Surface Water + Population Served by Surface Water + Area Irrigated

SUB_{SH}	148
MIG_S	10
REL_S	0
TAR_{SH}	7.0
SW_H	17.3

Pathway Scoring -Surface Water Route, Environmental Pathway

$$SW_E = (SUB_{SE} * 40/153) * [(MIG_S * 25/24) + REL_S + (TAR_{SE} * 30/34)] / 24$$

Where:

SUB_{SE} = (Env Tox Value + 3) * (Containment + 1) + Substance Qty

MIG_S = Soil Permeability + Annual Precip + Rainfall Frequency + Floodplain + Slope

REL_S = Release to Surface Water

TAR_{SE} = Distance to Surface Water + Distance to Fishery + Distance to Sensitive Environment

SUB_{SE}	93
MIG_S	10
REL_S	0
TAR_{SE}	25.0
SW_E	32.9

Worksheet 5**Air Route**

CSID: 1588

Site Name: Blaser Die Casting

1.0 Substance Characteristics**1.1 Introduction (WARM Scoring Manual) - Please Review before scoring****1.2 Human Toxicity**

Substance	Ambient Air Standard Value	Acute Toxicity Value	Chronic Toxicity Value	Carcinogenicity Value
Trichloroethylene	10	3	X	4
1,4-Dioxane	4	5	X	X
Vinyl chloride	10	1	X	X
Tetrachloroethylene	9	5	X	X
Cis-1,2-dichloroethylene	1	3	X	X

Highest Value 10

Bonus Points? 2

Toxicity Value **12****1.3 Mobility**

Gaseous Mobility	Max Value:	4
Particulate Mobility	Soil Type:	
	Erodibility:	
	Climatic Factor:	

Mobility Value **4****1.4 Final Human Health Toxicity/Mobility Matrix Value**HH Final Matrix Value **24****1.5 Environmental Toxicity/Mobility**

Substance	Non-human Mammalian Inhalation Toxicity (mg/m3)	Acute Value	Mobility Value	Table A-7 Matrix Value
Trichloroethylene	15583	3	4	6
1,4-Dioxane	1694	5	4	10
Vinyl chloride	460123	1	4	2
Tetrachloroethylene	4000	5	4	10
Cis-1,2-dichloroethylene	65000	3	4	6

Env. Final Matrix Value **10****1.6 Substance Quantity**

Amount: Approximately 2,500 square feet

Basis: Estimated surface area of impacted soil

Substance Quantity Value **4**

Worksheet 5**Air Route**

CSID: 1588

Site Name: Blaser Die Casting

2.0 Migration Potential**2.1 Containment**Containment Value

Explain Basis: Cover of at least 2 feet, and a
functioning vapor collection system is present

3.0 Targets**3.1 Nearest Population**Population Distance Value

Less than 200 feet to the nearest dwelling

3.2 Distance to and name of nearest sensitive environmentsSensitive Environment Value

Approximately 2,100 feet to the Lower Duwamish Waterway

3.3 Population within 0.5 milesPopulation Value

267 population

4.0 ReleaseRelease to Air Value

Explain basis for scoring a release to air:

Confirmed release to air

Pathway Scoring - Air Route, Human Health Pathway

$$AIR_H = (SUB_{AH} * 60/329) * [REL_A + (TAR_{AH} * 35/85)] / 24$$

Where:

$$SUB_{AH} = (\text{Human toxicity} + 5) * (\text{Containment} + 1) + \text{Substance Qty}$$

$$REL_A = \text{Release to Air}$$

$$TAR_{AH} = \text{Nearest Population} + \text{Population within 1/2 mile}$$

SUB _{AH}	33
REL _A	5
TAR _{AH}	26.3
AIR _H	4.0

Pathway Scoring - Air Route, Environmental Pathway

$$AIR_E = (SUB_{AE} * 60/329) * [REL_A + (TAR_{AE} * 35/85)] / 24$$

Where:

$$SUB_{AE} = (\text{Environmental Toxicity Value} + 5) * (\text{Containment} + 1) + \text{Substance Qty}$$

$$REL_A = \text{Release to Air}$$

$$TAR_{AE} = \text{Nearest Sensitive Environment}$$

SUB _{AE}	19
REL _A	5
TAR _{AE}	5.0
AIR _E	1.0

Worksheet 6
Groundwater Route

CSID: 1588

Site Name: Blaser Die Casting Co

1.0 Substance Characteristics

1.1 Human Toxicity

Substance	Drinking Water Standard Value	Acute Toxicity Value	Chronic Toxicity Value	Carcinogenicity Value
Tetrachloroethylene	8	5	3	4
Trichloroethylene	8	3	X	4
Vinyl Chloride	8	5	X	7
1,4-dioxane	X	1	X	4
Cis-1,2-dichloroethylene	6	X	3	X

Highest Value 8

Bonus Points? 2

Toxicity Value

1.2 Mobility

Cations/Anions

Max Value:

Solubility

Max Value:

3

Mobility Value

1.3 Substance Quantity

Amount: Approximately 110 cubic yards

Basis: Estimated volume of impacted soil

Substance Quantity Value

2.0 Migration Potential

2.1 Containment

Containment Value

Explain Basis: Contaminated soil

2.2 Net Precipitation

>10 to 20 inches

Net Precipitation Value

2.3 Subsurface Hydraulic Conductivity

Sand and silt

Conductivity Value

2.4 Vertical Depth to Groundwater

0 to 25 feet

Confirmed release: Yes

Depth to Aquifer Value

Worksheet 6
Groundwater Route

CSID: 1588

Site Name: Blaser Die Casting Co

3.0 Targets

3.1 Groundwater Usage

Aquifer Use Value

Industrial

3.2 Distance to Nearest Drinking Water Well

>10,000 feet

Well Distance Value

3.3 Population Served within 2 Miles

0 people

Population Served Value

3.4 Area Irrigated by GW Wells within 2 miles

0 acres

Area Irrigated Value

4.0 Release

Release to Groundwater Value

Explain basis for scoring a release to groundwater:

Confirmed release to groundwater

Pathway Scoring - Groundwater Route, Human Health Pathway

$$GW_H = (SUB_{GH} * 40/208) * [(MIG_G * 25/17) + REL_G + (TAR_{GH} * 30/165)] / 24$$

Where:

SUB_{GH} = (Human toxicity + mobility + 3) * (Containment + 1) + Substance Qty

MIG_G = Depth to Aquifer + Net Precip + Hydraulic Conductivity

REL_G = Release to Groundwater

TAR_{GH} = Aquifer Use + Well Distance + Population Served + Area Irrigated

SUB_{GH}	179
MIG_G	13
REL_G	5
TAR_{GH}	2.0
GW_H	35.1

Washington Ranking Method

Route Scores Summary and Ranking Calculation Sheet

Site Name: Blaser Die Casting Co

CSID: 1588

Site Address: 5700 3rd Ave S

FSID: 7118747

HUMAN HEALTH ROUTE SCORES

Enter Human Health Route Scores for all Applicable Routes:

Pathway	Route Score	Quintile Group
Surface Water	17.3	3
Air	4.0	1
Groundwater	35.1	3

H=	3
M=	3
L=	1

$$\begin{array}{c} H^2 \\ 9 \end{array} + \begin{array}{c} 2M \\ 6 \end{array} + \begin{array}{c} L \\ 1 \end{array} = \frac{\quad}{8}$$

**Human Health
Priority Bin Score:**
2
rounded up to next
whole number

ENVIRONMENT ROUTE SCORES

Enter Environment Route Scores for all Applicable Routes:

Pathway	Route Score	Quintile Group
Surface Water	21.2	2
Air	1.0	1

H=	2
L=	1

$$\begin{array}{c} H^2 \\ 4 \end{array} + \begin{array}{c} 2L \\ 2 \end{array} = \frac{\quad}{7}$$

**Environment
Priority Bin Score:**
1
rounded up to next
whole number

Comments/Notes:

**FINAL MATRIX
RANKING**

5

FOR REFERENCE:

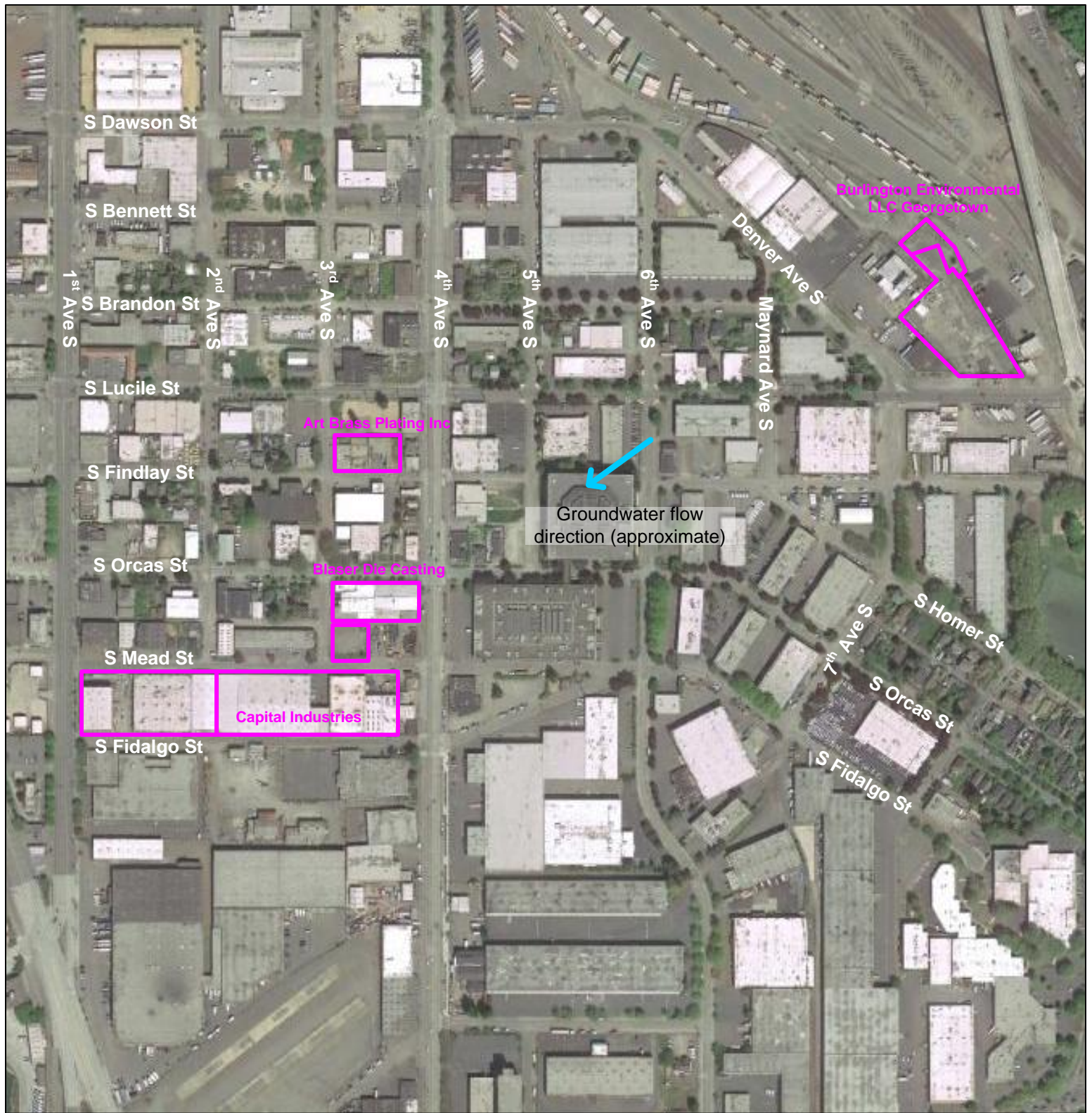
Final WARM Bin Ranking Matrix

Human Health Priority	Environment Priority					
	5	4	3	2	1	N/A
5	1	1	1	1	1	1
4	1	2	2	2	3	2
3	1	2	3	4	4	3
2	2	3	4	4	5	3
1	2	3	4	5	5	5
N/A	3	4	5	5	5	NFA

Quintile Values for Route Scores - February 2015 Values

Quintile	Human Health			Environment	
	Surface Water	Air	Ground Water	Surface Water	Air
5	>= 30.7	>= 37.6	>= 51.6	>= 50.9	>= 29.9
4	>= 23.1	>= 23.8	>= 40.9	>= 31.2	>= 22.5
3	>= 14.1	>= 15.5	>= 33.2	>= 23.6	>= 14.0
2	>= 7.0	>= 8.5	>= 23.5	>= 11.0	>= 1.6
1	<= 6.9	<= 8.4	<= 23.4	<= 10.9	<= 1.5

Quintile value associated with each route score entered above

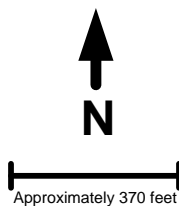


Legend:

Property location (approximate)

Notes:

1. All locations are approximate, and not to scale.

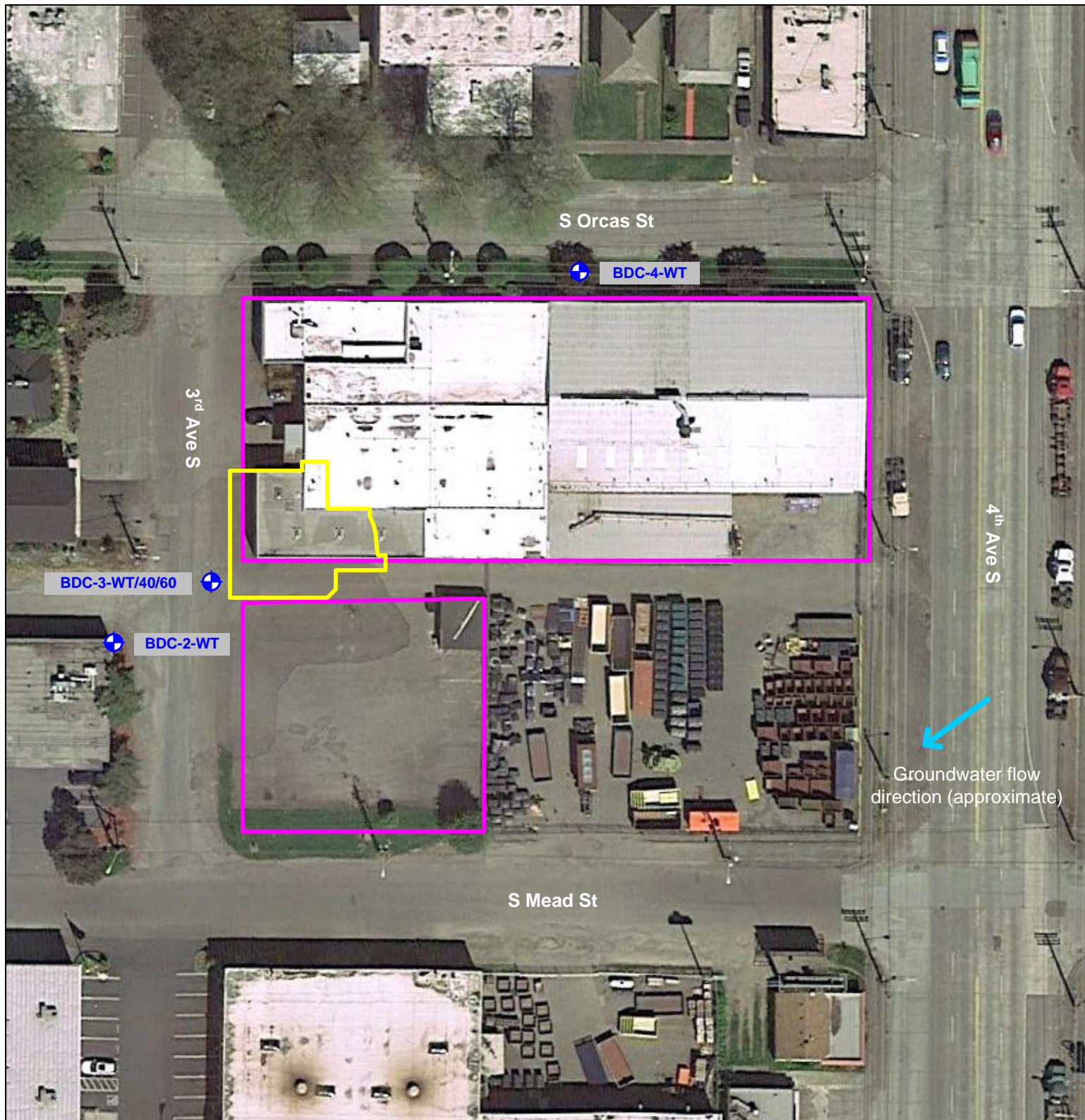


West of Fourth

Site Overview Map



CSID 12260
CSID12260.vsd

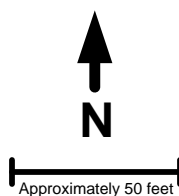


Legend:

- Property location (approximate)
- 2008 Excavation area (approximate)
- ⬇ Monitoring well (approximate)

Notes:

1. All locations are approximate, and not to scale.



Blaser Die Casting Co
5700 3rd Avenue South
Seattle, WA 98108

Site Overview Map

CSID 1588
 CSID1588.vsd