

SITE HAZARD ASSESSMENT

Worksheet 1

Summary Score Sheet

SITE INFORMATION:

Penthouse Drapery Cleaners
 1752 Rainier Ave S
 Seattle, King County, WA 98144

Cleanup Site ID: 3184
 Facility/Site ID: 23408

Section:	9	Latitude:	47.58759
Township:	24	Longitude:	-122.30481
Range:	4E	Tax/Parcel ID:	7548301155

Site scored/ranked for the Hazardous Sites List Publication: August 2018

SITE DESCRIPTION:

The Penthouse Drapery Cleaners site (Site) is a former dry cleaner located in Seattle, King County, Washington. The 0.11-acre property is located approximately 4,400 feet from Lake Washington, and zoned for commercial (C1-65) use.

The Site is currently operated as the Seattle Collision Center (SCC) by Todd and Karen Sullivan.

The Site is located on the southeast corner of Rainier Ave S and S State St in the Mt Baker neighborhood of Seattle. The source of contamination is located on tax parcel 754830-1155, the location of the former Penthouse Drapery Cleaners. The parcel is currently occupied by a 4,790 square foot commercial building housing an automotive repair facility. Contamination extends onto adjacent parcels 754830-1115, -1120, and -1150.

Across Rainier Ave to the west are the Stewart Lumber & Hardware Company and a parking lot. North of the Site, across S State St, is a commercial building housing the Seattle Kettlebell Club. A residential area is located northeast of the Site. The areas east and south of the Site are in transition, and currently house one structure on the southwest corner, equipment for the remedial action discussed below and trailers for the company implementing the remedial action. The eastern properties were formerly residential and the southern property was occupied by Belshaw Brothers, Inc., a facility that manufactured bakery and restaurant equipment. The eastern and southern properties are currently part of a proposed redevelopment into a residential area to be called Grand Street Commons. A Prospective Purchaser Consent Decree is currently being finalized for Grand Street Commons to address contamination from historical Belshaw Brothers operations (CSID: 3018).

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>
1951	1970	Associated Industries Fabricators, Inc.	Aircraft parts manufacturing
1970	1975	Multiple	Pool supply retailers
	1980	Atlas Equipment Pumps	
1984	1990	Penthouse Drapery	Dry cleaners
	1994	Don-Vinn Company	Restaurat equipment and supply retailer
1998	2018	Seattle Collision Center	Auto body repair

SITE HAZARD ASSESSMENT

Worksheet 1

Summary Score Sheet

SITE CONTAMINATION:

In 2010 the Penthouse Drapery Cleaners site was reported to Washington State Department of Ecology (Ecology) and placed on the Confirmed and Suspected Contaminated Sites List (CSCSL).

During site investigations at the adjacent Belshaw Brothers property prior to 2008, the SCC property was identified as a potential source of tetrachloroethylene (PCE) contamination in groundwater. Following private negotiations, Penthouse Drapery was determined to be the primary PLP for the Site and entered the Site into the Voluntary Cleanup Program in 2010 (VCP ID:NW2278).

Multiple phases of sampling have been conducted to characterize the Site. In 2008, 2 soil borings were advanced on the Penthouse Drapery property (SCC-1 and -2) and completed as monitoring wells. In 2009, 15 borings were advanced on the Penthouse Drapery and Belshaw properties on behalf of consultants for both Sites. These borings were completed as monitoring well clusters MW-24 through -28 and MW-29. In 2010 and 2011, Pacific Crest continued Site characterization activities for the Penthouse Drapery Site. This work included 4 soil borings (PH-SB-2 through -5), 9 monitoring well borings (well clusters MW-30 through -32), and collection of sub-slab and ambient air samples in the Seattle Collision Center Building to assess the vapor intrusion pathway.

Monitoring well clusters were installed at multiple locations to target the multiple layers of groundwater present on Site. Generally, groundwater between 12 and 60 feet below ground surface (bgs) is considered to be part of discontinuous, perched water layers. This is divided into 3 layers for sampling purposes: shallow (12-25 feet bgs), intermediate (25-40 feet bgs), and intermediate-deep (40-59 feet bgs). Groundwater between 60 and 100 feet bgs is considered to be the deep aquifer. Vertical continuity between aquifers has been documented on Site.

From all Site characterization activities, an area of soil contaminated with PCE above Method A cleanup levels has been delineated (see figure below). Most of the contaminated soil is located under the SCC building, with additional contamination located off-property to the east and south. An area of PCE present as free product (AKA dense non aqueous phase liquid or DNAPL) has been identified near the southeast corner of the SCC building.

Groundwater is contaminated with PCE and its breakdown product trichloroethylene (TCE) at concentrations above Method A cleanup levels on Site. The groundwater contamination extends under most of the SCC building as well as off-property to the south and southeast. The plume is comingled with contaminated groundwater traced back to historic activities at the Belshaw Brothers facility. While TCE is present in contaminated groundwater from both sources, the source can be distinguished based on associated contamination with PCE (Penthouse Drapery source) or 1,4-dioxane (Belshaw Brothers source). The approximate extent of groundwater contamination is shown on the figure below. It is possible that contaminated groundwater extends farther to the west than is indicated, as no monitoring wells have been installed directly west of the Site under the sidewalk or in Rainier Ave.

Ambient air collected just outside the SCC building did not contain PCE or TCE above laboratory reporting limits. Sub-slab soil vapor from under the SCC building contained PCE above Method B screening levels, but no TCE above laboratory reporting limits. To date, no indoor air samples have been collected to confirm a completed vapor intrusion exposure pathway.

REMEDIATION ACTIVITIES:

In 2010, a pilot-scale soil vapor extraction system was installed on Site to evaluate system performance across the entire Site. Based on pilot-scale results, this was determined not to be a viable remedial action for the Site. A 2014 Feasibility Study selected electrical resistance heating (ERH) followed by in-situ enhanced anaerobic bioremediation as the preferred remedial action for the Site. The planned remedial action includes the installation of the ERH system across the area of contaminated soil, which is expected to reduce soil concentrations below the cleanup level. If groundwater contamination remains following ERH, injections will be made to stimulate reductive dechlorination of contaminants. Monitored attenuation and possible in-situ enhanced bioremediation will be used to address the contamination that extends off property to the west under Rainier Avenue.

SITE HAZARD ASSESSMENT

Worksheet 1

Summary Score Sheet

The ERH system began running in March 2018. The ERH system is located on the parcel to the south of the Site. The entire area is fenced to limit access, and a low-visibility mesh lines the fence along Rainier Ave.

CURRENT SITE CONDITIONS:

The Site is connected to municipal water, sewer, and stormwater systems. The Site's stormwater drainage places it within the Duwamish/Diagonal Way Source Control Area for the Lower Duwamish Waterway. The Hamlin Robinson School is located 400 feet northwest of the Site. Multiple parks are located within 500 feet of the Site, including the Colman Playground to the east and the Atlantic Street Park to the north. Tents that appeared to be used for housing were observed within a half mile of the Site during a July 2018 visit, indicating an additional potentially exposed population that is not accounted for in the population value used in scoring.

There are 15 additional Ecology cleanup sites located within 0.5 mile of the Site. Eight have received a No Further Action determination, three are designated cleanup started, and four are designated as awaiting cleanup. The adjacent Grand Street Commons site (former Belshaw Brothers property) underwent a Site Hazard Assessment in 2015 and received a ranking of 3.

The approximate depth to groundwater is 12 feet below ground surface, with groundwater flowing to the west-southwest. Subsurface soils are silt and sand.

SPECIAL CONSIDERATIONS:

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

Surface Water

Surface water was not scored due to subsurface contamination.

Air

Volatile chemicals are present in the subsurface and have been measured in sub-slab soil vapor above Method B screening levels.

Groundwater

Contamination has been detected in groundwater on Site.

As part of the ERH system, vapors removed from the soil are filtered prior to emission, capturing the contaminants of concern. Containment was therefore scored based on a functioning vapor collection system.

ROUTE SCORES:

Surface Water/ Human Health:		Surface Water/ Environment:	
Air/ Human Health:	8.8	Air/ Environment:	1.1
Groundwater/ Human Health:	37.4		

Overall Rank: 5

REFERENCES:

- 1 ESRI. Accessed 2018. World Annual Evapotranspiration Map. Accessed through <https://www.esri.com/arcgis-blog/products/arcgis-online/mapping/world-average-annual-evapotranspiration-web-map-now-available/>
- 2 King County iMap. Accessed 2018. <https://gismaps.kingcounty.gov/iMap/>
- 3 Missouri Census Data Center. Accessed 2018. Circular Area Profiles – Version 10C. <http://mcdc.missouri.edu/websas/caps10c.html>

SITE HAZARD ASSESSMENT

Worksheet 1

Summary Score Sheet

- 4 NOAA National Centers for Environmental Information. Accessed 2018. Global Summary of the Year 2000 - 2017 – Seattle Sand Point Weather Forecast Office. Requested from <https://www.ncdc.noaa.gov/cdo-web/>
 - 5 Pacific Crest Environmental. 2011. Remedial Investigation-Feasibility Study Report, Former Penthouse Drapery, 1752 Rainier Avenue South, Seattle, Washington.
 - 6 Pacific Crest Environmental. 2014. Remedial Investigation-Feasibility Study Report, Former Penthouse Drapery and Belshaw Site, 1752 Rainier Avenue South and 1750 22nd Avenue South, Seattle, Washington. (Draft for Ecology Review)
 - 7 Pacific Crest Environmental. 2015. Cleanup Action Plan - Site Area 1, Former Penthouse Drapery and Belshaw Site. (Draft for Ecology Review)
 - 8 Pacific Crest Environmental. 2015. Letter re: Response to Opinion Letter Regarding Draft RI/FS, Former Penthouse Drapery and Belshaw Site.
 - 9 WA Dept of Ecology. 2015. Site Hazard Assessment - Belshaw Brothers Inc. Available from: <https://fortress.wa.gov/ecy/gsp/CleanupSiteDocuments.aspx?csid=3018>
 - 10 WA Dept. of Ecology. Accessed 2018. What's in My Neighborhood. <https://fortress.wa.gov/ecy/neighborhood/>
 - 11 WA Dept. of Ecology. Accessed 2018. Lower Duwamish Waterway Source Control Area Map. King County iMap. <https://ecology.wa.gov/Spills-Cleanup/Contamination-cleanup/Cleanup-sites/Toxic-cleanup-sites/Lower-Duwamish-Waterway/Source-control-area-map>
 - 12 WA Dept. of Ecology. Accessed 2018. Well Report Viewer. <https://fortress.wa.gov/ecy/waterresources/map/WCLSWebMap/default.aspx>
 - 13 WA Dept. of Health Office of Drinking Water. Accessed 2018. Find Water System. <https://fortress.wa.gov/doh/eh/portal/odw/si/FindWaterSystem.aspx>
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SITE HAZARD ASSESSMENT

Worksheet 2

Route Documentation

Cleanup Site ID: 3184
Facility/Site ID: 23408

Penthouse Drapery Cleaners

1. SURFACE WATER ROUTE

List those substances to be considered for scoring:

Not scored.

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

List those management units to be considered for scoring:

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

2. AIR ROUTE

List those substances to be considered for scoring:

PCE

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

PCE has been detected above screening levels in sub-slab soil vapor.

List those management units to be considered for scoring:

Soil, groundwater

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

Both contaminated soil and groundwater have been identified under the SCC building and are potential sources for vapor.

3. GROUNDWATER ROUTE

List those substances to be considered for scoring:

PCE, TCE

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

PCE and TCE have been detected in groundwater on Site.

List those management units to be considered for scoring:

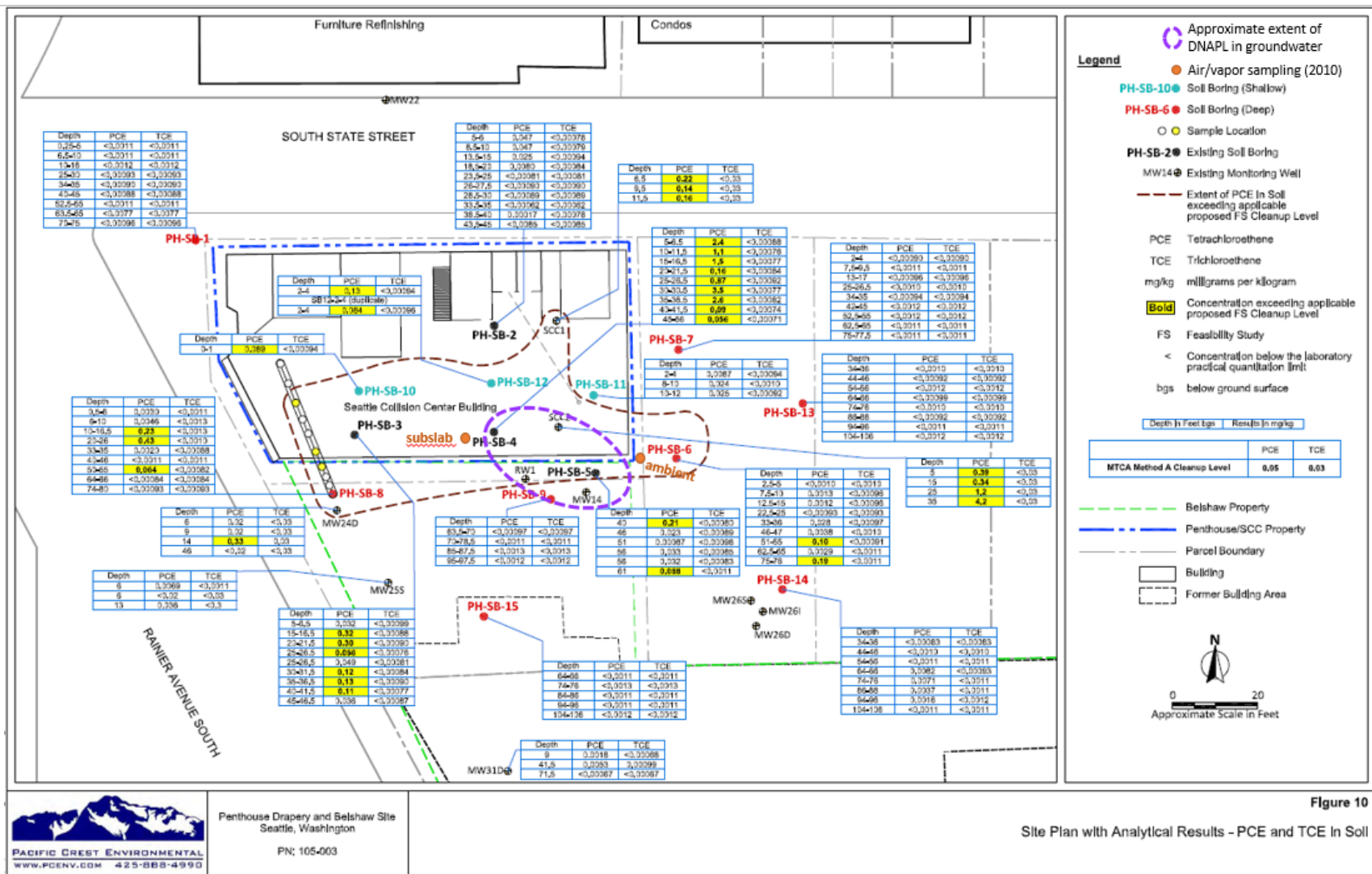
Soil, groundwater

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

Contaminated soil and groundwater have been documented on Site.



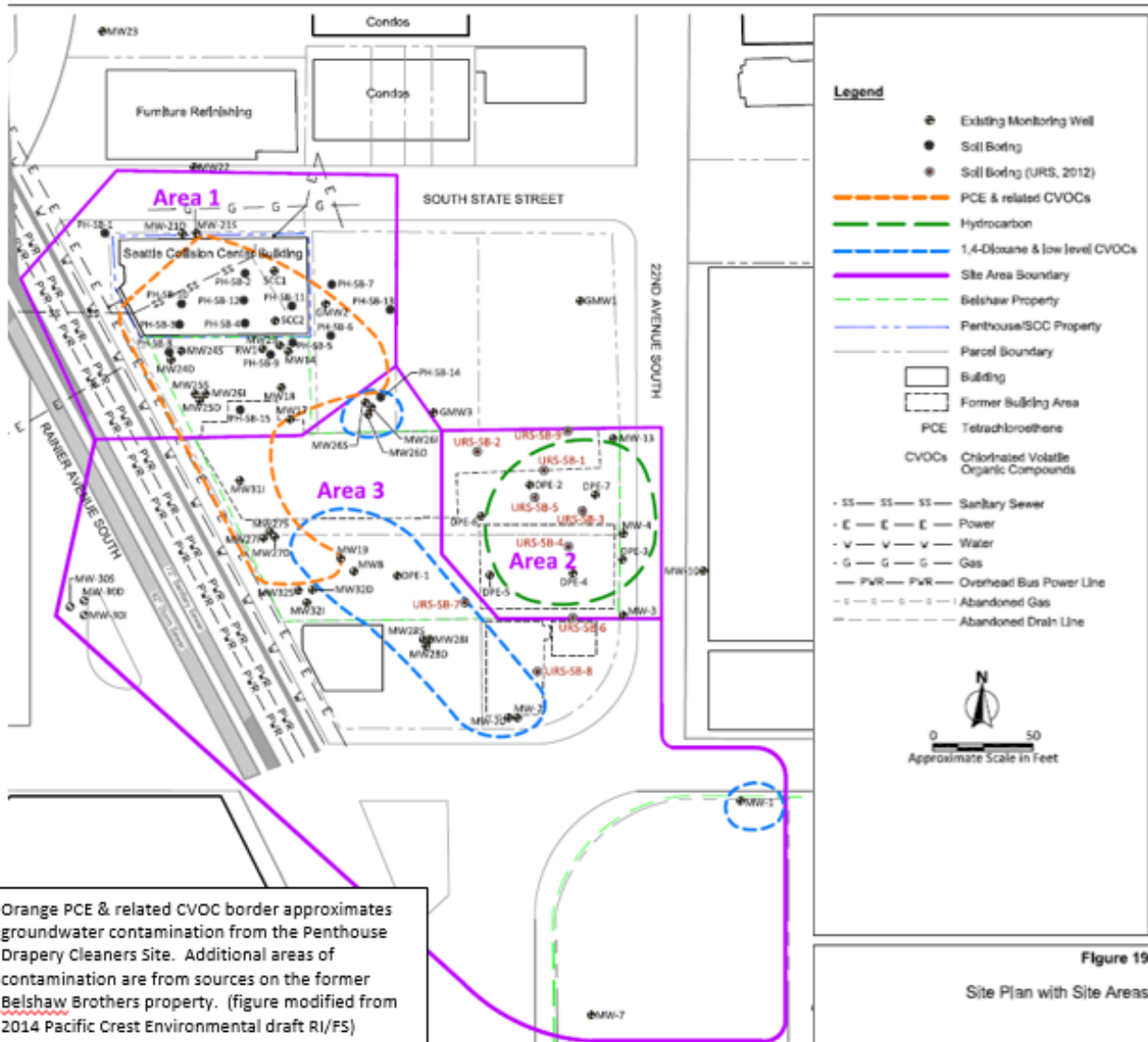
General layout of former Penthouse Drapery Cleaners and former Belshaw Brothers properties.



Location of contaminated soil and NAPL with PCE concentrations.



Penthouse Drapery and Belshaw Site
Seattle, Washington
PN: 105-003



Orange PCE & related CVOC border approximates groundwater contamination from the Penthouse Drapery Cleaners Site. Additional areas of contamination are from sources on the former Belshaw Brothers property. (figure modified from 2014 Pacific Crest Environmental draft RI/FS)

Location of contaminated groundwater.

Worksheet 4

Surface Water Route

CSID: 3184

Site: Penthouse Drapery Cleaners

Not scored.

Worksheet 5

Air Route

CSID: 3184

Site: Penthouse Drapery Cleaners

1.0 SUBSTANCE CHARACTERISTICS

1.1 Introduction

No scoring in Section 1.1.

1.2 Human Toxicity

Substance	Amb. Air Stnd.		Acute Toxicity		Chronic Toxicity		Carcinogenicity	
	Value (ug/m ³)	Score	Value (mg/m ³)	Score	Value (mg/kg/day)	Score	Adj. CPFI (risk/mg/kg- day)	Score
Tetrachloroethene (PCE)	1.69E-01	10	4.00E+03	5	1.14E-02	5	7.28E-04	3

Maximum score: 10

Bonus points:

Source: WARM Toxicity Database

Human Toxicity Score: 10

Range: 1-12

1.3 Mobility

Gaseous Mobility

Substance	Vapor Pressure		Henry's Law	
	Value (mm Hg)	Score	Value (atm- m ³ / mol)	Score
Tetrachloroethene (PCE)	1.80E+01	4		

Maximum score: 4

Source: WARM Toxicity Database

Particulate Mobility

Soil type:

Erodibility factor:

Climatic factor:

Mobility value:

Source:

Mobility Score: 4

Range: 0-4

1.4 Human Toxicity/Mobility

Source: WARM Scoring Manual

Human Tox/Mobil Score: 20
Range: 1-24

1.5 Environmental Toxicity/Mobility

Substance	Acute Value (mg/m ³)	Score
Tetrachloroethene (PCE)	4.00E+03	5
Maximum score	5	
Source:	WARM Toxicity Database	

Environmental Toxicity Score: 5
Range: 1-10

Environmental Tox/Mobil Score: 10
Range: 1-24

1.6 Substance Quantity

Quantity: 2,600 ft²
Basis: aerial extent of contaminated soil
Source: site reports

Substance Quantity Score: 4
Range: 1-10

2.1 Containment

Description: see Special Considerations
Basis: site reports

Containment Score: 0
Range: 0-10

SUBSTANCE PARAMETER CALCULATIONS

Human Health Pathway

SUBh (Human Tox/Mobil + 5) x (Containment +1) + Substance Quantity

29.0

Environmental Pathway

SUBe (Environ. Tox/Mobil + 5) x (Containment +1) + Substance Quantity

19.0

3.0 TARGETS

3.1 Nearest Population

Description: commercial building to the north (Seattle Kettlebell Club)
Distance (ft): 52
Source: iMap

Nearest Population Score: 10
Range: 0-10

3.2 Nearest Sensitive Environment

Description: Atlantic Street Park
Distance (ft): 415
Source: iMap

Nearest Sensitive Environment Score: 7
Range: 0-7

3.3 Population within One-Half Mile

Number: 5,644
Source: MO CDC

Population within Half Mile Score: 75.0
Range: 0-75

TARGET PARAMETER CALCULATIONS

Human Health Pathway

TARh: Nearest Population + Population within Half Mile

85.0

Environmental Pathway

TARe Nearest Sensitive Environment

7.0

4.0 RELEASE

Evid. of release? detected in sub-slab soil vapor
Source: site reports

Release Score (REL): 5.0
Range: 0 or 5

AIR ROUTE CALCULATIONS

Human Health Pathway

AIRh : (SUBh x 60/329) x {REL + (TARh x 35/85)} / 24

8.8

Environmental Pathway

AIRe : (SUBe x 60/329) x {REL + (TARe x 35/85)} / 24

1.1

Range: 0-100

Worksheet 6

Groundwater Route

CSID: 3184

Site: Penthouse Drapery Cleaners

1.0 SUBSTANCE CHARACTERISTICS

1.1 Human toxicity

Substance	Drink. Wat. Stnd		Acute Toxicity		Chronic Toxicity		Carcinogenicity	
	Value (ug/L)	Score	Value (mg/kg)	Score	Value (mg/kg/day)	Score	Adj. CPFo (risk/mg/kg-day)	Score
Tetrachloroethene (PCE)	5.00E+00	8	8.00E+02	5	6.00E-03	3	1.68E-03	3
Trichloroethene (TCE)	5.00E+00	8	2.40E+03	3	5.00E-04	5	4.64E-02	5

Maximum score: 8

Bonus points: 2

Source: WARM Toxicity Database

Human Toxicity Score: 10

Range: 1-12

1.2 Mobility

Substance	Solubility	
	Value (mg/L)	Score
Tetrachloroethene (PCE)	2.00E+02	2
Trichloroethene (TCE)	1.10E+03	3

Maximum value: 3

Source: WARM Toxicity Database

Mobility Score: 3

Range: 1-3

1.3 Substance quantity

Quantity: 1,450 yd³

Basis: estimated contaminated soil (aerial extent x mean depth of 5 yards contamination)

Source: site reports

Substance Quantity Score: 4

Range: 1-10

2.1 Containment

Description: contamination has reached groundwater

Source: site reports

Containment Score: 10

Range: 0-10

SUBSTANCE PARAMETER CALCULATION

SUB = (Human Toxicity + Mobility + 3) x (Containment + 1) + Substance Quantity

180.0

2.0 MIGRATION POTENTIAL

2.2 Net precipitation

Amount (in.): 23.3
Source: NOAA NCEA, ESRI

Net Precipitation Score: 3
Range: 0-5

2.3 Subsurface Hydraulic Conductivity

Description: silt and sand
Source: site reports

Hydraulic Conductivity Score: 3
Range: 1-4

2.4 Vertical Depth to Aquifer

Depth (ft): contamination in groundwater
Source: site reports

Depth to Aquifer Score: 8
Range: 1-8

MIGRATION PARAMETER CALCULATION

MIG = Depth to Aquifer + Net Precipitation + Hydraulic Conductivity

14.0

3.0 TARGETS

3.1 Aquifer Usage

Description: groundwater not used but usable
Source: iMap, WDOH Water System Database

Aquifer Use Score: 2
Range: 1-10

3.2 Distance to Nearest Drinking Water Well

Distance (ft): >2 mi
Source: iMap, WDOH Water System Database

Well Distance Score: 0
Range: 0-5

3.3 Population Served by Drinking Water Wells within Two Miles

No. of people: 0
Source: WDOH Water System Database, Well Log Viewer

Population Served Score: 0.0
Range: 0-100

3.4 Area Irrigated by Wells within Two Miles

Area (acres): 0
Source: Water Resources Explorer

Area Irrigated Score: 0.0
Range: 0-50

TARGET PARAMETER CALCULATION

2.0

TAR = Aquifer Use + Well Distance + Population Served + Area Irrigated

4.0 RELEASE

Evid. of release? contamination detected in groundwater
Source: site reports

Release Score (REL): 5.0

Range: 0 or 5

GROUND WATER ROUTE CALCULATION

37.4

GW = (SUB x 40/208) x {(MIG x 25/17) + REL + (TAR x 30/165)} / 24

Range: 0-100

Washington Ranking Method

Route Scoring Summary and Ranking Calculation

CSID: 3184
Site: Penthouse Drapery Cleaners

Human Health Route Scores		
Pathway	Score	Quintile
Surface water	0.0	
Air	8.8	2
Groundwater	37.4	3

Quintile	Value
High (H)	3
Middle (M)	2
Low (L)	

Human Health Pathway Quintiles - February 2018							
Quintile	Surface Water		Air		Groundwater		
1	<=	7.9	<=	8.5	<=	24.0	
2		8.0		16.3		33.0	
3		15.5		25.3		40.3	
4		21.4		40.1		49.8	
5	>=	29.9	>=	40.2	>=	49.9	

$$(H^2 + 2M + L) / 8$$

Human Health Priority Bin Score: 1.6

Environmental Route Scores		
Pathway	Score	Quintile
Surface water	0.0	
Air	1.1	1

Quintile	Value
High (H)	1
Low (L)	

Environmental Pathway Quintiles - February 2018				
Quintile	Surface Water		Air	
1	<=	11.3	<=	1.2
2		11.4		1.5
3		24.2		14.1
4		32.1		27.7
5	>=	49.7	>=	27.8

$$(H^2 + 2L) / 7$$

Environmental Priority Bin Score: 0.1

FINAL MATRIX RANKING

Human Health Priority	Environmental 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

n/a - not applicable

NFA - no further action

Site Rank: 5