

# SITE HAZARD ASSESSMENT WORKSHEET 1

## Summary Score Sheet

### **SITE INFORMATION:**

Name: **Skagit Farmers Supply Wolfkill**  
Address: **205 West Fir Street**  
City: **Mount Vernon** County: **Skagit** State: **WA** Zip: **98273**  
Parcels: **P26114, P26132, P26134, P26161**  
Section/Township/Range: **SE ¼, SE ¼, Section 18, Township 34 North, Range 4 East**  
Latitude: **48.4288** Longitude: **-122.3377**  
FSID #: **4755451**

Site scored/ranked for the August, 2010 update of the Site Register by Corrina Marote, Skagit County Public Health Department, June 25, 2010

### **SITE DESCRIPTION:**

The Skagit Farmers Supply Wolfkill site, owned by Skagit Farmers Supply, is located in Mount Vernon. The property was occupied by Wolfkill Feed and Fertilizer and used for agriculture chemical storage and loading for at least 25 years. Skagit Farmer Supply bought the property from Wolfkill in 1998 and used it for agriculture chemical storage and loading until the City of Mt. Vernon rented the remaining building on site for storing sand and gravel a year or more ago. The City of Mount Vernon Public Works has occupied the site immediately west of the site for over 30 years. There was reportedly (undocumented) a substantial release from one their underground storage tanks (contents and size unspecified) prior to the cleanup effort at Wolfkill. South of the site a trucking company, which may have underground storage tanks, and asphalt staging area were located. Currently that site is occupied by a carpet store and a recreational vehicle storage area that offers shrink-wrapping services. Two former bulk fuel depots and gasoline retail facilities are located east of the site. The land surface consists of a layer of asphalt over silty sand fill over sand and silt, over clay silts. The land is fairly level and the Skagit River is approximately 650' to the southwest. The area is served by PUD for drinking water and the City of Mount Vernon for sewer service. There are 67 drinking water wells and the City of Anacortes Water Treatment Plant within the 2 mile buffer zone. A general vicinity map is presented in Figure 1.

Rittenhouse-Zemon & Associates, Inc. (RZA) performed an Environmental Assessment of the site in 1990. Four underground storage tanks, three (one 1,000- and two 500-gallon) gasoline and one 8,000-gallon diesel tanks were located and removed. The two 500-gallon gasoline tanks appeared to be structurally compromised. Petroleum hydrocarbon contaminated soil was discovered during the removal of these tanks. Approximately 670 cubic yards of soil were removed during the excavation. Twenty seven soil samples were taken from the tank pit at depths between 4 and 6 feet. Four soil samples were taken from borings at 2.5 and 7.5' depths. Three ground water samples were also taken. The soil and groundwater samples were analyzed for Total Petroleum Hydrocarbons (TPH), benzene, toluene, ethyl benzene, and xylenes (BTEX). The inferred groundwater flow is to the northeast at the time of sampling; however, the conclusion indicates that the direction of groundwater flow may change seasonally.

Results of soil samples showed contamination in one soil boring site and in multiple locations throughout the excavation site that exceeded Model Toxics Control Act (MTCA) Method A (unrestricted land use) Cleanup Levels for TPH-Gasoline (5 locations), benzene (5 locations), ethyl benzene (1 location), xylene (1 location). All groundwater samples from the monitoring wells

exceeded Method A Cleanup Levels for TPH-Gasoline and benzene. Locations of the sample sites are in Figure 2 of the 1990 report. The report concludes that the contamination may not have come from the tanks that were removed, based on the calculated direction of groundwater flow. However, the consultant recommended further monitoring followed by a review from Ecology.

The second report produced by Wolfkill describes results from samples taken in 1997 and remedial action in preparation for transferring the property. Stained soil was observed below an asphalt cap where vehicles had been parked periodically (B-5 on map, copy attached). Nearly 3 tons of petroleum contaminated soils were excavated in an area 5' by 5' by 1' and transported to a treatment facility. Organics (GCMS SVOC method), pesticides (GCECD PESTICIDE method), herbicides (GCECD HERBICIDE method), and aromatics (GC AROMATIC VOC method) were detected in several samples but were below Method B (direct contact) Cleanup levels. A second area that had been a rail and truck unloading system (B-7 on map) was excavated along an area 20' long by 2' wide and 2' deep. This soil, with elevated nitrogen levels, was landfarmed at acceptable agronomic rates for standard farming practices. The samples from both these sites were taken from the excavation pits but the report does not specify whether the samples were taken from the walls, the bottom, or from the excavation pile. Furthermore, remediation under the tracks was determined to be unnecessary due to cost.

In 1998 the site owner contracted AGRA (formerly RZA) for further groundwater monitoring and site assessment. Only Monitoring Well 1 exceeded Method A Cleanup levels for TPH and benzene. The two other monitoring wells had detectable levels of petroleum products but they were well under the Method A Cleanup level. Additionally, lead was detected in Monitoring Well 2 but the concentration was also under the cleanup level. The calculated groundwater flow is to the northeast. The 1999 report concludes that attenuation is happening naturally over time due to dilution, dispersion, and possibly biological degradation and areas of soil contamination may exist but is not likely to contaminate groundwater in the future.

In March 1999 Wolfkill notified Ecology of the contamination, remediation, and monitoring activity. An Ecology inspector performed an Initial Investigation, which resulted in an NFA based on the levels of contaminants, their respective applicability to groundwater standards, and that the site is paved.

In 2002 Ecology requested further monitoring since cleanup standards had changed since the last monitoring event. AMEC (formerly AGRA) reported that petroleum products were detected from Monitoring Well 1 but only benzene exceeded the Method A Cleanup level. The other two monitoring wells did not have detectable levels of contaminants. A calculation predicted that groundwater flow is to the southwest. AMEC concluded that residual soil contamination is likely negligible based on sampling result trends over the years. Ecology stated that one year of quarterly monitoring that demonstrated contamination concentration in groundwater was less than MTCA Method A Cleanup levels is the preferred action. Since there was no evidence of further monitoring the site was placed on the Confirmed and Suspected Contaminated Sites List in February 2009. If the site owners enter the Voluntary Cleanup Program and complete the required quarterly groundwater monitoring for one year, NFA may be granted. Until that time it must be assumed that contamination still exists.

Polly Dubbel performed a site visit for the Site Hazard Assessment on April 15, 2010. The site is still used for sand and gravel storage by the City of Mount Vernon. The southern-most and northern most buildings have been removed. Much of the site is covered by old, cracking asphalt. A 3-sided building is on the east northeast end of the property. Ken Kadlec, General Manager for Skagit Farmers Supply, confirmed where the groundwater monitoring wells were located and where tank removal occurred. This is indicated on Figure 2. No obvious signs of contamination on the surface were found during the site visit.

Since remaining contamination at the site is documented to be subsurface only, in groundwater and possibly sub surface soil, only the groundwater route will be scored. The Skagit River flows through the western part of the two mile buffer zone forming a hydrologic barrier to groundwater; drinking water, irrigation wells, and public water systems on the opposite side of the river were not considered in the route scoring.

**ROUTE SCORES:**

Surface Water/Human Health: NS  
Air/Human Health: NS  
Groundwater/Human Health: 25.8

Surface Water/Environmental: NS  
Air/Environmental: NS

**OVERALL RANK: 5**

**WORKSHEET 2**  
**Route Documentation**

**1. SURFACE WATER ROUTE**

- a. List those substances to be considered for scoring: Source: \_\_\_\_\_
- b. Explain basis for choice of substance(s) to be used in scoring.
- c. List those management units to be considered for scoring: Source: \_\_\_\_\_
- d. Explain basis for choice of unit to be used in scoring:

**2. AIR ROUTE**

- a. List those substances to be considered for scoring: Source: \_\_\_\_\_
- b. Explain basis for choice of substance(s) to be used in scoring:
- c. List those management units to be considered for scoring: Source: \_\_\_\_\_
- d. Explain basis for choice of unit to be used in scoring:

**3. GROUNDWATER ROUTE**

- a. List those substances to be considered for scoring: Source: 2, 3, 4,5,6,7  
**Benzene**
- b. Explain basis for choice of substance(s) to be used in scoring:  
**Documented groundwater contamination above cleanup levels**
- c. List those management units to be considered for scoring:  
**Groundwater**
- d. Explain basis for choice of unit to be used in scoring:  
**Documented groundwater contamination**

## WORKSHEET 4 Surface Water Route

### 1.0 SUBSTANCE CHARACTERISTICS

1.2 Human Toxicity										
1	Substance	Drinking Water Standard (µg/L)	Value	Acute Toxicity (mg/ kg-bw)	Value	Chronic Toxicity (mg/kg/day)	Value	Carcinogenicity		Value
								WOE	PF*	
2										
3										
4										
5										
6										

\* Potency Factor

Source: \_\_\_\_\_

**Highest Value:** \_\_\_\_\_

(Max = 10)

**Plus 2 Bonus Points** \_\_\_\_\_

**Final Toxicity Value:** \_\_\_\_\_

(Max = 12)

1.2 Environmental Toxicity – Marine Water					
1	Substance	Acute Water Quality Criteria		Non-Human Mammalian Acute Toxicity	
		(µg/L)	Value	(mg/kg)	Value
2					
3					
2					
4					

Source: \_\_\_\_\_

**Highest Value:** \_\_\_\_\_

(Max = 10)

1.3 Substance Quantity	
<p><b>Explain Basis:</b> Unknown quantity, default to 1.</p>	<p>Source: _____ <b>Value:</b> _____ (Max = 10)</p>

## 2.0 MIGRATION POTENTIAL

		Source	Value
2.1	<b>Containment:</b> No containment <b>Explain basis:</b> Contaminated surface soil, minimal pavement		(Max = 10)
2.2	<b>Surface Soil Permeability:</b> Site is adjacent to surface water		(Max = 7)
2.3	<b>Total Annual Precipitation:</b> Anacortes 25.7"		(Max = 5)
2.4	<b>Max 2yr/24hr Precipitation:</b> 1.5 inches		(Max = 2)
2.5	<b>Flood Plain:</b> Not in the flood plain		(Max = 2)
2.6	<b>Terrain Slope:</b> Adjacent to surface water		(Max = 5)

## 3.0 TARGETS

		Source	Value
3.1	<b>Distance to Surface Water:</b> 0 feet		(Max = 10)
3.2	<b>Population Served within 2 miles (see WARM Scoring Manual Regarding Direction ): 0</b>		(Max = 75)
3.3	<b>Area Irrigated by surface water within 2 miles : 0</b>		(Max = 30)
3.4	<b>Distance to Nearest Fishery Resource:</b> Guemes Channel <1000feet		(Max = 12)
3.5	<b>Distance to, and Name(s) of, Nearest Sensitive Environment(s):</b> Guemes Channel <1000 feet		(Max = 12)

## 4.0 RELEASE

<b>Explain Basis:</b> No release documented to surface water from upland chemicals of concern	<b>Source:</b> _____ <b>Value:</b> _____ (Max = 5)
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**WORKSHEET 5  
AIR ROUTE**

**1.0 SUBSTANCE CHARACTERISTICS**

**1.1.** Introduction (WARM Scoring Manual) – Please review before scoring

<b>1.2 Human Toxicity</b>									
Substance	Air Standard (µg/m <sup>3</sup> )	Value	Acute Toxicity (mg/ m <sup>3</sup> )	Value	Chronic Toxicity (mg/kg/day)	Value	Carcinogenicity		Value
							WOE	PF*	
1									
2									
3									
4									
5									

\* Potency Factor

Source: \_\_\_\_\_

**Highest Value:** \_\_\_\_\_

(Max = 10)

**Plus 2 Bonus Points**

**Final Toxicity Value:** \_\_\_\_\_

(Max = 12)

<b>1.3 Mobility (Use numbers to refer to above listed substances)</b>				
<b>1.3.1 Gaseous Mobility</b>		<b>1.3.2 Particulate Mobility</b>		
Vapor Pressure(s) (mmHg)		Soil Type	Erodibility	Climatic Factor
1-TPH Gas				
2-TPH Diesel				
3-Cadmium				
4-Copper				
5-Lead				

Source: \_\_\_\_\_

**G.M. Value:** \_\_\_\_\_  
(Max = 4)

Compare:  $20/4 = 20$  vs.  $12/0 = 3$

**P.M. Value:** \_\_\_\_\_  
(Max = 4)

**1.4**

**Final Matrix Value:** \_\_\_\_\_  
(Max = 24)

1.5 Environmental Toxicity/Mobility					
Substance	Non-human Mammalian Inhalation Toxicity (mg/m <sup>3</sup> )	Acute Value	Mobility	Value	Matrix Value
1					
3					

Highest Environmental Toxicity Matrix Value (from Table A-7) = **Final Matrix Value:** \_\_\_\_\_  
 (Max = 24)

1.6 Substance Quantity	
Explain Basis: Unknown, use default value = 1	Source: _____ Value: _____ (Max = 10)

2.0 MIGRATION POTENTIAL

		Source	Value
2.1	<b>Containment:</b> Contaminated surface soil, no cover, no containment	1,2,6	(Max = 10)

3.0 TARGETS

		Source	Value
3.1	<b>Nearest Population:</b> < 1000'	1,6	(Max = 10)
3.2	<b>Distance to [and name(s) of] nearest sensitive environment(s):</b> City of Anacortes Rotary Park = 1700 feet	6,12	(Max = 7)
3.3	<b>Population within 0.5 miles:</b> Est 200 buildings x 3 =600, sqrt 600 = 24	6,12	(Max = 75)

4.0 RELEASE

Explain Basis: No documented release to air.	Source: _____ Value: _____ (Max = 5)
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WORKSHEET 6  
Groundwater Route

**2.0 SUBSTANCE CHARACTERISTICS**

1.2 Human Toxicity										
Substance	Drinking Water Standard (µg/L)	Value	Acute Toxicity (mg/ kg-bw)	Value	Chronic Toxicity (mg/kg/day)	Value	Carcinogenicity		Value	
							WOE	PF*		
1 Benzene	5	8	3306, rat	3	ND	-	A	0.029	5	

\* Potency Factor

Source: 2, 3, 4, 5,6,7

**Highest Value: 8**

(Max = 10)

**Plus 2 Bonus Points?**

**Final Toxicity Value: 8**

(Max = 12)

1.2 Mobility (use numbers to refer to above listed substances)	
Cations/Anions [Coefficient of Aqueous Migration (K)]	OR Solubility (mg/L)
1=	1= 1800 value=3

Source: 2, 3, 4, 5,6,7

**Value: 3**

(Max = 3)

1.3 Substance Quantity (volume):	
Explain basis: Unknown quantity, default to 1	Source: <u>2, 3, 4, 5,6,7</u> <b>Value: 1</b> (Max=10)

**3.0 MIGRATION POTENTIAL**

		Source	Value
2.1	<b>Containment (explain basis):</b> Contaminated soil, no liner, low permeability with no maintenance, no leachate system	1,2,3, 4, 5, 6, 7	<b>6</b> (Max = 10)
2.2	<b>Net precipitation:</b> (5.6+6.4+5.4+4.2+4.7+3.3)-(.9+.5+.4+.6+1.2+2.1) = 29.6"	6,8	<b>3</b> (Max = 5)
2.3	<b>Subsurface hydraulic conductivity:</b> sand and gravel > 10E-3	2,6	<b>4</b> (Max = 4)
2.4	<b>Vertical depth to groundwater:</b> Soil boring on site found groundwater at 5-10 feet bgs	2,6	<b>8</b> (Max = 8)

**4.0 TARGETS**

		<b>Source</b>	<b>Value</b>
<b>3.1</b>	<b>Groundwater usage:</b> Private supply but alternate sources available	6,10,12	<b>4</b> (Max = 10)
<b>3.2</b>	<b>Distance to nearest drinking water well:</b> >2640 - 5000 feet	6,10,12	<b>2</b> (Max = 5)
<b>3.3</b>	<b>Population served within 2 miles:</b> $\sqrt{\text{pop.}} = \sqrt{0} = 0$	6,10,12	<b>14</b> (Max = 100)
<b>3.4</b>	<b>Area irrigated by (groundwater) wells within 2 miles:</b> $(0.75) * \sqrt{\# \text{ acres}} = 0.75 * \sqrt{193.25} = 10.4$	6,10,12	<b>10</b> (Max = 50)

## 5.0 RELEASE

		<b>Source</b>	<b>Value</b>
	<b>Explain basis for scoring a release to groundwater:</b> Documented release to groundwater	2,4,5,6	<b>5</b> (Max = 5)

### SOURCES USED IN SCORING

1. Skagit County Health Department, Skagit Farmers Supply/Wolfkill file and field notes, May 2010.
2. Rittenhouse-Zeman & Associates, Subsurface Petroleum Hydrocarbon Investigation Wolfkill Yard, Mount Vernon, WA, March.
3. Wolfkill Feed and Fertilizer, Remediation Summary for Skagit Farmers Supply/Old Wolfkill Feed and Fertilizer, Mount Vernon, WA, March 1999.
4. AGRA Earth & Environmental, Groundwater Status Report Wolfkill Feed and Fertilizer, January 1999.
5. AMEC Earth & Environmental, Groundwater Status Report Former Wolfkill Yard, May 2002.
6. Washington Department of Ecology, WARM Scoring Manual, April, 1992.
7. Washington Department of Ecology, Toxicology Database for Use in Washington Ranking Method Scoring, January, 1992.
8. National Weather Service, Washington Climate Data.
9. Washington Department of Ecology, Water Rights Information System (WRIS), 1997.
10. Washington Department of Ecology, Well Logs.
11. Washington Department of Health Public Water Supply Data.
12. Skagit County Mapping, SkagitView Version 5.0, June 2008.

# Photo Album

by Corrina L. Marote



2 mile buffer map



Tank removal site in front of remaining building



Tank removal site

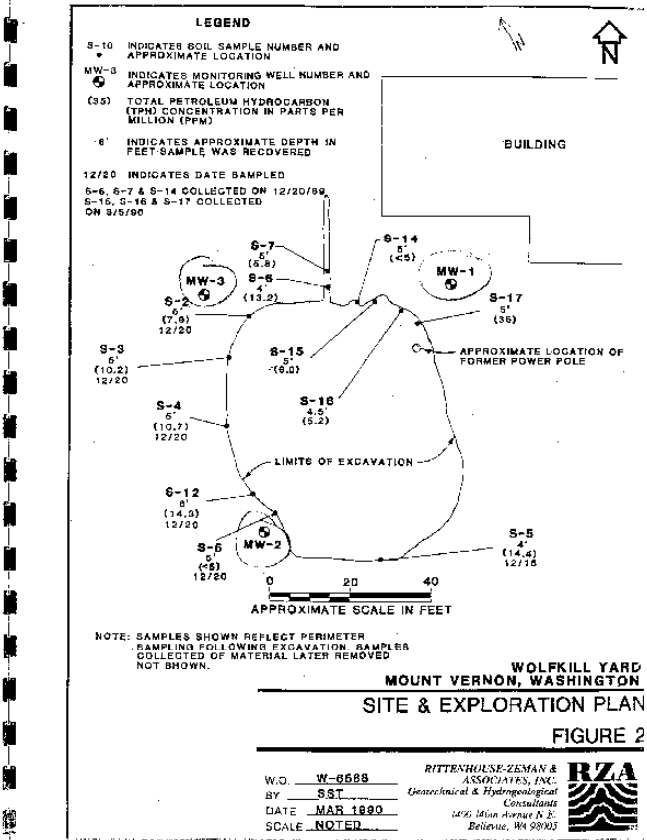


Tank removal site area



More views of site from gate

# Tank Removal Site Diagram, March 1990



# 1997 Site Diagram

