

# SITE HAZARD ASSESSMENT

## WORKSHEET 1

### Summary Score Sheet

#### SITE INFORMATION:

Vashon Athletic Club  
19120 Vashon Hwy SW  
Vashon, King County, WA 98070

Section/Township/Range: 32/ 23N/ 03E  
Latitude: 47° 30' 00"  
Longitude: 122° 27' 43.78"  
Ecology Facility Site ID No: 6319811

*Site scored/ranked for the February 19, 2009 update*

*January 12, 2009*

#### **Site Description**

The Vashon Athletic Club site consists of one 92,783 square foot parcel of land located on Vashon Island, Washington. The site is bordered by residential and commercial properties to the north, 192<sup>nd</sup> Street to the south, Vashon Highway South to the east and undeveloped land to the west. About one half of the site is covered by concrete and asphalt with the remaining half soil and planting areas filled with vegetation.

The property has a single-story building that contains the Vashon Athletic Club and a small grocery store. A gasoline station with two fueling islands and five underground storage tanks (USTs) is also located on the site. The five USTs consist of two 10,000-gallon and three 5,000-gallon tanks that are used to store gasoline and diesel fuel. One of the 5,000-gallon tanks was emptied and removed from service during 2000. Vashon Island is served by a sole-source aquifer. Water is obtained through a mix of private and municipal well systems. Sewage is handled with a mix of private sewage systems and a municipal collection system.

#### **Background**

The current building on the property was built in 1974 and has been used for a variety of businesses. During the fall of 1989, a limited site analysis of the property was conducted by the site owner to see if the USTs being used by a gasoline station on the site were leaking. The limited data gathered during the investigation indicated that soil contamination on the site did exist.

In May and June of 1999 two more limited investigations of the site were conducted by the site owner to check the USTs. The investigation conducted in May found no contamination concentrations

around the USTs above their respective Model Toxics Control Act (MTCA) Method A Soil Cleanup Levels for Unrestricted Land Use. A soil and groundwater sample collected north of the UST showed contamination above the MTCA cleanup levels. An expanded investigation in June included nine additional soil borings. This investigation showed that the contaminated soil was limited to the south side of the property building. At that point approximately 220 tons of petroleum contaminated soil were excavated and removed from the property.

In November of 2000 another 150 tons of petroleum contaminated soil was excavated and stockpiled on the site. Further soil analysis showed that contaminated soil existed to the east and northeast of the UST area. One of the 5,000-gallon USTs that was being used for gasoline storage was thought to be leaking and causing the site contamination. That tank was then emptied and removed from service. During the summer of 2001 three groundwater monitoring wells were installed and four soil test pits were excavated for further groundwater and soil analysis.

Groundwater and soil samples were taken and analyzed for Total Petroleum Hydrocarbons Gasoline/Benzene, Toluene, Ethyl-benzene and Xylenes (TPH-Gx/BTEX) and Total Lead. Groundwater analysis has continued at the site with the last round of sampling being conducted during March 2007. Results of the testing showed that the Vashon Athletic Club property is contaminated with gasoline, benzene, ethyl-benzene and xylenes at concentrations above their respective MTCA Method A Groundwater Cleanup Levels. The following table shows the highest levels of groundwater contamination encountered at the property during the March 2007 analysis.

Analyte	V1-MW2 (ppb)	V1-MW3 (ppb)	Standard	(ppb)
TPH- Gasoline	26,700	12,000	MTCA A *	800 (w/benzene)
Benzene	150	40	"	5
Ethylbenzene	1,400	700	"	700
Xylenes	2,600	1,000	"	1,000

\*MTCA A refers to the Model Toxics Control Act Table 720-1 Method A Cleanup Levels for Ground Water.  
ppb = parts per billion

During the fall of 1999 the Washington Department of Ecology (Ecology) was contacted by a Vashon Athletic Club site representative. The site entered Ecology's Voluntary Cleanup Program (VCP) so it could be remediated under the guidance of Ecology. Due to remediation inactivity the Vashon Athletic Club property was removed from the VCP on December 15, 2006. The site was then added to Ecology's Confirmed and Suspected Contaminated Sites list to await Site Hazard Assessment (SHA).

### Site Hazard Assessment

A SHA was conducted by Carsten Thomsen, Public Health – Seattle & King County during October and November 2008. A phone interview with Mike Arnold, the current consultant for the property, was used to gather information on the site. Mr. Arnold also provided reports and contamination monitoring results related to the Vashon Athletic Club property. A SHA site visit was conducted on November 26, 2008. No visible contamination was encountered during the SHA visit.

**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):**

Due to the significant contamination documented on-site being primarily subsurface, the surface water route is not applicable for WARM scoring for this site. Thus, only the air and groundwater routes will be scored.

**ROUTE SCORES:**

Surface Water/Human Health: NS  
Air/Human Health: 14.2  
Groundwater/Human Health: 78.8

Surface Water/Environmental.: NS  
Air/Environmental: 12.7

**OVERALL RANK: 3**

WORKSHEET 2  
Route Documentation

1. AIR ROUTE

- a. List those substances to be considered for scoring: Source: 1,2,3  
**TPH-Gasoline (Benzene), Ethylbenzene and Xylene**
- b. Explain basis for choice of substance(s) to be used in scoring:  
**Analytical results from soil and water sampling indicate the presence of these hazardous substances at levels which exceed our current Method A cleanup levels.**
- c. List those management units to be considered for scoring: Source: 1,2,3  
**Surface and subsurface soils**
- d. Explain basis for choice of unit to be used in scoring:  
**Spills/discharges caused soil contamination**

2. GROUNDWATER ROUTE

- a. List those substances to be considered for scoring: Source: 1,2,3  
**TPH-Gasoline (Benzene), Ethylbenzene and Xylene**
- b. Explain basis for choice of substance(s) to be used in scoring:  
**Analytical results from soil and water sampling indicate the presence of these hazardous substances at levels which exceed our current Method A cleanup levels.**
- c. List those management units to be considered for scoring: Source: 1,2,3  
**Surface and subsurface soils**
- d. Explain basis for choice of unit to be used in scoring:  
**Spills/discharges caused soil contamination**

WORKSHEET 3  
Air Route

**1.0 SUBSTANCE CHARACTERISTICS**

**1.1. Introduction**

<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 TPH-Gasoline (Benzene)	0.12	10	31947	3	-	ND	A	0.029	5	
2 Ethyl-benzene	1448.6	1	-	ND	-	ND	-	-	ND	
3 Xylenes	1448.6	1	21714	3	0.085	1	-	-	ND	

\* Potency Factor

Source: 1,2,3

**Highest Value: 10**

(Max = 10)

**Plus 2 Bonus Points? No**

**Final Toxicity Value: 10**

(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	Particulate Value
1	95, Value = 4		Sand, Gravel	22	1 - 10	0
2	7, Value = 3					
3	10, Value = 3					

Source: 2

**Value: 4**

(Max = 4)

Source: 2,3

**Value: 0**

(Max = 4)

**1.4 Highest Human Health Toxicity/ Mobility Matrix Value (from Table A-7)**

**Final Matrix Value: 20**

(Max = 24)

1.5 Environmental Toxicity/Mobility						
	Substance	Non-human Mammalian Inhalation Toxicity (mg/m <sup>3</sup> )	Acute Value	Mobility (mmHg)	Value	Matrix Value
1	TPH-Gasoline (Benzene)	31947 (rat)	3	95	4	6
2	Ethylbenzene	No Data	ND	7	3	NS
3	Xylenes	21714 (rat)	3	>10E-03 to 10	3	5

Highest Environmental Toxicity/Mobility Matrix Value (from Table A-7) = **Final Matrix Value: 6**  
(Max = 24)

1.6 Substance Quantity	
Explain Basis: Unknown. Sampling has not determined the extent of contamination. Use Default.	Source: <u>2,3</u> Value: <u>1</u> (Max = 10)

## 2.0 MIGRATION POTENTIAL

		Source	Value
2.1	<b>Containment:</b> Soil cover >2 feet thick, no vapor collection system	2	<u>5</u> (Max = 10)

## 3.0 TARGETS

		Source	Value
3.1	<b>Nearest Population:</b> 40' to nearest house	8	<u>10</u> (Max = 10)
3.2	<b>Distance to [and name(s) of] nearest sensitive environment(s) [fisheries excluded]:</b> 1258 feet, Vashon Commons Park	8	<u>5</u> (Max = 7)
3.3	<b>Population within 0.5 miles:</b> $\sqrt{\text{pop.}} = 402$ ; $\sqrt{402} = 20.05$	8	<u>20</u> (Max = 75)

## 4.0 RELEASE

Explain Basis for scoring a release to air: Not documented	Source: <u>2</u> Value: <u>0</u> (Max = 5)
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WORKSHEET 4  
Groundwater Route

**1.0 SUBSTANCE CHARACTERISTICS**

<b>1.2 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 TPH-Gasoline (Benzene)	5	8	3306	3	-	ND	A	0.029	5	
3 Ethyl-benzene	700	4	3500	3	0.1	1	-	-	ND	
4 Xylenes	10,000	2	50	10	2	1	-	-	ND	

\* Potency Factor

Source: 1,2,3

**Highest Value: 10**

(Max = 10)

**Plus 2 Bonus Points? Yes**

**Final Toxicity Value: 12**

(Max = 12)

<b>1.2 Mobility (use numbers to refer to above listed substances)</b>	
Cations/Anions	OR Solubility (mg/L)
1=	1= $1.8 \times 10^3 = \text{Value 3}$
2=	2= $1.5 \times 10^2 = \text{Value 2}$
3=	3= $2.0 \times 10^2 = \text{Value 2}$

Source: 1,2

**Value: 3**

(Max = 3)

<b>1.3 Substance Quantity:</b>	
Explain basis: Unknown. Sampling has not determined the extent of contamination. Use Default.	Source: <u>2,3</u> <b>Value: <u>1</u></b> (Max=10)

## 2.0 MIGRATION POTENTIAL

		Source	Value
2.1	<b>Containment (explain basis):</b> Leaking Underground Storage Tank	2	<u>10</u> (Max = 10)
2.2	<b>Net precipitation:</b> Vashon Island: 34.5" - 5.7" = 28.8"	5	<u>3</u> (Max = 5)
2.3	<b>Subsurface hydraulic conductivity:</b> Silt/gravel/loam	2	<u>4</u> (Max = 4)
2.4	<b>Vertical depth to groundwater:</b> 3 feet	2	<u>8</u> (Max = 8)

## 3.0 TARGETS

		Source	Value
3.1	<b>Groundwater usage:</b> Sole source aquifer	2,9	<u>10</u> (Max = 10)
3.2	<b>Distance to nearest drinking water well:</b> 817 feet	2,9	<u>4</u> (Max = 5)
3.3	<b>Population served within 2 miles:</b> >10,000	2,9	<u>100</u> (Max = 100)
3.4	<b>Area irrigated by (groundwater) wells within 2 miles:</b> $0.75\sqrt{148} = 9$	2	<u>9</u> (Max = 50)

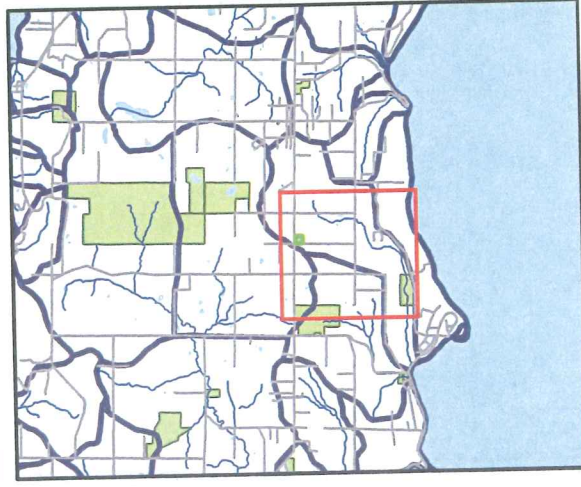
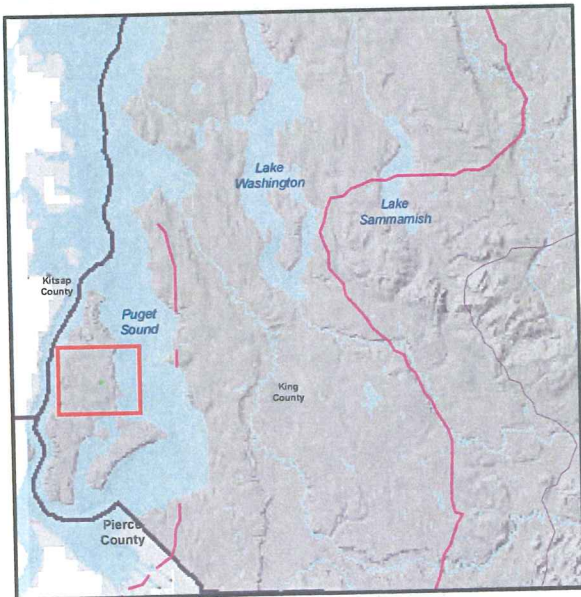
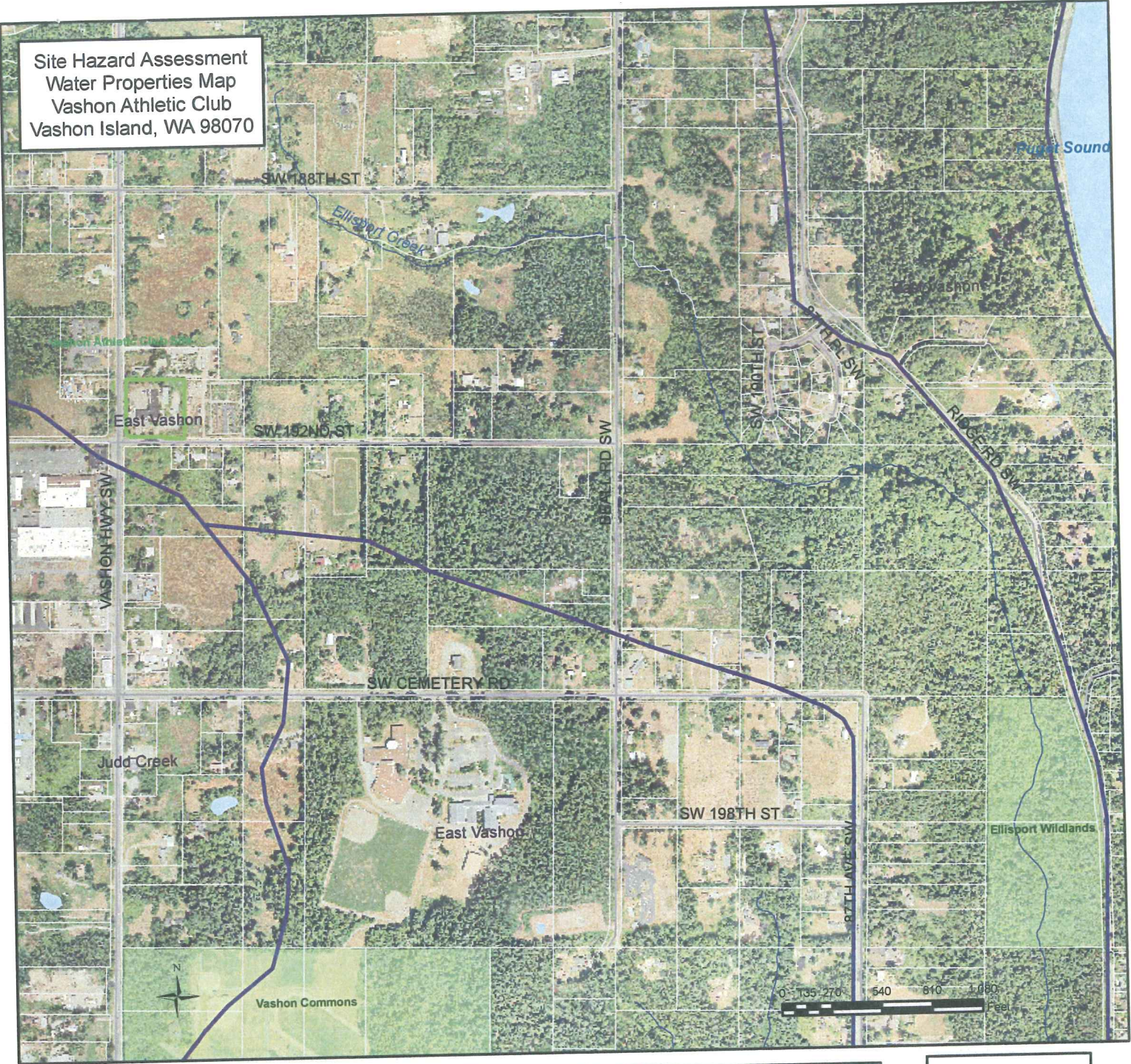
## 4.0 RELEASE

		Source	Value
	<b>Explain basis for scoring a release to groundwater:</b> Release confirmed by sampling results.	2,3	<u>5</u> (Max = 5)

## SOURCES USED IN SCORING

1. Washington ranking Method Toxicological Data-Base
2. Phase II Environmental Site Assessment and Ground Water Monitoring, Vashon Athletic Club/Mom's Grocery and Deli, 19124 Vashon Highway South, Vashon, WA, Herrera Environmental Consultants, Inc., July 23, 2001
3. March 2007 Ground Water Monitoring Report, Vashon Athletic Club Facility, Vashon, WA, Environmental Resources Management, April 6, 2007
4. Site Hazard Assessment, PHSKC, 10/08
5. National Weather Service Data
6. Washington State Department of Health Public Water Supply Listing
7. Washington State Water Use Data
8. King County GIS Center Data, April 2007
9. 2000 Census Data, King County GIS Center
10. Washington Department of Ecology, Warm Scoring Manual

Site Hazard Assessment  
 Water Properties Map  
 Vashon Athletic Club  
 Vashon Island, WA 98070



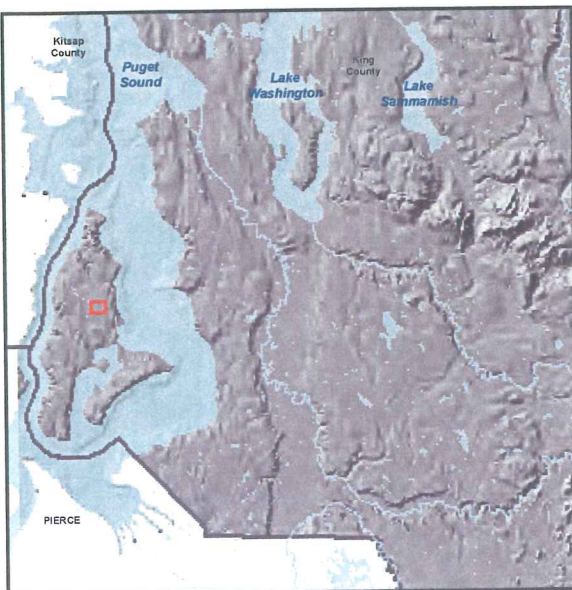
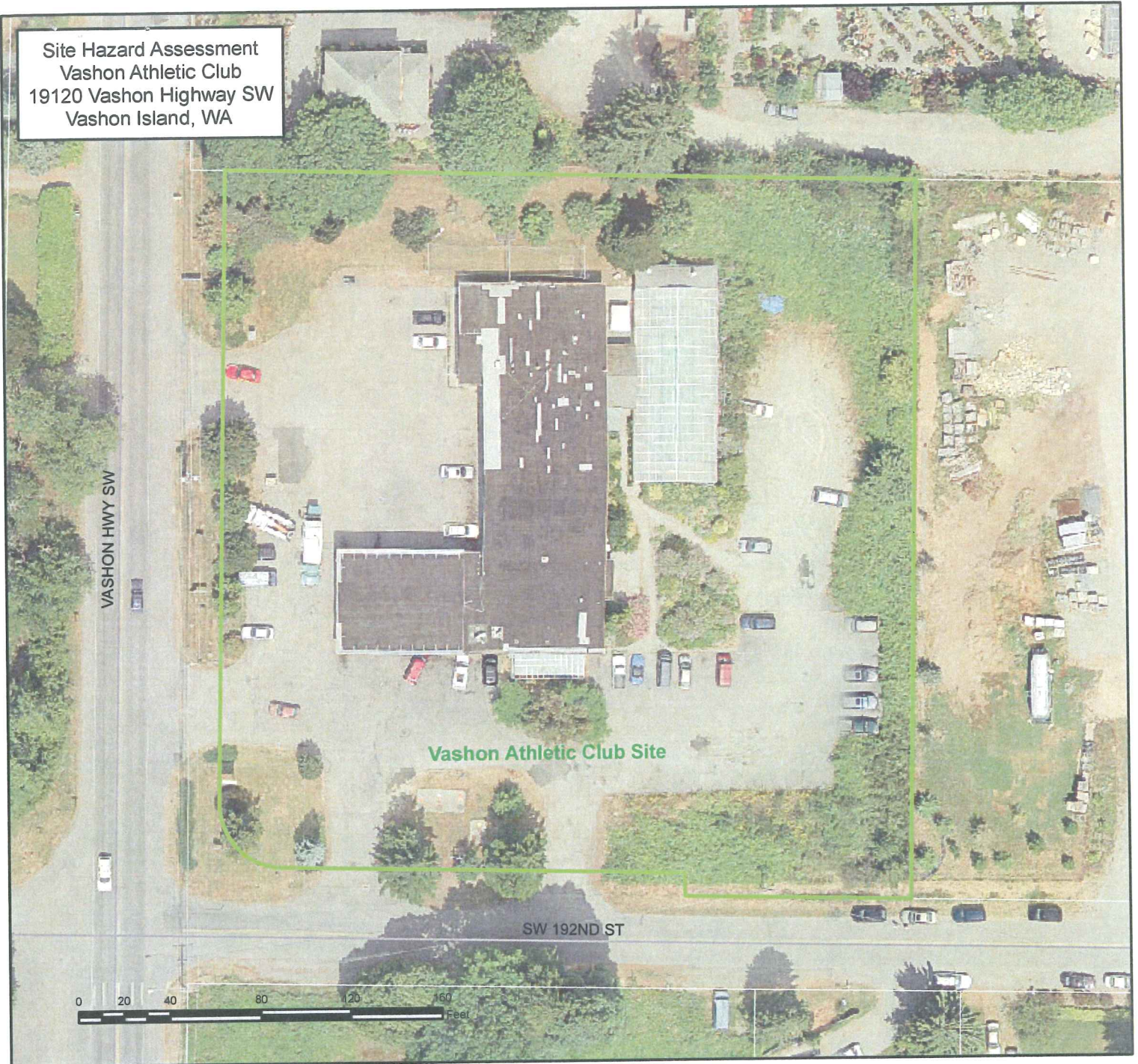
**Legend**

- Vashon Athletic Club Site
- Isopleths Max 2 Year 24 Hour**
- 1.2 inches
- 2 inches
- 3 inches
- 4 inches
- 5 inches
- 6 inches
- 6.6 inches
- Drainage Basins
- Water
- Parcels
- Streets
- Streams
- Parks

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Site Hazard Assessment  
 Vashon Athletic Club  
 19120 Vashon Highway SW  
 Vashon Island, WA



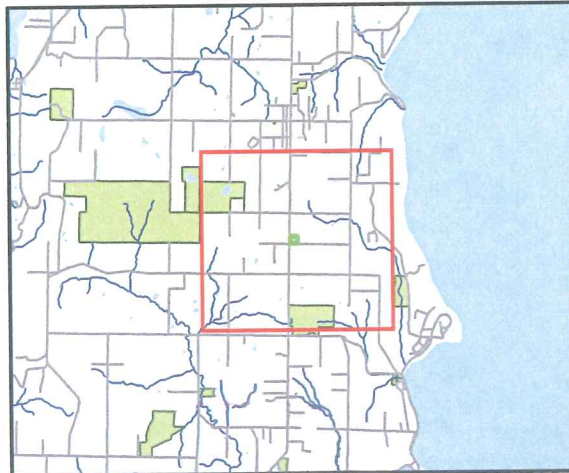
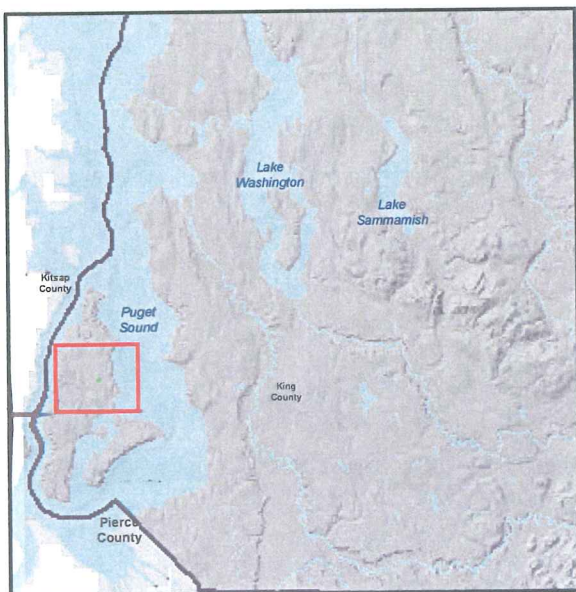
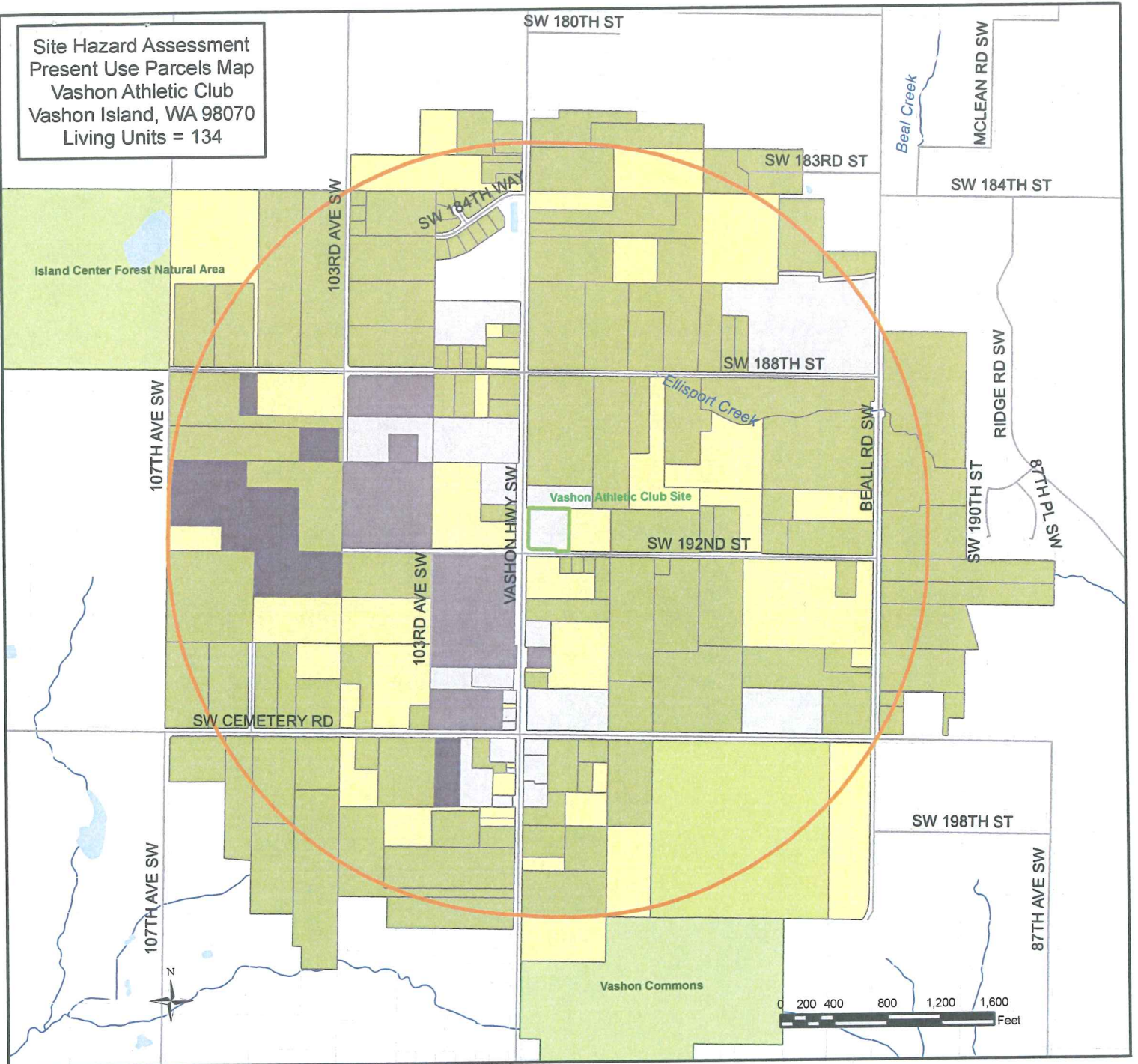
**Legend**

-  Vashon Athletic Club Site
-  Parcels
-  Streets

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Site Hazard Assessment  
 Present Use Parcels Map  
 Vashon Athletic Club  
 Vashon Island, WA 98070  
 Living Units = 134



**Legend**

- Vashon Athletic Club site
- Vashon Athletic Club half mile buffer
- Streets
- Present Use Parcels**
- Residential
- School
- Commercial
- Industrial
- Utility
- Vacant
- Water
- Parks
- Parcels
- Streams

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**Environmental Health Services Division**

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JAN 20 2009

DEPT. OF ECOLOGY

January 15, 2009

Mr. Mark Leonard  
16427 115<sup>th</sup> Ave SW  
Vashon Island, WA 98070  
Facility Site ID # 6319811

Dear Mr. Leonard:

Public Health-Seattle & King County has completed the site hazard assessment (SHA) of the Vashon Athletic Club site, as required under the Model Toxics Control Act. This site's hazard ranking, an estimation of the potential threat to human health and/or the environment relative to all other Washington state sites assessed at this time, has been determined to be a 3, where 1 represents the highest relative risk and 5 the lowest.

For your information, Ecology will be publishing the ranking of this and other recently assessed sites in the February 19, 2009 Special Issue of the Site Register. The site hazard ranking will be used in conjunction with other site-specific considerations in determining Ecology's priority for future actions.

Please contact me at (206) 263-8447 if you have any questions relating to the SHA of your site. For inquiries/comments about the scoring/ranking of your site, or further activities by Ecology now that it is on Ecology's Hazardous Sites List, please call Donna Musa at (425) 649-7136.

Sincerely,



Carsten Thomsen  
Health and Environmental Investigator III

CT:sf

cc: Donna Musa, Washington Department of Ecology



STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

PO Box 47600 • Olympia, WA 98504-7600 • 360-407-6000  
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

September 3, 2008

Mark Leonard  
19120 Vashon Highway SW  
Vashon, WA 98070

Subject: Site Hazard Assessment – Vashon Athletic Club  
Ecology Facility Site ID: 6319811

Dear Mr. Leonard:

The Department of Ecology (Ecology) will conduct a site hazard assessment (SHA) of the Vashon Athletic Club site, 19120 Vashon Highway SW, Vashon, WA 98070, under the Model Toxics Control Act (MTCA), Chapter 173-340-320 WAC. This site has been on Ecology's Confirmed and Suspected Contaminated Sites (CSCS) List since November 15, 1999, and now has a site status of Awaiting SHA. This assessment will be performed by Carsten Thomsen, Public Health – Seattle & King County. He will contact you in the near future to arrange a suitable time for a site visit, as appropriate.

The purpose of an SHA is to gather information on past/present waste management activities, along with other basic site-specific environmental data, in order to score the site following the Washington Ranking Method (WARM) Scoring Manual guidelines. Potential/actual threats to human health and the environment are evaluated for each applicable migration route, with a resultant "hazard ranking" for the site determined.

Sites are ranked on a scale of one (1) to five (5), with 1 representing the highest level of concern, and 5 the lowest, relative to all other assessed/ranked sites in the state. The level of relative concern may be such that a recommendation of "No Further Action" (NFA) can be made, and your site will then be removed from Ecology's CSCS list.

For your information, Ecology will publish a notice in an upcoming issue of the *Site Register* that an SHA is scheduled for this site. This notice may evoke media inquiries. Likewise, the SHA outcome, either as a ranked site or a determination as NFA, will be published in the *Site Register*.

In addition to any required fieldwork, the following information will be considered in scoring this site:

- Ecology Northwest Regional Office Site Files
- Public Health – Seattle & King County Site Files

Mark Leonard  
September 3, 2008  
Page 2

You are requested to submit any additional environmental information regarding this site to:

Mr. Carsten Thomsen  
Environmental Health  
Public Health – Seattle & King County  
401 5<sup>th</sup> Avenue, Suite 1100  
Seattle, WA 98104

Additional data could include any environmental assessments or laboratory analyses which have been conducted regarding this site and which have not previously been submitted to Ecology. Every attempt will be made to obtain the most recent and accurate data for scoring your site. If you have better information or comments on the adequacy of the data we already have, please let us know as soon as possible. The final site rank and eventual site priority will be based primarily on the information used in the scoring. Your active participation in the assessment and scoring process is important to insure that only the best data available is used.

Fact sheets describing Site Hazard Assessments, the Washington Ranking Method and the Hazardous Sites List are enclosed for your information, as well as a copy of the Integrated Site Information System (ISIS) Site Data Summary Sheet for this site. If you have any questions please call me at (360) 407-7195 (or e-mail me at [mspe461@ecy.wa.gov](mailto:mspe461@ecy.wa.gov)) or Carsten Thomsen at (206) 296-4830 (or e-mail him at [carsten.thomsen@metrokc.gov](mailto:carsten.thomsen@metrokc.gov)).

Sincerely,



Michael J. Spencer  
Site Hazard Assessments  
Toxics Cleanup Program

MJS: ms  
Enclosures (4)

cc: Carsten Thomsen, Public Health – Seattle & King County  
Donna Musa, Ecology Northwest Regional Office Toxics Cleanup Program