

CSID: 3572

SITE HAZARD ASSESSMENT
WORKSHEET 1
SUMMARY SCORE SHEET

Site Name/Location (Street, City, County, Section/Township/Range, TCP ID Number):

Sunnydale/Dryke Shooting Range
292 Dryke Road
Sequim, Clallam County, WA 98382
Latitude: 48° 05' 33"
Longitude: 123° 13' 08"

Ecology Facility Site ID: ~~6904640~~
Sec 17 T 30N R 04W 1283666

Site scored/ranked for Feb 2006 update

Site Description (Include management areas, substances of concern, and quantities):

Sunnydale/Dryke Shooting Range is a shooting range that has been in operation since the 1950's. The site is 39.01 acres. There are two ponds on site. The upper pond is approximately two acres and is located near the center of the parcel. The lower pond is approximately one acre and is on the northeastern corner of the parcel. The ponds were built with a Soil Conservation Service grant around 1963. The lower pond collects surface water and then water is pumped into the upper pond. Mr. Dryke stated that no surface water runs off the property.

The area is approximately 3.8 miles west of the City of Sequim. It is zoned Rural Moderate (R2). The purpose of the Rural Moderate (R2) zone is to provide areas having a moderate density rural setting free from commercial, industrial, and high-density residential developments. Shooting ranges are prohibited in R2, however, the site was established as a shooting range before the zoning codes were in effect. The residential area is largely served by Group A water systems, such as Solmar, Kingsway Forsquare, and Olympic View.

There is a long history of water quality and hazardous waste complaints at this site. In March 1989, Clallam County received a report of surfacing sewage, surface water violations, and improper discharge of dog waste from a kennel operation on site. The County worked with Mr. Dryke to install an on-site sewage system. In May 1990, the County referred the rest of the report of surface water violations and improper discharge of kennel waste to the Washington Department of Ecology (Ecology). Ecology Water Quality inspectors conducted site visits in January and July 1991.

In October 1990, Ecology recorded a complaint concerned about lead contamination on their property from the shooting range. The case narrative from the environmental report dated October 8 1990, states, "...we (Ecology) have no authority to have Mr. Dryke stop his clients from shooting toward the Miller's property. Suggested they get community support to have the area zoned so that the activity can be controlled. Also suggested that there is probably a good case for getting Mr. Dryke to clean up their property. If pursued in Court. No action by Ecology."

In November 1991, Bill Young with Ecology's Water Quality section talked with Joel Fruedenthal with Clallam County Water Quality. Mr. Fruedenthal had taken fecal coliform samples in the creek on the complainants property and found 10-15 FC/100 ml, which was not a water quality violation.

On December 5, 1991, Mr. Young wrote a memorandum to Rusty Post an Ecology Cleanup Program inspector. The memorandum stated water quality inspectors had investigated the site and determined the water quality complaints regarding surface water are not valid. Mr. Young states the site is used as a trap and skeet shooting ranges and the complainants have some evidence the lead concentration is increasing in the

groundwater. The complainants believe the lead is accumulating into the soil and leaching into groundwater. Mr. Young referred the complaint to Ecology's Toxics Cleanup Program.

On December 11, 1992, Megan White with Ecology was sent a copied on a letter dated December 4, 1992 to the complainants from Mr. Fruedenthal with the County regarding some water sampling that he had conducted in their stock pond, the duck pond (lower pond) on Mr. Dryke's property, and the Agnew Irrigation ditch. Mr. Fruedenthal's letter states, "the duck pond may be exceeding the chronic water quality standard for lead."

On December 29, 1993, Rusty Post, Ecology, sent Mr. Dryke a certified letter regarding a recent inspection he had conducted at the Sunnydale Shooting Range. The letter said based on Mr. Post's estimation, there was a high likelihood that the soil will exceed the state's cleanup standards for lead, and the site will be listed on Ecology's Site Information System (SIS) database. The letter also stated that a Site Hazard Assessment may be conducted in the future. On January 14, 1994, Mr. Dryke submitted a letter, laboratory data, and an Independent Remedial Action Report Summary. On February 1, 1994, Mr. Dryke submitted additional water test results from the ponds.

Mr. Post sent Mr. Dryke another letter on February 4, 1994. The letter stated the laboratory data showed some lead levels in the pond up to 14 ppb, which exceeded the surface water standard of 3.2 ppb. Mr. Post's letter reiterated being placed on the SIS database.

On June 22, 2004, Clallam County Environmental Health (CCEH) received an Environmental Report Tracking System e-mail from Ecology's Southwest Regional Office regarding possible lead contamination at the Sunnydale Shooting Range. On August 8, 2004, Jennifer Garcelon met the complainant at her property to discuss the contamination. The complainant was mostly concerned about water from the Sunnydale Shooting Range creating a wetland on her property and killing her trees.

On September 8, 2004, CCEH sampled for lead by taking water samples in the two ponds on site, and two sediment samples. One water sample was taken in the upper pond, and two water samples were taken in the lower pond. The sediment samples were taken from four points in each pond. As part of the Site Hazard Assessment in July 2005, additional samples were taken and tested for lead and polyaromatic hydrocarbons (PAHs). Three soil samples from around the property were taken, and four soil samples at the water line of the upper pond were taken. The table on the next page summarizes the sampling results.

Sample	Matrix	Analyte Found	Sample Result (ppm)	Applicable Standard	(ppm)
Upper Pond (UP)	Sediment	Lead	77,800	MTCA A ULU	250
UP Dog Jump	Soil	Lead	46,000	MTCA A ULU	250
UP Cat Tail	Soil	Lead	5,210	MTCA A ULU	250
Rabbit Run	Soil	Lead	618	MTCA A ULU	250
	Soil	Benzo-a-pyrene	8.5	MTCA A ULU	0.1
	Soil	Benzo-b-fluoranthene	2.4	TEF*	0.1
	Soil	Benzo-k-fluoranthene	.810	TEF*	0.1
	Soil	Chrysene	8.4	TEF*	0.1
	Soil	Fluorene	.045	TEF*	0.1
	Soil	Napthalene	.0099	TEF*	0.1
	Soil	Pyrene	7.3	TEF*	0.1
Weeping Willow	Soil	Benzo-a-pyrene	200	MTCA A ULU	0.1
	Soil	Benzo-b-fluoranthene	160	TEF*	0.1
	Soil	Benzo-k-fluoranthene	140	TEF*	0.1
	Soil	Chrysene	160	TEF*	0.1
	Soil	Fluorene	1.10	TEF*	0.1
	Soil	Napthalene	.330	TEF*	0.1
	Soil	Pyrene	250	TEF*	0.1

* Toxicity Equivalency Factor (TEF) Result Exceeded 0.1 ppm

Based on the sample results taken September 4, 2004, CCEH sent a field report to Ecology suggesting the site be added to the list of Confirmed or Suspected Contaminated Sites.

On July 29, 2005, Jennifer Garcelon and Michael Spencer with Ecology's Toxics Cleanup Program performed the Site Hazard Assessment (SHA). Based on the soil sampling results during the SHA, the site will be scored under Washington's Ranking Method as described in Ecology's Publication 90-14.

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):

None noted

ROUTE SCORES:

Surface Water/Human Health: 35.1 Surface Water/Environ.: 66.2
 Air/Human Health: 13.7 Air/Environmental: 26.6
 Ground Water/Human Health: 34.4

OVERALL RANK: 1

WORKSHEET 2 - ROUTE DOCUMENTATION

1. SURFACE WATER ROUTE

List those substances to be considered for scoring: Source: 1,2,3

Lead and PAHs.

Explain basis for choice of substance(s) to be used in scoring.

Analytical results from soil samples showed concentrations greater than their respective MTCA Method A cleanup levels for all of the above.

List those management units to be considered for scoring: Source: 1,2,3

Contaminated on-site surface and subsurface soils.

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

Chemical analyses of on-site soils indicated significant concentrations of Pb and PAHs.

2. AIR ROUTE

List those substances to be considered for scoring: Source: 1,2,3

Lead and PAHs.

Explain basis for choice of substance(s) to be used in scoring.

Analytical results from soil samples showed concentrations greater than their respective MTCA Method A cleanup levels for all of the above.

List those management units to be considered for scoring: Source: 1,2,3

Contaminated on-site surface and subsurface soils.

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

Chemical analyses of on-site soils indicated significant concentrations of Pb and PAHs.

3. GROUND WATER ROUTE

List those substances to be considered for scoring: Source: 1,2,3

Lead and PAHs.

Explain basis for choice of substance(s) to be used in scoring.

Analytical results from soil samples showed concentrations greater than their respective MTCA Method A cleanup levels for all of the above.

List those management units to be considered for scoring: . Source: 1,2,3

Contaminated on-site surface and subsurface soils.

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

Chemical analyses of on-site soils indicated significant concentrations of Pb and PAHs.

WORKSHEET 3 (If Required)
 SUBSTANCE CHARACTERISTICS WORKSHEET
 FOR MULTIPLE UNIT/SUBSTANCE SITES
Combination 1 Combination 2 Combination 3

Unit: **Section Not Applicable.**

1. SURFACE WATER ROUTE

Substance(s):
 Human Toxicity Value:
 Environ. Toxicity Value:
 Containment Value:
 Rationale:

Surface Water Human
 Subscore: (+3)(+1)= (+3)(+1)= (+3)(+1)=
 () () = () () = () () =

Surface Water Environ.
 Subscore: (+3)(+1)= (+3)(+1)= (+3)(+1)=
 () () = () () = () () =

2. AIR ROUTE

Substance(s):
 Human Toxicity/Mobility
 Value:
 Environ. Toxicity/
 Mobility Value:
 Containment Value:
 Rationale:

Air Human Subscore: (+3)(+1)= (+3)(+1)= (+3)(+1)=
 () () = () () = () () =

Air Environ. Subscore: (+3)(+1)= (+3)(+1)= (+3)(+1)=
 () () = () () = () () =

3. GROUND WATER ROUTE

Substance(s):
 Human Toxicity Value:
 Containment Value:
 Rationale:

Ground Water Subscore: (+3)(+1)= (+3)(+1)= (+3)(+1)=
 () () = () () = () () =

Based on their respective highest scoring toxicity/containment combinations, the following management units will be used for route scoring:

- Surface Water -
- Air -
- Ground Water -

**WORKSHEET 4
SURFACE WATER ROUTE**

1.0 SUBSTANCE CHARACTERISTICS

1.1 Human Toxicity

Substance	Drinking Water Standard		Acute Toxicity		Chronic Toxicity		Carcinogenicity		
	(µg/l)	Val.	(mg/kg-bw)	Val.	(mg/kg/day)	Val.	WOE	PF*	Val.
1. Pb	5	8	ND	-	ND	-	B2=.8	ND	-
2. Benzo-a-pyrene	.1	10	50 (rat)	10	ND	-	B2=.8	ND	-
3. Pyrene	.2	10	2700 (rat)	3	.03	1	X	ND	-
4. Fluorene	.2	10	ND	-	.04	1	X	ND	-
5. Chrysene	.2	10	ND	-	ND	-	B2=.8	ND	-
6. Benzo-b-fluor.	.2	10	ND	-	ND	-	B2=.8	ND	-
7. Benzo-k-fluor.	.2	10	ND	-	ND	-	B2=.8	ND	-
8. Napthalene	20	6	490 (rat)	5	.004	3	X	ND	-

*Potency Factor

Source: 1, 2, 3, 5
 Highest Value: 10
 (Max.=10)
 +2 Bonus Points? 2
Final Toxicity Value: 12
 (Max.=12)

1.2 Environmental Toxicity

- (X) Freshwater
 () Marine

Substance	Acute Water Quality Criteria		Non-human Mammalian Acute Toxicity		Source: <u>1, 2, 5</u>	Value: <u>10</u> (Max.=10)
	(µg/l)	Value	(mg/kg)	Value		
1. Pb	82	6				
2. Benzo-a-pyrene	ND	-	50 (rat)	10		
3. Pyrene	ND	-	2700 (rat)	3		
4. Fluorene	ND	-				
5. Chrysene	ND	-				
6. Benzo-b-fluor.	ND	-				
7. Benzo-k-fluor.	ND	-				
8. Napthalene	2300	2				

1.3 Substance Quantity: Unknown; use default = 1 Source: 1, 2, 6 Value: 1
 Explain basis: _____
 (Max.=10)

WORKSHEET 4 (CONTINUED)
SURFACE WATER ROUTE

2.0 MIGRATION POTENTIAL

- 2.1 Containment Source: 1,3 Value: 10
 Explain basis: contaminated soil with no
run-off control or unmaintained runon/runoff (Max.=10)
- 2.2 Surface Soil Permeability: clay Source: 1,2,6 Value: 7
 (Max.=7)
- 2.3 Total Annual Precipitation: 17.1 inches Source: 7 Value: 2
 (Max.=5)
- 2.4 Max. 2-Yr/24-hour Precipitation: 1.5-2.0 inches Source: 7 Value: 2
 (Max.=5)
- 2.5 Flood Plain: not in flood plain Source: 9 Value: 0
 (Max.=2)
- 2.6 Terrain Slope: ≤ 2% Source: 3,9 Value: 1
 (Max.=5)

3.0 TARGETS

- 3.1 Distance to Surface Water: adj. to surface water Source: 9 Value: 10
 (Max.=10)
- 3.2 Population Served within 2 miles (See WARM Scoring
 Manual Regarding Direction): $\sqrt{\text{pop.}} = \sqrt{15} = 3.9$ Source: 5,6 Value: 4
 (Max.=75)
- 3.3 Area Irrigated within 2 miles $0.75\sqrt{\text{no. acres}} =$
 $0.75\sqrt{(30)} = (.75)(5.4) = 4.1$ Source: 5,6 Value: 4
 (Max.=30)
- 3.4 Distance to Nearest Fishery Resource: 2,500' Source: 9 Value: 9
 (Max.=12)
- 3.5 Distance to, and Name(s) of, Nearest Sensitive
 Environment(s) McDonald Creek 2,500' Source: 9 Value: 9
 (Max.=12)

4.0 RELEASE

- Explain basis for scoring a release to surface
 water: Source: 1,3 Value: 5
release onto surface water (Max.=5)

**WORKSHEET 5
AIR ROUTE**

1.0 SUBSTANCE CHARACTERISTICS

1.1 Introduction (WARM Scoring Manual) - Please review before scoring

1.2 Human Toxicity

Substance	Air Standard		Acute Toxicity		Chronic Toxicity		Carcinogenicity		
	($\mu\text{g}/\text{m}^3$)	Val.	(mg/m^3)	Val.	($\text{mg}/\text{kg}/\text{day}$)	Val.	WOE	PF*	Val.
1. Pb	.5	10	ND	-	ND	-	X	ND	-
2. benzo-a-pyrene	.0006	10	ND	-	ND	-	B2=.8	ND	-
3. Pyrene	ND	-	170 (rat)	8	ND	-	X	ND	-
4. Fluorene	ND	-	ND	-	ND	-	X	ND	-
5. Chrysene	ND	-	ND	-	ND	-	B2=.8	ND	-
6. Benzo-b-fluor.	ND	-	ND	-	ND	-	B2=.8	ND	-
7. Benzo-k-fluor.	ND	-	ND	-	ND	-	B2=.8	ND	-
8. Napthalene	166.5	4	ND	-	ND	-	X	ND	-

*Potency Factor

Source: 1, 5
Highest Value: 10
(Max.=10)

+2 Bonus Points? 2
Final Toxicity Value: 12
(Max.=12)

1.3 Mobility (Use numbers to refer to above listed substances)

1.3.1 Gaseous Mobility

Vapor Pressure(s) (mmHg): _____ Source: 5
Value: 0
(Max.=4)

1.3.2 Particulate Mobility 1,2

Soil type: sandy loam Source: 11
Erodibility: 86 Value: 1
Climatic Factor: <1 (Max.=4)

1.4 Highest Human Health Toxicity/Mobility Matrix Value (from Table A-7) equals **Final Matrix Value: 6**
(Max.=24)

1.5 Environmental Toxicity/Mobility Source: 6

Substance	Non-human Mammalian Acute		Mobility	(Table A-7)	
	Inhal. Toxicity (mg/m^3)	Value		Value	Matrix Value
1. Pyrene	170 (rat)	8	Particulate	1	

Highest Environmental Toxicity/Mobility Matrix Value
(From Table A-7) equals **Final Matrix Value: 4**
(Max.=24)

WORKSHEET 5 (CONTINUED)
AIR ROUTE

1.6 Substance Quantity: Unknown; use default = 1 Source: 1 Value: 1
Explain basis: _____ (Max.=10)

2.0 MIGRATION POTENTIAL

2.1 Containment: _____ Source: 1,3 Value: 10
from surface spill/discharge, contaminated soil (Max.=10)
contaminated soil w/o cover

3.0 TARGETS

3.1 Nearest Population: 100' Source: 9,10 Value: 10
(Max.=10)

3.2 Distance to, and Name(s) of, Nearest Sensitive Environment(s) _____ Source: 9 Value: 7
adjacent to a wetland (Max.=7)

3.3 Population within 0.5 miles: $\sqrt{\text{pop.}} = \sqrt{687} = 26.2$ Source: 10 Value: 26
(Max.=75)

4.0 RELEASE

Explain basis for scoring a release to air: _____ Source: - Value: 0
_____ (Max.=5)

**WORKSHEET 6
GROUND WATER ROUTE**

1.0 SUBSTANCE CHARACTERISTICS

1.1 Human Toxicity

Substance	Drinking Water Standard		Acute Toxicity		Chronic Toxicity		Carcinogenicity		
	(µg/l)	Val.	(mg/kg-bw)	Val.	(mg/kg/day)	Val.	WOE	PF*	Val.
1. Pb	5	8	ND	-	ND	-	B2=.8	ND	-
2. Benzo-a-pyrene	.1	10	50 (rat)	10	ND	-	B2=.8	ND	-
3. Pyrene	.2	10	2700 (rat)	3	.03	1	X	ND	-
4. Fluorene	.2	10	ND	-	.04	1	X	ND	-
5. Chrysene	.2	10	ND	-	ND	-	B2=.8	ND	-
6. Benzo-b-fluor.	.2	10	ND	-	ND	-	B2=.8	ND	-
7. Benzo-k-fluor.	.2	10	ND	-	ND	-	B2=.8	ND	-
8. Napthalene	20	6	ND	-	ND	-	X	ND	-

*Potency Factor

Source: 5
Highest Value: 10
(Max.=10)

+2 Bonus Points? 2
Final Toxicity Value: 12
(max.+12)

1.2 Mobility (Use numbers to refer to above listed substances)
Cations/Anions: 1=2; Source: 5,6 Value: 2
(Max.=3)

Or

Solubility(mg/l): 2-8=0

1.3 Substance Quantity: Unknown; use default = 1 Source: 1,3 Value: 1
Explain basis: _____ (Max.=10)

2.0 MIGRATION POTENTIAL

2.1 Containment Source: 1,3 Value: 10
Explain basis: soil contamination (Max.=10)

2.2 Net Precipitation: 18.1-6 = 12.1 inches Source: 7 Value: 1
(Max.=5)

2.3 Subsurf.Hydraul.Conduct.: clayey silt Source: 9 Value: 3
(Max.=4)

2.4 Vertical Depth to Ground Water: 64 feet Source: 8 Value: 4
(Max.=8)

WORKSHEET 6 (CONTINUED)
GROUND WATER ROUTE

3.0 TARGETS

3.1	Ground Water Usage: <u>pub/priv source available</u>	Source: <u>6</u>	Value: <u>4</u> <small>(Max.=10)</small>
3.2	Dist. to Nearest Drinking Water Well: <u>on-site</u>	Source: <u>4</u>	Value: <u>5</u> <small>(Max.=5)</small>
3.3	Population Served within 2 Miles: $\sqrt{\text{pop.}=\sqrt{(1454)}=38}$	Source: <u>4</u>	Value: <u>38</u> <small>(Max.=100)</small>
3.4	Area Irrigated by (Groundwater) Wells within 2 miles: $0.75\sqrt{\text{no. acres}}=$ <u>$0.75\sqrt{(353)}=14.1$</u>	Source: <u>4</u>	Value: <u>14</u> <small>(Max.=50)</small>
4.0	RELEASE		
	Explain basis for scoring a release to ground water: _____	Source: <u>1,3</u>	Value: <u>0</u> <small>(Max.=5)</small>

SOURCES USED IN SCORING

1. Ecology ERTS 541614.
2. Ecology ISIS Data Summary, as of 12/14/2004.
3. Site Hazard Assessment Visit by Jennifer Garcelon and Michael Spencer, July 29, 2005.
4. Ecology Water Rights Application Tracking System (WRATS).
5. Washington Department of Ecology, Toxicology Database for Use in Washington Ranking Method Scoring, January 1992.
6. Washington Department of Ecology, WARM Scoring Manual, April 1992.
7. See attached table identified as Reference 7.
8. Washington State Department of Health SADIE Information 12/14/2004.
9. Clallam County Department of Community Development Critical Areas Map.
10. US Census Information <http://factfinder.census.gov>.
11. Ecology Facility/Site Atlas Map <http://apps.ecy.wa.gov/servlet/com>.