

WASHINGTON RANKING METHOD

ROUTE SCORES SUMMARY AND RANKING CALCULATION SHEET

Site name: Dryden Landfill Region: CRO

City, county: Dryden, Chelan

This site was ranked on August 12, 1991, based on quintile values from 259 assessed/scored sites.

Pathway	Route Score(s)	Quintile Group number(s)	Priority scores:
SW-HH	<u>16.3</u>	<u>3</u>	$\frac{9 + 4 + 2}{8} = 1.7 = 2$
Air-HH	<u>7.6</u>	<u>2</u>	
GW-HH	<u>29.0</u>	<u>2</u>	
Sed-HH	<u>-</u>	<u>-</u>	
SW-En	<u>29.1</u>	<u>3</u>	$\frac{9 + 0}{7} = 1.2 = 2$
Air-En	<u>NS</u>	<u>0</u>	
Sed-En	<u>-</u>	<u>-</u>	

Use the matrix presented to the right, along with the two priority scores, to determine the site ranking. N/A refers to where there is no applicable pathway.

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

DRAFT / FINAL

Matrix ("bin") Ranking: 4, or          No Further Action

CONFIDENCE LEVEL: The relative position of this site within this bin is:

- almost into the next higher bin.
- X right in the middle, unlikely to ever change.
- almost into the next lower bin.

WORKSHEET 1  
SUMMARY SCORE SHEET

Site Name: Dryden Landfill

Site Location: (City, County, or Section/Township/Range)

Section 27 T24N R18E  
Dryden, Washington (Chelan County)

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

A landfill was operated at the site from 1960 to 1987 accepting municipal solid waste, domestic sludge (until 1980) and agricultural solid waste. The landfill has been closed and a solid waste transfer station operates at the site. Leachate seeps from the landfill to the Wenatchee River were observed from 1980 to 1987. Chromium and nickel have been detected in groundwater onsite in excess of 75% of the MCL. Lead, iron and manganese have been detected at least one of the seeps.

Special Considerations: (Include limitations in site file data, data which cannot be accommodated in the model, but which are important in evaluating the risk associated with the site)

ROUTE SCORES:

Ground Water/Human:

22.7

Overall Rank: \_\_\_\_\_

Surface Water/Human:

16.3

Air/Human:

7.6

Air/Environmental:

NS

Surface Water/Environmental:

29.1

WORKSHEET 2  
ROUTE DOCUMENTATION

SURFACE WATER ROUTE

List substances to be considered for scoring.

Source: 1

1. CHROMIUM
2. NICKEL
3. IRON
4. MANGANESE
5. LEAD

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

CHROMIUM, NICKEL AND LEAD WERE USED IN SCORING BECAUSE THEY PRESENTED THE GREATEST HEALTH AND ENVIRONMENTAL THREAT.

List management units to be considered in scoring:

Source: 1, 2

1. LANDFILL

Explain basis for choice of unit used in scoring.

THE SITE WAS OPERATED AS A LANDFILL BY CHELAN COUNTY FROM 1960 TO 1987.

AIR ROUTE

List substances to be considered for scoring.

Source: 1

1. CHROMIUM
2. NICKEL
3. IRON
4. MANGANESE
5. LEAD

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

CHROMIUM, NICKEL AND LEAD WERE USED IN SCORING BECAUSE THEY PRESENTED THE GREATEST HEALTH AND ENVIRONMENTAL THREAT.

List management units to be considered in scoring:

Source: 1, 2

1. LANDFILL

Explain basis for choice of unit used in scoring.

THE SITE WAS OPERATED AS A LANDFILL BY CHELAN COUNTY FROM 1960 TO 1987. CONSIDERATION WAS GIVEN TO NOT SCORING THE AIR ROUTE BECAUSE A COVER IS IN PLACE AND CONTAMINANTS ARE PARTICULATE, BUT A CRACK WAS OBSERVED IN THE LANDFILL COVER, SO THE AIR ROUTE WAS SCORED.

WORKSHEET 2 (CONTINUED)  
ROUTE DOCUMENTATION

GROUND WATER ROUTE

List substances to be considered for scoring.

Source: 1

1. CHROMIUM
2. NICKEL
3. IRON
4. MANGANESE
5. LEAD

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

CHROMIUM, NICKEL AND LEAD WERE USED IN SCORING BECAUSE THEY PRESENTED THE GREATEST HEALTH AND ENVIRONMENTAL THREAT.

List management units to be considered in scoring:

Source: 1, 2

1. LANDFILL

Explain basis for choice of unit used in scoring.

THE SITE WAS OPERATED AS A LANDFILL BY CHELAN COUNTY FROM 1960 TO 1987.

WORKSHEET 3  
 SUBSTANCE CHARACTERISTIC WORKSHEET  
 FOR MULTIPLE UNIT/SUBSTANCE SITES

	Combination 1	Combination 2	Combination 3
Unit: Substance:  <u>AIR ROUTE</u>  Human Toxicity/Mobility Value:  Environmental Toxicity/Mobility Value:  Containment Value:  Air Human Subscore:  Air Environmental Score:			
<u>SURFACE WATER ROUTE</u>  Human Toxicity Value:  Environmental Toxicity Value:  Containment Value:  Surface Water Human Subscore:  Surface Water Environmental Subscore:			
<u>GROUND WATER ROUTE</u>  Human Toxicity/Mobility Value:  Containment Value:  Ground Water Subscore:			

**WORKSHEET 4  
SURFACE WATER ROUTE**

**1.0 SUBSTANCE CHARACTERISTICS**

**1.1 Human Toxicity**

Substance	Drinking Water Std.		Chronic Toxicity		Acute Toxicity		Carcinogenicity		
	(µg/l)	Value	mg/kg/day	Value	mg/kg-bw	Value	WOE	Potency Factor	Value
1. CHROMIUM	1, 100 PMCL	1.6	1, 005	3	X	—	A	TR	—
2. NICKEL	2, 100 PMCL	2.6	2, 02	1	X	—	A	TR	—
3. LEAD	3, 5 PMCL	3.8	3, 0005	5	X	—	B2	ND	—
4.									
5.									
6.									

Source: 5  
 Highest Value: 8  
 +2 Bonus Points?: 2  
 Value: 10

**1.2 Environmental Toxicity**

Substance	Acute Criteria (µg/L)	Non-human mammalian acute toxicity (mg/kg)	Value
1. CHROMIUM	1.16 (1700) <sup>1</sup>		6 (2)
2. NICKEL	2.1100		6
3. LEAD	3.82		
4.			
5.			
6.			

Source: 5,6 Value: 6

1. HEXAVALENT CHROMIUM = 16, TRIVALENT CHROMIUM = 1700

**1.3 Substance Quantity**

Source: 1,9 Value: 6

Explain basis: LEACHATE SEEP AREA ESTIMATED  
AT 100 FEET X 10 FEET = 1000 FT<sup>2</sup>

**2.0 MIGRATION POTENTIAL**

**2.1 Containment**

Source: 9 Value: 5

Explain basis: LANDFILL, UNMAINTAINED COVER

2.2 Surface Soil Permeability: LOW

Source: 9,10,11 Value: 5

2.3 Total Annual Precipitation: 17 INCHES

Source: 4 Value: 2

2.4 Maximum 2-Year 24-Hr Precipitation: 1.5 INCHES

Source: 1 Value: 2

2.5 Flood Plain: NOT IN FLOOD PLAIN

Source: 8 Value: 0

2.6 Terrain Slope: GREATER THAN 60%

Source: 9 Value: 5

WORKSHEET 4 (CONTINUED)  
SURFACE WATER ROUTE

3.0 TARGETS

- 3.1 Distance to Surface Water: .05 MILE = 264 FEET Source: 1 Value: 10
- 3.2 Population Served within 2 miles: √3 DOMESTIC + 0 PUBLIC Source: 12, 13 Value: 2
- 3.3 Area Irrigated by Sources within 2 miles: .75 √191 Source: 12 Value: 10
- 3.4 Distance to Fishery Resource: 264 FEET WENATCHEE RIVER Source: 1 Value: 12
- 3.5 Distance to Sensitive Environment: 264 FEET Source: 1 Value: 12
- List: WENATCHEE RIVER (FISHERY RESOURCE)
- 

4.0 RELEASE

Explain basis: LEACHATE TO RIVER SHOWED ELEVATED Source: 1 Value: 0  
LEVELS OF MANGANESE AND IRON (1984). SEDIMENT  
SAMPLE FROM SEEPAGE SHOWED 24.5 mg/Kg LEAD,  
130T WATER SAMPLE FROM THIS LOCATION DID  
NOT DETECT LEAD. BEST PROFESSIONAL JUDGMENT:  
A RELEASE HAS NOT BEEN DOCUMENTED.

**WORKSHEET 5  
AIR ROUTE**

**1.0 SUBSTANCE CHARACTERISTICS**

**1.1 Introduction - please review before scoring**

**1.2 Human Toxicity**

Substance	Air Std.		Chronic Toxicity		Acute Toxicity		Carcinogenicity		
	$\mu\text{g}/\text{m}^3$	Value	$\text{mg}/\text{kg}/\text{day}$	Value	$\text{mg}/\text{kg}-\text{bw}$	Value	WOE	Potency Factor	Value
1. CHROMIUM	WA ASIL	10	1. ND	-	1. X	-	1. A	41	9
2. NICKEL	1. 10000 $\mu\text{g}/\text{m}^3$ (1.7)	7	2. ND	-	2. X	-	2. A	.84	5
3. LEAD	2. 100 $\mu\text{g}/\text{m}^3$	7	3. ND	-	3. X	-	3. B2	ND	
4.	3. 50 $\mu\text{g}/\text{m}^3$								
5.	3,3-PEL								
6.									

Source: 5  
 Highest Value: 10  
 +2 Bonus Points?: 2  
 Toxicity Value: 12

**1.3 Mobility**

**1.3.1 Gaseous Mobility**

Vapor Pressure: N.A.  
 Value: \_\_\_\_\_

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

**1.3.2 Particulate Mobility**

Soil Type: CHELAN COBBLY SANDY LOAM  
 Erodibility: 86 TONS/ACRE/YEAR  
 Climatic Factor: 10-30  
 Particulate Mobility Potential Value: 2

Source: 14

**1.4 Final Human Health Toxicity/Mobility Matrix:** TOXICITY - 12 Value: 12  
 MOBILITY - 2

**1.5 Environmental Toxicity/Mobility**

Substance	Non-human mammalian Acute Toxicity	Value	Mobility	Value
1. CHROMIUM	X		2	
2. NICKEL	X		2	
3. LEAD	X		2	
4.				
5.				
6.				

ENVIRONMENTAL TOXICITY DATA ON THE COMPOUNDS OF CONCERN WERE NOT OBTAINED.

Environmental Toxicity Mobility Matrix: Source: \_\_\_\_\_ Value: \_\_\_\_\_

**1.6 Substance Quantity:** 9 ACRES

Source: 1 Value: 8

WORKSHEET 5 (CONTINUED)  
AIR ROUTE

2.0 MIGRATION POTENTIAL

2.1 Containment: LANDFILL WITH UNCONTAMINATED SOIL COVER Source: 9 Value: 5  
LESS THAN 6 INCHES (COVER IS GREATER THAN 6 INCHES  
IN ALL PLACES EXCEPT FOR CRACK IN COVER)

3.0 TARGETS

3.1 Nearest Population: 0.2 MILE = 1056 FEET Source: 1 Value: 8

3.2 Nearest Sensitive Environment: 264 FEET Source: 1 Value: 7

List: WENATCHEE RIVER (FISHERY RESOURCE)

\_\_\_\_\_

\_\_\_\_\_

3.3 Population within 1/2 mile: 198 Source: 9 Value: 14

4.0 RELEASE: NONE DOCUMENTED Source:     Value: 0

**WORKSHEET 6  
GROUND WATER ROUTE**

**1.0 SUBSTANCE CHARACTERISTICS**

**1.1 Human Toxicity**

Substance	Drinking Water Std.		Chronic Toxicity		Acute Toxicity		Carcinogenicity Potency		
	µg/l	Value	mg/kg/day	Value	mg/kg-bw	Value	WOE	Potency Factor	Value
1. CHROMIUM	1. 100 PMCL	1, 6	1. .005	3	1. X	---	A	INH.	---
2. NICKEL	2. 100 PMCL	2, 6	2. .02	1	2. X	---	A	INH.	---
3. LEAD	3. 6 PMCL	3, 8	3. .0005	5	3. X	---	B2	NO	---
4.									
5.									
6.									

Source: 5  
 Highest Value: 8  
 +2 Bonus Points?: 2  
 Value: 10

**1.2 Mobility**

Substance: 1. CHROMIUM K<sub>d</sub> = 1 2. NICKEL K<sub>d</sub> = 1 to 1.0 3. LEAD - K<sub>d</sub> = 1 to 1.0, VALUE = 2

Source: 7 Value: 2

**1.3 Substance Quantity**

Explain basis: 231,000 TONS (1413) = 462,000 YD<sup>3</sup>  
USE CONTAMINATED SOIL

Source: 2 Value: 8

**2.0 MIGRATION POTENTIAL**

**2.1 Containment**

Explain basis: LAND FILL 3. NO LINER + 1 COVER (POOR MAINTENANCE)  
+2 NO LEACHATE COLLECTION + 3 LIQUIDS DISPOSED

Source: 1, 9 Value: 9

**2.2 Net Precipitation: 3 INCHES**

Source: 3 Value: 1

**2.3 Subsurface Hydraulic Conductivity: 10<sup>-4</sup> to 10<sup>-3</sup> cm/sec PART 5, VI**

Source: 1 Value: 3

**2.4 Vertical Depth to Ground Water: 120 FEET**

Source: 1 Value: 3

**3.0 TARGETS**

**3.1 Ground Water Usage: PUBLIC, NO ALTERNATE**

Source: 13 Value: 9

**3.2 Distance to Nearest Drinking Water Well: .25 MILE = 1320 FEET**

Source: 1 Value: 3

**3.3 Population Served with 2 miles: √407 PUBLIC + 57 DOMESTIC**

Source: 12, 13 Value: 22

**3.4 Area Irrigated by Wells within 2 miles: .75 √107 ACRES**

Source: 12 Value: 8

**4.0 RELEASE**

Explain basis: CHROMIUM DETECTED ABOVE MCL  
IN ON SITE MONITORING WELLS

Source: 1 Value: 5

WORKSHEET 7  
SOURCES USED IN SCORING

1. SITE INSPECTION REPORT DRYDEN LANDFILL, MICHAEL J. SPENCER, 1988.
2. SOLID WASTE INVENTORY DATA QUESTIONNAIRE, WASHINGTON STATE DEPARTMENT OF ECOLOGY.
3. WASHINGTON CLIMATE FOR THESE COUNTIES CHELAN, DOUGLAS OKANOGAN, COOPERATIVE EXTENSION SERVICE, WASHINGTON STATE UNIVERSITY.
4. DRYDEN LANDFILL CLOSURE PLAN, CHELAN COUNTY PUBLIC WORKS, CH2M HILL AND SWEET, EDWARDS AND ASSOCIATES, APRIL 1986.
5. WASHINGTON DEPARTMENT OF HEALTH GUIDE TO PHYSICO-CHEMICAL, TOXICOLOGICAL AND REGULATORY VALUES FOR PRIORITY POLLUTANTS, MONA KIMBELL ET AL, DRAFT, JULY, 1990.
6. SUPERFUND PUBLIC HEALTH EVALUATION MANUAL, USEPA, ICF CORP, 1986
7. WASHINGTON RANKING METHOD SCORING MANUAL, DEPT. OF ECOLOGY, 1990.
8. FLOOD BOUNDARY AND FLOODWAY MAP, COMMUNITY - PANEL NO. 53 0015 0800 A, FEMA FEDERAL INSURANCE ADMINISTRATION.
9. SITE INSPECTION, DEPT. OF ECOLOGY, BOB SWACKHAMER, 1991
10. DRYDEN LANDFILL CLOSURE PLAN, CH2M HILL, 1986
11. CORRESPONDENCE, CHRIS HAYNES TO ANN JENSEN, 4/7/1988.
12. RECORDED WATER RIGHTS OF THE DEPARTMENT OF ECOLOGY REGION 4, 8/16/90
13. PUBLIC WATER SUPPLY SYSTEM LISTING, WASHINGTON DEPT. OF HEALTH, 11/08/89.
14. SOIL SURVEY OF CHELAN AREA, WASHINGTON, USDA SOIL CONSERVATION SERVICE