SITE: Terrell Drive
BREAK: 1.11
OTHER: V1

CONFIDENTIAL

HAZARD RANKING SYSTEM PRELIMINARY SCORE FOR TERRELL DRIVE DUMP DANVILLE, BOYLE COUNTY, KENTUCKY EPA ID NO. KYD980839849 WASTELAN NO. 2151

The preliminary scores for the groundwater, surface water, soil exposure and air pathways were evaluated using the Site Inspection (SI) Worksheets.

FOIA EXEMPTION 5

S_{gw} = 0.00
S_{sw} = 97.07
S_{se} = 1.16
S_{air} = 10.47

OVERALL SCORE 48.82

Approving Official 6/7/94 Date

Sources and Waste Quantity

The area of the Terrell Drive Dump (the dump) is approximately 10 acres. It is not known if the entire 10 acres was used as a landfill. For the purposes of this Site Inspection Prioritization (SIP), the entire 10 acres was used. The dump, an unpermitted landfill from the 1960s to 1975, is located adjacent to Clarks Run Creek, a small stream; the dump received municipal and industrial wastes. The 1983 NUS Corporation SI found a number of organic compounds heavy metals above background concentrations onsite. An observed release to surface water was documented. The landfill was not lined and did not have any run-on and runoff control systems. A Hazardous Waste Quantity (HWQ) value of 100 was assigned.

Groundwater Migration Pathway

Only one groundwater sample was collected at the dump. Although contaminants were detected in the sample, an observed release to groundwater was not documented. The target population for potential groundwater contamination is zero. All urban and rural residents in the vicinity of the site are served by municipal water obtained from the city of Danville surface water intake on Herrington Lake.

Surface Water Pathway

The surface water migration pathway was scored using an observed release. Analysis of samples collected during the SI indicated the following contaminants at elevated levels in downstream sediment samples collected from Clarks Run Creek, which is a fishery: dieldrin, DDD, PCB-1260 (a polychlorinated biphenyl), beryllium, cobalt and vanadium. The concentration of an analyte is considered elevated if the concentration is greater than or equal to three times the concentration in the background or control sample or greater than or equal to the Minimum Quantitation Limit (MQL)

10582152

if not detected in the background/control sample. Dieldrin, DDD, beryllium, cobalt and vanadium were also detected in onsite soil samples collected from the dump. PCB-1242 and PCB-1248 were detected in onsite soil samples. It is unknown if pesticide wastes were deposited in the dump or if they have been used for lawn maintenance.

Soil Exposure Pathway

There is observed contamination of the surface soils at the site, but no resident population. The score for the soil exposure pathway is based on an accessible playground located at the dump and the proximity of an urban population. It is unknown if employees are located at the city of Danville maintenance garage, or even if the maintenance garage is still located at the dump.

Air Migration Pathway

The air migration pathway was scored using potential to release. The total population within 4 miles is estimated to be 18,350 persons.

Conclusion/Recommendation

Elevated levels of dieldrin, DDD, beryllium, cobalt and vanadium were detected in sediment samples collected from Clarks Run Creek, which is a fishery, and in onsite soil samples. These samples were collected in 1983. Dynamac Corporation recommends that onsite samples be collected to characterize the dump and that additional sediment samples be collected from Clarks Run Creek to assess current impact on water quality. Appropriate background samples should be collected for all media.

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Site Name: Terrell Drive Dump
Location: Danville, Boyle County, Kentucky

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GROUNDWATER MIGRATION PATHWAY SCORESHEET

Factor Categories and Factors

	Likelihood of Release to an Aquifer	Maximum Value	Value Assigned	
1.	Observed Release	550	-	
2.	Potential to Release			
	2a. Containment	10	-	
	2b. Net Precipitation	10	-	
	2c. Depth to Aquifer	5	-	
	2d. Travel Time	35	-	
	2e. Potential to Release (lines 2a x [2b + 2c + 2d])	500	-	
3.	Likelihood of Release (higher of lines 1 and 2e)	550		500*
	Waste Characteristics			
4.	Toxicity/Mobility	[a]	10,000	
5.	Hazardous Waste Quantity	[a]	100	
6.	Waste Characteristics	100		32
	Targets			
7.	Nearest Well	50	0	
8.	Population			
	8a. Level I Concentrations	[b]	0	
	8b. Level II Concentrations	[b]	0	
	8c. Potential Contamination	[b]	0	
	8d. Population (lines 8a + 8b + 8c)	[b]	0	
9.	Resources	5	0	
10.	Wellhead Protection Area	20	0	
11.	Targets (lines 7 + 8d + 9 + 10)	[b]		0
	Groundwater Migration Score for an Aquifer			
12.	Aquifer Score ([lines 3 x 6 x 11]/82,500)[c]	100		0
	Groundwater Migration Pathway Score			
13.	Groundwater Migration Pathway Score (S_{gw})[c] (highest value from line 12 for all aquifers evaluated)	100		0

[a] Maximum value applies to waste characteristics category.
[b] Maximum value not applicable.
[c] Do not round to nearest integer.
* Default value.
\- Not evaluated.

7

Site Name: Terrell Drive Dump
Location: Danville, Boyle County, Kentucky

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SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET

Factor Categories and Factors	Maximum Value	Value Assigned	
DRINKING WATER THREAT			
Likelihood of Release			
1. Observed Release	550	550	
2. Potential to Release by Overland Flow			
2a. Containment	10	-	
2b. Runoff	25	-	
2c. Distance to Surface Water	25	-	
2d. Potential to Release by Overland Flow (lines 2a x [2b + 2c])	500	-	
3. Potential to Release by Flood			
3a. Containment (Flood)	10	-	
3b. Flood Frequency	50	-	
3c. Potential to Release by Flood (lines 3a x 3b)	500	-	
4. Potential to Release (lines 2d + 3c, subject to a maximum of 500)	500	-	
5. Likelihood of Release (higher of lines 1 and 4)	550		550
Waste Characteristics			
6. Toxicity/Persistence	a	10,000	
7. Hazardous Waste Quantity	a	100	
8. Waste Characteristics	100		32
Targets			
9. Nearest Intake	50	0	
10. Population			
10a. Level I Concentrations	b	0	
10b. Level II Concentrations	b	0	
10c. Potential Contamination	b	0	
10d. Population (lines 10a + 10b + 10c)	b	0	
11. Resources	5	5	
12. Targets (lines 9 + 10d + 11)	b		5
Drinking Water Threat Score			
13. Drinking Water Threat Score ([lines 5 x 8 x 12]/82,500, subject to a maximum of 100)	100		1.07

Site Name: Terrell Drive Dump
Location: Danville, Boyle County, Kentucky

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SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET, Continued

Factor Categories and Factors	Maximum Value	Value Assigned	
HUMAN FOOD CHAIN THREAT			
Likelihood of Release			
14. Likelihood of Release (value from line 5)	550		550
Waste Characteristics			
15. Toxicity/Persistence/Bioaccumulation	a	$5x10^8$	
16. Hazardous Waste Quantity	a	100	
17. Waste Characteristics	1,000		320
Targets			
18. Food Chain Individual	50	45	
19. Population			
19a. Level I Concentrations	b	0	
19b. Level II Concentrations	b	0	
19c. Potential Human Food Chain Contamination	b	0	
19d. Population (lines 19a + 19b + 19c)	b	45	
20. Targets (lines 18 + 19d)	b		45
Human Food Chain Threat Score			
21. Human Food Chain Threat Score ([lines 14 x 17 x 20]/82,500, subject to a maximum of 100)	100		96.00
ENVIRONMENTAL THREAT			
Likelihood of Release			
22. Likelihood of Release (value from line 5)	550		550
Waste Characteristics			
23. Ecosystem Toxicity/Persistence/ Bioaccumulation	a	$5x10^8$	
24. Hazardous Waste Quantity	a	100	
25. Waste Characteristics	1,000		320

Site Name: Terrell Drive Dump
Location: Danville, Boyle County, Kentucky

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SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET, Concluded

Factor Categories and Factors	Maximum Value	Value Assigned	
ENVIRONMENTAL THREAT (concluded)			
Targets			
26. Sensitive Environments			
26a. Level I Concentrations	[b]	0	
26b. Level II Concentrations	[b]	0	
26c. Potential Contamination	[b]	0	
26d. Sensitive Environments (lines 26a + 26b + 26c)	[b]	0	
27. Targets (value from line 26d)	[b]		0
Environmental Threat Score			
28. Environmental Threat Score ([lines 22 x 25 x 27]/82,500, subject to a maximum of 60)	60		0
SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE FOR A WATERSHED			
29. Watershed Score[c] (lines 13 + 21 + 28, subject to a maximum of 100)	100		97.07
SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE			
30. Component Score (S_{of})[c] (highest score from line 29 for all watersheds evaluated, subject to a maximum of 100)	100		97.07

[a] Maximum value applies to waste characteristics category.
[b] Maximum value not applicable.
[c] Do not round to nearest integer.
\- Not evaluated.

Site Name: Terrell Drive Dump
Location: Danville, Boyle County, Kentucky

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SOIL EXPOSURE PATHWAY SCORESHEET

Factor Categories and Factors	Maximum Value	Value Assigned	
RESIDENT POPULATION THREAT			
Likelihood of Exposure			
1. Likelihood of Exposure	550		550
Waste Characteristics			
2. Toxicity	a	10,000	
3. Hazardous Waste Quantity	a	100	
4. Waste Characteristics	100		32
Targets			
5. Resident Individual	50	0	
6. Resident Population			
6a. Level I Concentrations	b	0	
6b. Level II Concentrations	b	0	
6c. Resident Population (lines 6a + 6b)	b	0	
7. Workers	15	0	
8. Resources	5	0	
9. Terrestrial Sensitive Environments	d	0	
10. Targets (lines 5 + 6c + 7 + 8 + 9)	b		0
Resident Population Threat Score			
11. Resident Population Threat ([lines 1 x 4 x 10]/82,500)	b		0
NEARBY POPULATION THREAT			
Likelihood of Exposure			
12. Attractiveness/Accessibility	100	75	
13. Area of Contamination	100	80	
14. Likelihood of Exposure	500		375
Waste Characteristics			
15. Toxicity	a	10,000	
16. Hazardous Waste Quantity	a	100	
17. Waste Characteristics	100		32

Site Name: Terrell Drive Dump
Location: Danville, Boyle County, Kentucky

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SOIL EXPOSURE PATHWAY SCORESHEET, Concluded

Factor Categories and Factors	Maximum Value	Value Assigned	
NEARBY POPULATION THREAT (Concluded)			
Targets			
18. Nearby Individual	1	1	
19. Population Within 1 Mile	[b]	7	
20. Targets (lines 18 + 19)	[b]		8
Nearby Population Threat Score			
21. Nearby Population Threat ([lines 14 x 17 x 20]/82,500)	[b]		1.16
SOIL EXPOSURE PATHWAY SCORE			
22. Soil Exposure Pathway Score (S_{soil})[d] (lines 11 + 21, subject to a maximum of 100)	100		1.16

[a] Maximum value applies to waste characteristics category.
[b] Maximum value not applicable.
[c] Do not round to nearest integer.
[d] No specific maximum value applies to factor. However, a pathway score based solely on sensitive environments is limited to a maximum value of 60.

Site Name: Terrell Drive Dump
Location: Danville, Boyle County, Kentucky

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AIR MIGRATION PATHWAY SCORESHEET

Factor Categories and Factors

	Likelihood of Release	Maximum Value	Value Assigned	
1.	Observed Release	550	0	
2.	Potential to Release			
	2a. Gas Potential to Release	500	-	
	2b. Particulate Potential to Release	500	-	
	2c. Potential to release higher of lines 2a and 2b)	500	-	
3.	Likelihood of Release (higher of lines 1 and 2c)	550		500*
	Waste Characteristics			
4.	Toxicity/Mobility	[a]	10,000	
5.	Hazardous Waste Quantity	[a]	100	
6.	Waste Characteristics	100		32
	Targets			
7.	Nearest Individual	50	20	
8.	Population			
	8a. Level I Concentrations	[b]	0	
	8b. Level II Concentrations	[b]	0	
	8c. Potential Contamination	[b]	34	
	8d. Population (lines 8a + 8b + 8c)	[b]	34	
9.	Resources	5	0	
10.	Sensitive Environments			
	10a. Actual Contamination	[d]	0	
	10b. Potential Contamination	[d]	0	
	10c. Sensitive Environments (lines 10a + 10b)	[d]	54	
11.	Targets (lines 7 + 8d + 9 + 10c)	[b]		54
	Air Migration Pathway Score			
12.	Air Migration Pathway Score (S_{air})[c] ([lines 3 x 6 x 11]/82,500)	100		10.47

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[a] Maximum value applies to waste characteristics category.
[b] Maximum value not applicable.
[c] Do not round to nearest integer.
[d] No specific maximum value applies to factor. However, a pathway score based solely on sensitive environments is limited to a maximum value of 60.
* Default value.
\- Not evaluated.

CERCLA Eligibility Form

Site Name: Terrell Drive Dump

City/County/State: Danville, Boyle County, Kentucky

EPA ID Number: KYD980839849

Type of Facility: Generator ___ Transporter ___ Disposal ✓
Treatment ___ Storage (more than 90 days) ___

	Yes	No
Has this facility treated, stored or disposed of a RCRA hazardous waste since Nov. 19, 1980?	___	✓
Has a RCRA Facility Assessment (RFA) been performed on this site?	___	✓
Does the facility have a RCRA operating or post-closure permit? If so, date issued	___	✓
Did the facility file a RCRA Part A application?	___	✓
If so:		
1) Does the facility currently have interim status?	___	___
2) Did the facility withdraw its interim status?	___	___
3) Is the facility a known or possible protective filer?	___	___
Is the facility a late (after Nov. 19, 1980) or non-filer that has been identified by EPA or the State?	___	✓
Is the site a Federal Facility?	___	✓
Is there at least one source onsite which is not covered by CERCLA Petroleum Exclusion Legislation?	✓	___
Is the facility owned by an entity that has filed for bankruptcy under federal or State laws?	___	✓
Has the facility lost authorization to operate or had its interim status revoked?	___	✓
Has the facility been involved in any other RCRA enforcement action?	___	✓

TES VIII WORK ASSIGNMENT NO. C04119
SITE INSPECTION PRIORITIZATION
TERRELL DRIVE DUMP
DANVILLE, BOYLE COUNTY, KENTUCKY
EPA ID NO. KYD980839849
WASTELAN NO. 2151

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SITE INSPECTION WORKSHEETS

CERCLIS IDENTIFICATION NUMBER
KYD 980 839 849

SITE LOCATION			
SITE NAME: LEGAL, COMMON, OR DESCRIPTIVE NAME OF SITE Terrell Drive Dump			
STREET ADDRESS, ROUTE, OR SPECIFIC LOCATION IDENTIFIER Terrell Drive			
CITY Danville	STATE KY	ZIP CODE 40422	TELEPHONE ( ) NA
COORDINATES: LATITUDE and LONGITUDE 37° 38' 00" N 84° 45' 54" W	TOWNSHIP, RANGE, AND SECTION NA		

OWNER/OPERATOR IDENTIFICATION					
OWNER City of Danville			OPERATOR Same as Owner		
OWNER ADDRESS City Hall			OPERATOR ADDRESS		
CITY Danville			CITY		
STATE KY	ZIP CODE 40422	TELEPHONE (606) 236-1990	STATE	ZIP CODE	TELEPHONE ( )

SITE EVALUATION		
AGENCY/ORGANIZATION Dynamac Corporation		
INVESTIGATOR Russ Crittenden/Dawn Thompson		
CONTACT		
ADDRESS 111 N Canal St Suite 941		
CITY Chicago	STATE IL	ZIP CODE 60606
TELEPHONE (312) 466-0222		

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GENERAL INFORMATION

Site Description and Operational History: Provide a brief description of the site and its operational history. State the site name, owner, operator, type of facility and operations, size of property, active or inactive status, and years of waste generation. Summarize waste treatment, storage, or disposal activities that have or may have occurred at the site; note whether these activities are documented or alleged. Identify all source types and prior spills, floods, or fires. Summarize highlights of the PA and other investigations. Cite references.

The Terrell Drive Dump Site (Dump Site) is located in Danville, Kentucky adjacent to Terrell Drive. The site is inactive and occupies an estimated 10 acres of land with a playground on the west end and a maintenance building along the north central side (Ref. 2, p. 3; 3, p. 4, pp. 1, 2). There is no documentation indicating whether the Dump Site is fenced (Ref. 3, pp. 1, 2). Prior to the late 1960's, the Dump Site was used as a city dump. From the late 1960's until 1975, the City of Danville owned and operated the Dump Site as an unpermitted landfill (Ref. 2, p. 3; 4, p. 2). The current owner of the Dump Site is not documented in available file information. In August 1980, construction workers discovered buried drums during installation of new sewer lines across the Dump Site. One drum was ruptured during construction activities and is reported to have contained a cloudy liquid with an odor similar to paint thinner. The drums were covered and no further action was taken at that time. The Kentucky Natural Resources and Environmental Protection agency conducted inspections in 1979 and 1983 and observed leachate entering Clarks Run and a leachate break-through (Refs. 2, pp. 1-3; 4, p. 2). In November 1983, NUS Corporation conducted a Site Inspection (SI) of the Dump Site. NUS collected soil, groundwater, surface water, and sediment samples during the SI. (Ref. 4). [illegible] collected during the SI [illegible] that [illegible] observed release to surface water.

References

1. U.S. Geological Survey 7.5 minute series Topographic Quadrangle Maps of Kentucky: Bryantsville 1952 (Photorevised [PR] 1979), Danville 1967 (Photoinspected 1985, PR 1979), Junction City 1952 (PR 1979), Stanford 1961 (PR 1979), scale 1:24,000.

2. Hannah Leonard, Supervisor, Frankfort Field Office, interoffice memorandum with attachment to Barry Burrus, Chief, Uncontrolled Site Section, Kentucky Natural Resources and Environmental Protection Cabinet (KNREPC), July 22, 1983. Subject: Terrell Drive Dump in Danville, Boyle County.

3. Potential Hazardous Waste Site Identification and Preliminary Assessment (EPA Form T2070-2) for Terrell Drive Dump, Danville, Kentucky, filed by Barry Burrus, KNREPC, August 23, 1983.

4. NUS Corporation, Superfund Division, Sampling Investigation Report, Terrell Drive Dump, Danville, Kentucky, prepared under TDD No. F4-8310-05 for the Air and Waste Management Division of EPA (August 27, 1984).

5. Mike Blanton, Environmental Engineer, State Superfund Section, KNREPC, telephone conversation with Russ Crittenden, Dynamac Corporation, November 4, 1993. Subject: Terrell Drive Dump.

6. U.S. Department of Commerce, Climatic Atlas of the United States, (Washington, D.C.: GPO, June 1968), reprint: 1983, National Oceanic and Atmospheric Administration, excerpt, 4 pages.

7. U.S. Department of Commerce, Rainfall Frequency Atlas of the United States, Technical Paper No. 40, (Washington, D.C.: GPO, 1961), excerpt, 3 pages.

8. Marsha Denton, Field Inspector, Non-Hazardous Waste Management Section, Kentucky Department for Natural Resources and Environmental Protection, letter to Roy Arnold, Mayor, City of Danville, July 9, 1979. Subject: Inspection of June 21, 1979 at Terrell Drive Dump.

9. U.S. Geological Survey, Geologic Map of Kentucky, Sesquicentennial Edition of the Kentucky Geological Survey (1988).

10. Charles B. Hunt, Natural Regions of the United States and Canada (San Francisco: W.H. Freeman and Co., 1974), excerpt, 2 pages.

11. U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of Boyle and Mercer Counties, Kentucky (April 1983), excerpt, 10 pages.

12. E.R. Cressman, Geologic Map of the Danville Quadrangle, Mercer and Boyle Counties, Kentucky, (Washington, D.C.: U.S. Geological Survey, 1972), excerpt, 1 plate.

13. W.N. Palmquist, Jr. and F.R. Hall, Availability of Ground Water in Boyle, Garrard, Lincoln, and Mercer Counties, Kentucky, Hydrologic Investigations Atlas HA-20, (Washington, D.C.: U.S. Geological Survey, 1960), excerpt, 3 plates.

14. Tom Crawford, Utility Director, Danville Water Department, telephone conversation with Russ Crittenden, Dynamac Corporation, August 26, 1993. Subject: Drinking water supply for Danville and surrounding areas.

15. Luther Galloway, City Engineer, Danville Water Department, telephone conversation with Dawn Thompson, Dynamac Corporation, September 9, 1993. Subject: Drinking water supply for Danville and surrounding areas.

16. Charlotte Boulind, Environmental Scientist, Dynamac Corporation, project note to Terrell Drive Dump file, November 28, 1993. Subject: Map of Danville Water Department service area.

17. Harold Leach, Mayor, City of Junction City, telephone conversation with Russ Crittenden, Dynamac Corporation, October 25, 1993. Subject: Drinking water supply for Lincoln County.

18. Federal Emergency Management Agency, Flood Insurance Rate Map for City of Danville, Boyle County, Kentucky, Corporate limits, Map 01, Map Index, September 27, 1985.

19. D.L. McClain, F.D. Byrd, and A.C. Brown, Water Resources Data Kentucky Water Year 1990, U.S. Geological Survey Water-Data Report KY-90-1, (Louisville, Kentucky: U.S. Geological Survey, 1991), excerpt, 7 pages.

20. Benjy Kinman, Fishery Program Coordinator, Department of Fish and Wildlife, telephone conversation with Dawn Thompson, Dynamac Corporation, September 9, 1993. Subject: Recreational and commercial fishing in Clarks Run and Herrington Lake.

21. U.S. Fish and Wildlife Service, Endangered and Threatened Species of the Southeast United States (Atlanta, Georgia, 1992), excerpt, 5 pages.

22. Charlotte M. Boulind, Environmental Scientist, Dynamac Corporation, project note to Terrell Drive Dump file, November 28, 1993. Subject: Reallocation of population derived from the Graphical Exposure Modeling System (GEMS) database printout for the area within 4 miles of Terrell Drive Dump.

23. David E. McChesney, Wildlife Biologist, Environmental Section, Kentucky Department of Fish and Wildlife Resources, letter with attachments to Dawn Thompson, Dynamac Corporation, September 9, 1993. Subject: Endangered/threatened species information for Clark's Run, Boyle County, Kentucky.

24. U.S. Environmental Protection Agency, Graphical Exposure Modeling System (GEMS) Database, compiled from U.S. Bureau of Census data (1990).

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SOURCE DESCRIPTION

Fill in these two pages for each source at the site (see Section 1.0 for definitions).

Name by which this source will be identified: Landfill

Location of the source, with reference to a map of site.

The landfill occupies the entire Terrell Drive Dump Site

What is this source (e.g., drum pile--use plain English)

landfill

Containment--the methods, natural or engineered, that have been used to restrict the release of hazardous substance and the current state of containment:

Air: (6.1.2.1.1) Inadequate cover, surface soils contaminated

10

Ground water: (3.1.2.1) No liner

10

Surface water: (4.1.2.1.2.1.1) Evidence of release to surface water

10

FIELD TEST DRAFT

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SOURCE DESCRIPTION (Concluded)

History--emphasis on use, closure, remedial actions, regulatory status.

The landfill was operated as an open dump beginning or prior to 1971 until 1975. The landfill may have been used as early as the mid-1950's. Cover was placed on the dump in the 1970's, but found to be inadequate during a 1979 state inspection. Leachate was observed flowing into Clarks Run Creek from the landfill in 1979. Drums were exposed during excavation activities in 1980 at the landfill. One drum was observed to contain waste. The drums were re-buried. No remediation has occured at the site. The site was not permitted except for 6 months in 1972. There is no evidence of a liner. (Ref 2;4).

Hazardous substances--cite evidence of the specific hazardous substances known to be associated with the source (e.g., by deposition or sampling). Cite specific sample numbers that document concentrations significantly over background. (Ref 4).

From 1983 Sampling Investigation:

		Contaminants	
Sample Numbers (Soil) —	AS-01	ethyl benzene	barium
	AS-02	total xylenes	beryllium
	AS-03	benzoic acid	cobalt
	CS-01	dieldrin	copper
	LS-01	DDT	cyanide
	LS-02	DDE	lead
		DDD	mercury
		Arochlor-1242	vanadium
Background sample # (Soil) — CS-02		Arochlor-1248	zinc

Source Hazardous Substance Quantity

Constituent quantity, wastestream quantity, and volume are all undocumented.

Area of landfill is 10 acres

Hazardous Waste Quantity Score = 100

FIELD TEST DRAFT

Groundwater Pathway

use hazardous Substance Reference table.

Contaminant	Toxicity	(Karst) Mobility	Table 3-9 Toxicity/Mobility
ethyl benzene	10	1.0	10
total xylenes	1	1.0	1.0
benzoic acid	1	1.0	1.0
dieldrin	10,000	1.0	10000 *
DDT	1000	1.0	1000
DDE	100	1.0	100
DDD	100	1.0	100
Aroclor -1242 (PCBs)	10,000	1.0	10,000 *
Aroclor -1248 (PCBs)	—	—	—
barium	10	1.0	10
beryllium	10,000	1.0	10,000 *
cobalt	1.0	1.0	1.0
copper	—	—	—

Note: If a contaminant is found in the observed release, it gets a value of "1" for mobility.

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Groundwater Pathway

use hazardous Substance Reference table.

Contaminant	Toxicity	(Karst) Mobility	Table 3-9 Toxicity / Mobility
cyanide	100	1.0	100
lead	10,000	1.0	10,000 *
mercury	10,000	1.0	10,000 *
Vanadium	100	1.0	100
zinc	10	1.0	10

Note: If a contaminant is found in the observed release, it gets a value of "1" for mobility.

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Site Name:

Surface Water Pathway

Food Chain and Drinking Water

use hazardous substance reference table

Contaminant	Toxicity	Persistence	Table 4-12 Toxicity/Persistence	Food Chain Bioaccumulation	Table 4-16 Toxicity/Persistence/Bioaccu
ethyl benzene	10	0.4	4.0	50	200
total xylenes	1	0.4	0.4	50	20
benzoic acid	1	1.0	1.0	5.0	5.0
dieldrin	10,000	1.0	10,000	50,000	5.0 E+08 *
DDT	1000	1.0	1000	50,000	5.0 E+07
DDD	100	1.0	100	50,000	5.0 E+06
DDE	100	1.0	100	50,000	5.0 E+06
PCBs	10,000	1.0	10,000	50,000	5.0 E+08 *
barium	10	1.0	10	0.5	5.0
beryllium	10,000	1.0	10,000	50	5.0E05
cobalt	1.0	1.0	1.0	0.5	0.5

Surface Water Values: Fresh ✓ Rivers ✓
Salt ___ Lakes ___

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Site Name:

Surface Water Pathway
Food Chain and Drinking Water

use hazardous substance reference table

Contaminant	Toxicity	Persistence	Table 4-12 Toxicity/Persistence	Food Chain Bioaccumulation	Table 4-16 Toxicity/Persistence/Bioaccu
copper	—	—	—	—	—
cyanide	100	0.4	40	0.5	20
lead	10000	1.0	10,000	50	5.0 E+05
mercury	10,000	1.0	10,000	50,000	5.0 E+08 *
vandium	100	1.0	100	0.5	50
zinc	10	1.0	10	500	5000

Surface Water Values: Fresh ✓ Rivers ✓
Salt — Lakes —

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Site Name:

Surface Water Pathway
Environmental (Sensitive Environments)

use hazardous substance reference table

Contaminant	Ecotoxicity	Persistence	Table 4-20 Ecotoxicity/Persistence	Environmental Bioaccumulation	Table 4-21 Ecotoxicity/Persistence/Bioaccumulation	
ethyl benzene	100	0.4	40	50	2000	
total xylenes	100	0.4	40	50	2000	
benzoic acid	1.0	1.0	1.0	5.0	5.0	
dieldrin	10,000	1.0	10,000	50,000	5.0 E+08	*
DDT	10,000	1.0	10,000	50,000	5.0 E+08	*
DDD	10,000	1.0	10,000	50,000	5.0 E+08	*
DDE	10,000	1.0	10,000	50,000	5.0 E+08	*
PCBs	10,000	1.0	10,000	50,000	5.0 E+08	*
barium	1.0	1.0	1.0	0.5	0.5	
beryllium	—	—	—	—	—	
cobalt	—	—	—	—	—	

Surface Water Values: Fresh ✓ Rivers ✓
Salt ___ Lakes ___

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Site Name:

Surface Water Pathway
Environmental (Sensitive Environments)

use hazardous substance reference table

Contaminant	Ecotoxicity	Persistence	Table 4-20 Ecotoxicity/Persistence	Environmental Bioaccumulation	Table 4-21 Ecotoxicity/Persistence/Bioaccumulation
copper	—	—	—	—	—
cyanide	1000	0.4	400	0.5	200
lead	1000	1.0	1000	5000	5.0E+06
mercury	10,000	1.0	10,000	50,000	5.0E+08 *
vanadium	—	—	—	—	—
zinc	10	1.0	10	500	5000

Surface Water Values: Fresh ✓ Rivers ✓
Salt ___ Lakes ___

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use hazardous substance reference table

Site NAME:

AIR PATHWAY

G = Gas
P = Particulate
Mob. = mobility

P, G, or Both	Contaminant	Gas Mig. Bf.	Toxicity	Mob(G) (Fig. 6-3)	Mob(P)	Matrix T/M (Table 6-13)
G	ethylbenzene	17	10	1.0	—	10
G	total xylenes	17	1	1.0	—	1.0
Both	benzoic acid	11	1	0.2	0.00008	0.2
Both	dieldrin	6	10,000	0.002	0.00008	20
Both	DDT	6	1,000	0.002	0.00008	20
Both	DDD	6	100	0.002	0.00008	20
Both	DDE	6	100	0.002	0.00008	20
G	PCBs	11	10,000	1.0	—	10,000 *
P	barium	NA	10	—	0.00008	0.0008
P	beryllium	NA	10,000	—	0.00008	0.8
P	cobalt	NA	1	—	0.00008	0.00008
P	copper	NA	—	—	—	—

Assign a mobility factor value of 0.02 for Particulates that meet an observed release.
Assign a mobility factor value of 1 for each gaseous substance that meets an observed release.

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use hazardous substance reference table

Site NAME:

AIR PATHWAY

G = Gas
P = Particulate
Mob. = mobility

P, G, or Both	Contaminant	Gas High Pot.	Toxicity	Mob(G)	(Fig. 6-3) Mob(P)	Table 6-13 Matrix T/M
P	cyanide	NA	100	—	0.00008	0.008
P	lead	NA	10,000	—	0.00008	0.8
Both	mercury	"	10,000	0.2	0.00008	2000
P	vanadium	NA	100	—	0.00008	0.008
P	zinc	NA	10	—	0.00008	0.0008

Assign a mobility factor value of 0.02 for Particulates that meet an observed release.
Assign a mobility factor value of 1 for each gaseous substance that meets an observed release.

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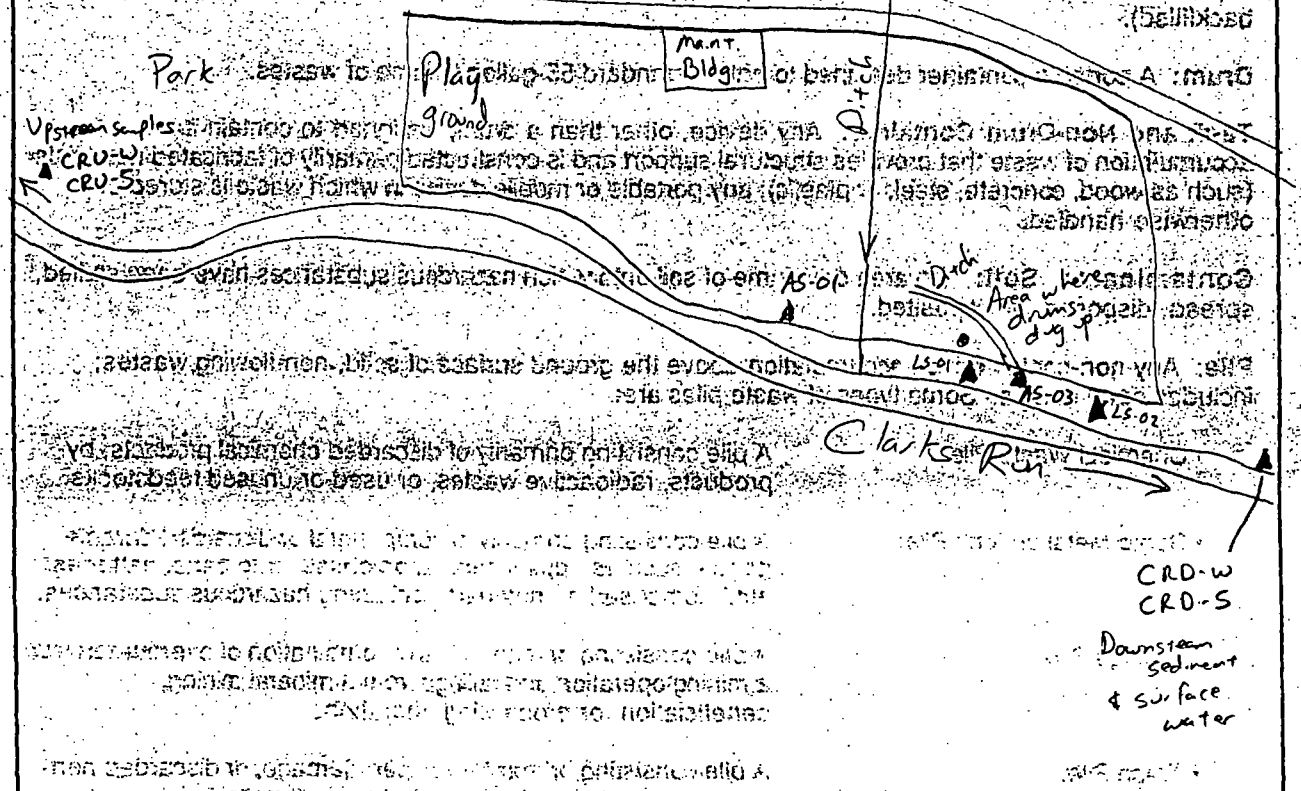
GENERAL INFORMATION (continued)

Site Sketch: Provide a sketch of the site. Indicate all pertinent features of the site and nearby environments including sources of wastes, areas of visible and buried wastes, buildings, residences, access roads, parking areas, fences, fields, drainage patterns, water bodies, vegetation, wells, sensitive environments, and other features.



Scale
1:4600 (Ref. 4, p.11)

GENERAL INFORMATION (continued)

Source Descriptions: Describe all sources at the site. Identify source type and relate to waste disposal operations. Provide source dimensions and the best available waste quantity information. Describe the condition of sources and all containment structures. Cite references.

SOURCE TYPES

Landfill: A man-made (by excavation or construction) or natural hole in the ground into which wastes have come to be disposed by backfilling, or by contemporaneous soil deposition with waste disposal.

Surface Impoundment: A natural topographic depression, man-made excavation, or diked area, primarily formed from earthen materials (lined or unlined) and designed to hold an accumulation of liquid wastes, wastes containing free liquids, or sludges not backfilled or otherwise covered; depression may be wet with exposed liquid or dry if deposited liquid has evaporated, volatilized or leached; structures that may be described as lagoon, pond, aeration pit, settling pond, tailings pond, sludge pit; also a surface impoundment that has been covered with soil after the final deposition of waste materials (i.e., buried or backfilled).

Drum: A portable container designed to hold a standard 55-gallon volume of wastes.

Tank and Non-Drum Container: Any device, other than a drum, designed to contain an accumulation of waste that provides structural support and is constructed primarily of fabricated materials (such as wood, concrete, steel, or plastic); any portable or mobile device in which waste is stored or otherwise handled.

Contaminated Soil: An area or volume of soil onto which hazardous substances have been spilled, spread, disposed, or deposited.

Pile: Any non-containerized accumulation above the ground surface of solid, non-flowing wastes; includes open dumps. Some types of waste piles are:

- Chemical Waste Pile: A pile consisting primarily of discarded chemical products, by-products, radioactive wastes, or used or unused feedstocks.
- Scrap Metal or Junk Pile: A pile consisting primarily of scrap metal or discarded durable goods (such as appliances, automobiles, auto parts, batteries, etc.) composed of materials containing hazardous substances.
- Tailings Pile: A pile consisting primarily of any combination of overburden from a mining operation and tailings from a mineral mining, beneficiation, or processing operation.
- Trash Pile: A pile consisting primarily of paper, garbage, or discarded non-durable goods containing hazardous substances.

Land Treatment: Landfarming or other method of waste management in which liquid wastes or sludges are spread over land and tilled, or liquids are injected at shallow depths into soils.

Other: Sources not in categories listed above.

GENERAL INFORMATION (continued)

Source Description: Include description of containment per pathway for ground water (see HRS Table 3-2), surface water (see HRS Table 4-2), and air (see HRS Tables 6-3 and 6-9).

The only source at the site is a landfill covering approximately 10 acres. The source was used beginning in or prior to 1971 until 1975. The landfill may have been in operation as early as the mid-1950s. The landfill was first covered in the 1970's, but the cover was inadequate and leachate outbreaks were observed in 1979. Drums were uncovered in the landfill in 1980, and reburied. Groundwater containment: no liner. Surface water containment: there is evidence of a release to surface water. Air containment: surface soils contaminated. (Refs. 2, p.3; 3, pp. 1, 2; 4, pp. 1, 2, 6-9).

Hazardous Waste Quantity (HWQ) Calculation: SI Tables 1 and 2 (See HRS Tables 2-5, 2-6, and 5-2).

Constituent quantity, wastestream quantity, and volume are all undocumented.

Area of landfill on map (USGS Geologic Quadrangle) is 10 acres. (Refs. 5, p.1; 4, p1,

This agrees with estimate in Preliminary Assessment and Sampling Investigation Report.

HWQ = 100

Note exact size of the dump is unknown. 10 acres used for worst-case

Attach additional pages, if necessary

HWQ = 100

SI TABLE 1: HAZARDOUS WASTE QUANTITY (HWQ) SCORES FOR SINGLE SOURCE SITES AND FORMULAS FOR MULTIPLE SOURCE SITES

		Single Source Sites (assigned HWQ scores)	
(Column 1)	(Column 2)	(Column 3)	(Column 4)
TIER	Source Type	HWQ = 10	HWQ = 100
A Hazardous Constituent Quantity	N/A	HWQ = 1 if Hazardous Constituent Quantity data are complete HWQ = 10 if Hazardous Constituent Quantity data are not complete	>100 to 10,000 lbs
B Hazardous Wastestream Quantity	N/A	≤ 500,000 lbs	>500,000 to 50 million lbs
C Volume	Landfill	≤ 6.75 million ft^3 ≤ 250,000 yd^3	>6.75 million to 675 million ft^3 >250,000 to 25 million yd^3
	Surface impoundment	≤6,750 ft^3 ≤250 yd^3	>6,750 to 675,000 ft^3 >250 to 25,000 yd^3
	Drums	≤1,000 drums	>1,000 to 100,000 drums
	Tanks and non-drum containers	≤50,000 gallons	>50,000 to 5 million gallons
	Contaminated soil	≤6.75 million ft^3 ≤250,000 yd^3	>6.75 million to 675 million ft^3 >250,000 to 25 million yd^3
	Pile	≤6,750 ft^3 ≤250 yd^3	>6,750 to 675,000 ft^3 >250 to 25,000 yd^3
	Other	≤6,750 ft^3 ≤250 yd^3	>6,750 to 675,000 ft^3 >250 to 25,000 yd^3
D Area	Landfill	≤340,000 ft^2 ≤7.8 acres	>340,000 to 34 million ft^2 >7.8 to 780 acres
	Surface impoundment	≤1,300 ft^2 ≤0.029 acres	>1,300 to 130,000 ft^2 >0.029 to 2.9 acres
	Contaminated soil	≤3.4 million ft^2 ≤78 acres	> 3.4 million to 340 million ft^2 > 78 to 7,800 acres
	Pile	≤1,300 ft^2 ≤0.029 acres	>1,300 to 130,000 ft^2 >0.029 to 2.9 acres
	Land treatment	≤27,000 ft^2 ≤0.62 acres	>27,000 to 2.7 million ft^2 >0.62 to 62 acres

1 ton = 2,000 pounds = 1 cubic yard = 4 drums = 200 gallons

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TABLE 1 (CONTINUED)

Single Source Sites (assigned HWQ scores)		Multiple Source Sites		
(Column 5) HWQ = 10,000	(Column 6) HWQ = 1,000,000	(Column 7) Divisors for Assigning Source WQ Values	(Column 2) Source Type	(Column 1) TIER
>10,000 to 1 million lbs	>1 million lbs	lbs ÷ 1		A Hazardous Constituent Quantity
>50 million to 5 billion lbs	> 5 billion lbs	lbs ÷ 5,000	N/A	B Hazardous Wastestream Quantity
>675 million to 67.5 billion ft^3 >25 million to 2.5 billion yd^3	>67.5 billion ft^3 >2.5 billion yd^3	ft^3 ÷ 67,500 yd^3 ÷ 2,500	Landfill	C Volume
>675,000 to 67.5 million ft^3 >25,000 to 2.5 million yd^3	> 67.5 million ft^3 > 2.5 million yd^3	ft^3 ÷ 67.5 yd^3 ÷ 2.5	Surface Impoundment	
>100,000 to 10 million drums	> 10 million drums	drums ÷ 10	Drums	
>5 million to 500 million gallons	> 500 million gallons	gallons ÷ 500	Tanks and non-drum containers	
>675 million to 67.5 billion ft^3 >25 million to 2.5 billion yd^3	> 67.5 billion ft^3 > 2.5 billion yd^3	ft^3 ÷ 67,500 yd^3 ÷ 2,500	Contaminated Soil	
>675,000 to 67.5 million ft^3 >25,000 to 2.5 million yd^3	> 67.5 million ft^3 > 2.5 million yd^3	ft^3 ÷ 67.5 yd^3 ÷ 2.5	Pile	
>675,000 to 67.5 million ft^3 >25,000 to 2.5 million yd^3	> 67.5 million ft^3 > 2.5 million yd^3	ft^3 ÷ 67.5 yd^3 ÷ 2.5	Other	
>34 million to 3.4 billion ft^2 >780 to 78,000 acres	> 3.4 billion ft^2 >78,000 acres	ft^2 ÷ 3,400 acres ÷ 0.078	Landfill	
>130,000 to 13 million ft^2 >2.9 to 290 acres	> 13 million ft^2 > 290 acres	ft^2 ÷ 13 acres ÷ 0.00029	Surface Impoundment	D Area
> 340 million to 34 billion ft^2 > 7,800 to 780,000 acres	> 34 billion ft^2 > 780,000 acres	ft^2 ÷ 34,000 acres ÷ 0.78	Contaminated Soil	
> 130,000 to 13 million ft^2 > 2.9 to 290 acres	> 13 million ft^2 > 290 acres	ft^2 ÷ 13 acres ÷ 0.00029	Pile	
>2.7 million to 270 million ft^2 >62 to 6,200 acres	> 270 million ft^2 > 6,200 acres	ft^2 ÷ 270 acres ÷ 0.0062	Land Treatment	

1 ton = 2,000 pounds = 1 cubic yard = 4 drums = 200 gallons

HAZARDOUS WASTE QUANTITY (HWQ) CALCULATION

For each migration pathway, evaluate HWQ associated with sources that are available (i.e., incompletely contained) to migrate to that pathway. (Note: If *Actual Contamination Targets* exist for ground water, surface water, or air migration pathways, assign the calculated HWQ score or 100, whichever is greater, as the HWQ score for that pathway.) For each source, evaluate HWQ for one or more of the four tiers (SI Table 1; HRS Table 2-5) for which data exist: constituent quantity, wastestream quantity, source volume, and source area. Select the tier that gives the highest value as the source HWQ. Select the source volume HWQ rather than source area HWQ if data for both tiers are available.

Column 1 of SI Table 1 indicates the quantity tier. Column 2 lists source types for the four tiers. Columns 3, 4, 5, and 6 provide ranges of waste amount for sites with only one source, corresponding to HWQ scores at the tops of the columns. Column 7 provides formulas to obtain source waste quantity values at sites with multiple sources.

1. Identify each source type.
2. Examine all waste quantity data available for each source. Record constituent quantity and waste stream mass or volume. Record dimensions of each source.
3. Convert source measurements to appropriate units for each tier to be evaluated.
4. For each source, use the formulas in the last column of SI Table 1 to determine the waste quantity value for each tier that can be evaluated. Use the waste quantity value obtained from the highest tier as the quantity value for the source.
5. Sum the values assigned to each source to determine the total site waste quantity.
6. Assign HWQ score from SI Table 2 (HRS Table 2-6).

Note these exceptions to evaluate soil exposure pathway HWQ (see HRS Table 5-2):

- The divisor for the area (square feet) of a landfill is 34,000.
- The divisor for the area (square feet) of a pile is 34.
- Wet surface impoundments and tanks and non-drum containers are the only sources for which volume measurements are evaluated for the soil exposure pathway.

SI TABLE 2: HWQ SCORES FOR SITES

Site WQ Total	HWQ Score
0	0
1[a] to 100	1[b]
> 100 to 10,000	100
> 10,000 to 1 million	10,000
> 1 million	1,000,000

[a] If the WQ total is between 0 and 1, round it to 1.
[b] If the hazardous constituent quantity data are not complete, assign the score of 10.

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SI TABLE 3: WASTE CHARACTERIZATION WORKSHEET

Site Name: Terrell Drive Dump

References

Sources:

1. Landfill
2.
3.
4.
5.
6.
7.
8.
9.

SOURCE	HAZARDOUS SUBSTANCE	TOXICITY	GROUND WATER PATHWAY		SURFACE WATER PATHWAY											AIR Pathway
					OVERLAND/FLOOD MIGRATION							GROUND WATER TO SURFACE WATER				
			(Karst) GW Mobility (HRS Table 3-8)	Tox/ Mobility Value (HRS Table 3-9)	Per (HRS Tables 4-10 and 4-11)	Tox/Per Value (HRS Table 4-12)	Bioac Pot. (HRS Table 4-15)	Tox/ Per/ Bioac Value (HRS Table 4-16)	Ecotox (HRS Table 4-19)	Ecotox/ Pers (HRS Table 4-20)	Ecotox/ Pers/ Bioacc Value (HRS Table 4-21)	Tox/ Mob/ Pers Value (HRS Table 4-26)	Tox/ Mob/ Pers/ Bioacc Value (HRS Table 4-28)	Ecotox/ Mob/ Pers Value (HRS Table 4-29)	Ecotox/ Mob/ Per/ Bioacc Value (HRS Table 4-30)	Toxicity mobility
1	ethyl benzene	10	1.0	10	0.4	4.0	50	200	100	40	2000	4.0	200	40	2000	10
1	total xylenes	1.0	1.0	1.0	0.4	4.0	50	200	100	40	2000	4.0	200	40	2000	1.0
1	benzoic acid	1.0	1.0	1.0	1.0	1.0	5.0	5.0	1.0	1.0	5.0	1.0	5.0	1.0	5.0	0.2
* 1	dieldrin	10,000	1.0	10,000	1.0	10,000	50,000	5.0E+08	10,000	10,000	5.0E+08	10,000	5.0E+08	10,000	5.0E+08	20
1	DDT	1,000	1.0	1,000	1.0	1,000	50,000	5.0E+07	10,000	10,000	5.0E+08	1,000	5.0E+07	10,000	5.0E+08	20
1	DDE	100	1.0	100	1.0	100	50,000	5.0E+06	10,000	10,000	5.0E+08	100	5.0E+06	10,000	5.0E+08	20
1	DDD	100	1.0	100	1.0	100	50,000	5.0E+06	10,000	10,000	5.0E+08	100	5.0E+06	10,000	5.0E+08	20
* 1	PCBs	10,000	1.0	10,000	1.0	10,000	50,000	5.0E+08	10,000	10,000	5.0E+08	10,000	5.0E+08	10,000	5.0E+08	10,000
1	beryllium	10,000	1.0	10,000	1.0	10,000	50	5.0E+05	—	—	—	10,000	5.0E+05	—	—	0.8
1	cyanide	100	1.0	100	0.4	100	0.5	0.5	1000	400	200	100	0.5	400	200	0.008
1	lead	10,000	1.0	10,000	1.0	10,000	50	50	1000	1000	5.0E+06	10,000	50	1000	5.0E+06	0.8
* 1	mercury	10,000	1.0	10,000	1.0	10,000	50,000	50,000	10,000	10,000	5.0E+08	10,000	50,000	10,000	5.0E+08	2000
1	vanadium	100	1.0	100	1.0	100	0.5	0.5	—	—	—	100	0.5	—	—	0.008
1	barium	10	1.0	10	1.0	10	0.5	5.0	1.0	1.0	0.5	10	5.0	1.0	0.5	0.0008

Ground Water Observed Release Substances Summary Table

On SI Table 4, list the hazardous substances associated with the site detected in ground water samples for that aquifer. Include only those substances directly observed or with concentrations significantly greater than background levels. Obtain toxicity values from the Superfund Chemical Data Matrix (SCDM). Assign mobility a value of 1 for all observed release substances regardless of the aquifer being evaluated. For each substance, multiply the toxicity by the mobility to obtain the toxicity/mobility factor value; enter the highest toxicity/mobility value for the aquifer in the space provided.

Ground Water Actual Contamination Targets Summary Table

If there is an observed release at a drinking water well, enter each hazardous substance meeting the requirements for an observed release by well and sample ID on SI Table 5 and record the detected concentration. Obtain benchmark, cancer risk, and reference dose concentrations from SCDM. For MCL and MCLG benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages for the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage or the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate the population using the well as a Level I target. If these percentages are less than 100% or all are N/A, evaluate the population using the well as a Level II target for that aquifer.

SI TABLE 4: GROUND WATER OBSERVED RELEASE SUBSTANCES (BY AQUIFER)

Sample ID	Hazardous Substance	Bckgrd. Conc.	Toxicity/ Mobility	References
NONE				
		Highest Toxicity/Mobility		

SI TABLE 5: GROUND WATER ACTUAL CONTAMINATION TARGETS

Well ID: None Level I ____ Level II ____ Population Served ____ References ____

Sample ID	Hazardous Substance	Conc. (µg/L)	Benchmark Conc. (MCL or MCLG)	% of Benchmark	Cancer Risk Conc.	% of Cancer Risk Conc.	RfD	% of RfD
			Highest Percent		Sum of Percents		Sum of Percents	

Well ID: ____ Level I ____ Level II ____ Population Served ____ References ____

Sample ID	Hazardous Substance	Conc. (µg/L)	Benchmark Conc. (MCL or MCLG)	% of Benchmark	Cancer Risk Conc.	% of Cancer Risk Conc.	RfD	% of RfD
			Highest Percent		Sum of Percents		Sum of Percents	

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GROUND WATER PATHWAY
GROUND WATER USE DESCRIPTION

Describe Ground Water Use within 4 Miles of the Site: Not Used For Drinking
Describe generalized stratigraphy, aquifers, municipal and private wells

The bedrock aquifers in the area include the Lexington Limestone Members overlying the Tyrone Limestone. Alluvium may overlie the bedrock in some valley bottoms. There are no groundwater wells within 4 miles of the Dump Site because wells generally produce too little water for domestic use, and the groundwater is too brackish for consumption (Refs. 9; 10; 11; 12; 13). There is one public water supply system, the Danville water system, which serves all of Boyle County, including rural areas in the vicinity of the site. The Danville water system obtains drinking water from a surface water intake located on Herrington Lake. (Refs 14, 15, 16)

Show Calculations of Ground Water Drinking Water Populations for each Aquifer:
Provide apportionment calculations for blended supply systems.
County average number of persons per household: 2.49 Reference Census

No groundwater target population

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GROUND_WATER_PATHWAY WORKSHEET

LIKELIHOOD OF RELEASE	Score	Data Type	Refs
1. OBSERVED RELEASE: If sampling data or direct observation support a release to the aquifer, assign a score of 550. Record observed release substances on SI Table 4.	0		
2. POTENTIAL TO RELEASE: Depth to aquifer: 6 feet. If sampling data do not support a release to the aquifer, and the site is in karst terrain or the depth to aquifer is 70 feet or less, assign a score of 500; otherwise, assign a score of 340. Optionally, evaluate potential to release according to HRS Section 3.	500	H	Soil Survey
LR =	500		

TARGETS	Score	Data Type	Refs
Are any wells part of a blended system? Yes ___ No X If yes, attach a page to show apportionment calculations.			
3. ACTUAL CONTAMINATION TARGETS: If analytical evidence, indicates that any target drinking water well for the aquifer has been exposed to a hazardous substance from the site, evaluate the factor score for the number of people served (SI Table 5). Level I: _____ people x 10 = _____ Level II: _____ people x 1 = _____ Total =	0	Sampling	SI and phone log
4. POTENTIAL CONTAMINATION TARGETS: Determine the number of people served by drinking water wells for the aquifer or overlying aquifers that are not exposed to a hazardous substance from the site; record the population for each distance category in SI Table 6a or 6b. Sum the population values and multiply by 0.1.	0	H	Phone Log
5. NEAREST WELL: Assign a score of 50 for any Level I Actual Contamination Targets for the aquifer or overlying aquifer. Assign a score of 45 if there are Level II targets but no Level I targets. If no Actual Contamination Targets exist, assign the Nearest Well score from SI Table 6a or 6b. If no drinking water wells exist within 4 miles, assign 0.	0	H	Phone Log
6. WELLHEAD PROTECTION AREA (WHPA): If any source lies within or above a WHPA for the aquifer, or if a ground water observed release has occurred within a WHPA, assign a score of 20; assign 5 if neither condition applies but a WHPA is within 4 miles; otherwise assign 0.	0	H	None in Region VI
7. RESOURCES: Assign a score of 5 if one or more ground water resource applies; assign 0 if none applies. • Irrigation (5 acre minimum) of commercial food crops or commercial forage crops • Watering of commercial livestock • Ingredient in commercial food preparation • Supply for commercial aquaculture • Supply for a major or designated water recreation area, excluding drinking water use	0	E	Phone Log
Sum of Targets T=	0		

SI TABLE 6 (From HRS TABLE 3-12): VALUES FOR POTENTIAL CONTAMINATION GROUND-WATER TARGET POPULATIONS

SI Table 6a: Other Than Karst Aquifers

Distance from Site	Pop.	Nearest Well (choose highest)	Population Served by Wells within Distance Category												Pop. Value	Ref.
			1 to 10	11 to 30	31 to 100	101 to 300	301 to 1000	1001 to 3000	3001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	1,000,000 to 3,000,000		
0 to $\frac{1}{4}$ mile		20	4	17	53	164	522	1,633	5,214	16,325	52,137	163,246	521,360	1,632,455		
$>\frac{1}{4}$ to $\frac{1}{2}$ mile		18	2	11	33	102	324	1,013	3,233	10,122	32,325	101,213	323,243	1,012,122		
$>\frac{1}{2}$ to 1 mile		9	1	5	17	52	167	523	1,669	5,224	16,684	52,239	166,835	522,385		
> 1 to 2 miles		5	0.7	3	10	30	94	294	939	2,939	9,385	29,384	93,845	293,842		
> 2 to 3 miles		3	0.5	2	7	21	68	212	678	2,122	6,778	21,222	67,777	212,219		
>3 to 4 miles		2	0.3	1	4	13	42	131	417	1,306	4,171	13,060	41,709	130,596		
Nearest Well =		N/A												Sum	0	

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SI TABLE 6 (From HRS TABLE 3-12): VALUES FOR POTENTIAL CONTAMINATION GROUND WATER TARGET POPULATIONS (continued)

SI Table 6b: Karst Aquifers

Distance from Site	Pop.	Nearest Well (choose highest)	Population Served by Wells within Distance Category												Pop. Value	Ref.
			1 to 10	11 to 30	31 to 100	101 to 300	301 to 1000	1001 to 3000	3001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	1,000,000 to 3,000,000		
0 to $\frac{1}{4}$ mile		20	4	17	53	164	522	1,633	5,214	16,325	52,137	163,246	521,360	1,632,455		Phone Log
> $\frac{1}{4}$ to $\frac{1}{2}$ mile		20	2	11	33	102	324	1,013	3,233	10,122	32,325	101,213	323,243	1,012,122		
> $\frac{1}{2}$ to 1 mile		20	2	9	26	82	261	817	2,607	8,163	26,068	81,623	260,680	816,227		
> 1 to 2 miles		20	2	9	26	82	261	817	2,607	8,163	26,068	81,623	260,680	816,227		
> 2 to 3 miles		20	2	9	26	82	261	817	2,607	8,163	26,068	81,623	260,680	816,227		
>3 to 4 miles		20	2	9	26	82	261	817	2,607	8,163	26,068	81,623	260,680	816,227		
														Sum	0	

Nearest Well = 0

no ground water wells within 4 miles

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GROUND WATER PATHWAY WORKSHEET (concluded)

WASTE CHARACTERISTICS	Score	Data Type	Does not Apply
8. If any Actual Contamination Targets exist for the aquifer or overlying aquifers, assign the calculated hazardous waste quantity score or a score of 100, whichever is greater; if no Actual Contamination Targets exist, assign the hazardous waste quantity score calculated for sources available to migrate to ground water.	0	H	
9. Assign the highest ground water toxicity/mobility value from SI Table 3 or 4.	10,000	H	
10. Multiply the ground water toxicity/mobility and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below: (from HRS Table 2-7)	32		
WC =	32		

Product	WC Score
0	0
>0 to <10	1
10 to <100	2
100 to <1,000	3
1,000 to < 10,000	6
10,000 to <1E + 05	10
1E + 05 to <1E + 06	18
1E + 06 to <1E + 07	32
1E + 07 to <1E + 08	56
1E + 08 or greater	100

Multiply LR by T and by WC. Divide the product by 82,500 to obtain the ground water pathway score for each aquifer. Select the highest aquifer score. If the pathway score is greater than 100, assign 100.

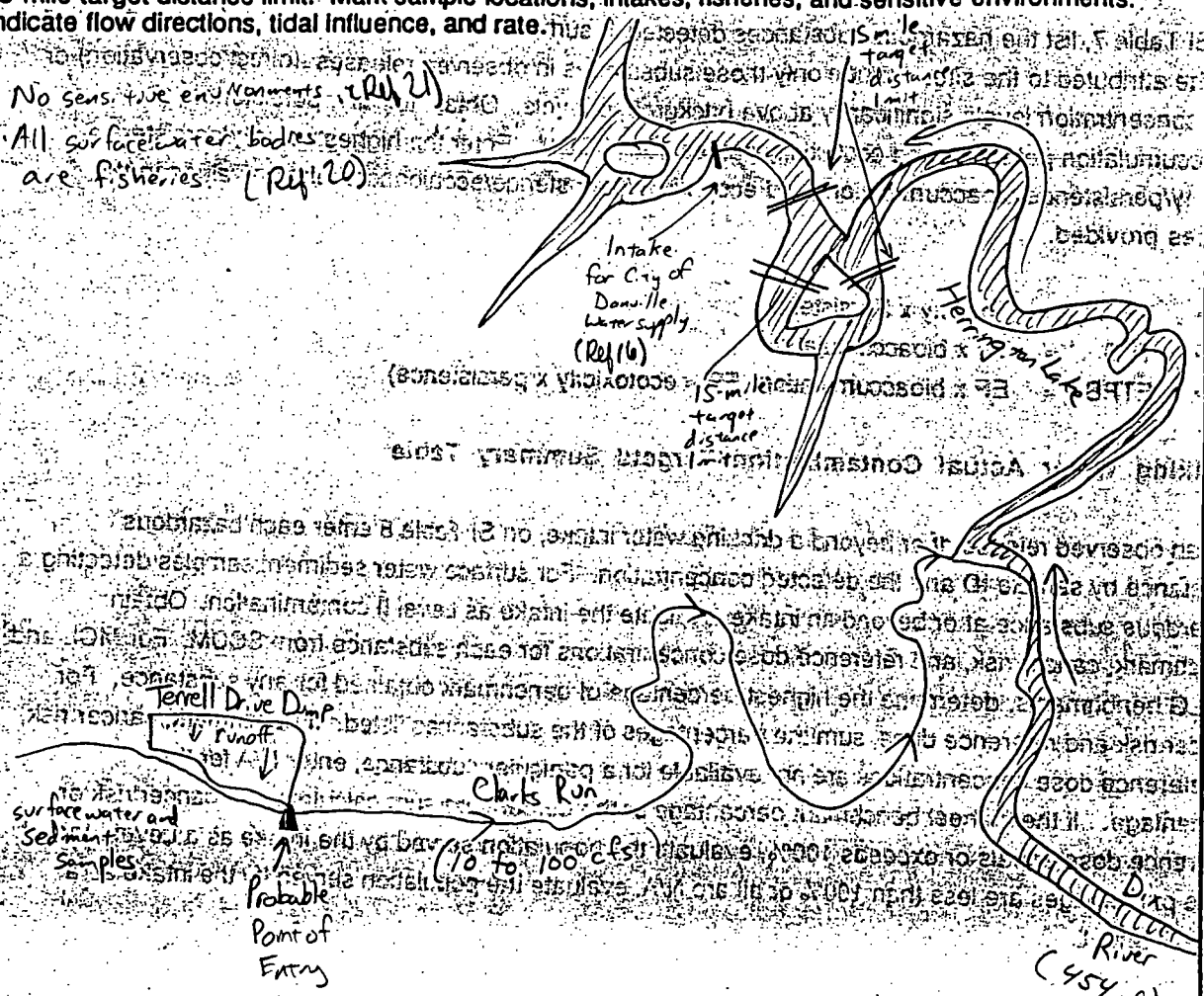
GROUND WATER PATHWAY SCORE: $\frac{LR \times T \times WC}{82,500}$

$\frac{500 \times 0 \times 32}{82,500}$

0 (Maximum of 100)

SURFACE WATER PATHWAY

Sketch of the Surface Water Migration Route:
Label all surface water bodies. Include runoff route and drainage direction, probable point of entry, and 15-mile target distance limit. Mark sample locations, intakes, fisheries, and sensitive environments. Indicate flow directions, tidal influence, and rate.



(Ref. 1

SURFACE WATER PATHWAY

Surface Water Observed Release Substances Summary Table

On SI Table 7, list the hazardous substances detected in surface water samples for the watershed, which can be attributed to the site. Include only those substances in observed releases (direct observation) or with concentration levels significantly above background levels. Obtain toxicity, persistence, bioaccumulation potential, and ecotoxicity values from SCDM. Enter the highest toxicity/persistence, toxicity/persistence/bioaccumulation, and ecotoxicity/persistence/ecobioaccumulation values in the spaces provided.

- TP = Toxicity x Persistence
- TPB = TP x bioaccumulation
- ETPB = EP x bioaccumulation (EP = ecotoxicity x persistence)

Drinking Water Actual Contamination Targets Summary Table

For an observed release at or beyond a drinking water intake, on SI Table 8 enter each hazardous substance by sample ID and the detected concentration. For surface water sediment samples detecting a hazardous substance at or beyond an intake, evaluate the intake as Level II contamination. Obtain benchmark, cancer risk, and reference dose concentrations for each substance from SCDM. For MCL and MCLG benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages of the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage or the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate the population served by the intake as a Level I target. If the percentages are less than 100% or all are N/A, evaluate the population served by the intake as a Level II target.

SI TABLE 7: SURFACE WATER OBSERVED RELEASE SUBSTANCES

Sample ID	and concentration Hazardous Substance	Bckgrd. Conc.	Toxicity/ Persistence	Toxicity/ Persis./ Bioaccum	Ecotoxicity/ Persis/ Ecobioaccum	References
CRD-S	dieldrin 1.0 ug/kg	ND	10,000	5.0E+08	5.0E+08	Sampling Report
(sediment)	DDD 8.4 "	1.1 ug/kg	100	5.0E+06	5.0E+08	Sampling Report
	beryllium 3,000 "	ND	10,000	5.0E+05	—	Sampling Report
	vanadium 50,000	ND	100	0.5	—	
		Highest Values				

SI TABLE 8: SURFACE WATER DRINKING WATER ACTUAL CONTAMINATION TARGETS

Intake ID: None Sample Type _____ Level I _____ Level II _____ Population Served _____ References _____

Sample ID	Hazardous Substance	Conc. (µg/L)	Benchmark Conc. (MCL or MCLG)	% of Benchmark	Cancer Risk Conc.	% of Cancer Risk Conc.	RfD	% of RfD
			Highest Percent		Sum of Percents		Sum of Percents	

Intake ID: _____ Sample Type _____ Level I _____ Level II _____ Population Served _____ References _____

Sample ID	Hazardous Substance	Conc. (µg/L)	Benchmark Conc. (MCL or MCLG)	% of Benchmark	Cancer Risk Conc.	% of Cancer Risk Conc.	RfD	% of RfD
			Highest Percent		Sum of Percents		Sum of Percents	

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SURFACE WATER PATHWAY
LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT WORKSHEET

LIKELIHOOD OF RELEASE–OVERLAND/FLOOD MIGRATION

	Score	Data Type	Refs
1. OBSERVED RELEASE: If sampling data or direct observation support a release to surface water in the watershed, assign a score of 550. Record observed release substances on SI Table 7.	550	H	SI
2. POTENTIAL TO RELEASE: *Distance to surface water: <100 (feet)* If sampling data do not support a release to surface water in the watershed, use the table below to assign a score from the table below based on distance to surface water and flood frequency.			

Distance to surface water <2500 feet	500
Distance to surface water >2500 feet, and:	
Site in annual or 10-yr floodplain	500
Site in 100-yr floodplain	400
Site in 500-yr floodplain	300
Site outside 500-yr floodplain	100

Optionally, evaluate surface water potential to release according to HRS Section 4.1.2.1.2

LR = 550

LIKELIHOOD OF RELEASE GROUND WATER TO SURFACE WATER MIGRATION

	Score	Data Type	Refs
1. OBSERVED RELEASE: If sampling data or direct observation support a release to surface water in the watershed, assign a score of 550. Record observed release substances on SI Table 7.			
NOTE: Evaluate ground water to surface water migration only for a surface water body that meets all of the following conditions: 1) A portion of the surface water is within 1 mile of site sources having a containment factor greater than 0. 2) No aquifer discontinuity is established between the source and the above portion of the surface water body. 3) The top of the uppermost aquifer is at or above the bottom of the surface water. Elevation of top of uppermost aquifer____ Elevation of bottom of surface water body____			
2. POTENTIAL TO RELEASE: Use the ground water potential to release. Optionally, evaluate surface water potential to release according to HRS Section 3.1.2.			

LR =

Not evaluated

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SURFACE WATER PATHWAY
LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT WORKSHEET
(CONTINUED)

DRINKING WATER THREAT TARGETS	Score	Data Type	Refs
Record the water body type, flow, and number of people served by each drinking water intake within the target distance limit in the watershed. If there is no drinking water intake within the target distance limit, assign 0 to factors 3, 4, and 5.			
Intake Name / Water Body Type / Flow / People Served			
Are any intakes part of a blended system? Yes _____ No _____ If yes, attach a page to show apportionment calculations.			
3. ACTUAL CONTAMINATION TARGETS: If analytical evidence indicates a drinking water intake has been exposed to a hazardous substance from the site, list the intake name and evaluate the factor score for the drinking water population (SI Table 8). Level I: 0 people x 10 = ____ Level II: 0 people x 1 = ____ Total =	0	H	Phone Log
4. POTENTIAL CONTAMINATION TARGETS: Determine the number of people served by drinking water intakes for the watershed that have not been exposed to a hazardous substance from the site. Assign the population values from SI Table 9. Sum the values and multiply by 0.1.	0	H	Phone Log
5. NEAREST INTAKE: Assign a score of 50 for any Level I Actual Contamination Drinking Water Targets for the watershed. Assign a score of 45 if there are Level II targets for the watershed, but no Level I targets. If no Actual Contamination Drinking Water Targets exist, assign a score for the intake nearest the PPE from SI Table 9. If no drinking water intakes exist, assign 0.	0	H	Phone Log
6. RESOURCES: Assign a score of 5 if one or more surface water resource applies; assign 0 if none applies. • Irrigation (5 acre minimum) of commercial food crops or commercial forage crops • Watering of commercial livestock • Ingredient in commercial food preparation • Major or designated water recreation area, excluding drinking water use ✓	5	E	Phone Log
SUM OF TARGETS T=	5		

SI TABLE 9 (From HRS Table 4-14): DILUTION-WEIGHTED POPULATION VALUES FOR POTENTIAL CONTAMINATION FOR SURFACE WATER MIGRATION PATHWAY

Type of Surface Water Body	Pop.	Nearest Intake	Number of people									Pop. Value
			0	1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	
Minimal Stream (<10 cfs)		20	0	4	17	53	164	522	1,633	5,214	16,325	
Small to moderate stream (10 to 100 cfs)		2	0	0.4	2	5	16	52	163	521	1,633	
Moderate to large stream (> 100 to 1,000 cfs)		0	0	0.04	0.2	0.5	2	5	16	52	163	
Large Stream to river (>1,000 to 10,000 cfs)		0	0	0.004	0.02	0.05	0.2	0.5	2	5	16	
Large River (> 10,000 to 100,000 cfs)		0	0	0	0.002	0.005	0.02	0.05	0.2	0.5	16	
Very Large River (>100,000 cfs)		0	0	0	0	0.001	0.002	0.005	0.02	0.05	0.2	
Shallow ocean zone or Great Lake (depth < 20 feet)		0	0	0	0.002	0.005	0.02	0.05	0.2	0.5	2	
Moderate ocean zone or Great Lake (Depth 20 to 200 feet)		0	0	0	0	0.001	0.002	0.005	0.02	0.05	0.2	
Deep ocean zone or Great Lake (depth > 200 feet)		0	0	0	0	0	0.001	0.003	0.008	0.03	0.08	
3-mile mixing zone in quiet flowing river (≥ 10 cfs)		10	0	2	9	26	82	261	817	2,607	8,163	

Nearest Intake = 0

Sum = 0

References: Topo and phone log

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SURFACE WATER PATHWAY

Human Food Chain Actual Contamination Targets Summary Table

On SI Table 10, list the hazardous substances detected in sediment, aqueous, sessile benthic organism tissue, or fish tissue samples (taken from fish caught within the boundaries of the observed release) by sample ID and concentration. Evaluate fisheries within the boundaries of observed releases detected by sediment or aqueous samples as Level II, if at least one observed release substance has a bioaccumulation potential factor value of 500 or greater (see SI Table 7). Obtain benchmark, cancer risk, and reference dose concentrations from SCDM. For FDAAL benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages for the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate this portion of the fishery as subject to Level I concentrations. If the percentages are less than 100% or all are N/A, evaluate the fishery as a Level II target.

Sensitive Environment Actual Contamination Targets Summary Table

On SI Table 11, list each hazardous substance detected in aqueous or sediment samples at or beyond wetlands or a surface water sensitive environment by sample ID. Record the concentration. If contaminated sediments or tissues are detected at or beyond a sensitive environment, evaluate the sensitive environment as Level II. Obtain benchmark concentrations from SCDM. For AWQC/AALAC benchmarks, determine the highest percentage of benchmark of the substances detected in aqueous samples. If benchmark concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage equals or exceeds 100%, evaluate that part of the sensitive environment subject to Level I concentrations. If the percentage is less than 100%, or all are N/A, evaluate the sensitive environment as Level II.

SI TABLE 10: HUMAN FOOD CHAIN ACTUAL CONTAMINATION TARGETS FOR WATERSHED

Fishery ID: Clarks Run Sample Type sediment Level I ____ Level II X References SI

Sample ID	Hazardous Substance	Conc. (mg/kg)	Benchmark Concentration (FDAAL)	% of Benchmark	Cancer Risk Concentration	% of Cancer Risk Concentration	RfD	% of RfD
CRD-S	dieldrin	0.001	3.0E-1	0.33	8.1E-5	1234.57	6.5E-2	1.54
CRD-S	DDD	0.0084	5.0	0.168	5.4E-3	155.55	—	—
			Highest Percent	0.33	Sum of Percents	1390.12	Sum of Percents	1.54

SI TABLE 11: SENSITIVE ENVIRONMENT ACTUAL CONTAMINATION TARGETS FOR WATERSHED

Environment ID: None Sample Type ____ Level I ____ Level II ____ Environment Value ____

Sample ID	Hazardous Substance	Conc. (µg/L)	Benchmark Concentration (AWQC or AALAC)	% of Benchmark	References
			Highest Percent		

Environment ID: ____ Sample Type ____ Level I ____ Level II ____ Environment Value ____

Sample ID	Hazardous Substance	Conc. (µg/L)	Benchmark Concentration (AWQC or AALAC)	% of Benchmark	References
			Highest Percent		

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SURFACE WATER PATHWAY (continued)
HUMAN FOOD CHAIN THREAT WORKSHEET

HUMAN FOOD CHAIN THREAT TARGETS	Score	Data Type	Refs
Record the water body type and flow for each fishery within the target distance limit. If there is no fishery within the target distance limit, assign a score of 0 at the bottom of this page.			
Fishery Name Clarks Run Water Body creek Flow 10 to 100 cfs Species unknown Production unknown lbs/yr Species ____ Production ____ lbs/yr			
Fishery Name Dix River Lake Water Body River Flow 454 cfs Species unknown Production unknown lbs/yr Species ____ Production ____ lbs/yr			
Fishery Name Herrington Water Body Lake Flow 454 cfs Species unknown Production unknown lbs/yr Species ____ Production ____ lbs/yr			
FOOD CHAIN INDIVIDUAL			
7. ACTUAL CONTAMINATION FISHERIES: If analytical evidence indicates that a fishery has been exposed to a hazardous substance with a bioaccumulation factor greater than or equal to 500 (SI Table 10), assign a score of 50 if there is a Level I fishery. Assign 45 if there is a Level II fishery, but no Level I fishery.			
8. POTENTIAL CONTAMINATION FISHERIES: If there is a release of a substance with a bioaccumulation factor greater than or equal to 500 to a watershed containing fisheries within the target distance limit, but there are no Level I or Level II fisheries, assign a score of 20.		H	SI and scom
If there is no observed release to the watershed, assign a value for potential contamination fisheries from the table below using the lowest flow at all fisheries within the target distance limit:			

Lowest Flow	FCI Value
<10 cfs	20
10 to 100 cfs	2
>100 cfs, coastal tidal waters, oceans, or Great Lakes	0
3-mile mixing zone in quiet flowing river	10

FCI Value = ____

SUM OF TARGETS T = 45

SURFACE WATER PATHWAY (continued)
ENVIRONMENTAL THREAT WORKSHEET

When measuring length of wetlands that are located on both sides of a surface water body, sum both frontage lengths. For a sensitive environment that is more than one type, assign a value for each type.

ENVIRONMENTAL THREAT TARGETS	Score	Data Type	Refs
Record the water body type and flow for each surface water sensitive environment within the target distance (see SI Table 12). If there is no sensitive environment within the target distance limit, assign a score of 0 at the bottom of the page.			

Environment Name	Water Body Type	Flow
		cfs
		cfs
		cfs
		cfs
		cfs

9. ACTUAL CONTAMINATION SENSITIVE ENVIRONMENTS: If sampling data or direct observation indicate any sensitive environment has been exposed to a hazardous substance from the site, record this information on SI Table 11, and assign a factor value for the environment (SI Tables 13 and 14).

Environment Name	Environment Type and Value (SI Tables 13 & 14)	Multiplier (10 for Level I, 1 for Level II)	Product
		x	=
		x	=
		x	=
		x	=
		Sum =	

Score: 0 Data Type: H Refs: Topo ST

10. POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS:

Flow	Dilution Weight (SI Table 12)	Environment Type and Value (SI Tables 13 & 14)	Pot. Cont.	Product
cfs	x	x	0.1 =	
cfs	x	x	0.1 =	
cfs	x	x	0.1 =	
cfs	x	x	0.1 =	
cfs	x	x	0.1 =	
			Sum =	

Score: 0 Data Type: H Refs: Topo

T = 0

SI TABLE 12 (HRS Table 4-13): SURFACE WATER DILUTION WEIGHTS

Type of Surface Water Body		Assigned Dilution Weight
Descriptor	**Flow Characteristics**	
Minimal stream	< 10 cfs	1
Small to moderate stream	10 to 100 cfs	0.1
Moderate to large stream	> 100 to 1,000 cfs	0.01
Large stream to river	> 1,000 to 10,000 cfs	0.001
Large river	> 10,000 to 100,000 cfs	0.0001
Very large river	> 100,000 cfs	0.00001
Coastal tidal waters	Flow not applicable; depth not applicable	0.001
Shallow ocean zone or Great Lake	Flow not applicable; depth less than 20 feet	0.001
Moderate depth ocean zone or Great Lake	Flow not applicable; depth 20 to 200 feet	0.0001
Deep ocean zone or Great Lake	Flow not applicable; depth greater than 200 feet	0.000005
3-mile mixing zone in quiet flowing river	10 cfs or greater	0.5

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SI TABLE 13 (HRS TABLE 4-23): SURFACE WATER AND AIR SENSITIVE ENVIRONMENTS VALUES

SENSITIVE ENVIRONMENT	ASSIGNED VALUE
Critical habitat for Federal designated endangered or threatened species Marine Sanctuary National Park Designated Federal Wilderness Area Ecologically important areas identified under the Coastal Zone Wilderness Act Sensitive Areas identified under the National Estuary Program or Near Coastal Water Program of the Clean Water Act Critical Areas identified under the Clean Lakes Program of the Clean Water Act (subareas in lakes or entire small lakes) National Monument (air pathway only) National Seashore Recreation Area National Lakeshore Recreation Area	100
Habitat known to be used by Federal designated or proposed endangered or threatened species National Preserve National or State Wildlife Refuge Unit of Coastal Barrier Resources System Coastal Barrier (undeveloped) Federal land designated for the protection of natural ecosystems Administratively Proposed Federal Wilderness Area Spawning areas critical for the maintenance of fish/shellfish species within a river system, bay, or estuary Migratory pathways and feeding areas critical for the maintenance of anadromous fish species within river reaches or areas in lakes or coastal tidal waters in which the fish spend extended periods of time Terrestrial areas utilized by large or dense aggregations of vertebrate animals (semi-aquatic foragers) for breeding National river reach designated as recreational	75
Habitat known to be used by State designated endangered or threatened species Habitat known to be used by a species under review as to its Federal endangered or threatened status Coastal Barrier (partially developed) Federally designated Scenic or Wild River	50
State land designated for wildlife or game management State designated Scenic or Wild River State designated Natural Area Particular areas, relatively small in size, important to maintenance of unique biotic communities	25
State designated areas for the protection of maintenance of aquatic life under the Clean Water Act	5
Wetlands See SI Table 14 (Surface Water Pathway) or SI Table 23 (Air Pathway)	

SI TABLE 14 (HRS TABLE 4-24): SURFACE WATER WETLANDS FRONTAGE VALUES

Total Length of Wetlands	Assigned Value
Less than 0.1 mile	0
0.1 to 1 mile	25
Greater than 1 to 2 miles	50
Greater than 2 to 3 miles	75
Greater than 3 to 4 miles	100
Greater than 4 to 8 miles	150
Greater than 8 to 12 miles	250
Greater than 12 to 16 miles	350
Greater than 16 to 20 miles	450
Greater than 20 miles	500

SURFACE WATER PATHWAY (concluded)

WASTE CHARACTERISTICS, THREAT, AND PATHWAY SCORE SUMMARY

WASTE CHARACTERISTICS	Score
14. If an Actual Contamination Target (drinking water, human food chain, or environmental threat) exists for the watershed, assign the calculated hazardous waste quantity score, or a score of 100, whichever is greater.	100
15. Assign the highest value from SI Table 7 (observed release) or SI Table 3 (no observed release) for the hazardous substance waste characterization factors below. Multiply each by the surface water hazardous waste quantity score and determine the waste characteristics score for each threat.	WC Score (from Table) (Maximum of 100)

	Substance Value		HWQ		Product	WC Score (from Table) (Maximum of 100)
Drinking Water Threat Toxicity/Persistence	10,000	x	100	=	1.0E06	32
Food Chain Threat Toxicity/Persistence/ Bioaccumulation	5.0E+08	x	100	=	5.0E+10	320
Environmental Threat Ecotoxicity/Persistence/ Ecobioaccumulation	5.0E+08	x	100	=	5.0E+10	320

Product	WC Score
0	0
>0 to <10	1
10 to <100	2
100 to <1,000	3
1,000 to < 10,000	6
10,000 to <1E + 05	10
1E + 05 to <1E + 06	18
1E + 06 to <1E + 07	32
1E + 07 to <1E + 08	56
1E + 08 to <1E + 09	100
1E + 09 to <1E + 10	180
1E + 10 to <1E + 11	320
1E + 11 to <1E + 12	560
1E + 12 or greater	1000

SURFACE WATER PATHWAY THREAT SCORES

Threat	Likelihood of Release (LR) Score	Targets (T) Score	Pathway Waste Characteristics (WC) Score (determined above)	Threat Score $\frac{LR \times T \times WC}{82,500}$ (maximum of 100)
Drinking Water	550	5	32	1.07
Human Food Chain	550	45	320	14.97
Environmental	550	0	320	(maximum of 60) 0

SURFACE WATER PATHWAY SCORE (Drinking Water Threat + Human Food Chain Threat + Environmental Threat)

(maximum of 100)
97.07
43.74

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SOIL EXPOSURE PATHWAY

If there is no observed contamination (e.g., ground water plume with no known surface source), do not evaluate the soil exposure pathway. Discuss evidence for no soil exposure pathway.

Soil Exposure Resident Population Targets Summary

For each property (duplicate page 35 as necessary):

If there is an area of observed contamination on the property and within 200 feet of a residence, school, or day care center, enter on Table 15 each hazardous substance by sample ID. Record the detected concentration. Obtain cancer risk, and reference dose concentrations from SCDM. Sum the cancer risk and reference dose percentages for the substances listed. If cancer risk or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate the residents and students as Level I. If both percentages are less than 100% or all are N/A, evaluate the targets as Level II.

SI TABLE 15: SOIL EXPOSURE RESIDENT POPULATION TARGETS

Residence ID: None Level I ____ Level II ____ Population ____

Sample ID	Hazardous Substance	Conc. (mg/kg)	Cancer Risk Concentration	% of Cancer Risk Conc.	RfD	% of RfD	Toxicity Value	References
			Highest Percent		Sum of Percents		Sum of Percents	

Residence ID: ____ Level I ____ Level II ____ Population ____

Sample ID	Hazardous Substance	Conc. (mg/kg)	Cancer Risk Concentration	% of Cancer Risk Conc.	RfD	% of RfD	Toxicity Value	References
			Highest Percent		Sum of Percents		Sum of Percents	

Residence ID: ____ Level I ____ Level II ____ Population ____

Sample ID	Hazardous Substance	Conc. (mg/kg)	Cancer Risk Concentration	% of Cancer Risk Conc.	RfD	% of RfD	Toxicity Value	References
			Highest Percent		Sum of Percents		Sum of Percents	

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SOIL EXPOSURE PATHWAY WORKSHEET
RESIDENT POPULATION THREAT

LIKELIHOOD OF EXPOSURE	Score	Data Type	Refs
1. OBSERVED CONTAMINATION: If evidence indicates presence of observed contamination (depth of 2 feet or less), assign a score of 550; otherwise, assign a 0. Note that a likelihood of exposure score of 0 results in a soil exposure pathway score of 0.	550	H	SI Report
LE =	550		

TARGETS	Score	Data Type	Refs
2. RESIDENT POPULATION: Determine the number of people living or attending school or day care on a property with an area of observed contamination and whose residence, school, or day care center, respectively, is on or within 200 feet of the area of observed contamination. Level I: ____ people x 10 = ____ Level II: ____ people x 1 = ____ Sum =	0	H	SI
3. RESIDENT INDIVIDUAL: Assign a score of 50 if any Level I resident population exists. Assign a score of 45 if there are Level II targets but no Level I targets. If no resident population exists (*i.e.*, no Level I or Level II targets), assign 0 (HRS Section 5.1.3).	0	H	SI
4. WORKERS: Assign a score from the table below for the total number of workers at the site and nearby facilities with areas of observed contamination associated with the site.	0	H	SI

Number of Workers	Score
0	0
1 to 100	5
101 to 1,000	10
>1,000	15

	Score	Data Type	Refs
5. TERRESTRIAL SENSITIVE ENVIRONMENTS: Assign a value for each terrestrial sensitive environment (SI Table 16) in an area of observed contamination.			

Terrestrial Sensitive Environment Type	Value

	Score	Data Type	Refs
Sum =	0	E	U.S. Fish + wildlife
6. RESOURCES: Assign a score of 5 if any one or more of the following resources is present on an area of observed contamination at the site; assign 0 if none applies: • Commercial agriculture • Commercial silviculture • Commercial livestock production or commercial livestock grazing	0	H	SI
Total of Targets T=	0		

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SI TABLE 16 (HRS TABLE 5-5): SOIL EXPOSURE PATHWAY TERRESTRIAL SENSITIVE ENVIRONMENT VALUES

TERRESTRIAL SENSITIVE ENVIRONMENT	ASSIGNED VALUE
Terrestrial critical habitat for Federal designated endangered or threatened species National Park Designated Federal Wilderness Area National Monument	100
Terrestrial habitat known to be used by Federal designated or proposed threatened or endangered species National Preserve (terrestrial) National or State terrestrial Wildlife Refuge Federal land designated for protection of natural ecosystems Administratively proposed Federal Wilderness Area Terrestrial areas utilized by large or dense aggregations of animals (vertebrate species) for breeding	75
Terrestrial habitat used by State designated endangered or threatened species Terrestrial habitat used by species under review for Federal designated endangered or threatened status	50
State lands designated for wildlife or game management State designated Natural Areas Particular areas, relatively small in size, important to maintenance of unique biotic communities	25

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SOIL EXPOSURE PATHWAY WORKSHEET
NEARBY POPULATION THREAT

LIKELIHOOD OF EXPOSURE	Score	Data Type	Ref.
7. Attractiveness/Accessibility (from SI Table 17 or HRS Table 5-6) Value 75	75	H	SI
Area of Contamination (from SI Table 18 or HRS Table 5-7) Value 80	80	H	PA
Likelihood of Exposure (from SI Table 19 or HRS Table 5-8) LE =	375		

note: if there is no area of observed contamination, LE = 0

TARGETS	Score	Data Type	Ref.
8. Assign a score of 0 if Level I or Level II resident individual has been evaluated or if no individuals live within 1/4 mile travel distance of an area of observed contamination. Assign a score of 1 if nearby population is within 1/4 mile travel distance and no Level I or Level II resident population has been evaluated.	1	H	Topo
9. Determine the population within 1 mile travel distance that is not exposed to a hazardous substance from the site (*i.e.*, properties that are not determined to be Level I or Level II); record the population for each distance category in SI Table 20 (HRS Table 5-10). Sum the population values and multiply by 0.1	7	E	Topo
T =	48		

SI TABLE 17 (HRS TABLE 5-6): ATTRACTIVENESS/ACCESSIBILITY VALUES

Area of Observed Contamination	Assigned Value
Designated recreational area	100
Regularly used for public recreation (for example, vacant lots in urban area)	75
Accessible and unique recreational area (for example, vacant lots in urban area)	75
Moderately accessible (may have some access improvements for example, gravel road) with some public recreation use	50
Slightly accessible (for example, extremely rural area with no road improvement) with some public recreation use	25
Accessible with no public recreation use	10
Surrounded by maintained fence or combination of maintained fence and natural barriers	5
Physically inaccessible to public, with no evidence of public recreation use	0

SI TABLE 18 (HRS TABLE 5-7): AREA OF CONTAMINATION FACTOR VALUES

Total area of the areas of observed contamination (square feet)	Assigned Value
≤ to 5,000	5
> 5,000 to 125,000	20
> 125,000 to 250,000	40
> 250,000 to 375,000	60
> 375,000 to 500,000	80
> 500,000	100

SI TABLE 19 (HRS TABLE 5-8): NEARBY POPULATION LIKELIHOOD OF EXPOSURE FACTOR VALUES

AREA OF CONTAMINATION FACTOR VALUE	ATTRACTIVENESS/ACCESSIBILITY FACTOR VALUE						
	100	75	50	25	10	5	0
100	500	500	375	250	125	50	0
80	500	375	250	125	50	25	0
60	375	250	125	50	25	5	0
40	250	125	50	25	5	5	0
20	125	50	25	5	5	5	0
5	50	25	5	5	5	5	0

SI TABLE 20 (HRS TABLE 5-10): DISTANCE-WEIGHTED POPULATION VALUES FOR NEARBY POPULATION THREAT

Travel Distance Category (miles)	Pop.	Number of people within the travel distance category												Pop. Value
		0	1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,001	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	
Greater than 0 to $\frac{1}{4}$	341	0	0.1	0.4	1.0	4	13	41	130	408	1,303	4,081	13,034	13
Greater than $\frac{1}{4}$ to $\frac{1}{2}$	1022	0	0.05	0.2	0.7	2	7	20	65	204	652	2,041	6,517	20
Greater than $\frac{1}{2}$ to 1	4091	0	0.02	0.1	0.3	1	3	10	33	102	326	1,020	3,258	33
													Sum =	66

Reference(s)

GEMS - Refs. 22, 24

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SOIL EXPOSURE PATHWAY WORKSHEET (concluded)

WASTE CHARACTERISTICS

10. Assign the hazardous waste quantity score calculated for soil exposure. HRS Section 5.1.2.2 and HRS Table 5-2.	100
11. Assign the highest toxicity value from SI Table 16. 3 or For the soil exposure pathway	10,000
12. Multiply the toxicity and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below:	WC = 32

Product	WC Score
0	0
>0 to <10	
10 to <100	2
100 to <1,000	3
1,000 to < 10,000	6
10,000 to <1E + 05	10
1E + 05 to <1E + 06	18
1E + 06 to <1E + 07	32
1E + 07 to <1E + 08	56
1E + 08 or greater	100

RESIDENT POPULATION THREAT SCORE:
(Likelihood of Exposure, Question 1;
Targets = Sum of Questions 2, 3, 4, 5, 6)

$$\frac{550 \times 0 \times 32}{\text{LE X T X WC}} \quad \cancel{82,500}$$

0

NEARBY POPULATION THREAT SCORE:
(Likelihood of Exposure, Question 7;
Targets = Sum of Questions 8, 9)

$$\frac{375 \times 8 \times 32}{\text{LE X T X WC}} \quad \cancel{82,500}$$

96,000
42,000

SOIL EXPOSURE PATHWAY SCORE:
Resident Population Threat + Nearby Population Threat % 82,500

4.516
(Maximum of 100)

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AIR PATHWAY

Air Pathway Observed Substances Summary Table

On SI Table 21, list the hazardous substances detected in air samples of a release from the site. Include only those substances with concentrations significantly greater than background levels. Obtain benchmark, cancer risk, and reference dose concentrations from SCDM. For NAAQS/NESHAPS benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages for the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage or the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate targets in the distance category from which the sample was taken and any closer distance categories as Level I. If the percentages are less than 100% or all are N/A, evaluate targets in that distance category and any closer distance categories that are not Level I as Level II.

SI TABLE 21: AIR PATHWAY OBSERVED RELEASE SUBSTANCES

Sample ID: None Level I ____ Level II ____ Distance from Sources (mi) ____ References ____

Hazardous Substance	Conc. (µg/m³)	Gaseous Particulate	Benchmark Conc. (NAAQS or NESHAPS)	% of Benchmark	Cancer Risk Conc.	% of Cancer Risk Conc.	RfD	% of RfD
	Highest Toxicity/ Mobility		Highest Percent		Sum of Percents		Sum of Percents	

Sample ID: ____ Level I ____ Level II ____ Distance from Sources (mi) ____ References ____

Hazardous Substance	Conc. (µg/m³)	Toxicity/ Mobility	Benchmark Conc. (NAAQS or NESHAPS)	% of Benchmark	Cancer Risk Conc.	% of Cancer Risk Conc.	RfD	% of RfD
	Highest Toxicity/ Mobility		Highest Percent		Sum of Percents		Sum of Percents	

Sample ID: ____ Level I ____ Level II ____ Distance from Sources (mi) ____ References ____

Hazardous Substance	Conc. (µg/m³)	Toxicity/ Mobility	Benchmark Conc. (NAAQS or NESHAPS)	% of Benchmark	Cancer Risk Conc.	% of Cancer Risk Conc.	RfD	% of RfD
	Highest Toxicity/ Mobility		Highest Percent		Sum of Percents		Sum of Percents	

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AIR PATHWAY WORKSHEET

LIKELIHOOD OF RELEASE	Score	Data Type	Refs
1. OBSERVED RELEASE: If sampling data or direct observation support a release to air, assign a score of 550. Record observed release substances on SI Table 21.	0		
2. POTENTIAL TO RELEASE: If sampling data do not support a release to air, assign a score of 500. Optionally, evaluate air migration gaseous and particulate potential to release (HRS Section 6.1.2).	500	E	SI
LR =	500		
TARGETS			
3. ACTUAL CONTAMINATION POPULATION: Determine the number of people within the target distance limit subject to exposure from a release of a hazardous substance to the air. a) Level I: ____ people x 10 = ____ b) Level II: ____ people x 1 = ____ Total =	0	H	SI
4. POTENTIAL TARGET POPULATION: Determine the number of people within the target distance limit not subject to exposure from a release of a hazardous substance to the air, and assign the total population score from SI Table 22. Sum the values and multiply the sum by 0.1.	334	E	Topo
5. NEAREST INDIVIDUAL: Assign a score of 50 if there are any Level I targets. Assign a score of 45 if there are Level II targets but no Level I targets. If no Actual Contamination Population exists, assign the Nearest Individual score from SI Table 22.	20	H	Topo
6. ACTUAL CONTAMINATION SENSITIVE ENVIRONMENTS: Sum the sensitive environment values (SI Table 13) and wetland acreage values (SI Table 23) for environments subject to exposure from the release of a hazardous substance to the air.	0	H	Topo
7. POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS: Use SI Table 24 to evaluate sensitive environments not subject to exposure from a release.	0	H	Topo
8. RESOURCES: Assign a score of 5 if one or more air resources apply within 1/2 mile of a source; assign a 0 if none applies. • Commercial agriculture • Commercial silviculture • Major or designated recreation area	0	E	SI and Topo
T =	545		

Sensitive Environment Type	Value

Wetland Acreage	Value

SI TABLE 22 (From HRS TABLE 6-17): VALUES FOR POTENTIAL CONTAMINATION AIR TARGET POPULATIONS

Distance from Site	Pop.	Nearest Individual (choose highest)	Number of People within the Distance Category												Pop. Value
			1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	1,000,000 to 3,000,000	
On a source	0	20	4	17	53	164	522	1,633	5,214	16,325	52,137	163,246	521,360	1,632,455	0
0 to $\frac{1}{4}$ mile	341	*	1	4	13	41	131	408	1,304	4,081	13,034	40,812	130,340	408,114	131
$>\frac{1}{4}$ to $\frac{1}{2}$ mile	1022	2	0.2	0.9	3	9	28	88	282	882	2,815	8,815	28,153	88,153	88
$>\frac{1}{2}$ to 1 mile	4091	1	0.06	0.3	0.9	3	8	26	83	261	834	2,612	8,342	26,119	83
> 1 to 2 miles	8416	0	0.02	0.09	0.3	0.8	3	8	27	83	266	833	2,659	8,326	27
> 2 to 3 miles	896	0	0.009	0.04	0.1	0.4	1	4	12	38	120	375	1,199	3,755	1
> 3 to 4 miles	3584	0	0.005	0.02	0.07	0.2	0.7	2	7	28	73	229	730	2,285	7
	Nearest Individual =	20												Sum =	337

Nearest Individual is located about 260' south of the Dump

References

* Score = 20 if the Nearest Individual is within $\frac{1}{8}$ mile of a source; score = 7 if the Nearest Individual is between $\frac{1}{8}$ and $\frac{1}{4}$ mile of a source.

GEMS Refs. 22, 24

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SI TABLE 23 (HRS TABLE 6-18): AIR PATHWAY VALUES FOR WETLAND AREA

Wetland Area	Assigned Value
< 1 acre	0
1 to 50 acres	25
> 50 to 100 acres	75
> 100 to 150 acres	125
> 150 to 200 acres	175
> 200 to 300 acres	250
> 300 to 400 acres	350
> 400 to 500 acres	450
> 500 acres	500

SI TABLE 24: DISTANCE WEIGHTS AND CALCULATIONS FOR AIR PATHWAY POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS

Distance	Distance Weight	Sensitive Environment Type and Value (from SI Tables 13 and 20) 23	Product
On a Source	0.10	x	
		x	
0 to 1/4 mile	0.025	x	
		x	
		x	
1/4 to 1/2 mile	0.0054	x	
		x	
		x	
1/2 to 1 mile	0.0016	x	
		x	
		x	
1 to 2 miles	0.0005	x	
		x	
		x	
2 to 3 miles	0.00023	x	
		x	
		x	
3 to 4 miles	0.00014	x	
		x	
		x	
> 4 miles	0	x	
			Total Environments Score =

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AIR PATHWAY (concluded)

WASTE CHARACTERISTICS

9. If any Actual Contamination Targets exist for the air pathway, assign the calculated hazardous waste quantity score or a score of 100, whichever is greater; if there are no Actual Contamination Targets for the air pathway, assign the calculated HWQ score for sources available to air migration.	100
10. Assign the highest air toxicity/mobility value from SI Table 21.	10,000
11. Multiply the air pathway toxicity/mobility and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below:	WC = 32

Product	WC Score
0	0
>0 to <10	1
10 to <100	2
100 to <1,000	3
1,000 to ≤ 10,000	6
10,000 to <1E + 05	10
1E + 05 to <1E + 06	18
1E + 06 to <1E + 07	32
1E + 07 to <1E + 08	56
1E + 08 or greater	100

AIR PATHWAY SCORE: $\frac{LE \times T \times WC}{82,500}$ (500 LR, 54, 32) = 10.48 (maximum of 100)

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SITE SCORE CALCULATION	S	S^2
GROUND WATER PATHWAY SCORE (S_{GW})	0	0
SURFACE WATER PATHWAY SCORE (S_{SW})	97.07	9422.58
SOIL EXPOSURE (S_S)	61.16	3743.35
AIR PATHWAY SCORE (S_A)	10.97	109.62
SITE SCORE $\sqrt{\frac{S_{GW}^2+S_{SW}^2+S_S^2+S_A^2}{4}}$ =		48.82

COMMENTS

Conclusion/Recommendation

Elevated levels of dieldrin, DDD, beryllium, cobalt and vanadium were detected in sediment samples collected from Clarks Run Creek, which is a fishery, and in onsite soil samples. These samples were collected in 1983. Dynamac Corporation recommends that onsite samples be collected to characterize the dump and that additional sediment samples be collected from Clarks Run Creek to assess current impact on water quality. Appropriate background samples should be collected for all media.