DECLASSIFIED
Date: 10/17/13 Initial: JL

163416

Report No. 8003-194

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Recommendation

A recommendation of **Site Evaluation Accomplished** (SEA) is given for the Busters Junkyard site The following is the definition of SEA To the best of the EPA's knowledge, Superfund has completed an assessment at this site, and has determined that no further steps to list this site on the NPL will be taken unless information indicating that this decision was not appropriate or other considerations make a recommendation for listing appropriate at a later time A SEA decision does not necessarily mean that there is no hazard associated with a given site; it means only that based upon available information, the location is not judged to be a potential NPL site The existing information, data, and additional information collected were sufficient to evaluate the site to determine that further CERCLA remedial action is not required The site is an active metal reclamation facility that allegedly accepted wastes from a nearby NPL site, the Lang property. Previous investigations at the site have indicated buried drums and landfilling of household waste

During a U S EPA Region II FIT Site Inspection in 1989, various volatile organic compounds and semi-volatile compounds were detected in a sediment sample significantly above the background soil sample collected. As this sediment sample was the only soil sample that analytical results indicated contaminants were above the background soil sample, the area of contaminated soil on-site was determined to be 1 square foot The site is fenced and patrolled by dogs There are five residences, housing 14 people, within 200 feet There are no schools, or day care facilities within 200 feet The site is located within the Pinelands Protection Area, a National Preserve There are two workers associated with the site

The nearest surface water body is an unnamed stream, approximately 2,000 feet from the site Analytical results of surface water samples collected during the U S EPA Region II FIT Site Inspection indicated the presence of total xylene and various inorganics in surface waters on site, however, samples were not collected or analyzed from surface waters along the surface water migration pathway During the on-site reconnaissance it was noted that off-site soil appeared to have been added to low-lying areas on site, therefore, containing most of the surface waters on site in localized ponding (puddles) During periods of heavy rain, it was reported by neighboring property owners that the drainage ditch does carry surface waters Overland flow from the site follows the intermittent drainage ditch leading from the site southwest crossing through three residential properties before entering a palustrine forested wetland where the surface waters would follow topography and enter the unnamed stream The surface water pathway includes the unnamed stream, Mirror Lake, and North Branch Rancocas Creek. There are no known drinking water intakes downstream of the site There are over 20 miles of wetland frontage and multiple sensitive environments and fisheries along the surface water pathway

Groundwater is used as the primary source of potable water within 4 miles of the site Groundwater samples were collected and analyzed for the 1989 Site Inspection, however, no contaminants were detected in the downgradient samples significantly above the upgradient samples There are approximately 14,436 people served by six public supply wells and 873 private supply wells within 4 miles of the site Three public supply wells are located downgradient, two are located side gradient, and one is located upgradient from the site Most of the private supply wells are located downgradient.

A release to air has not been documented Direct observation during the on-site reconnaissance did not indicate a release to air There are greater than 1,831 acres of wetlands within 4 miles of the site The site is located within the Pinelands Protection Area, a National Preserve Within 4 miles of the site exists one federally-listed endangered species, one federally-listed threatened species, 11 state-listed endangered species, and four state-listed threatened species. Approximately 23,709 people live within 4 miles of the site

SITE INSPECTION WORKSHEETS

CERCLIS IDENTIFICATION NUMBER
NJD 981 560 949

SITE LOCATION			
SITE NAME: LEGAL, COMMON, OR DESCRIPTIVE NAME OF SITE			
Busters Junkyard (aka Buster's Garage)			
STREET ADDRESS, ROUTE, OR SPECIFIC LOCATION IDENTIFIER			
34 Pepper Road			
CITY	STATE	ZIP CODE	TELEPHONE
Browns Mills	NJ	08015	(609) 893-5575
COORDINATES: LATITUDE and LONGITUDE	TOWNSHIP, RANGE, AND SECTION		
39° 58' 19" N / 74° 31' 51" W			

OWNER/OPERATOR IDENTIFICATION					
OWNER			OPERATOR		
Leonard "Buster" Perrine			Leonard "Buster" Perrine		
OWNER ADDRESS			OPERATOR ADDRESS		
34 Pepper Road			34 Pepper Road		
CITY			CITY		
Browns Mills			Browns Mills		
STATE	ZIP CODE	TELEPHONE	STATE	ZIP CODE	TELEPHONE
NJ	08015	(609) 893-5575	NJ	08015	(609) 893-5575

SITE EVALUATION		
AGENCY/ORGANIZATION		
U.S. EPA, Region II		
INVESTIGATOR		
Corry T. Platt		
CONTACT		
Sandy Foose		
ADDRESS		
Woodbridge Ave		
CITY	STATE	ZIP CODE
Edison	New Jersey	
TELEPHONE		
(908) 906-6808		

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).

There is no liner, engineered cover, functioning run-on or run-off control system, functioning leachate collection and removal system, gas collection / treatment system, or cover to prevent off-site migration of contaminants through the groundwater, surface water or air pathways.

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

Contaminated Soil: 1 sq. ft. ÷ 34,000 = 0.000 ⇐ WQ

Drums: < 1,000 drums ÷ 10 = < 100 ⇐ WQ

WQ Totals

Contaminated Soil	0.000
+ Drums	< 100
Total =	< 100

Attach additional pages, if necessary

HWQ = 10

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) TIER	(Column 2) Source Type	(Column 3) HWQ = 10	(Column 4) 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

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	N/A	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	D Area
>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	
> 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	

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.

SI TABLE 3: WASTE CHARACTERIZATION WORKSHEET

Site Name: Busters Junkyard

References 14; 15, pp. 33 – 42

Sources:

1. Contaminated Soil
2.
3.
4.
5.
6.
7.
8.
9.

SOURCE	HAZARDOUS SUBSTANCE	TOXICITY	GROUND WATER PATHWAY		SURFACE WATER PATHWAY											AIR PATH-WAY
					OVERLAND FLOOD MIGRATION							GROUNDWATER TO SURFACE WATER				
			GW Mobility (HRS Table 3-8)	Toxicity/ Mobility Value (HRS Table 3-9)	SW Persist. (HRS Tables 4-10 and 4-11)	Toxicity/ Persist. Value (HRS Table 4-12)	Bioacc. Potential (HRS Table 4-15)	Toxicity/ Persist./ Bioacc. Value (HRS Table 4-16)	Ecotox-icity (HRS Table 4-19)	Ecotox./ Persist. (HRS Table 4-20)	Ecotox./ Persist./ Bioacc. Value (HRS Table 4-21)	Toxicity/ Mobility/ Persist. Value (HRS Table 4-26)	Toxicity/ Mobility/ Persist./ Bioacc. Value (HRS Table 4-28)	Ecotox./ Mobility/ Persist. Value (HRS Table 4-29)	Ecotox./ Mobility/ Persist./ Bioacc. Value (HRS Table 4-30)	Air Toxicity/ Mobility Value (HRS Table 6-13)
1	acetone	10	1	10	0.4	4	0.5	2	100	40	20	4	2	40	20	10
1	dimethylphthalate	1	0.01	0.01	1	1	50	50	10	10	500	0.01	0.5	0.1	5	0.2
1	2-methylnaphtha	no value	0.2	no value	0.4	no value	5000	no value	1000	400	2E+06	no value	no value	80	400000	no value
1	naphthalene	100	0.002	0.2	0.4	40	500	20000	1000	400	200000	0.08	40	0.8	400	20
1	xylene (total)	10	0.01	0.1	0.4	4	50	200	100	40	20000	0.04	2	0.4	200	10
				0		0		0		0		0	0	0	0	
				0		0		0		0		0	0	0	0	
				0		0		0		0		0	0	0	0	
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				0		0		0		0		0	0	0	0	
				0		0		0		0		0	0	0	0	
				0		0		0		0		0	0	0	0	
Highest Value		100	1	10	1	40	5000	20000	1000	400	2E+06	4	40	80	400000	20

Updated: January 20, 1993

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

Sample ID	Hazardous Substance	Bckgrd. Conc.	Toxicity/ Mobility	References
		Highest Toxicity/Mobility		

This table is not applicable because there is no observed release of contaminants to groundwater.

SI TABLE 5: GROUND WATER ACTUAL CONTAMINATION TARGETS

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

Sample ID	Hazardous Substance	Conc. (ug/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. (ug/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 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.			
2. POTENTIAL TO RELEASE: Depth to aquifer: 2.5 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		15 p. 65
LR =	500		

TARGETS	Score	Data Type	Refs
Are any wells part of a blended system? Yes X No ____ 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 =	Ø		
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.	206.6		2; 4
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.	20		15, p. 4
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		10
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	5		2
Sum of Targets T=	231.6		

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	103	20	4	17	53	164	522	1,633	5,214	16,325	52,137	163,246	521,360	1,632,455	164	4
>$\frac{1}{4}$ to $\frac{1}{2}$ mile	299	18	2	11	33	102	324	1,013	3,233	10,122	32,325	101,213	323,243	1,012,122	102	4
>$\frac{1}{2}$ to 1 mile	234	9	1	5	17	52	167	523	1,669	5,224	16,684	52,239	166,835	522,385	52	4
>1 to 2 miles	8,419	5	0.7	3	10	30	94	294	939	2,939	9,385	29,384	93,845	293,842	939	4
>2 to 3 miles	4,338	3	0.5	2	7	21	68	212	678	2,122	6,778	21,222	67,777	212,219	678	4
>3 to 4 miles	1,043	2	0.3	1	4	13	42	131	417	1,306	4,171	13,060	41,709	130,596	131	4

Nearest Well = 20

Sum = 2066

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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.	10		
9. Assign the highest ground water toxicity/mobility value from SI Table 3 or 4.	10		
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)			

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

WC = 3

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: $\frac{LR \times T \times WC}{82,500}$ = 4.211 (Maximum of 100)

This table is not applicable because there are no observed release or actual contamination to surface water

SI TABLE 7: SURFACE WATER OBSERVED RELEASE SUBSTANCES

Sample ID	Hazardous Substance	Bckgrd. Conc.	Toxicity/ Persistence	Toxicity/ Persis./ Bioaccum	Ecotoxicity/ Persis/ Ecobioaccum	References
		Highest Values				

SI TABLE 8: SURFACE WATER DRINKING WATER ACTUAL CONTAMINATION TARGETS

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	

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.			
2. POTENTIAL TO RELEASE: Distance to surface water: 2000 (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.			3; 5

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 = 500

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 =

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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: None 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: _____ people x 10 = _____ Level II: _____ people x 1 = _____ Total =	Ø		4
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.	Ø		4
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.	Ø		4
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		3; 15 p. 5
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	Population	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	
Minimal Stream (<10 cfs)		20	0	4	17	53	164	522	1,633	
Small to Moderate Stream (10 to 100 cfs)		2	0	0.4	2	5	16	52	163	
Moderate to Large Stream (100 to 1000 cfs)		0	0	0.04	0.2	0.5	2	5	16	
Large Stream to River (>1,000 to 10,000 cfs)		0	0	0.004	0.02	0.05	0.2	0.5	2	
Large River (>10,000 to 100,000 cfs)		0	0	0	0.002	0.005	0.02	0.05	0.2	
Very Large River (>100,000 cfs)		0	0	0	0	0.001	0.002	0.005	0.02	
Shallow Ocean Zone or Great Lake (depth <20 feet)		0	0	0	0.002	0.005	0.02	0.05	0.2	
Moderate Ocean Zone or Great Lake (depth 20-200 ft)		0	0	0	0	0.001	0.002	0.005	0.02	
Deep Ocean Zone or Great Lake (depth > 200 feet)		0	0	0	0	0	0.001	0.003	0.008	
3-mile mixing zone in quiet flowing river (>or = 10 cfs)		10	0	2	9	26	82	261	817	

Type of Surface Water Body	Population	Nearest Intake	Number of People							Pop. Value
			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	1,000,001 to 3,000,000	3,000,001 to 10,000,000	
Minimal Stream (<10 cfs)		20	5,214	16,325	52,137	163,246	521,360	1,632,455	5,213,590	
Small to Moderate Stream (10-100 cfs)		2	521	1,633	5,214	16,325	52,136	163,245	521,359	
Moderate to Large Stream (100 to 1000 cfs)		0	52	163	521	1,633	5,214	16,325	52,136	
Large Stream to River (>1,000 to 10,000 cfs)		0	5	16	52	163	521	1,632	5,214	
Large River (>10,000 to 100,000 cfs)		0	0.5	2	5	16	52	163	521	
Very Large River (>100,000 cfs)		0	0.05	0.2	0.5	2	5	16	52	
Shallow Ocean Zone or Great Lake (depth <20 feet)		0	0.5	2	5	16	52	163	521	
Moderate Ocean Zone or Great Lake (depth 20-200 ft)		0	0.05	0.2	0.5	2	5	16	52	
Deep Ocean Zone or Great Lake (depth > 200 feet)		0	0.03	0.08	0.3	1	3	8	26	
3-mile mixing zone in quiet flowing river (>or = 10 cfs)		10	2,607	8,163	26,068	81,623	260,680	816,227	2,606,795	

Nearest Intake = [ ]

Sum = [ ]

References _____

This table is not applicable because there are no drinking water intakes along the surface water pathway

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

Fishery ID: _____ Sample Type _____ Level I _____ Level II _____ References _____

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

SI TABLE 11: SENSITIVE ENVIRONMENT ACTUAL CONTAMINATION TARGETS FOR WATERSHED

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		

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		

This table is not applicable because there are no actual contaminated targets along the surface water pathway.

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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 Mirror Lake Water Body____ Flow 10-100 cfs			3; 5;
Species Bass Production 1 lbs/yr			8
Species____ Production____ lbs/yr			
Fishery Name N.B. Ranocas Creek Water Body____ Flow 10-100 cfs			
Species Pickerel Production 1 lbs/yr			
Species____ Production____ lbs/yr			
Fishery Name____ Water Body____ Flow____ cfs			
Species____ Production____ 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.			
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

3; 5; 8

FCI Value = 2

SUM OF TARGETS T = 2.

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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

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
Wetlands	Small to Moderate Stream	10-100 cfs
Wetlands	Moderate to Large Stream	170 cfs
State-listed endang. Spec.	Moderate to Large Stream	170 cfs
National Preserve	Small to Moderate Stream	10-100 cfs
[illegible]	[illegible] Large Stream	170 cfs
Classified Waterway	Small to Moderate Stream	10-100

Score | Data Type | Refs: 3; 5; 6; 7

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 =	

10. POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS:

Flow	Dilution Weight (SI Table 12)	Environment Type and Value (SI Tables 13 & 14)	Pot. Cont.	Product
10-100 cfs	0.1 x	Wetlands 1.25 mi 50 x	0.1 =	0.5
170 cfs	0.01 x	Wetlands >20 mi 500 x	0.1 =	0.5
170 cfs	0.01 x	State-listed end. spec. 50 x	0.1 =	0.05
10-100 cfs	0.1 x	National Preserve 75 x	0.1 =	0.75
10-100 cfs	0.1 x	Class. water 5 x	0.1 =	0.05
			Sum =	

Score: 1,850 (.905)

T = 1,850

Refs: 3; 5; 6; 7

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	0.0001
Shallow ocean zone or Great Lake	Flow not applicable; depth less than 20 feet	0.0001
Moderate depth ocean zone or Great Lake	Flow not applicable; depth 20 to 200 feet	0.00001
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

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SURFACE WATER PATHWAY (concluded)

WASTE CHARACTERISTICS, THREAT, AND PATHWAY SCORE SUMMARY

WASTE CHARACTERISTICS	Score
11. 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.	10
12. 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 for drinking water threat) (Maximum of 1000 for human food chain and environmental threats)

	Substance Value		HWQ		Product	
Drinking Water Threat Toxicity/Persistence	40	x	10	=	400	3
Food Chain Threat Toxicity/Persistence Bioaccumulation	20,000	x	10	=	2×10^5	18
Environmental Threat Ecotoxicity/Persistence/ Ecobioaccumulation	2×10^6	x	10	=	5×10^7	56

Product	WC Score
0	0
>0 to <10	1
10 to <100	2
→ 100 to <1,000	3
1,000 to < 10,000	5
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 $\frac{LR \times T \times WC}{82,500}$
Drinking Water	500	5	3	(maximum of 100) 0.091
Human Food Chain	500	2	18	(maximum of 100) 0.218
Environmental	500	1,850	56	(maximum of 60) 0.6[illegible]

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

(maximum of 100)
0.93[illegible]

SI TABLE 15: SOIL EXPOSURE RESIDENT POPULATION TARGETS

This table is not applicable because there are no resident population targets.

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	

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		15, pp. 33-42, 44, 45
LE =	550		

TARGETS

	Score	Data Type	Refs
2. RESIDENT POPULATION: Determine the number of people occupying residences or attending scool or day care on the property and within 200 feet of areas of observed contamination (HRS section 5.1.3). Level I: _____ people X 10 = _____ Level II: _____ people X 1 = _____ Sum =	Ø		
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).	Ø		
4. WORKERS: Assign a score from the table below for the total number of workers at the site and nearby facilities and within 200 feet of areas of observed contamination associated with the site.	5		9 p. 12
5. TERRESTRIAL SENSITIVE ENVIRONMENTS: Assign a value for each terrestrial sensitive environment (SI Table 16) in an area of observed contamination.	75		7 pp. 1, 20-23
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	Ø		9 p. 18
Total of Targets T =	80		

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

Terrestrial Sensitive Environment Type	Value
National Preserve	75

Updated: April 1, 1993

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

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 5			9 pp. 3, 21;
Area of Contamination (from SI Table 18 or HRS Table 5-7)	Value 5			15 pp. 33-45
Likelihood of Exposure (from SI Table 19 or HRS Table 5-8)				
	LE =	5		

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		9 p. 18; 13
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.	0.6		9 p. 12; 13
	T =	1.6	

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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 $\frac{1}{4}$	50	0	0.1	0.4	1.0	4	13	41	130	408	1,303	4,081	13,034	1
Greater than $\frac{1}{4}$ to $\frac{1}{2}$	183	0	0.05	0.2	0.7	2	7	20	65	204	652	2,041	6,517	2
Greater than $\frac{1}{2}$ to 1	776	0	0.02	0.1	0.3	1	3	10	33	102	326	1,020	3,258	3

Reference(s) 9 p. 12 ; 13

Sum = 6

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SOIL EXPOSURE PATHWAY WORKSHEET (concluded)

WASTE CHARACTERISTICS

10.	Assign the hazardous waste quantity calculated for soil exposure	10
11.	Assign the highest toxicity value from SI Table 3 or 15	100
12.	Multiply the toxicity and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below:	WC = 6

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

RESIDENT POPULATION THREAT SCORE:

(Likelihood of Exposure, Question 1; Targets = Sum of Questions 2, 3, 4, 5, 6)

$$\frac{LE \times T \times WC}{82{,}500}$$

3.2

NEARBY POPULATION THREAT SCORE

(Likelihood of Exposure, Question 7; Targets = Sum of Questions 8, 9)

$$\frac{LE \times T \times WC}{82{,}500}$$

0.001

SOIL EXPOSURE PATHWAY SCORE:

Resident Population Threat + Nearby Population Threat

3.201
(Maximum of 100)

Updated: January 26, 1993

This table is not applicable because there is no observed release to air.

SI TABLE 21: AIR PATHWAY OBSERVED RELEASE SUBSTANCES

Sample ID: _____ 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.			
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		9 pp. 5-8, 10, 11
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 =	∅		
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.	8.0		9 p. 12; 13
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		9 p. 12
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.			15 pp. 33-45
7. POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS: Use SI Table 24 to evaluate sensitive environments not subject to exposure from a release.	10.805		6; 7
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	∅		2; 9 p. 18
T =	38.805		

Sensitive Environment Type	Value
None	

Wetland Acreage	Value
None	

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	2	20	4	17	53	164	522	1,633	5,214	16,325	52,137	163,248	521,360	1,632,455	4
0 to 1/4 mile	51	*	1	4	13	41	131	408	1,304	4,081	13,034	40,812	130,340	408,114	13
> 1/4 to 1/2 mile	183	2	0.2	0.9	3	9	28	88	282	882	2,815	8,815	28,153	88,153	9
> 1/2 to 1 mile	776	1	0.06	0.3	0.9	3	8	26	83	261	834	2,612	8,342	26,119	8
> 1 to 2 miles	6,063	0	0.02	0.09	0.3	0.8	3	8	27	83	266	833	2,659	8,326	27
> 2 to 3 miles	9,933	0	0.009	0.04	0.1	0.4	1	4	12	38	120	375	1,199	3,755	12
> 3 to 4 miles	6,703	0	0.005	0.02	0.07	0.2	0.7	2	7	23	73	229	730	2,285	7
														Sum =	80

Nearest Individual = 20

References 9 p. 12; 13

* Score = 20 if the Nearest Individual is within 1/8 mile of a source; score = 7 if the Nearest Individual is between 1/8 and 1/4 mile of a source.

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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)		Product
On a Source	0.10	x National Preserve	75	7.5
		x		
0 to 1/4 mile	0.025	x Wetlands (33 ac)	25	0.625
		x		
		x		
1/4 to 1/2 mile	0.0054	x Wetlands (63 ac)	75	0.405
		x		
		x		
1/2 to 1 mile	0.0016	x Wetlands (235 ac)	250	0.400
		x 2 Fed. End/Threat Spec.	150	0.240
		x 15 State End/Threat Spec.	750	1.200
1 to 2 miles	0.0005	x Wetlands (7500 ac)	500	0.250
		x		
		x		
2 to 3 miles	0.00023	x Wetlands (7500 ac)	500	0.115
		x		
		x		
3 to 4 miles	0.00014	x Wetlands (7500 ac)	500	0.070
		x		
		x		
> 4 miles	0	x		

Total Environments Score = 10.805

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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.	10
10. Assign the highest air toxicity/mobility from SI Table 21 or SI Table 3.	20
11. Multiply the air pathway toxicity/mobility and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below:	WC = 3

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: $\frac{LE \times T \times WC}{82,500}$ = 0.706 (maximum of 100)

SITE SCORE CALCULATION	S	S^2
GROUND WATER PATHWAY SCORE (S_{GW})	4.211	17.733
SURFACE WATER PATHWAY SCORE (S_{SW})	0.937	0.878
SOIL EXPOSURE (S_S)	3.201	10.246
AIR PATHWAY SCORE (S_A)	0.706	0.498
SITE SCORE $\sqrt{\frac{S_{GW}^2+S_{SW}^2+S_S^2+S_A^2}{4}}$		2.710

COMMENTS