G-000-103.32

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RESPONSE TO NOTICE OF VIOLATION

03/04/92

DOE-1058-92
DOE-FN/OEPA
15
LETTER

[redacted]

Department of Energy
Fernald Environmental Management Project
P.O. Box 398705
Cincinnati, Ohio 45239-8705
(513) 738-6357

3830

MAR 0 4 1992
DOE-1058-92

Mr. Phil Harris
Ohio Environmental Protection Agency
40 South Main Street
Dayton, Ohio 45402-2086

Dear Mr. Harris:

RESPONSE TO NOTICE OF VIOLATION

Reference: Letter, P. E. Harris to R. E. Tiller, "Notice of Violations regarding the Groundwater Quality Assessment Annual Reports," dated February 4, 1992

As required in your correspondence dated February 4, 1992, the results of analysis of samples extracted from Pit 4 are enclosed for your review. Table 1 summarizes analyses conducted as part of the Characterization Investigation Study (CIS) conducted by Roy F. Weston, Inc., 1987. Composite samples were collected from four boreholes drilled into Pit 4 (see enclosed figure). The samples, labelled 04-01 through 04-04, were analyzed for Resource Conservation and Recovery Act (RCRA) characteristics (EP Toxicity), Hazardous Substance List (HSL) inorganics (Table 2), HSL organics, with a library search for non-HSL constituents (Table 3), Appendix IX constituents (Table 4), carbonate, bicarbonate, total dissolved solids, total suspended solids, nitrate, sulfate, chloride, and fluoride.

Groundwater quality adjacent to Waste Pit 4 has been characterized with respect to Appendix IX parameters as part of the RCRA Assessment Monitoring program. Quarterly monitoring is conducted for a list of site specific parameters; this list was the subject of Ohio Environmental Protection Agency (OEPA) comment in the February 4, 1992, letter to R.E. Tiller. As required by the OEPA, the list has been compared to the results of the CIS for completeness.

The site specific list was selected based on review of the results of the CIS, previous Appendix IX sampling, and the results of HSL sampling conducted as part of the Remedial Investigation (RI). The results of the Appendix IX and HSL sampling have been reported to the OEPA in the 1989 and 1990 RCRA Annual Assessment Monitoring Reports and the Draft RI Groundwater Report. The site specific list contains the inorganic constituents reported in highest concentrations in the CIS, and mobile organic constituents reported in the CIS. Results of the Appendix IX and HSL analyses support the adequacy of the site specific list in that all groundwater contaminants detected through these analyses had been included on the site specific list.

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As part of the proposed RCRA Groundwater Monitoring Program several monitoring wells will be installed. One round of samples from these monitoring wells will be analyzed for Appendix IX constituents. The site specific list will be modified to include additional hazardous constituents should any be identified by future Appendix IX analyses.

In summary, the Appendix IX sampling is conducted to meet the requirement of OAC 3745-65-93(d)(3)(ii), which requires that the assessment program provide sampling and analytical methods for those hazardous waste or hazardous waste constituents in the facility. The site specific list includes constituents most likely to migrate in groundwater in addition to those constituents whose presence has been confirmed in the groundwater. Quarterly sampling for the site specific list of constituents is conducted to meet the requirement of OAC 3745-65-93 (d)(4) which requires that the facility owner/operator determine the extent of migration of hazardous waste or hazardous waste constituents in the groundwater.

Additional sampling of Pit 4 was conducted in the summer of 1991 as part of the ongoing RI/FS for Operable Unit 1. The data from this sampling effort is presently undergoing a validation process. Results of this sampling effort will be provided to OEPA following validation.

We believe the enclosed information addresses the questions you raised under violation OAC 3745-65-93(D)(4)(b) concerning Waste Pit 4 characterization in the referenced letter. This response satisfies the thirty (30) day commitment for this violation and we are pursuing additional technical meetings with OEPA to resolve the remaining three violations. It is important that we keep all our communication options open to resolve these issues.

If you have any questions, please contact Edward Skintik at (513) 738-6660.

Sincerely,

R.E. Tiller

R. E. Tiller
Manager

FN:Skintik

Enclosure: As Stated

cc w/enc.:

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bcc w/o enc.:

J. R. Craig, DOE, FN
E. L. Osheim, DOE, FN
W. J. Quaider, DOE, FN

Mon Nov 16

TABLE 1

CIS Analytical Data For Waste Pit 4

Borehole Number	Sample Id	Batch Number	Parameter	Concentration	Unit Of Measure
04-01	FMP-PS-04-001	8704-236-0050	ALUMINUM, TOTAL	10120.84	MG/KG
			BARIUM, TOTAL	2064.55	MG/KG
			CADMIUM, TOTAL	1.92	MG/KG
			CALCIUM, TOTAL	49272.38	MG/KG
			CHROMIUM, TOTAL	17.30	MG/KG
			COPPER, TOTAL	43.51	MG/KG
			FLUORIDE	47812.36	MG/KG
			IRON, TOTAL	10447.78	MG/KG
			LEAD, TOTAL	45.33	MG/KG
			MAGNESIUM, TOTAL	11423.80	MG/KG
			MANGANESE, TOTAL	3596.38	MG/KG
			MERCURY, TOTAL	.37	MG/KG
			NICKEL, TOTAL	20.67	MG/KG
			POTASSIUM, TOTAL	1322.20	MG/KG
			SILVER, TOTAL	6.25	MG/KG
			SODIUM, TOTAL	408.68	MG/KG
			VANADIUM, TOTAL	24.04	MG/KG
			ZINC, TOTAL	35.09	MG/KG
04-02	FMP-PS-04-021	8704-254-0010	ALUMINUM, TOTAL	3645.60	MG/KG
			BARIUM, TOTAL	457.20	MG/KG
			CALCIUM, TOTAL	61252.80	MG/KG
			CHROMIUM, TOTAL	7.92	MG/KG
			COPPER, TOTAL	22.80	MG/KG
			FLUORIDE	124576.13	MG/KG
			IRON, TOTAL	3045.60	MG/KG
			LEAD, TOTAL	39.64	MG/KG
			MAGNESIUM, TOTAL	23656.80	MG/KG
			MANGANESE, TOTAL	1752.00	MG/KG
			PHENOL	.43	MG/KG
			POTASSIUM, TOTAL	1920.00	MG/KG
			SODIUM, TOTAL	456.00	MG/KG
			SULFIDE	.50	MG/KG
			ZINC, TOTAL	13.92	MG/KG
		8704-254-0250	BARIUM, EP LEACHATE	1023.00	UG/L

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Pit Four Inorganic Data Summary

Borehole Number	Sample Id	Batch Number	Parameter	Concentration	Unit Of Measure
04-03	FMP-PS-04-038	8704-254-0030	ALUMINUM, TOTAL	10325.99	MG/KG
			BARIUM, TOTAL	444.03	MG/KG
			CADMIUM, TOTAL	2.03	MG/KG
			CALCIUM, TOTAL	52221.36	MG/KG
			CHROMIUM, TOTAL	16.05	MG/KG
			COPPER, TOTAL	33.90	MG/KG
			FLUORIDE	118242.78	MG/KG
			IRON, TOTAL	16127.52	MG/KG
			LEAD, TOTAL	23.55	MG/KG
			MAGNESIUM, TOTAL	15890.46	MG/KG
			MANGANESE, TOTAL	3303.50	MG/KG
			MERCURY, TOTAL	.18	MG/KG
			NICKEL, TOTAL	22.43	MG/KG
			PHENOL	.83	MG/KG
			POTASSIUM, TOTAL	892.15	MG/KG
			SILVER, TOTAL	3.82	MG/KG
			SODIUM, TOTAL	254.90	MG/KG
			VANADIUM, TOTAL	25.74	MG/KG
			ZINC, TOTAL	43.07	MG/KG
		8704-254-0270	MERCURY, EP LEACHATE	1.06	UG/L
04-04	FMP-PS-04-061	8705-342-0020	ALUMINUM, TOTAL	4259.04	MG/KG
			ARSENIC, TOTAL	4.63	MG/KG
			BARIUM, TOTAL	6668.76	MG/KG
			BERYLLIUM, TOTAL	13.30	MG/KG
			CADMIUM, TOTAL	28.72	MG/KG
			CALCIUM, TOTAL	14252.84	MG/KG
			CHROMIUM, TOTAL	93.63	MG/KG
			COBALT, TOTAL	84.06	MG/KG
			COPPER, TOTAL	187.73	MG/KG
			IRON, TOTAL	6103.69	MG/KG
			LEAD, TOTAL	62.51	MG/KG
			MAGNESIUM, TOTAL	24251.31	MG/KG
			MANGANESE, TOTAL	1947.39	MG/KG
			MERCURY, TOTAL	.63	MG/KG
			NICKEL, TOTAL	49.73	MG/KG
			SILVER, TOTAL	443.65	MG/KG
			SODIUM, TOTAL	1237.55	MG/KG
			VANADIUM, TOTAL	235.36	MG/KG
			ZINC, TOTAL	84.06	MG/KG

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Pit Four Inorganic Data Summary

Borehole Number	Sample Id	Batch Number	Parameter	Concentration	Unit Of Measure
04-04	FMP-PS-04-061	8705-342-0090	ARSENIC, EP LEACHATE	582.00	UG/L
			BARIUM, EP LEACHATE	81470.00	UG/L
			CADMIUM, EP LEACHATE	141.00	UG/L
			LEAD, EP LEACHATE	753.00	UG/L
			SILVER, EP LEACHATE	2767.00	UG/L

Pit Four Organic Data Summary

Borehole Number	Sample Id	Batch Number	Parameter	Concentration	Unit Of Measure	Qualifier
04-01	FMP-PS-04-001	8704-236-0050	ETHYL PARATHION	150.00	UG/KG	
			NAPHTHALENE	110.00	UG/KG	J
			NAPHTHALENE	110.00	UG/KG	J
			INDENO(1,2,3-CD)PYRENE	180.00	UG/KG	J
			BENZO(G,H,I)PERYLENE	65.00	UG/KG	J
			BENZO(B)FLUORANTHENE	510.00	UG/KG	
			PYRENE	1400.00	UG/KG	
			FLUORANTHENE	2200.00	UG/KG	
			DIBENZO(A,H)ANTHRACENE	170.00	UG/KG	J
			FLUORENE	310.00	UG/KG	J
			BENZO(K)FLUORANTHENE	560.00	UG/KG	
			CHRYSENE	760.00	UG/KG	
			PHENANTHRENE	2100.00	UG/KG	
			DIBENZOFURAN	160.00	UG/KG	J
			BENZO(A)PYRENE	550.00	UG/KG	
			CHLOROFORM	85.00	UG/KG	J
			INDENO(1,2,3-CD)PYRENE	180.00	UG/KG	J
			ACENAPHTHENE	170.00	UG/KG	J
			AROCLOR-1254	1008.00	UG/KG	
			AROCLOR-1248	854.00	UG/KG	
			METHYLENE CHLORIDE	230.00	UG/KG	J*
			ACETONE	350.00	UG/KG	J*
			DI-N-OCTYL PHTHALATE	170.00	UG/KG	J*
			DIBENZO(A,H)ANTHRACENE	65.00	UG/KG	J
			BIS(2-ETHYLHEXYL)PHTHALATE	270.00	UG/KG	J*
			BENZO(G,H,I)PERYLENE	170.00	UG/KG	J
			METHYL PARATHION	800.00	UG/KG	
			PYRENE	1400.00	UG/KG	
			ANTHRACENE	510.00	UG/KG	
			BENZO(A)ANTHRACENE	750.00	UG/KG	
			CHRYSENE	760.00	UG/KG	
			FLUORANTHENE	2200.00	UG/KG	
			PHENANTHRENE	2100.00	UG/KG	
04-02	FMP-PS-04-021	8704-254-0010	BENZO(A)ANTHRACENE	390.00	UG/KG	J
			BENZO(A)PYRENE	320.00	UG/KG	J
			PHENANTHRENE	1000.00	UG/KG	
			BENZO(B)FLUORANTHENE	250.00	UG/KG	J
			NAPHTHALENE	62.00	UG/KG	J
			ETHYL PARATHION	860.00	UG/KG	

J = Concentration is below quantification level; * = Common laboratory contaminant

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Pit Four Organic Data Summary

Borehole Number	Sample Id	Batch Number	Parameter	Concentration	Unit Of Measure	Qualifier
04-02	FMP-PS-04-021	8704-254-0010	BENZO(G,H,I)PERYLENE	130.00	UG/KG	J
			PYRENE	670.00	UG/KG	
			FLUORENE	160.00	UG/KG	J
			TETRACHLOROETHENE	530.00	UG/KG	
			INDENO(1,2,3-CD)PYRENE	150.00	UG/KG	J
			ACENAPHTHENE	87.00	UG/KG	J
			METHYL PARATHION	2100.00	UG/KG	
			ANTHRACENE	260.00	UG/KG	J
			MALATHION	670.00	UG/KG	
			DI-N-BUTYL PHTHALATE	490.00	UG/KG	*
			BENZO(K)FLUORANTHENE	330.00	UG/KG	J
			AROCLOR-1254	296.00	UG/KG	J
			CHLOROFORM	430.00	UG/KG	
			AROCLOR-1248	460.00	UG/KG	
			DIBENZOFURAN	98.00	UG/KG	J
			CHRYSENE	420.00	UG/KG	J
			FLUORANTHENE	1000.00	UG/KG	
04-03	FMP-PS-04-038	8704-254-0030	CHLOROFORM	1300.00	UG/KG	
			PHENANTHRENE	110.00	UG/KG	J
			CHRYSENE	70.00	UG/KG	J
			PYRENE	93.00	UG/KG	J
			AROCLOR-1242	1034.00	UG/KG	
			DI-N-BUTYL PHTHALATE	60.00	UG/KG	J*
			METHYL PARATHION	370.00	UG/KG	
			FLUORANTHENE	170.00	UG/KG	J
			ACETONE	520.00	UG/KG	J*
			TOLUENE	67.00	UG/KG	J*
			BIS(2-ETHYLHEXYL)PHTHALATE	140.00	UG/KG	J*
			ETHYL PARATHION	82.00	UG/KG	
			BENZO(A)ANTHRACENE	52.00	UG/KG	J
			AROCLOR-1254	523.00	UG/KG	J
04-04	FMP-PS-04-061	8705-342-0020	2-BUTANONE	100.00	UG/KG	J*
			AROCLOR-1242	99.00	UG/KG	
			CHLOROFORM	40.00	UG/KG	J
			TRICHLOROETHENE	300.00	UG/KG	
			TRANS-1,2-DICHLOROETHENE	60.00	UG/KG	J
			TOLUENE	60.00	UG/KG	J*

J = Concentration is below quantification level; * = Common laboratory contaminant

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Pit Four Organic Data Summary

Borehole Number	Sample Id	Batch Number	Parameter	Concentration	Unit Of Measure	Qualifier
04-04	FMP-PS-04-061	8705-342-0020	ACETONE	130.00	UG/KG	J*
			METHYLENE CHLORIDE	170.00	UG/KG	J*
			1,1,1-TRICHLOROETHANE	120.00	UG/KG	J
		8705-342-0020DIL	TETRACHLOROETHENE	30000.00	UG/KG	
			2-BUTANONE	7900.00	UG/KG	*

J = Concentration is below quantification level; * = Common laboratory contaminant

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Radiochemical Analysis of Composite Samples of Waste Pit Borings

Borehole Number (a)	Radionuclide (b)	VQ	Activity Concentration (pCi/g,dry)	Uncertainty (pCi/g,dry)
03-07	CS-137	<	.80	
	NP-237	<	.20	
	PB-210	=	NOT ANALYZED	
	PU-238	=	.10	.10
	PU-239/240	<	.10	
	RA-226	=	155.00	4.50
	RA-228	=	NOT ANALYZED	
	RU-106	<	6.00	
	SR-90	<	.60	
	TC-99	=	93.00	3.00
	TH-228	=	5.90	1.60
	TH-230	=	5900.00	50.00
	TH-232	=	9.40	2.00
	U-234	=	167.00	9.00
	U-235	=	14.00	2.00
	U-238	=	1380.00	20.00
04-01	CS-137	<	.20	
	NP-237	<	.10	
	PB-210	=	NOT ANALYZED	
	PU-238	=	.10	.10
	PU-239/240	=	.10	.10
	RA-226	=	16.10	1.50
	RA-228	=	NOT ANALYZED	
	RU-106	<	2.00	
	SR-90	<	.40	
	TC-99	=	6.80	1.00
	TH-228	=	22.00	4.00
	TH-230	=	566.00	20.00
	TH-232	=	17.00	3.00
	U-234	=	366.00	5.00
	U-235	=	84.00	2.00
	U-238	=	737.00	7.00
04-02	CS-137	<	.30	
	NP-237	<	.40	
	PB-210	=	NOT ANALYZED	
	PU-238	=	.10	.10

(a) Refer to Table 2-1 in Subsection 2.1.2 for boring numbers and grid locations
(b) RA-226 and RA-228, when reported, were measured by gamma spectrometry and reported on a dry weight basis

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Radiochemical Analysis of Composite Samples of Waste Pit Borings

Borehole Number (a)	Radionuclide (b)	VQ	Activity Concentration (pCi/g,dry)	Uncertainty (pCi/g,dry)
04-02	PU-239/240	=	.20	.10
	RA-226	=	5.00	1.10
	RA-228	=	NOT ANALYZED	
	RU-106	<	3.00	
	SR-90	<	.40	
	TC-99	=	59.00	2.00
	TH-228	=	18.00	4.00
	TH-230	=	553.00	19.00
	TH-232	=	18.00	3.00
	U-234	=	298.00	5.00
	U-235	=	35.00	2.00
	U-238	=	509.00	6.00
04-03	CS-137	<	.50	
	NP-237	<	.20	
	PB-210	=	NOT ANALYZED	
	PU-238	=	.50	.10
	PU-239/240	=	.40	.10
	RA-226	=	18.00	1.80
	RA-228	=	NOT ANALYZED	
	RU-106	<	4.00	
	SR-90	<	.60	
	TC-99	=	31.00	2.00
	TH-228	=	24.00	5.00
	TH-230	=	369.00	19.00
	TH-232	=	21.00	5.00
	U-234	=	149.00	7.00
	U-235	=	64.00	5.00
	U-238	=	1530.00	20.00
04-04	CS-137	<	.20	
	NP-237	=	.40	.20
	PB-210	=	NOT ANALYZED	
	PU-238	=	.40	.10
	PU-239/240	=	.10	.10
	RA-226	<	20.00	
	RA-228	=	NOT ANALYZED	
	RU-106	<	2.00	
	SR-90	<	1.00	

(a) Refer to Table 2-1 in Subsection 2.1.2 for boring numbers and grid locations
(b) RA-226 and RA-228, when reported, were measured by gamma spectrometry and reported on a dry weight basis

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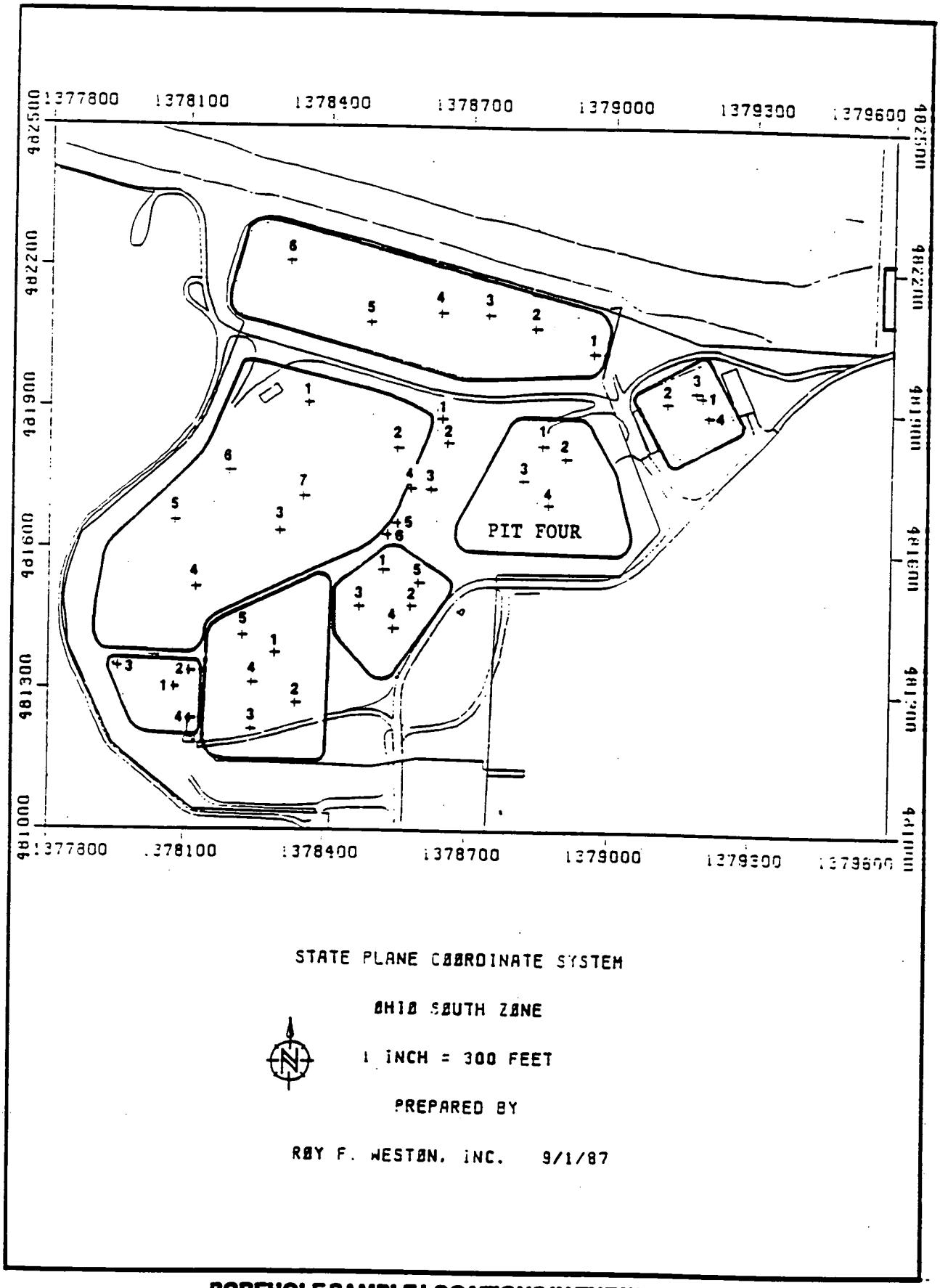
Radiochemical Analysis of Composite Samples of Waste Pit Borings

Borehole Number (a)	Radionuclide (b)	VQ	Activity Concentration (pCi/g,dry)	Uncertainty (pCi/g,dry)
04-04	TC-99	=	225.00	10.00
	TH-228	=	.30	.10
	TH-230	=	2.20	.30
	TH-232	=	.30	.10
	U-234	=	2320.00	90.00
	U-235	=	426.00	38.00
	U-238	=	15800.00	200.00
05-01	CS-137	<	2.00	
	NP-237	=	2.60	.50
	PB-210	=	NOT ANALYZED	
	PU-238	<	.10	
	PU-239/240	<	.10	
	RA-226	=	495.00	96.00
	RA-228	=	NOT ANALYZED	
	RU-106	<	13.00	
	SR-90	=	4.10	1.10
	TC-99	=	423.00	20.00
	TH-228	=	41.00	3.00
	TH-230	=	3080.00	30.00
	TH-232	=	21.00	2.00
	U-234	=	430.00	5.00
	U-235	=	26.00	1.00
	U-238	=	387.00	4.00
05-02	CS-137	<	7.00	
	NP-237	=	9.30	1.20
	PB-210	=	NOT ANALYZED	
	PU-238	=	2.40	.20
	PU-239/240	=	13.00	1.00
	RA-226	=	443.00	17.00
	RA-228	=	NOT ANALYZED	
	RU-106	<	35.00	
	SR-90	=	.80	.30
	TC-99	=	1830.00	200.00
	TH-228	=	78.00	16.00
	TH-230	=	11600.00	200.00
	TH-232	=	90.00	16.00
	U-234	=	1250.00	20.00

(a) Refer to Table 2-1 in Subsection 2.1.2 for boring numbers and grid locations
(b) RA-226 and RA-228, when reported, were measured by gamma spectrometry and reported on a dry weight basis



BOREHOLE SAMPLE LOCATIONS IN THE WASTE STORAGE AREA

TABLE 2 HSL INORGANICS

Analyte	Contract Required Detection Limit (ug/L)
Aluminum	200
Antimony	60
Arsenic	10
Barium	200
Beryllium	5
Cadmium	5
Calcium	5000
Chromium	10
Cobalt	50
Copper	25
Iron	100
Lead	5
Magnesium	5000
Manganese	15
Mercury	0.2
Nickel	40
Potassium	5000
Selenium	5
Silver	10
Sodium	5000
Thallium	10
Vanadium	50
Zinc	20
Cyanide	10

TABLE 3 — HSL ORGANIC CONSTITUENTS

Volatiles	CAS Number	Detection Limits* Low Water[a] ug/L	Low Soil/Sediment[b] ug/Kg
1. Chloromethane	74-87-3	10	10
2. Bromomethane	74-83-9	10	10
3. Vinyl Chloride	75-01-4	10	10
4. Chloroethane	75-00-3	10	10
5. Methylene Chloride	75-09-2	5	5
6. Acetone	67-64-1	10	10
7. Carbon Disulfide	75-15-0	5	5
8. 1,1-Dichloroethene	75-35-4	5	5
9. 1,1-Dichloroethane	75-35-3	5	5
10. trans-1,2-Dichloroethene	156-60-5	5	5
11. Chloroform	67-66-3	5	5
12. 1,2-Dichloroethane	107-06-2	5	5
13. 2-Butanone	78-93-3	10	10
14. 1,1,1-Trichloroethane	71-55-6	5	5
15. Carbon Tetrachloride	56-23-5	5	5
16. Vinyl Acetate	108-05-4	10	10
17. Bromodichloromethane	75-27-4	5	5
18. 1,1,2,2-Tetrachloroethane	79-34-5	5	5
19. 1,2-Dichloropropane	78-87-5	5	5
20. trans-1,3-Dichloropropene	10061-02-6	5	5
21. Trichloroethene	79-01-6	5	5
22. Dibromochloromethane	124-48-1	5	5
23. 1,1,2-Trichloroethane	79-00-5	5	5
24. Benzene	71-43-2	5	5
25. cis-1,3-Dichloropropene	10061-01-5	5	5
26. 2-Chloroethyl Vinyl Ether	110-75-8	10	10
27. Bromoform	75-25-2	5	5
28. 2-Hexanone	591-78-6	10	10
29. 4-Methyl-2-pentanone	108-10-1	10	10
30. Tetrachloroethene	127-18-4	5	5
31. Toluene	108-88-3	5	5
32. Chlorobenzene	108-90-7	5	5
33. Ethyl Benzene	100-41-4	5	5
34. Styrene	100-42-5	5	5
35. Total Xylenes		5	5

[a]Medium Water Contract Required Detection Limits (CRDL) for Volatile HSL Compounds are 100 times the individual Low Water CRDL.

[b]Medium Soil/Sediment Contract Required Detection Limits (CRDL) for Volatile HSL Compounds are 100 times the individual Low Soil/Sediment CRDL.

TABLE 3 (continued)

Semi-Volatiles	CAS Number	Detection Limits[a] Low Water[b] ug/L	Detection Limits[a] Low Soil/Sediment[b] ug/kg
36. Phenol	108-95-2	10	330
37. bis(2-Chloroethyl) ether	111-44-4	10	330
38. 2-Chlorophenol	95-57-8	10	330
39. 1,3-Dichlorobenzene	541-73-1	10	330
40. 1,4-Dichlorobenzene	106-46-7	10	330
41. Benzyl Alcohol	100-51-6	10	330
42. 1,2-Dichlorobenzene	95-50-1	10	330
43. 2-Methylphenol	95-48-7	10	330
44. bis(2-Chloroisopropyl) ether	39638-32-9	10	330
45. 4-Methylphenol	106-44-5	10	330
46. N-Nitroso-Dipropylamine	621-64-7	10	330
47. Hexachloroethane	67-72-1	10	330
48. Nitrobenzene	98-95-3	10	330
49. Isophorone	78-59-1	10	330
50. 2-Nitrophenol	88-75-5	10	330
51. 2,4-Dimethylphenol	105-67-9	10	330
52. Benzoic Acid	65-85-0	50	1600
53. bis(2-Chloroethoxy) methane	111-91-1	10	330
54 2,4-Dichlorophenol	120-83-2	10	330
55. 1,2,4-Trichlorobenzene	120-82-1	10	330
56. Naphthalene	91-20-3	10	330
57. 4-Chloroaniline	106-47-8	10	330
58. Hexachlorobutadiene	87-68-3	10	330
59. 4-Chloro-3-methylphenol (para-chloro-meta-cresol)	59-50-7	10	330
60. 2-Methylnaphthalene	91-57-6	10	330
61. Hexachlorocyclopentadiene	77-47-4	10	330
62. 2,4,6-Trichlorophenol	88-06-2	10	330
63. 2,4,5-Trichlorophenol	95-95-4	50	1600
64. 2-Chloronaphthalene	91-58-7	10	330
65. 2-Nitroaniline	88-74-4	50	1600
66. Dimethyl Phthalate	131-11-3	10	330
67. Acenaphthylene	208-96-8	10	330
68. 3-Nitroaniline	99-09-2	50	1600
69. Acenaphthene	83-32-9	10	330
70. 2,4-Dinitrophenol	51-28-5	50	1600
71. 4-Nitrophenol	100-02-7	50	1600
72. Dibenzofuran	132-64-9	10	330
73. 2,4-Dinitrotoluene	121-14-2	10	330
74. 2,6-Dinitrotoluene	606-20-2	10	330
75. Diethylphthalate	84-66-2	10	330
76. 4-Chlorophenyl Phenyl ether	7005-72-3	10	330
77. Fluorene	86-73-7	10	330
78. 4-Nitroaniline	100-01-6	50	1600
79. 4,6-Dinitro-2-methylphenol	534-52-1	50	1600
80. N-nitrosodiphenylamine	86-30-6	10	330
81. 4-Bromophenyl Phenyl ether	101-55-3	10	330
82. Hexachlorobenzene	118-74-1	10	330
83. Pentachlorophenol	87-86-5	50	1600
84. Phenanthrene	85-01-8	10	330
85. Anthracene	120-12-7	10	330
86. Di-n-butylphthalate	84-74-2	10	330
87. Fluoranthene	206-44-0	10	330
88. Pyrene	129-00-0	10	330
89. Butyl Benzyl Phthalate	85-68-7	10	330
90. 3,3'-Dichlorobenzidine	91-94-1	20	660
91. Benzo(a)anthracene	56-55-3	10	330
92. bis(2-ethylhexyl)phthalate	117-81-7	10	330
93. Chrysene	218-01-9	10	330
94. Di-n-octyl Phthalate	117-84-0	10	330
95. Benzo(b)fluoranthene	205-99-2	10	330
96. Benzo(k)fluoranthene	207-08-9	10	330
97. Benzo(a)pyrene	50-32-8	10	330
98. Indeno(1,2,3-cd)pyrene	193-39-5	10	330
99. Dibenz(a,h)anthracene	53-70-3	10	330
100. Benzo(g,h,i)perylene	191-24-2	10	330

[a]Medium Water Contract Required Detection Limits (CRDL) for Semi-Volatile BNA Compounds are 100 times the individual Low Water CRDL.

[b]Medium Soil/Sediment Contract Required Detection Limits (CRDL) for Semi-Volatile BNA Compounds are 60 times the individual Low Soil/Sediment CRDL.

TABLE 3 (continued)

Pesticides	CAS Number	Detection Limits* Low Water[e] ug/L	Low Soil/Sediment[f] ug/Kg
101. alpha-BHC	319-84-6	0.05	8.0
102. beta-BHC	319-85-7	0.05	8.0
103. delta-BHC	319-86-8	0.05	8.0
104. gamma-BHC (Lindane)	58-89-9	0.05	8.0
105. Heptachlor	76-44-8	0.05	8.0
106. Aldrin	309-00-2	0.05	8.0
107. Heptachlor Epoxide	1024-57-3	0.05	8.0
108. Endosulfan I	959-98-8	0.05	8.0
109. Dieldrin	60-57-1	0.10	16.0
110. 4,4'-DDE	72-55-9	0.10	16.0
111. Endrin	72-20-8	0.10	16.0
112. Endosulfan II	33213-65-9	0.10	16.0
113. 4,4'-DDD	72-54-8	0.10	16.0
114. Endosulfan Sulfate	1031-07-8	0.10	16.0
115. 4,4'-DDT	50-29-3	0.10	16.0
116. Endrin Ketone	53494-70-5	0.10	16.0
117. Methoxychlor	72-43-5	0.5	80.0
118. Chlordane	57-74-9	0.5	80.0
119. Toxaphene	8001-35-2	1.0	160.0
120. AROCLOR-1016	12674-11-2	0.5	80.0
121. AROCLOR-1221	11104-28-2	0.5	80.0
122. AROCLOR-1232	11141-16-5	0.5	80.0
123. AROCLOR-1242	53469-21-9	0.5	80.0
124. AROCLOR-1248	12672-29-6	0.5	80.0
125. AROCLOR-1254	11097-69-1	1.0	160.0
126. AROCLOR-1260	11096-82-5	1.0	160.0

[e]Medium Water Contract Required Detection Limits (CRDL) for Pesticide HSL Compounds are 100 times the individual Low Water CRDL.

[f]Medium Soil/Sediment Contract Required Detection Limits (CRDL) for Pesticide HSL compounds are 15 times the individual Low Soil/Sediment CRDL.

*Detection limits listed for soil/sediment are based on wet weight. The detection limits calculated by the laboratory for soil/sediment, calculated on dry weight basis, as required by the contract, will be higher.

TABLE 4 - APPENDIX IV CONSTITUENTS

Common Name	Appendix VIII (IX)	Common Name	Appendix VIII (IX)
ORGANICS			
acenaphthene	X	3-chloropropionitrile	X
acenaphthylene	X	chrysene	X
acetone	A	ortho-cresol	X
acetonitrile	X	para-cresol	X
acetophenone	X	4,4'DDD	X
2-acetylaminofluorene	X	4,4'DDE	X
acrolein	X	4,4'DDT	X
acrylonitrile	X	dibenzo(a,h)anthracene	X
aldrin	X	dibenzofuran	A
allyl alcohol	X	dibenzo(a,e)pyrene	X
4-aminobiphenyl	X	dibenzo(a,h)pyrene	X
aniline	X	dibenzo(a,i)pyrene	X
anthracene	X	1,2-dibromo-3-chloropropane	X
aramite	X	1,2-dibromoethane	X
Aroclor 1016	X	dibromomethane	X
Aroclor 1221	X	di-n-butyl phthalate	X
Aroclor 1232	X	m-dichlorobenzene	X
Aroclor 1242	X	o-dichlorobenzene	X
Aroclor 1248	X	p-dichlorobenzene	X
Aroclor 1254	X	3,3'-dichlorobenzidine	X
Aroclor 1260	X	trans-1,4-dichloro-2-butene	X
benzene	X	dichlorodifluoromethane	X
benzenethiol	X	1,1-dichloroethane	X
benzidine	X	1,2-dichloroethane	X
benz(a)anthracene	X	1,1-dichloroethylene	X
benzo(b)fluoranthene	X	trans-1,2-dichloroethylene	X
benzo(k)fluoranthene	X	dichloromethane	X
benzoic acid	A	2,4-dichlorophenol	X
benzo(ghi)perylene	X	2,6-dichlorophenol	X
benzo(a)pyrene	X	2,4-dichlorophenoxyacetic acid	X
p-benzoquinone	X	1,2-dichloropropane	X
benzyl alcohol	A	cis-1,3-dichloropropene	X
alpha-BHC	X	trans-1,3-dichloropropene	X
beta-BHC	X	dieldrin	X
delta-BHC	X	diethyl phthalate	X
gamma-BHC	X	0,0-diethyl-0-2-pyrazinyl phosphorothioate	X
bis(2-chloroethoxy)methane	X	3,3'-dimethoxybenzidine	X
bis(2-chloroethyl)ether	X	p-dimethylaminoazobenzene	X
bis(2-chloroisopropyl)ether	X	7,12-dimethylbenz(a)anthracene	X
bis(2-ethylhexyl)phthalate	X	3,3'-dimethylbenzidine	X
bromodichloromethane	X	alpha, alpha-dimethyl-phenethylamine	X
bromomethane	X	2,4-dimethylphenol	X
4-bromophenyl phenyl ether	X	dimethyl phthalate	X
butyl benzyl phthalate	X	m-dinitrobenzene	X
2-sec-butyl-4,6-dinitrophenol	X	4,6-dinitro-o-cresol	X
carbon disulfide	X	2,4-dinitrophenol	X
carbon tetrachloride	X	2,4-dinitrotoluene	X
chlordane	X	2,6-dinitrotoluene	X
p-chloroaniline	X	di-n-octyl phthalate	X
chlorobenzene	X	1,4-dioxane	X
chlorobenzilate	X	diphenylamine	X
2-chloro-1,3-butadiene	X	1,2-diphenylhydrazine	X
p-chloro-m-cresol	X	di-n-propylnitrosamine	X
chlorodibromomethane	X	disulfoton	X
chloroethane	X	endosulfan sulfate	
2-chloroethyl vinyl ether	X	endosulfan I (alpha)	X
chloroform	X	endosulfan II (beta)	X
chloromethane	X	endrin	X
2-chloronaphthalene	X	endrin aldehyde	X
2-chlorophenol	X	endrin ketone	
4-chlorophenyl phenyl ether	A		
3-chloropropene	X		

TABLE 4 APPENDIX (continued)

Common Name	Appendix VIII (IX)
ethyl benzene	A
ethyl cyanide	X
ethylene oxide	X
ethyl methacrylate	X
famphur	X
fluoranthene	X
fluorene	X
heptachlor	X
heptachlor epoxide	X
hexachlorobenzene	X
hexachlorobutadiene	X
hexachlorocyclopentadiene	X
hexachlorodibenzo-p-dioxins	X
hexachlorodibenzofurans	X
hexachloroethane	X
hexachlorophene	X
hexachloropropene	X
2-hexanone	A
indeno(1,2,3-cd)pyrene	X
iodomethane	X
isobutyl alcohol	X
isodrin	X
isophorone	A
isosafrole	X
kepone	X
malononitrile	X
methacrylonitrile	X
methapyrilene	X
methoxychlor	X
3-methylcholanthrene	X
4,4'-methylene-bis(2-chloroaniline)	X
methyl ethyl ketone	X
methyl methacrylate	X
methyl methanesulfonate	X
2-methylnaphthalene	A
methyl parathion	X
4-methyl-2-pentanone	A
2-methylphenol	
4-methylphenol	
naphthalene	X
1,4-naphthoquinone	X
1-naphthylamine	X
2-naphthylamine	X
m-nitroaniline	A
o-nitroaniline	A
p-nitroaniline	X
nitrobenzene	X
2-nitrophenol	A
4-nitrophenol	X
N-nitrosodi-n-butylamine	X
N-nitrosodiethylamine	X
N-nitrosodimethylamine	X
N-nitrosodiphenylamine	X
N-nitrosomethylethylamine	X
N-nitrosomorpholine	X
N-nitrosopiperidine	X
N-nitrosopyrrolidine	X
5-nitro-o-toluidine	X
parathion	X
pentachlorobenzene	X
pentachlorodibenzo-p-dioxins	X
pentachlorodibenzofurans	X
pentachloroethane	X
pentachloronitrobenzene	X

Common Name	Appendix VIII (IX)
pentachlorophenol	X
phenacetin	X
phenanthrene	X
phenol	X
phorate	X
2-picoline	X
pronamide	X
2-propyn-1-ol	X
pyrene	X
pyridine	X
resorcinol	X
safrole	X
silvex	X
styrene	A
2,4,5-T	X
1,2,4,5-tetrachlorobenzene	X
2,3,7,8-tetrachlorodibenzo-p-dioxin	X
tetrachlorodibenzo-p-dioxins	X
tetrachlorodibenzofurans	X
1,1,1,2-tetrachloroethane	X
1,1,2,2-tetrachloroethane	X
tetrachloroethylene	X
2,3,4,6-tetrachlorophenol	X
tetraethyldithiopyrophosphate	X
toluene	X
toxaphene	X
tribromomethane	X
1,2,4-trichlorobenzene	X
1,1,1-trichloroethane	X
1,1,2-trichloroethane	X
trichloroethylene	X
trichloromethanethiol	X
trichloromonofluoromethane	X
2,4,5-trichlorophenol	X
2,4,6-trichlorophenol	X
1,2,3-trichloropropane	X
tris(2,3-dibromopropyl) phosphate	X
vinyl acetate	A
vinyl chloride	X
total xylenes	A
METALS	
aluminum	A
antimony	X
arsenic	X
barium	X
beryllium	X
cadmium	X
calcium	A
chromium	X
cobalt	A
copper	X
iron	A
lead	X
magnesium	A
manganese	A
mercury	X
nickel	X
osmium	X
potassium	A
selenium	X
silver	X

sodium	A
thallium	X
tin	A
vanadium	X
zinc	X
MISCELLANEOUS	
cyanide	X
fluoride	X
phenols	
sulfide	X

A = Added from Superfund List