4321

REMOVAL ACTION NUMBER 24: PILOT PLANT SUMP RESPONSE TO COMMENTS, FINAL REMOVAL ACTION WORK PLAN SUBMITTAL, AND ANALYTICAL RESULTS OF THE SUMP LIQUID CONTENTS

DOE-FN/EPA
DOE-1655-93
18
LETTER

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

APR 2 6 1993
DOE-1655-93

Mr. James A. Saric, Remedial Project Director
United States Environmental Protection Agency
Region V - 5HRE-8J
77 W. Jackson Boulevard
Chicago, Illinois 60604-3590

Mr. Graham E. Mitchell, Project Manager
Ohio Environmental Protection Agency
40 South Main Street
Dayton, Ohio 45402-2086

Dear Mr. Saric and Mr. Mitchell:

REMOVAL ACTION NUMBER 24: PILOT PLANT SUMP RESPONSE TO COMMENTS, FINAL REMOVAL ACTION WORK PLAN SUBMITTAL, AND ANALYTICAL RESULTS OF THE SUMP LIQUID CONTENTS

This letter transmits the final Removal Action Work Plan, response to comments and analytical results of the liquid contents previously contained in the Pilot Plant Temporary Sump. The Response to Comment (RTC) document, which was submitted in response to the conditional approval by both the United States Environmental Protection Agency (U.S. EPA) and the Ohio Environmental Protection Agency (OEPA), was verbally approved by the U.S. EPA on February 22, 1993. The OEPA approved the RTC document on the revised Work Plan on January 25, 1993.

Analytical results for samples of the liquid contents in the Pilot Plant temporary sump are in Tables 1, 2, and 3. The results are for samples that were taken in September, 1991, prior to the first pump out, and samples of the liquids removed during the second pump out in September, 1992. Additional analyses of liquids removed from the sump are in process.

The analytical results for total uranium (U) are in parts per million (ppm); total thorium (Th) are in grams per liter (g/l); corrosivity is expressed as pH; and flash point is in degrees Fahrenheit (F). These results are provided in Table 1. The concentrations of total U and total Th show significant concentration decreases between the original sump contents (1991) and the contents removed during the second pump out (1992). The pH measurements in the 1991 results were indicative of a highly acidic solution whereas the 1992 data show a pH that is very close to neutral (pH = 7.0). Also, the flash point measurements show significant increases from 118-120 degrees F in 1991 to over 200 degrees F in 1992. This increase in flash point suggests a substantial decrease in the concentration of ignitable organic compounds in the sump contents.

Recycled and Recyclable

TABLE 1

Sample Date	9/91	9/91	9/92	9/92	9/92	9/92
Sample ID*	910913-157	910913-158	920923-120	920923-121	920922-069	920922-070
total U (ppm)	611	577	31.5	6.7	12.7	55.7
pH	3.0	3.0	4.9	6.7	7.0	6.9
total Th (g/l)	7.54	7.62	0.4	0.028	0.1	0.98
Flash Point (F)	124	118	above 200	above 200	above 200	above 200

*Two samples were taken in 1991. One of these samples was for verification. Four samples were taken in 1992, one for each of four drums of liquid accumulated from the pump out. Sample 920922-121 contained liquids from the sump as well as rinsates from equipment cleaning after the pump out.

The concentrations of the organic contaminants which were detected in the samples are shown in Table 2. These contaminants also show a decrease between the 1991 results and those from 1992. Carbon tetrachloride, 1,1,1 trichloroethane (TCA), and o-xylene were the principal organics reported in the 1991 analyses. Benzene and toluene were present in the sample, but in very small amounts (3.3 and 2.9 ppm, respectively). The 1992 results report TCA in significantly reduced amounts, o-xylene in substantially smaller amounts, and carbon tetrachloride, benzene, and toluene below detection limits.

TABLE 2 ORGANICS
[Results in parts per million (ppm)]

Date	9/91	9/91	9/91	9/92	9/92	9/92	9/92
Sample ID	-157	-158	-017*	-120	-121	-069	-070
2-Butanone	<30[1]	<26	14	<0.67	<5.0	<6.7	<17
TCA	200	180	<2.4	1.2	22	13	37
Carbon Tet	30	27	2.6	<0.17	<1.2	<1.7	<4.2
Benzene	<10	<8.5	3.3	<0.17	<1.2	<1.7	<4.2
Toluene	<20	<17	3.9	<0.17	<1.2	<1.7	<4.2
Tetrachloro-ethylene	<56	<48	6.9	0.42	38	2.6	<20
o-Xylene	21	17	<0.8	0.33	6.1	<1.7	6.6
Acetone	<50	<42	<5.0	4.0	<2.5	13	14
total Organic ppm	251	224	30.7	5.95	66.1	28.6	57.6

*Complete sample ID 910916-017

[1] The symbol "<" means less than.

Reported levels of metals are presented in Table 3. These also show substantial decreases between 1991 and 1992. The 1991 results reported barium and lead as the principal metals present in the samples, but also reported detectable quantities of cadmium, chromium, mercury, and selenium. The 1992 data continues to show the presence of lead and mercury, but the other metals are below detection limits.

TABLE 3 METALS
[Results in parts per million (ppm)]

Date	9/91	9/91	9/91	9/92	9/92	9/92	9/92
Sample ID	-157	-158	-018*	-120	-121	-069	-070
Arsenic	<1.4	<1.4	0.74	<0.74	<0.69	<0.72	<0.73
Barium	25.9	26.4	1.19	<4.93	<4.93	<4.93	<4.72
Cadmium	0.62	0.64	0.48	<0.37	<0.37	<0.37	<0.35
Chromium	2.07	2.15	0.24	<1.10	<1.10	<1.1	<1.06
Lead	46.4	47.9	1.18	11.1	<1.85	<1.85	3.30
Mercury	0.051	0.056	1.03	0.226	<0.102	<0.10	0.154
Selenium	<0.6	<0.6	0.48	<0.44	<0.41	<0.43	<0.44
Silver	<0.04	<0.04	0.47	<1.23	<1.23	<1.23	<1.18
total Metal ppm	75.01	77.146	5.81	11.326	-	-	3.454

*Complete ID number is 910916-018

Based on the analytical data available thus far, it appears that water is seeping into the sump drain line and being collected in the temporary sump at the Pilot Plant. This would seem to be a correct conclusion based on the available analytical reports which show that the levels of metals and organics have decreased, total U and total Th have decreased, and the pH has increased and is now within the normal pH range for drinking water.

If you or your staff have any questions, please contact Anand Shah (513) 648-3146.

Sincerely,

Jack R. Craig
Fernald Remedial Action
Project Manager

FN:Shah

Enclosure: As Stated

cc w/ enc (Work Plan, response to comments and analytical results):

J. Michaels, PRC
T. Schneider, OEPA-Dayton
AR Coordinator, FERMCO

cc w/ enc (Response to comments and analytical results):

J. J. Fiore, EM-42, TREV
K. A. Hayes, EM-424, TREV
B. Barwick, USEPA-V, 5CS-TUB-3
G. Jablonowski, USEPA-V, AT-18J
J. Kwasniewski, OEPA-Columbus
P. Harris, OEPA-Dayton
M. Proffitt, OEPA-Dayton
L. August, GeoTrans

cc w/o enc:

R. L. Glenn, Parsons
K. Alikema, FERMCO
P. Clay, FERMCO/19
J. W. Thiesing, FERMCO/2
J. E. King, FERMCO/CR43

RAW DATA

Westinghouse Materials Co of Ohio
Analytical Chemistry Department
Results of Analyses

-120

Analis ID: 920923-120 Project: CNGW 2000 Customer Sample ID: 2000-1
Customer: WASTE TECHNOLOGY Requisition Number: 1680
Date Sampled: 23-SEP-1992 Date Sample Received: 23-SEP-1992
Sampled by: L.SNELL Date Sample Completed: 17-NOV-1992
Material Description: CONT.WATER.SUMP EOR Charge Number: WBAU6

Activ. Number	Procedure No.	Analysis		Result	Units	Data Entered By	QA File Number	Date Comple
300220	3002	U - BrPADAP AnL	R	31.5	mg/l	JL ROBERTS	1	4-NOV
303320	3033	pH - Electrode AnL		4.9	pH	FL MILLER	JJS	8-OCT
305920	3059	Total Th - Color. AnL		0.40	g/L	FL MILLER	1	12-NOV
306420	3064	Flash Pt. - Pensky Martens AnL		>200	Deg. F	FL MILLER	KDH	4-NOV

Westinghouse Materials Co of Ohio
Analytical Chemistry Department
Results of Analyses

-121

Analis ID: 920923-121 Project: CNGW 2000 Customer Sample ID: 2000-4
Customer: WASTE TECHNOLOGY Requisition Number: 1680
Date Sampled: 23-SEP-1992 Date Sample Received: 23-SEP-1992
Sampled By: L.SNELL Date Sample Completed: 16-NOV-1992
Material Description: CONT.WATER,SUMP LOW Charge Number: WBA06

Activ. Number	Procedure No.	Analysis		Result	Units	Data Entered By	QA File Number	Da Comp.
300220	3002	U - BPPADAP ANL	R	6.7	mg/l	JL ROBERTS	1	4-NO
303320	3033	pH - Electrode ANL		6.7	pH	FL MILLER	1	12-NO
305920	3059	Total Tn - Color. ANL		0.028	g/L	FL MILLER	1	12-NO
306420	3064	Flash Pt. - Pensky Martens ANL		>200	Deg. F	FL MILLER	RDH	4-NO

WEMCO PO: 413910
Release No.: 1680
Date: October 09, 1992

ANALYTICAL RESULTS FOR SAMPLES

WEMCO ID:	920923-120	920923-121
CWMI-CTC NO.:	200002601	200002602
Matrix:	LIQUID	LIQUID
Preparation:	1	1
Units:	ppm	ppm
Volatile Organics:		
Trichlorofluoromethane	<0.33	<2.5
1,1,2-Trichloro-1,2,2-Trifluoroethane	<0.33	<2.5
Acetone	4.0	<2.5
Carbon Disulfide	<0.33	<2.5
Methylene Chloride	<0.17	<1.2
2-Butanone (MEK)	<0.67	<5.0
1,1,1-Trichloroethane	1.2	22
Carbon Tetrachloride	<0.17	<1.2
Benzene	<0.17	<1.2
Trichloroethylene	<0.17	<1.2
Methyl Isobutyl Ketone	<0.17	<1.2
Toluene	<0.17	<1.2
Chlorobenzene	<0.33	<2.5
1,1,2-Trichloroethane	<0.17	<1.2
Tetrachloroethylene	0.42	38
Ethylbenzene	<0.17	<1.2
m,p-Xylenes	<0.33	<2.5
o-Xylene	0.33	6.1
o-Dichlorobenzene	<0.33	<2.5
2-Nitropropane	ND	ND
Cyclohexanone	ND	ND
Ethyl Acetate	ND	ND
Ethyl Ether	ND	ND
Pyridine	ND	ND
Chlorinated Fluorocarbons	ND	ND
Surrogates: (% Recovery)		
1,2-Dichloroethane-d4	96	103
Toluene-d8	96	105
Bromofluorobenzene	94	101

Preparation: 1 = No preparation
2 = Methanol extraction
3 = Methanol dilution

ND = Not detected through a computer search of the Wiley/EPA mass spect database
D = Surrogates diluted out of recovery range

WEMCO PO: 413910
Release No.: 1676
Date: October 09, 1992

ANALYTICAL RESULTS FOR SAMPLES

WEMCO ID:	920922-069	920922-070
CWMI-CTC NO.:	200002595	200002596
Matrix:	LIQUID	LIQUID
Preparation:	1	1
Units:	ppm	ppm
Volatile Organics:		
Trichlorofluoromethane	<3.3	<8.3
1,1,2-Trichloro-1,2,2-Trifluoroethane	<3.3	<8.3
Acetone	13	14
Carbon Disulfide	<3.3	<8.3
Methylene Chloride	<1.7	<4.2
2-Butanone (MEK)	<6.7	<17
1,1,1-Trichloroethane	13	37
Carbon Tetrachloride	<1.7	<4.2
Benzene	<1.7	<4.2
Trichloroethylene	<1.7	<4.2
Methyl Isobutyl Ketone	<1.7	<4.2
Toluene	<1.7	<4.2
Chlorobenzene	<3.3	<8.3
1,1,2-Trichloroethane	<1.7	<4.2
Tetrachloroethylene	2.6	<20
Ethylbenzene	<1.7	<4.2
m,p-Xylenes	<3.3	<8.3
o-Xylene	<1.7	6.6
o-Dichlorobenzene	<3.3	<8.3
2-Nitropropane	ND	ND
Cyclohexanone	ND	ND
Ethyl Acetate	ND	ND
Ethyl Ether	ND	ND
Pyridine	ND	ND
Chlorinated Fluorocarbons	ND	ND
Surrogates: (% Recovery)		
1,2-Dichloroethane-d4	95	94
Toluene-d8	96	96
Bromofluorobenzene	90	92

Preparation: 1 = No preparation
2 = Methanol extraction
3 = Methanol dilution

ND = Not detected through a computer search of the Wiley/EPA mass spect database
D = Surrogates diluted out of recovery range

WEMCO PO: 413910
Release No.: 1676
Date: October 09, 1992

ANALYTICAL RESULTS FOR SAMPLES

WEMCO ID:	920922-069	920922-070
CWMI-CTC No.:	200002595	200002596
Matrix:	LIQUID	LIQUID
Units:	ppm	ppm
Arsenic	<0.72	<0.73
Barium	<4.93	<4.72
Cadmium	<0.37	<0.35
Chromium	<1.10	<1.06
Lead	<1.85	3.30
Mercury	<0.100	0.154
Selenium	<0.43	<0.44
Silver	<1.23	<1.18

WEMCO PO: 413910
Release No.: 1680
Date: October 09, 1992

ANALYTICAL RESULTS FOR SAMPLES

WEMCO ID:	920923-120	920923-121
CWMI-CTC No.:	200002601	200002602
Matrix:	LIQUID	LIQUID
Units:	ppm	ppm
Arsenic	<0.74	<0.69
Barium	<4.93	<4.93
Cadmium	<0.37	<0.37
Chromium	<1.10	<1.10
Lead	11.1	<1.85
Mercury	0.226	<0.102
Selenium	<0.44	<0.41
Silver	<1.23	<1.23

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Westinghouse Materials Co of Ohio
Analytical Chemistry Department
Results of Analyses

Analis ID: 910913-157 Project: HWMU H005 Customer Sample ID: H005-1
Customer: HWMU Requisition Number:
Date Sampled: 13-SEP-1991 Date Sample Received: 13-SEP-1991
Sampled By: TS,DE Date Sample Completed:
Material Description: PILOT PLANT OUTDOOR SUMP Charge Number: WBA01

Activ. Number	Procedure No.	Analysis	Result	Units	Date Entered By	QA File Number	Date Comple
		Physical Description	SEE	COMMENTS	EPM-LAB		13-NOV
300220	3002	Total U - BrPADAP AnL EPM	611	ppm	JJ STOECKEL	1	26-SEP
303320	3033	pH - Electrode AnL EPM	3.0		JJ STOECKEL	1	26-SEP
305920	3059	Total Th - Color. AnL	7.54	g/L	JJ STOECKEL	2	6-NOV
306420	3064	Flash Pt. - Pensky Martens AnL	124	Deg. F	DL HARBULA	1	20-SEP

***** Comments from the ENVIRONMENTAL & PROCESS MATERIALS LABORATORY for sample 910913-157 *****

hysical description :Brown liguid with about
1/4" of solids in the bottom.
U & flash point by L.Harbula
pH by J.Roberts

Westinghouse Materials Co of Ohio

Analytical Chemistry Department

Results of Analyses

4321

AnaLIS ID: 910913-158 Project: HWMU H005 Customer Sample ID: H005-Z

Customer: HWMU Requisition Number:

Date Sampled: 13-SEP-1991 Date Sample Received: 13-SEP-1991

Sampled By: TS,DE Date Sample Completed:

Material Description: PILOT PLANT OUTDOOR SUMP Charge Number: WBA01

Activ. Number	Procedure No.	Analysis	Result	Units	Data Entered By	QA File Number	Date Complet
		Physical Description	SEE	COMMENTS	EPM-LAB		13-NOV-
300220	3002	Total U - BrPADAP AnL EPM	577	ppm	JJ STOECKEL	1	26-SEP-
303320	3033	pH - Electrode AnL EPM	3.0		JJ STOECKEL	1	26-SEP-
305920	3059	Total Th - Color. AnL	7.62	g/L	JJ STOECKEL	2	6-NOV-
306420	3064	Flash Pt. - Pensky Martens AnL	118	Deg. F	DL HARBULA	1	20-SEP-

***** Comments from the ENVIRONMENTAL & PROCESS MATERIALS LABORATORY for sample 910913-158 *****

Physical description :Brown liquid with about 1/4 " of liquid in the bottom.

U and flash point by L.Harbula

pH by J.Roberts

Westinghouse Materials Co of Ohio
Analytical Chemistry Department
Results of Analyses

4321

Analis ID: 910913-158 Project: HWMU H005 Customer Sample ID: H005-2
Customer: HWMU Requisition Number:
Date Sampled: 13-SEP-1991 Date Sample Received: 13-SEP-1991
Sampled By: 15.02 Date Sample Completed:
Material Description: PILOT PLANT OUTDOOR SUMP Charge Number: WBA01

Activ. Number	Procedure No.	Analysis	Result	Units	Date Entered By	QA File Number	Da Comp
330044	330044	U-235 - ISO TMS	1.16	WT%(U)	HR CHILES	4018-91-M099	27-S

***** Comments from the ENVIRONMENTAL & PROCESS MATERIALS LABORATORY for sample 910913-158 *****

Physical description :brown liquid with about 1/4 " of solids in the bottom.
U and flash point by L.Hardula
pH by J.Roberts

WEMCO PO: 413910
Release No.: 826
Date: October 29, 1991

ANALYTICAL RESULTS FOR SAMPLES 4321

WEMCO ID:	910913-157	910913-158	910916-017
CNLSI NO.:	912295	912296	912298
Matrix:	Liquid	Liquid	Liquid
Preparation:	1	1	1
Units:	ppm	ppm	ppm
Volatile Organics:			
Trichlorofluoromethane	<20	<17	<2.0
1,1,2-Trichloro-1,2,2-Trifluoroethane	<20	<17	<2.0
Acetone	<50	<42	<5.0
Carbon Disulfide	<14	<12	<1.4
Methylene Chloride	<12	<10	<1.2
2-Butanone (MEK)	<30	<26	14
1,1,1-Trichloroethane	200	~~180~~	<2.4
Carbon Tetrachloride	30	27	2.6
Benzene	<10	<8.5	3.3
Trichloroethylene	<26	<22	<2.6
Methyl Isobutyl Ketone	<20	<17	<2.0
Toluene	<20	<17	3.9
Chlorobenzene	<22	<19	<2.2
1,1,2-Trichloroethane	<12	<10	<1.2
Tetrachloroethylene	<56	<48	6.9
Ethylbenzene	<10	<8.5	<1.0
m,p-Xylenes	<12	<10	<1.2
o-Xylene	21	17	<0.80
o-Dichlorobenzene	<28	<24	<2.8
2-Nitropropane	ND	ND	ND
Cyclohexanone	ND	ND	ND
Ethyl Acetate	ND	ND	ND
Ethyl Ether	ND	ND	ND
Pyridine	ND	ND	ND
Chlorinated Fluorocarbons	ND	ND	ND
Surrogates: (% Recovery)			
1,2-Dichloroethane-d4	97	89	90
Toluene-d8	91	100	98
Bromofluorobenzene	95	88	101

Preparation: 1 = No preparation
2 = Methanol extraction

ND = Not detected through a computer search of the Wiley/EPA mass spectr: database
D = Surrogates diluted out of recovery range

WEMCO PO: 413910
Release No.: 826
Date: October 29, 1991

ANALYTICAL RESULTS FOR SAMPLES

WEMCO ID:	910913-157	910913-158	910916-018
CNLSI No.:	912295	912296	912297
Original Matrix:	Liquid	Liquid	Liquid
Units:	ppm	ppm	ppm
Toxicity Characteristics Leaching Procedure			
Arsenic	<1.40	<1.40	0.74
Barium	25.9	26.4	1.19
Cadmium	0.62	0.64	0.48
Chromium	2.07	2.15	0.24
Lead	46.4	47.9	1.18
Mercury	0.051	0.056	1.03
Selenium	<0.60	<0.60	0.48
Silver	<0.04	<0.04	0.47

Westinghouse Materials Co of Ohio
Analytical Chemistry Department
Results of Analyses

AnaLIS ID: 910111-010 Project: 0020 0001 Customer Sample ID: G-5
Customer: PILOT PLT Requisition Number:
Date Sampled: 11-JAN-1991 Date Sample Received: 11-JAN-1991
Sampled By: Date Sample Completed: 22-JAN-1991
Material Description: PILOT PLT SUMP PIT PP WEST 7 H20 Charge Number: SDB02

tiv. ber	Procedure No.	Analysis	Result	Units	Analyst	QA File Number	Dat Compl
0102	7001	Ba-XRF	0.17	Rel. Wt. %	RN BOLIN	7001-91-002	22-JA
	7001	Ca-XRF	0.12	Rel. Wt. %	RN BOLIN	7001-91-002	
	7001	Cr-XRF	0.39	Rel. Wt. %	RN BOLIN	7001-91-002	22-JA
	7001	Cu-XRF	0.42	Rel. Wt. %	RN BOLIN	7001-91-002	22-JA
	7001	Fe-XRF	35.56	Rel. Wt. %	RN BOLIN	7001-91-002	22-JA
	7001	Mn-XRF	0.18	Rel. Wt. %	RN BOLIN	7001-91-002	22-JA
	7001	Ni-XRF	0.05	Rel. Wt. %	RN BOLIN	7001-91-002	22-JA
	7001	P-XRF	0.15	Rel. Wt. %	RN BOLIN	7001-91-002	22-JA
	7001	Pb-XRF	0.60	Rel. Wt. %	RN BOLIN	7001-91-002	22-JA
	7001	Si-XRF	1.06	Rel. Wt. %	RN BOLIN	7001-91-002	22-JA
	7001	Tc-XRF	0.08	Rel. Wt. %	RN BOLIN	7001-91-002	22-JA
	7001	Th-XRF	55.09	Rel. Wt. %	RN BOLIN	7001-91-002	22-JA
	7001	Ti-XRF	3.90	Rel. Wt. %	RN BOLIN	7001-91-002	22-JA
	7001	U-XRF	2.17	Rel. Wt. %	RN BOLIN	7001-91-002	22-JA
	7001	XRF Qual./Quant. Analysis	COMPLETE	Rel. Wt. %	RN BOLIN	7001-91-002	22-JA
	7001	Zn-XRF	0.06	Rel. Wt. %	RN BOLIN	7001-91-002	22-JA