Ohio Environmental Protection Agency (OEPA)

And

Ravenna Army Ammunition Plant (RVAAP)

1996 Correspondences

RAVENNA ARMY AMMUNITION PLANT

8451 STATE ROUTE 5 • RAVENNA, OHIO 44266-9297

July 31, 1996

THRU: Contracting Officer's Representative
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, Ohio 44266-9297

TO: State of Ohio
Environmental Protection Agency
Northeast District Office
2110 E. Aurora Road
Twinsburg, Ohio 44087-1969
ATTN: Ms. Virginia Wilson, Solid Waste Management

Subject: Groundwater Monitoring, Ramsdell Landfill,
Ravenna Army Ammunition Plant

Dear Ms. Wilson:

Transmitted herewith are the ground water monitoring results for the June 1996 ground water sampling event at the installation's closed Ramsdell Landfill.

Also transmitted herewith are copies of pertinent statistical analyses, chain of custody forms, and ground water elevation maps showing the direction of ground water flow at the landfill.

The statistical analyses for the specified indicator parameters revealed statistically significant evidence of contamination for specific conductivity (Wells #3 and #5), total organic carbon (Well #3), and total dissolved solids (Wells #3 and #5). Confirmatory samples will be collected on August 8, 1996.

Please note that the personnel who collected the ground water samples reported anomalous ground water elevations for the June 1996 sampling event. Ground water elevations at the monitoring wells were measured, again, on July 29, 1996. Those measurements correspond to historical ground water flow patterns. A copy of the ground water elevation map for July 29, 1996 is also transmitted herewith. We are unable to explain the anomalous measurements.

The writer will serve as Mason & Hanger's point of contact with respect to this matter, and

can be reached at (330) 358-7400. The Army's point of contact is Mr. John A. Cicero, Jr., who can be reached at (330) 358-7311.

Sincerely,
Mason & Hanger Corporation

W. B. Talmon, Jr.
Site Manager

WBT/wbt/lfgm0696

cc: Robert Whelove, AMSIO-EQE
Portage County Combined General Health District, ATTN: Stephen Uecke
Landfill Ground Water Monitoring File
Reading File (w/o attachments)

Thermo Analytical, Inc.
387 Airport Industrial Drive
Ypsilanti, MI 48198-7812
Ph:(313)480-2500 Fax:480-2295

Mason & Hanger Co.
8451 State Route 5
Ravenna, OH 44266-9297

Attn: Lynnette Windland

Purchase Order: 940091
Invoice Number:

Order #: E6-06-068
Date: 07/18/96 15:54
Work ID: Landfill Monitoring Wells
Date Received: 06/21/96
Date Completed: 07/18/96

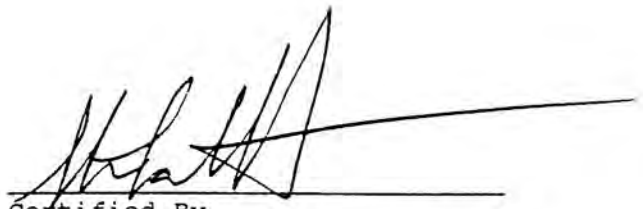
Client Code: RVAAP

SAMPLE IDENTIFICATION

Sample Number	Sample Description
01	Landfill Monitoring Well-1
02	Landfill Monitoring Well-2
03	Landfill Monitoring Well-3
04	Landfill Monitoring Well-4
05	Landfill Monitoring Well-5
06	Landfill Mon. Well-Dup (Well-5)
07	Trip Blank

ABREVIATION KEY

SR = See Attached Report
ND = Nondetected at Reported Limit
* = The Average of Duplicate Analysis



Certified By
Steven Lambright

JUL 24 1996

Sample: 01A Landfill Monitoring Well-1 Collected: 06/20/96
Job: LNDUNP Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Chloride in Water	5.0	0.20	mg/L	06/22/96	WO
Specific Conductivity	590		umhos	06/22/96	DB
Sulfate in Water	110	1.0	mg/L	06/22/96	CP
Total Alkalinity in Water	200	1.0	mg/L	06/23/96	JB
Total Dissolved Solids	360	4	mg/L	06/23/96	RP
Turbidity in Water	22		NTU	06/21/96	RP
pH in Water	6.7		s.u.	06/21/96	RP

Sample: 01B Landfill Monitoring Well-1 Collected: 06/20/96
Job: LND_SA Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Ammonia in Water	<0.005	0.005	mg/L	06/22/96	WO
Chemical Oxygen Demand	<4.0	4.0	mg/L	06/22/96	JB
Nitrate-Nitrite in Water	0.027	0.010	mg/L	06/21/96	JB
Total Phosphorous in Water	<0.050	0.050	mg/L	06/24/96	JB

Sample: 01C Landfill Monitoring Well-1 Collected: 06/20/96
Job: LNDPHE Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Phenols in Water	<0.010	0.010	mg/L	06/29/96	WO
Total Organic Carbon	1.4	1.0	mg/L	06/22/96	JB

Sample: 01D Landfill Monitoring Well-1 Collected: 06/20/96
Job: LND_CN Landfill Cyanide

Test Description	Result	Limit	Units	Analyzed	By
Cyanide Analysis in Water	<0.006	0.006	mg/L	06/22/96	JB

Sample: 01E Landfill Monitoring Well-1 Collected: 06/20/96
Job: LNDEXP Landfill Explosives

Test Description	Result	Limit	Units	Analyzed	By
2,4-DINITROTOLUENE	<1.0	1.0	ug/L	06/25/96	CP
2,6-DINITROTOLUENE	<1.0	1.0	ug/L	06/25/96	CP
HMX IN WATER	<1.0	1.0	ug/L	06/25/96	CP
RDX in Water	<1.0	1.0	ug/L	06/25/96	CP
Trinitrotoluene in Water	<1.0	1.0	ug/L	06/25/96	CP

Sample: 01F Landfill Monitoring Well-1 Collected: 06/20/96
Job: LND_ME Landfill Metals

Test Description	Result	Limit	Units	Analyzed	By
Arsenic in Water	0.003	0.003	mg/L	06/30/96	LD
Barium in Water	0.038	0.0002	mg/L	06/30/96	LD
Cadmium in Water	0.0006	0.0003	mg/L	06/30/96	LD

Test Description	Result	Limit	Units	Analyzed	By
Calcium in Water	69	0.070	mg/L	06/30/96	LD
Chromium in Water	0.002	0.0005	mg/L	06/30/96	LD
Copper in Water	<0.0008	0.0008	mg/L	06/30/96	LD
Hg Prep	06/21/96		date complete		LD
Iron in Water	2.2	0.003	mg/L	06/30/96	LD
Lead in Water	<0.002	0.002	mg/L	06/30/96	LD
Magnesium in Water	22	0.006	mg/L	06/30/96	LD
Manganese in Water	1.3	0.004	mg/L	06/30/96	LD
Mercury in Water	<0.0002	0.0002	mg/L	06/21/96	LD
Nickel in Water	0.11	0.0005	mg/L	06/30/96	LD
Potassium in Water	13	0.020	mg/L	06/30/96	LD
Prep for ICAP - Water	06/21/96		date complete		LD
Selenium in Water	<0.002	0.002	mg/L	06/30/96	LD
Silver in Water	0.002	0.0005	mg/L	06/30/96	LD
Sodium in Water	5.1	0.030	mg/L	06/30/96	LD
Zinc in Water	0.43	0.009	mg/L	06/30/96	LD

Sample: 02A Landfill Monitoring Well-2 Collected: 06/20/96
Job: LNDUNP Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Chloride in Water	1.4	0.20	mg/L	06/22/96	WO
Specific Conductivity	420		umhos	06/22/96	DB
Sulfate in Water	85	1.0	mg/L	06/22/96	CP
Total Alkalinity in Water	130	1.0	mg/L	06/23/96	JB
Total Dissolved Solids	290	4	mg/L	06/23/96	RP
Turbidity in Water	30		NTU	06/21/96	RP
pH in Water	6.7		s.u.	06/21/96	RP

Sample: 02B Landfill Monitoring Well-2 Collected: 06/20/96
Job: LND_SA Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Ammonia in Water	<0.005	0.005	mg/L	06/22/96	WO
Chemical Oxygen Demand	<4.0	4.0	mg/L	06/22/96	JB
Nitrate-Nitrite in Water	0.057	0.010	mg/L	06/21/96	JB
Total Phosphorous in Water	<0.050	0.050	mg/L	06/24/96	JB

Sample: 02C Landfill Monitoring Well-2 Collected: 06/20/96
Job: LNDPHE Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Phenols in Water	<0.020	0.020	mg/L	06/29/96	WO
Total Organic Carbon	2.0	1.0	mg/L	06/22/96	JB

Sample: 02D Landfill Monitoring Well-2 Collected: 06/20/96
Job: LND_CN Landfill Cyanide

Test Description	Result	Limit	Units	Analyzed	By
Cyanide Analysis in Water	<0.006	0.006	mg/L	06/22/96	JB

Sample: 02E Landfill Monitoring Well-2 Collected: 06/20/96
Job: LNDEXP Landfill Explosives

Test Description	Result	Limit	Units	Analyzed	By
2,4-DINITROTOLUENE	<1.0	1.0	ug/L	06/25/96	CP
2,6-DINITROTOLUENE	<1.0	1.0	ug/L	06/25/96	CP
HMX IN WATER	<1.0	1.0	ug/L	06/25/96	CP
RDX in Water	<1.0	1.0	ug/L	06/25/96	CP
Trinitrotoluene in Water	<1.0	1.0	ug/L	06/25/96	CP

Sample: 02F Landfill Monitoring Well-2 Collected: 06/20/96
Job: LND_ME Landfill Metals

Test Description	Result	Limit	Units	Analyzed	By
Arsenic in Water	<0.003	0.003	mg/L	06/30/96	LD
Barium in Water	0.043	0.0002	mg/L	06/30/96	LD
Cadmium in Water	0.003	0.0003	mg/L	06/30/96	LD
Calcium in Water	58	0.070	mg/L	06/30/96	LD
Chromium in Water	0.002	0.0005	mg/L	06/30/96	LD
Copper in Water	0.001	0.0008	mg/L	06/30/96	LD
Hg Prep	06/21/96		date complete		LD
Iron in Water	0.39	0.003	mg/L	06/30/96	LD
Lead in Water	<0.002	0.002	mg/L	06/30/96	LD
Magnesium in Water	12	0.006	mg/L	06/30/96	LD
Manganese in Water	0.26	0.004	mg/L	06/30/96	LD
Mercury in Water	<0.0002	0.0002	mg/L	06/21/96	LD
Nickel in Water	0.023	0.0005	mg/L	06/30/96	LD
Potassium in Water	2.7	0.020	mg/L	06/30/96	LD
Prep for ICAP - Water	06/21/96		date complete		LD
Selenium in Water	<0.002	0.002	mg/L	06/30/96	LD
Silver in Water	0.001	0.0005	mg/L	06/30/96	LD
Sodium in Water	3.1	0.030	mg/L	06/30/96	LD
Zinc in Water	0.13	0.009	mg/L	06/30/96	LD

Sample: 03A Landfill Monitoring Well-3 Collected: 06/20/96
Job: LNDUNP Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Chloride in Water	1.6	0.20	mg/L	06/22/96	WO
Specific Conductivity	440		umhos	06/22/96	DB
Sulfate in Water	90	1.0	mg/L	06/22/96	CP
Total Alkalinity in Water	120	1.0	mg/L	06/23/96	JB
Total Dissolved Solids	260	4	mg/L	06/23/96	RP
Turbidity in Water	0.35		NTU	06/21/96	RP
pH in Water	6.5		s.u.	06/21/96	RP

Sample: 03B Landfill Monitoring Well-3 Collected: 06/20/96
Job: LND_SA Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Ammonia in Water	<0.005	0.005	mg/L	06/22/96	WO

Test Description	Result	Limit	Units	Analyzed	By
Chemical Oxygen Demand	<4.0	4.0	mg/L	06/22/96	JB
Nitrate-Nitrite in Water	0.68	0.010	mg/L	06/21/96	JB
Total Phosphorous in Water	<0.050	0.050	mg/L	06/24/96	JB

Sample: 03C Landfill Monitoring Well-3 Collected: 06/20/96
Job: LNDPHE Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Phenols in Water	<0.020	0.020	mg/L	06/29/96	WO
Total Organic Carbon	2.9	1.0	mg/L	06/22/96	JB

Sample: 03D Landfill Monitoring Well-3 Collected: 06/20/96
Job: LND_CN Landfill Cyanide

Test Description	Result	Limit	Units	Analyzed	By
Cyanide Analysis in Water	<0.006	0.006	mg/L	06/22/96	JB

Sample: 03E Landfill Monitoring Well-3 Collected: 06/20/96
Job: LNDEXP Landfill Explosives

Test Description	Result	Limit	Units	Analyzed	By
2,4-DINITROTOLUENE	<1.0	1.0	ug/L	06/25/96	CP
2,6-DINITROTOLUENE	<1.0	1.0	ug/L	06/25/96	CP
HMX IN WATER	<1.0	1.0	ug/L	06/25/96	CP
RDX in Water	<1.0	1.0	ug/L	06/25/96	CP
Trinitrotoluene in Water	8.8	1.0	ug/L	06/25/96	CP

Sample: 03F Landfill Monitoring Well-3 Collected: 06/20/96
Job: LND_ME Landfill Metals

Test Description	Result	Limit	Units	Analyzed	By
Arsenic in Water	<0.003	0.003	mg/L	06/30/96	LD
Barium in Water	0.027	0.0002	mg/L	06/30/96	LD
Cadmium in Water	0.0003	0.0003	mg/L	06/30/96	LD
Calcium in Water	54	0.070	mg/L	06/30/96	LD
Chromium in Water	0.003	0.0005	mg/L	06/30/96	LD
Copper in Water	0.003	0.0008	mg/L	06/30/96	LD
Hg Prep	06/21/96		date complete		LD
Iron in Water	0.089	0.003	mg/L	06/30/96	LD
Lead in Water	0.006	0.002	mg/L	06/30/96	LD
Magnesium in Water	12	0.006	mg/L	06/30/96	LD
Manganese in Water	0.011	0.004	mg/L	06/30/96	LD
Mercury in Water	0.0006	0.0002	mg/L	06/21/96	LD
Nickel in Water	0.003	0.0005	mg/L	06/30/96	LD
Potassium in Water	6.0	0.020	mg/L	06/30/96	LD
Prep for ICAP - Water	06/21/96		date complete		LD
Selenium in Water	<0.002	0.002	mg/L	06/30/96	LD
Silver in Water	0.0009	0.0005	mg/L	06/30/96	LD
Sodium in Water	3.3	0.030	mg/L	06/30/96	LD
Zinc in Water	0.056	0.009	mg/L	06/30/96	LD

Sample: 04A Landfill Monitoring Well-4 Collected: 06/20/96
Job: LNDUNP Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Chloride in Water	1.9	0.20	mg/L	06/22/96	WO
Specific Conductivity	610		umhos	06/22/96	DB
Sulfate in Water	76	1.0	mg/L	06/22/96	CP
Total Alkalinity in Water	280	1.0	mg/L	06/23/96	JB
Total Dissolved Solids	400	4	mg/L	06/23/96	RP
Turbidity in Water	12		NTU	06/21/96	RP
pH in Water	7.0		s.u.	06/21/96	RP

Sample: 04B Landfill Monitoring Well-4 Collected: 06/20/96
Job: LND_SA Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Ammonia in Water	<0.005	0.005	mg/L	06/22/96	WO
Chemical Oxygen Demand	<4.0	4.0	mg/L	06/22/96	JB
Nitrate-Nitrite in Water	0.11	0.010	mg/L	06/21/96	JB
Total Phosphorous in Water	<0.050	0.050	mg/L	06/24/96	JB

Sample: 04C Landfill Monitoring Well-4 Collected: 06/20/96
Job: LNDPHE Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Phenols in Water	<0.020	0.020	mg/L	06/29/96	WO
Total Organic Carbon	1.5	1.0	mg/L	06/22/96	JB

Sample: 04D Landfill Monitoring Well-4 Collected: 06/20/96
Job: LND_CN Landfill Cyanide

Test Description	Result	Limit	Units	Analyzed	By
Cyanide Analysis in Water	<0.006	0.006	mg/L	06/22/96	JB

Sample: 04E Landfill Monitoring Well-4 Collected: 06/20/96
Job: LNDEXP Landfill Explosives

Test Description	Result	Limit	Units	Analyzed	By
2,4-DINITROTOLUENE	<1.0	1.0	ug/L	06/25/96	CP
2,6-DINITROTOLUENE	<1.0	1.0	ug/L	06/25/96	CP
HMX IN WATER	<1.0	1.0	ug/L	06/25/96	CP
RDX in Water	<1.0	1.0	ug/L	06/25/96	CP
Trinitrotoluene in Water	<1.0	1.0	ug/L	06/25/96	CP

Sample: 04F Landfill Monitoring Well-4 Collected: 06/20/96
Job: LND_ME Landfill Metals

Test Description	Result	Limit	Units	Analyzed	By
Arsenic in Water	<0.003	0.003	mg/L	06/30/96	LD
Barium in Water	0.058	0.0002	mg/L	06/30/96	LD
Cadmium in Water	0.0004	0.0003	mg/L	06/30/96	LD

Test Description	Result	Limit	Units	Analyzed	By
Calcium in Water	91	0.070	mg/L	06/30/96	LD
Chromium in Water	0.0021	0.0005	mg/L	06/30/96	LD
Copper in Water	0.0019	0.0008	mg/L	06/30/96	LD
Hg Prep	06/21/96		date complete		LD
Iron in Water	0.95	0.003	mg/L	06/30/96	LD
Lead in Water	0.002	0.002	mg/L	06/30/96	LD
Magnesium in Water	18	0.006	mg/L	06/30/96	LD
Manganese in Water	2.4	0.004	mg/L	06/30/96	LD
Mercury in Water	<0.0002	0.0002	mg/L	06/21/96	LD
Nickel in Water	0.0042	0.0005	mg/L	06/30/96	LD
Potassium in Water	1.3	0.020	mg/L	06/30/96	LD
Prep for ICAP - Water	06/21/96		date complete		LD
Selenium in Water	<0.002	0.002	mg/L	06/30/96	LD
Silver in Water	0.0011	0.0005	mg/L	06/30/96	LD
Sodium in Water	1.9	0.030	mg/L	06/30/96	LD
Zinc in Water	0.028	0.009	mg/L	06/30/96	LD

Sample: 05A Landfill Monitoring Well-5 Collected: 06/20/96
Job: LNDUNP Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Chloride in Water	15	0.20	mg/L	06/22/96	WO
Specific Conductivity	690		umhos	06/22/96	DB
Sulfate in Water	180	1.0	mg/L	06/22/96	CP
Total Alkalinity in Water	160	1.0	mg/L	06/23/96	JB
Total Dissolved Solids	480	4	mg/L	06/23/96	RP
Turbidity in Water	26		NTU	06/21/96	RP
pH in Water	6.6		s.u.	06/21/96	RP

Sample: 05B Landfill Monitoring Well-5 Collected: 06/20/96
Job: LND_SA Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Ammonia in Water	0.26	0.005	mg/L	06/22/96	WO
Chemical Oxygen Demand	<4.0	4.0	mg/L	06/22/96	JB
Nitrate-Nitrite in Water	0.058	0.010	mg/L	06/21/96	JB
Total Phosphorous in Water	<0.050	0.050	mg/L	06/24/96	JB

Sample: 05C Landfill Monitoring Well-5 Collected: 06/20/96
Job: LNDPHE Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Phenols in Water	<0.020	0.020	mg/L	06/29/96	WO
Total Organic Carbon	2.5	1.0	mg/L	06/22/96	JB

Sample: 05D Landfill Monitoring Well-5 Collected: 06/20/96
Job: LND_CN Landfill Cyanide

Test Description	Result	Limit	Units	Analyzed	By
Cyanide Analysis in Water	<0.006	0.006	mg/L	06/22/96	JB

Sample: 05E Landfill Monitoring Well-5 Collected: 06/20/96
Job: LNDEXP Landfill Explosives

Test Description	Result	Limit	Units	Analyzed	By
2,4-DINITROTOLUENE	<1.0	1.0	ug/L	06/25/96	CP
2,6-DINITROTOLUENE	<1.0	1.0	ug/L	06/25/96	CP
HMX IN WATER	<1.0	1.0	ug/L	06/25/96	CP
RDX in Water	<1.0	1.0	ug/L	06/25/96	CP
Trinitrotoluene in Water	<1.0	1.0	ug/L	06/25/96	CP

Sample: 05F Landfill Monitoring Well-5 Collected: 06/20/96
Job: LND_ME Landfill Metals

Test Description	Result	Limit	Units	Analyzed	By
Arsenic in Water	<0.003	0.003	mg/L	06/30/96	LD
Barium in Water	0.024	0.0002	mg/L	06/30/96	LD
Cadmium in Water	0.0004	0.0003	mg/L	06/30/96	LD
Calcium in Water	71	0.070	mg/L	06/30/96	LD
Chromium in Water	0.0030	0.0005	mg/L	06/30/96	LD
Copper in Water	0.0025	0.0008	mg/L	06/30/96	LD
Hg Prep	06/21/96		date complete		LD
Iron in Water	2.0	0.003	mg/L	06/30/96	LD
Lead in Water	<0.002	0.002	mg/L	06/30/96	LD
Magnesium in Water	40	0.006	mg/L	06/30/96	LD
Manganese in Water	7.6	0.004	mg/L	06/30/96	LD
Mercury in Water	<0.0002	0.0002	mg/L	06/21/96	LD
Nickel in Water	0.026	0.0005	mg/L	06/30/96	LD
Potassium in Water	4.4	0.020	mg/L	06/30/96	LD
Prep for ICAP - Water	06/21/96		date complete		LD
Selenium in Water	0.004	0.002	mg/L	06/30/96	LD
Silver in Water	0.0017	0.0005	mg/L	06/30/96	LD
Sodium in Water	11	0.030	mg/L	06/30/96	LD
Zinc in Water	0.024	0.009	mg/L	06/30/96	LD

Sample: 06A Landfill Mon. Well-Dup Collected: 06/20/96
Job: LNDUNP Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Chloride in Water	17	0.20	mg/L	06/22/96	WO
Specific Conductivity	690		umhos	06/22/96	DB
Sulfate in Water	200	1.0	mg/L	06/22/96	CP
Total Alkalinity in Water	160	1.0	mg/L	06/23/96	JB
Total Dissolved Solids	480	4	mg/L	06/23/96	RP
Turbidity in Water	27		NTU	06/21/96	RP
pH in Water	6.7		s.u.	06/21/96	RP

Sample: 06B Landfill Mon. Well-Dup Collected: 06/20/96
Job: LND_SA Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Ammonia in Water	0.26	0.005	mg/L	06/22/96	WO

Test Description	Result	Limit	Units	Analyzed	By
Chemical Oxygen Demand	<4.0	4.0	mg/L	06/22/96	JB
Nitrate-Nitrite in Water	0.18	0.010	mg/L	06/21/96	JB
Total Phosphorous in Water	<0.050	0.050	mg/L	06/24/96	JB

Sample: 06C Landfill Mon. Well-Dup Collected: 06/20/96
Job: LNDPHE Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Phenols in Water	<0.020	0.020	mg/L	06/29/96	WO
Total Organic Carbon	2.4	1.0	mg/L	06/22/96	JB

Sample: 06D Landfill Mon. Well-Dup Collected: 06/20/96
Job: LND_CN Landfill Cyanide

Test Description	Result	Limit	Units	Analyzed	By
Cyanide Analysis in Water	<0.006	0.006	mg/L	06/22/96	JB

Sample: 06E Landfill Mon. Well-Dup Collected: 06/20/96
Job: LNDEXP Landfill Explosives

Test Description	Result	Limit	Units	Analyzed	By
2,4-DINITROTOLUENE	<1.0	1.0	ug/L	06/25/96	CP
2,6-DINITROTOLUENE	<1.0	1.0	ug/L	06/25/96	CP
HMX IN WATER	<1.0	1.0	ug/L	06/25/96	CP
RDX in Water	<1.0	1.0	ug/L	06/25/96	CP
Trinitrotoluene in Water	<1.0	1.0	ug/L	06/25/96	CP

Sample: 06F Landfill Mon. Well-Dup Collected: 06/20/96
Job: LND_ME Landfill Metals

Test Description	Result	Limit	Units	Analyzed	By
Arsenic in Water	<0.003	0.003	mg/L	06/30/96	LD
Barium in Water	0.023	0.0002	mg/L	06/30/96	LD
Cadmium in Water	0.0004	0.0003	mg/L	06/30/96	LD
Calcium in Water	69	0.070	mg/L	06/30/96	LD
Chromium in Water	0.0038	0.0005	mg/L	06/30/96	LD
Copper in Water	<0.0008	0.0008	mg/L	06/30/96	LD
Hg Prep	06/21/96		date complete		LD
Iron in Water	1.8	0.003	mg/L	06/30/96	LD
Lead in Water	0.003	0.002	mg/L	06/30/96	LD
Magnesium in Water	39	0.006	mg/L	06/30/96	LD
Manganese in Water	7.4	0.004	mg/L	06/30/96	LD
Mercury in Water	<0.0002	0.0002	mg/L	06/21/96	LD
Nickel in Water	0.026	0.0005	mg/L	06/30/96	LD
Potassium in Water	4.3	0.020	mg/L	06/30/96	LD
Prep for ICAP - Water	06/21/96		date complete		LD
Selenium in Water	0.003	0.002	mg/L	06/30/96	LD
Silver in Water	0.0014	0.0005	mg/L	06/30/96	LD
Sodium in Water	9.8	0.030	mg/L	06/30/96	LD
Zinc in Water	0.022	0.009	mg/L	06/30/96	LD

Thermo Analytical, Inc.
TEST RESULTS BY SAMPLE

Sample Description: Landfill Monitoring Well-1 Lab No: 01G
Test Description: 8260 IN WATER Method: 8260 Test Code: 8260_W
Collected: 06/20/96

PARAMETER	RESULT
Acrolein	<10
Acrylonitrile	<10
Benzene	<10
Bromoform	<10
Carbon Tetrachloride	<10
Chlorobenzene	<10
Chlorodibromomethane	<10
Chloroethane	<10
Dichlorobromomethane	<10
1,1-Dichloroethane	<10
1,2-Dichloroethane	<10
1,2-Dichloroethylene	<10
1,2-Dichloropropane	<10
1,2-Dichloropropylene	<10
Ethylbenzene	<10
Methyl Bromide	<10
Methyl Chloride	<10
Methylene Chloride	<10
1,1,2,2-Tetrachloroethane	<10
Tetrachloroethylene	<10
Toluene	<10
1,2-Trans Dichloroethylene	<10
1,1,1-Trichloroethane	<10
1,1,2-Trichloroethane	<10
Trichloroethylene	<10
Vinyl Chloride	<10

Notes and Definitions for this Report:

DATE RUN 06/28/96
ANALYST SL
UNITS ug/L

Thermo Analytical, Inc.
TEST RESULTS BY SAMPLE

Sample Description: Landfill Monitoring Well-2 Lab No: 02G
Test Description: 8260 IN WATER Method: 8260 Test Code: 8260_W
Collected: 06/20/96

PARAMETER	RESULT
Acrolein	<10
Acrylonitrile	<10
Benzene	<10
Bromoform	<10
Carbon Tetrachloride	<10
Chlorobenzene	<10
Chlorodibromomethane	<10
Chloroethane	<10
Dichlorobromomethane	<10
1,1-Dichloroethane	<10
1,2-Dichloroethane	<10
1,2-Dichloroethylene	<10
1,2-Dichloropropane	<10
1,2-Dichloropropylene	<10
Ethylbenzene	<10
Methyl Bromide	<10
Methyl Chloride	<10
Methylene Chloride	<10
1,1,2,2-Tetrachloroethane	<10
Tetrachloroethylene	<10
Toluene	<10
1,2-Trans Dichloroethylene	<10
1,1,1-Trichloroethane	<10
1,1,2-Trichloroethane	<10
Trichloroethylene	<10
Vinyl Chloride	<10

Notes and Definitions for this Report:

DATE RUN 06/28/96
ANALYST SL
UNITS ug/L

Sample Description: Landfill Monitoring Well-3 Lab No: 03G
Test Description: 8260 IN WATER Method: 8260 Test Code: 8260_W
Collected: 06/20/96

PARAMETER	RESULT
Acrolein	<10
Acrylonitrile	<10
Benzene	<10
Bromoform	<10
Carbon Tetrachloride	<10
Chlorobenzene	<10
Chlorodibromomethane	<10
Chloroethane	<10
Dichlorobromomethane	<10
1,1-Dichloroethane	<10
1,2-Dichloroethane	<10
1,2-Dichloroethylene	<10
1,2-Dichloropropane	<10
1,2-Dichloropropylene	<10
Ethylbenzene	<10
Methyl Bromide	<10
Methyl Chloride	<10
Methylene Chloride	<10
1,1,2,2-Tetrachloroethane	<10
Tetrachloroethylene	<10
Toluene	<10
1,2-Trans Dichloroethylene	<10
1,1,1-Trichloroethane	<10
1,1,2-Trichloroethane	<10
Trichloroethylene	<10
Vinyl Chloride	<10

Notes and Definitions for this Report:

DATE RUN 06/28/96
ANALYST SL
UNITS ug/L

Thermo Analytical, Inc.
TEST RESULTS BY SAMPLE

Sample Description: Landfill Monitoring Well-4 Lab No: 04G
Test Description: 8260 IN WATER Method: 8260 Test Code: 8260_W
Collected: 06/20/96

PARAMETER	RESULT
Acrolein	<10
Acrylonitrile	<10
Benzene	<10
Bromoform	<10
Carbon Tetrachloride	<10
Chlorobenzene	<10
Chlorodibromomethane	<10
Chloroethane	<10
Dichlorobromomethane	<10
1,1-Dichloroethane	<10
1,2-Dichloroethane	<10
1,2-Dichloroethylene	<10
1,2-Dichloropropane	<10
1,2-Dichloropropylene	<10
Ethylbenzene	<10
Methyl Bromide	<10
Methyl Chloride	<10
Methylene Chloride	<10
1,1,2,2-Tetrachloroethane	<10
Tetrachloroethylene	<10
Toluene	<10
1,2-Trans Dichloroethylene	<10
1,1,1-Trichloroethane	<10
1,1,2-Trichloroethane	<10
Trichloroethylene	<10
Vinyl Chloride	<10

Notes and Definitions for this Report:

DATE RUN 06/28/96
ANALYST SL
UNITS ug/L

Thermo Analytical, Inc.
TEST RESULTS BY SAMPLE

Sample Description: Landfill Monitoring Well-5 Lab No: 05G
Test Description: 8260 IN WATER Method: 8260 Test Code: 8260_W
Collected: 06/20/96

PARAMETER	RESULT
Acrolein	<10
Acrylonitrile	<10
Benzene	<10
Bromoform	<10
Carbon Tetrachloride	<10
Chlorobenzene	<10
Chlorodibromomethane	<10
Chloroethane	<10
Dichlorobromomethane	<10
1,1-Dichloroethane	<10
1,2-Dichloroethane	<10
1,2-Dichloroethylene	<10
1,2-Dichloropropane	<10
1,2-Dichloropropylene	<10
Ethylbenzene	<10
Methyl Bromide	<10
Methyl Chloride	<10
Methylene Chloride	<10
1,1,2,2-Tetrachloroethane	<10
Tetrachloroethylene	<10
Toluene	<10
1,2-Trans Dichloroethylene	<10
1,1,1-Trichloroethane	<10
1,1,2-Trichloroethane	<10
Trichloroethylene	<10
Vinyl Chloride	<10

Notes and Definitions for this Report:

DATE RUN 06/28/96
ANALYST SL
UNITS ug/L

Thermo Analytical, Inc.
TEST RESULTS BY SAMPLE

Sample Description: Landfill Mon. Well-Dup Lab No: 06G
Test Description: 8260 IN WATER Method: 8260 Test Code: 8260_W
Collected: 06/20/96

PARAMETER	RESULT
Acrolein	<10
Acrylonitrile	<10
Benzene	<10
Bromoform	<10
Carbon Tetrachloride	<10
Chlorobenzene	<10
Chlorodibromomethane	<10
Chloroethane	<10
Dichlorobromomethane	<10
1,1-Dichloroethane	<10
1,2-Dichloroethane	<10
1,2-Dichloroethylene	<10
1,2-Dichloropropane	<10
1,2-Dichloropropylene	<10
Ethylbenzene	<10
Methyl Bromide	<10
Methyl Chloride	<10
Methylene Chloride	<10
1,1,2,2-Tetrachloroethane	<10
Tetrachloroethylene	<10
Toluene	<10
1,2-Trans Dichloroethylene	<10
1,1,1-Trichloroethane	<10
1,1,2-Trichloroethane	<10
Trichloroethylene	<10
Vinyl Chloride	<10

Notes and Definitions for this Report:

DATE RUN 06/28/96
ANALYST SL
UNITS ug/L

Sample Description: Trip Blank Lab No: 07A
Test Description: 8260 IN WATER Method: 8260 Test Code: 8260_W
Collected: 06/13/96

PARAMETER	RESULT
Acrolein	<10
Acrylonitrile	<10
Benzene	<10
Bromoform	<10
Carbon Tetrachloride	<10
Chlorobenzene	<10
Chlorodibromomethane	<10
Chloroethane	<10
Dichlorobromomethane	<10
1,1-Dichloroethane	<10
1,2-Dichloroethane	<10
1,2-Dichloroethylene	<10
1,2-Dichloropropane	<10
1,2-Dichloropropylene	<10
Ethylbenzene	<10
Methyl Bromide	<10
Methyl Chloride	<10
Methylene Chloride	<10
1,1,2,2-Tetrachloroethane	<10
Tetrachloroethylene	<10
Toluene	<10
1,2-Trans Dichloroethylene	<10
1,1,1-Trichloroethane	<10
1,1,2-Trichloroethane	<10
Trichloroethylene	<10
Vinyl Chloride	<10

Notes and Definitions for this Report:

DATE RUN 06/28/96
ANALYST SL
UNITS ug/L

Chloride, Colorimetric, Automated, USEPA Method 325.2

Cyanide, Spectrophotometric, USEPA Method 335.2

Nitrogen (Ammonia), Colorimetric, Automated Phenate, USEPA Method 350.1

Nitrate-Nitrite, Colorimetric, USEPA Method 353.2

Phenols, Colorimetric, 4-AAP, USEPA Method 420.1

Method 365.1, EPA-600/4-79-020 "Methods for Chemical Analysis of Water and Wastes", USEPA-EMSL Cincinnati; March, 1983.

Total Dissolved Solids, Gravimetric, USEPA Method 160.1

Chemical Oxygen Demand, Colorimetric, HACH MODIFIED, USEPA Method 410.4

Specific Conductivity, USEPA Method 120.1

pH, Electrometric, USEPA Method 150.1

Sulfate, Turbidimetric, USEPA Method 375.4

Method 310.1, EPA-600 " Methods for Chemical Analysis of Water and Wastes"

Total Organic Carbon, Combustion/Oxidation, USEPA Method 415.1

Turbidity, Nephelometric, USEPA Method 180.1

Mercury, Cold Vapor, USEPA Method 245.1

Silver, ICAP, USEPA Method 200.7

Arsenic in Water, Method 200.7

Barium, ICAP, USEPA Method 200.7

Kruskal-Wallace Test
Report Printed: 07-29-1996 10:26

Facility:67-00-06 RVAAP RAMSDELL LANDFILL

Address:8451 STATE ROUTE 5

City:RAVENNA ST:OH Zip:44266
County:PORTAGE

Contact:MR. WILLIAM TALMON
Phone:(330)358-7400

Permit Type:Detection

Constituent:pH pH

CAS Number: - -
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 0.000 ppb

Start Date:Nov 22 1988
End Date:Jun 20 1996

Data Mode:Log Transformed

Background Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-4	20	0	2.00	1.87	1.96	0.03

Compliance Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-1	18	0	2.01	1.82	1.94	0.04
MW-2	12	0	1.98	1.87	1.92	0.03
MW-3	20	0	1.99	1.84	1.90	0.04
MW-5	19	0	2.01	1.81	1.91	0.05

H Statistic: 22.1867
H Adjusted for Ties: 22.3042
Degrees of Freedom: 4
Chi-Squared: 9.4878
Zα/DF: 2.2414

Indicates significant evidence of contamination

Well ID	Crit. Diff.	Rank Avg.	Background Rank Avg.	Difference

MW-1	18.8072	49.06	65.93	-16.87
MW-2	21.1374	42.58	65.93	-23.34
MW-3	18.3056	30.92	65.93	-35.00
MW-5	18.5449	35.47	65.93	-30.45

Kruskal-Wallace Test
Report Printed: 07-29-1996 10:27

Facility:67-00-06 RVAAP RAMSDELL LANDFILL

Address:8451 STATE ROUTE 5

City:RAVENNA ST:OH Zip:44266
County:PORTAGE

Contact:MR. WILLIAM TALMON
Phone:(330)358-7400

Permit Type:Detection

Constituent:Cond L **Specific Conductivity, Lab**

CAS Number: - -
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 0.000 ppb

Start Date:Nov 22 1988
End Date:Jun 20 1996

Data Mode:Log Transformed

Background Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-4	22	0	6.46	5.60	6.14	0.24

Compliance Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-1	19	0	6.51	5.74	6.16	0.21
MW-2	13	0	6.39	5.90	6.18	0.15
MW-3	24	0	6.74	5.52	6.43	0.27
MW-5	23	0	6.76	5.70	6.35	0.20

H Statistic: 30.1364
H Adjusted for Ties: 30.1445
Degrees of Freedom: 4
Chi-Squared: 9.4878
Zα/DF: 2.2414

Indicates significant evidence of contamination

Well ID	Crit. Diff.	Rank Avg.	Background Rank Avg.	Difference

MW-1	20.5621	37.16	35.43	1.73
MW-2	22.9675	36.73	35.43	1.30
*MW-3	19.3787	72.21	35.43	36.78
*MW-5	19.5792	63.26	35.43	27.83

Kruskal-Wallace Test
Report Printed: 07-29-1996 10:29

Facility:67-00-06 RVAAP RAMSDELL LANDFILL

Address:8451 STATE ROUTE 5

City:RAVENNA ST:OH Zip:44266
County:PORTAGE

Contact:MR. WILLIAM TALMON
Phone:(330)358-7400

Permit Type:Detection

Constituent:TOC **Total Organic Carbon**

CAS Number: - -
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 1000.000 ppb

Start Date:Nov 22 1988
End Date:Jun 20 1996

Mode:Log Transformed

Background Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-4	22	32	10.82	6.21	7.52	1.21

Compliance Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-1	19	26	10.82	6.21	7.41	1.16
MW-2	13	15	9.39	6.21	7.60	0.90
MW-3	24	0	9.90	6.91	8.47	0.60
MW-5	22	9	9.85	6.21	7.96	0.79

H Statistic: 23.8821
H Adjusted for Ties: 23.9942
Degrees of Freedom: 4
Chi-Squared: 9.4878
2α/DF: 2.2414

dicates significant evidence of contamination

Well ID Crit. Diff. Rank Avg. Background Rank Avg. Difference

MW-1	20.3574	34.79	40.39	-5.60
MW-2	22.7389	42.12	40.39	1.73
*MW-3	19.1858	72.69	40.39	32.30
MW-5	19.5984	54.93	40.39	14.55

Kruskal-Wallace Test
Report Printed: 07-29-1996 10:31

Facility:67-00-06 RVAAP RAMSDELL LANDFILL

Address:8451 STATE ROUTE 5

City:RAVENNA ST:OH Zip:44266
County:PORTAGE

Contact:MR. WILLIAM TALMON
Phone:(330)358-7400

Permit Type:Detection

Constituent:TDS Total Dissolved Solids

CAS Number: - -
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 0.000 ppb

Start Date:Nov 22 1988
End Date:Jun 20 1996

[redacted] Mode:Log Transformed

Background Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-4	22	0	13.02	12.15	12.74	0.24

Compliance Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-1	19	0	12.97	12.30	12.69	0.23
MW-2	13	0	13.13	12.58	12.84	0.19
MW-3	24	0	13.52	10.34	12.94	0.62
MW-5	22	0	13.42	10.24	12.86	0.62

H Statistic: 22.4099
H Adjusted for Ties: 22.4302
Degrees of Freedom: 4
Chi-Squared: 9.4878
Zα/DF: 2.2414

[redacted]ndicates significant evidence of contamination

Well ID Crit. Diff. Rank Avg. Background Rank Avg. Difference

MW-1	20.3574	33.11	38.00	-4.89
MW-2	22.7389	47.62	38.00	9.62
*MW-3	19.1858	67.88	38.00	29.88
*MW-5	19.5984	60.77	38.00	22.77

Kruskal-Wallace Test
Report Printed: 07-29-1996 10:32

Facility:67-00-06 RVAAP RAMSDELL LANDFILL

Address:8451 STATE ROUTE 5

City:RAVENNA ST:OH Zip:44266
County:PORTAGE

Contact:MR. WILLIAM TALMON
Phone:(330)358-7400

Permit Type:Detection

Constituent:HMX **Cyclotetramethylenetetranitramine**

CAS Number: 2691-41-0
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 1.000 ppb

Start Date:Nov 22 1988
End Date:Jun 20 1996

Data Mode:Log Transformed

Background Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-4	16	94	0.59	-0.69	-0.61	0.32

Compliance Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-1	14	93	0.10	-0.69	-0.64	0.21
MW-2	14	50	1.19	-0.69	-0.03	0.73
MW-3	19	89	0.47	-0.69	-0.60	0.30
MW-5	15	100	-0.69	-0.69	-0.69	0.00

H Statistic: 7.5251
H Adjusted for Ties: 22.3019
Degrees of Freedom: 4
Chi-Squared: 9.4878
Zα/DF: 2.2414

Indicates significant evidence of contamination

Well ID Crit. Diff. Rank Avg. Background Rank Avg. Difference

MW-1	18.5787	36.96	36.94	0.03
MW-2	18.5787	54.43	36.94	17.49
MW-3	17.2257	36.47	36.94	-0.46
MW-5	18.2454	34.50	36.94	-2.44

Kruskal-Wallace Test
Report Printed: 07-29-1996 10:35

Facility:67-00-06 RVAAP RAMSDELL LANDFILL

Address:8451 STATE ROUTE 5

City:RAVENNA ST:OH Zip:44266
County:PORTAGE

Contact:MR. WILLIAM TALMON
Phone:(330)358-7400

Permit Type:Detection

Constituent:TNT 2,4,6-Trinitrotoluene; alpha-trinitrotoluene

CAS Number: 118-96-7
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 1.000 ppb

Start Date:Nov 22 1988
End Date:Jun 20 1996

Data Mode:Log Transformed

Background Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-4	15	100	-0.69	-0.69	-0.69	0.00

Compliance Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-1	13	100	-0.69	-0.69	-0.69	0.00
MW-2	12	100	-0.69	-0.69	-0.69	0.00
MW-3	17	88	2.17	-0.69	-0.42	0.79
MW-5	14	93	0.18	-0.69	-0.63	0.23

H Statistic: 0.5404
H Adjusted for Ties: 4.4478
Degrees of Freedom: 4
Chi-Squared: 9.4878
Zα/DF: 2.2414

Indicates significant evidence of contamination

Well ID	Crit. Diff.	Rank Avg. Background	Rank Avg.	Difference

MW-1	19.0228	40.46	37.50	2.96
MW-2	19.0228	49.68	37.50	12.18
MW-3	17.3878	41.03	37.50	3.53
MW-5	18.3593	37.56	37.50	0.06

Kruskal-Wallace Test
Report Printed: 07-29-1996 10:34

Facility:67-00-06 RVAAP RAMSDELL LANDFILL

Address:8451 STATE ROUTE 5

City:RAVENNA ST:OH Zip:44266
County:PORTAGE

Contact:MR. WILLIAM TALMON
Phone:(330)358-7400

Permit Type:Detection

Constituent:RDX Cyclotrimethylenetrinitramine; cyclonite

CAS Number: 121-82-4
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 1.000 ppb

Start Date:Nov 22 1988
End Date:Jun 20 1996

Data Mode:Log Transformed

Background Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-4	17	82	1.19	-0.69	-0.40	0.66

Compliance Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-1	14	79	1.74	-0.69	-0.23	0.93
MW-2	14	50	2.12	-0.69	0.08	0.91
MW-3	20	75	2.25	-0.69	-0.23	0.91
MW-5	16	81	1.10	-0.69	-0.43	0.60

H Statistic: 2.6301
H Adjusted for Ties: 4.4313
Degrees of Freedom: 4
Chi-Squared: 9.4878
Ta/DF: 2.2414

Indicates significant evidence of contamination

Well ID	Crit. Diff.	Rank Avg. Background	Rank Avg.	Difference

MW-1	17.5302	34.50	34.50	0.00
MW-2	17.9172	34.50	34.50	0.00
MW-3	16.3881	38.74	34.50	4.24
MW-5	17.1915	36.96	34.50	2.46

TMA
Thermo Analytical

CHAIN OF CUSTODY RECORD

cc: J Johnson

Thermo Analytical
387 Airport Industrial Drive
Ypsilanti, MI 48197

PROJECT NUMBER	PROJECT NAME: VIA FED EX
MH91	SAMPLES TO TMA

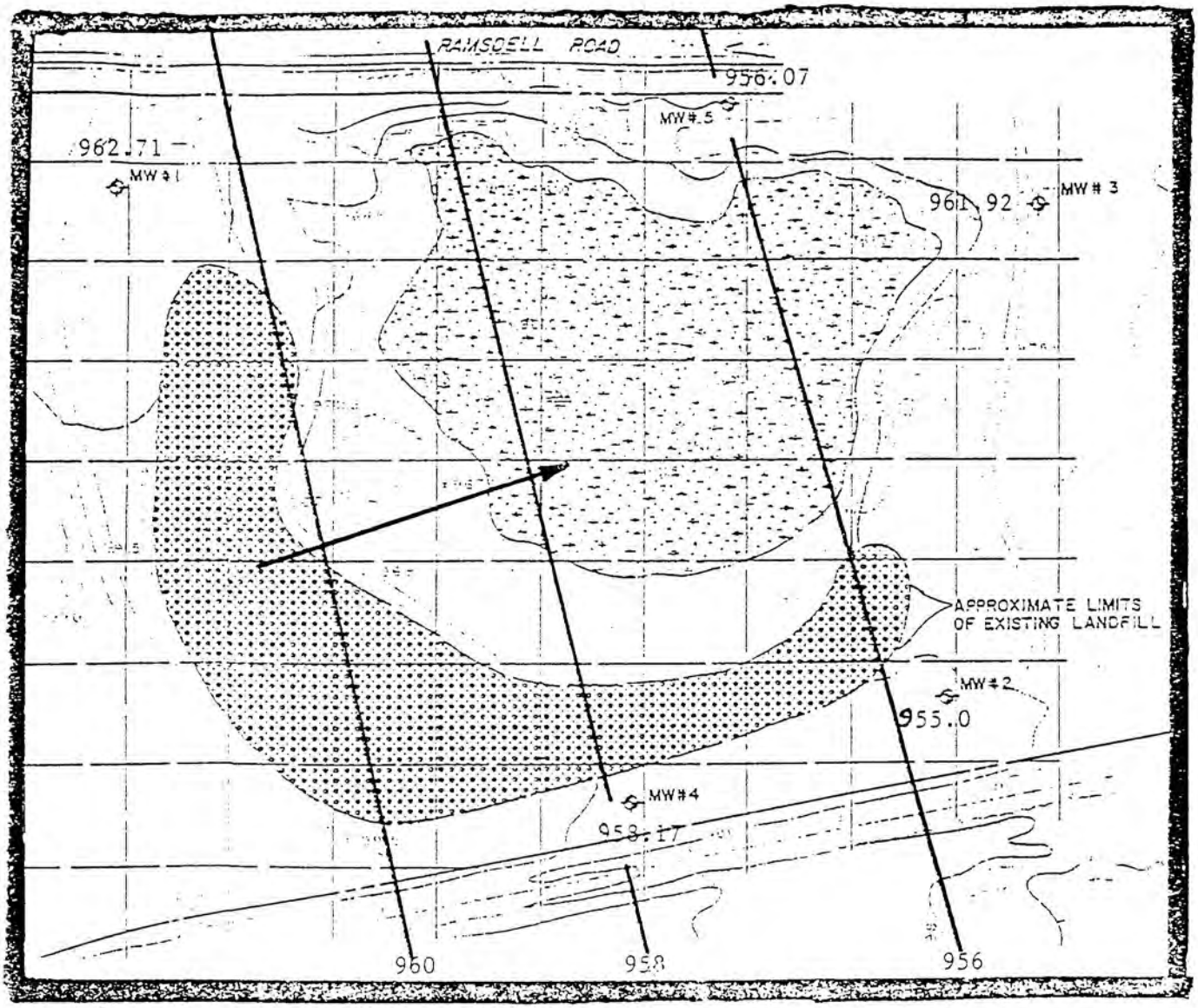
SAMPLERS: (SIGNATURE)
L Johnson / Frank Jackson

STATION NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	REMARKS
DET wells 1-4 + Dup	6/20 12			✓	DEMO GROUND MONITORING WELLS 1-4 + DUP	2 @	SAMPLES TO BE ANALIZED AS PER CONTRACT W/ MASON HANGER
OB6 wells 1-4 + Dup					BURNING GROUND MONITORING WELLS 1-4 + DUP	2 @	" "
LAND FILL MONITORING WELLS 1-5 + DUP					LAND FILL MONITORING WELLS 1-5 + DUP	2 @	" "

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)
L Johnson / Frank Jackson		Denise Barfuss			JUL 12 1996
RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)

COMMENTS:

RVAAP RAMSDELL LANDFILL

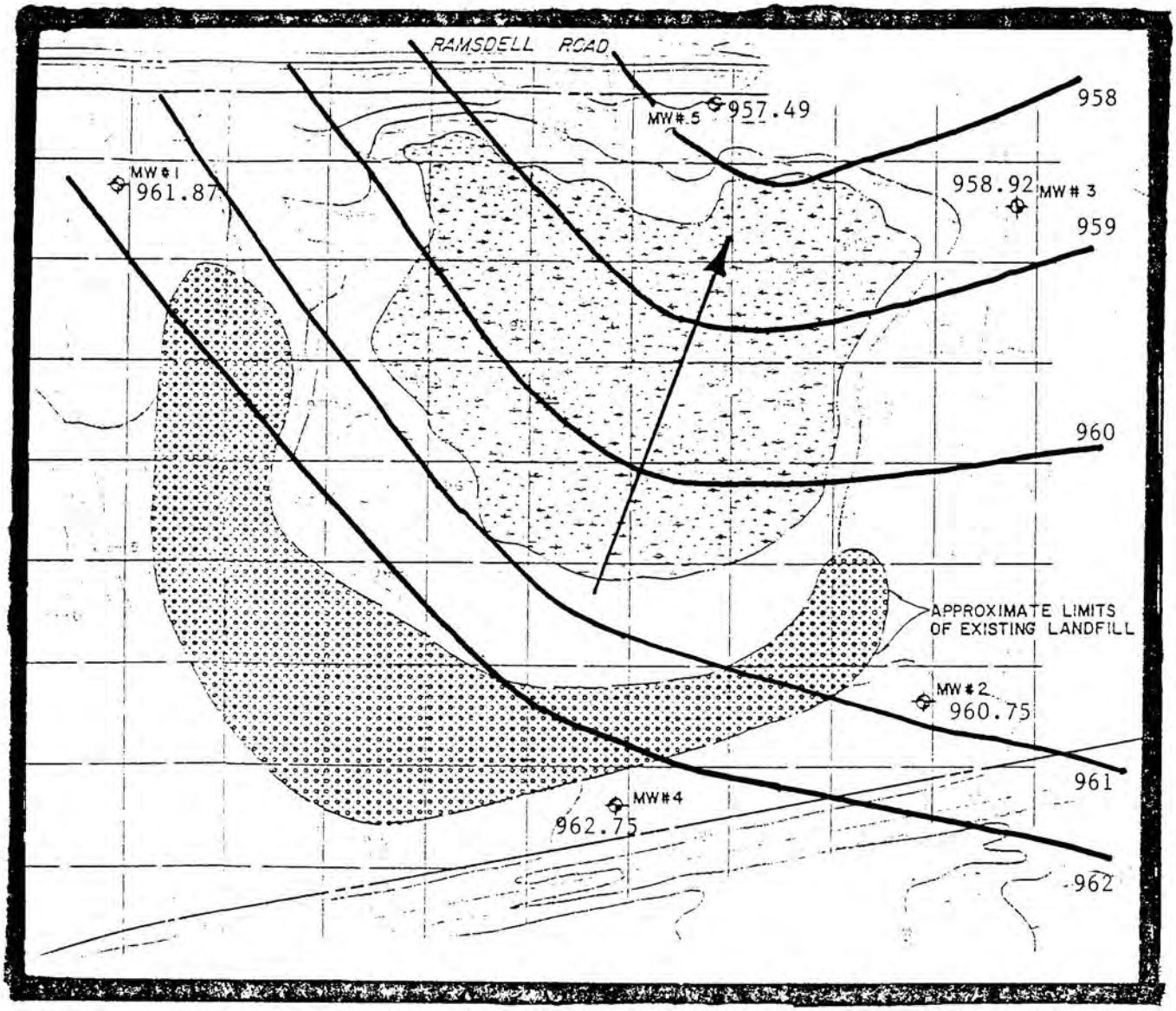


GROUNDWATER LEVEL ELEVATIONS

DATE: June 20, 1996

EXISTING MONITOR WELL
LOCATIONS

RVAAP RAMSDELL LANDFILL



GROUNDWATER LEVEL ELEVATIONS

DATE: 7/29/96

EXISTING MONITOR WELL
LOCATIONS

28.01

RAVENNA ARMY AMMUNITION PLANT

8451 STATE ROUTE 5 • RAVENNA, OHIO 44266-9297

October 14, 1996

Thru: Contracting Officer's Representative
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, OH 44266-9297

To: State of Ohio
Environmental Protection Agency
Northeast District Office
2110 E. Aurora Road
Twinsburg, Ohio 44087-1969
ATTN: Ms. Virginia Wilson, Solid Waste Management

Subject: Ground Water Monitoring, Ramsdell Landfill,
Ravenna Army Ammunition Plant.

Reference: 1. Mason & Hanger letter dated July 31, 1996, SAB
2. August 28, 1996 telephone conversation between Ms. Kurlich (OEPA) and Mr. Talmon, SAB

Dear Ms. Wilson:

On July 31, 1996, we furnished to your office the analytical results regarding the ground water sampling event that took place at the installation's closed Ramsdell Landfill, on June 20, 1996. At that time, we reported that statistical analyses of specified indicator parameters had revealed statistically significant evidence of contamination for specific conductivity (Wells #3 and #5), total organic carbon (Well #3), and total dissolved solids (Wells #3 and #5). We also reported that confirmatory samples would be collected from the wells on August 8, 1996.

Wells #3, #4 (Background), and #5 were sampled on August 8, 1996, as planned. On August 27, 1996, we received preliminary analytical results from Thermo Analytical, Inc., our contract laboratory. Their preliminary data contained results that were much higher than the historical values for total organic carbon. We immediately requested that they review their results, along with their analytical procedures. We also requested that they re-analyze the samples, in question. On August 28, 1996, the laboratory confirmed its original findings. On August 28, 1996, the writer contacted Ms. Kurlich, and informed her about the situation. She agreed that it would be appropriate for the installation to re-sample the

wells in question. The wells in question were re-sampled on September 5, 1996. Transmitted herewith (Attachments 1 and 2) are the analytical results for both sampling efforts. A review of the September 5, 1996 data reveals analytical results that are in line with the historical results (Attachment 3) for the parameters in question. Ground water elevation drawings (Attachment 4), and chain of custody forms (Attachment 5) for both sets of results are also transmitted herewith, along with statistical analyses for the September 5, 1996 analytical results (Attachment 6). The statistical analyses of the sampling results continue to indicate statistically significant evidence of contamination at monitoring well #3 (for specific conductivity, total dissolved solids and total organic carbon) and at monitoring well #5 (for specific conductivity and total dissolved solids).

Thermo Analytical, Inc. has been unable to shed any light on the cause of the anomalous TOC results for the August 8, 1996 sampling event. Our own personnel have been questioned about the procedures that were employed to collect the samples in question. They have indicated that they followed approved procedures when they collected the samples. It seems clear, however, that the samples in question were contaminated at some stage of the collection/ analytical process.

Please share this information with Diane Kurlich. The writer will serve as Mason & Hanger's point of contact with respect to this matter, and can be reached at (330) 358-7400. The Army's local point of contact is Mr. John A. Cicero, Jr., who can be reached at (330) 358-7311.

Very truly yours,
MASON & HANGER CORPORATION

W. B. Talmon, Jr.
Site Manager

WBT:wbt:lfgm0996

cc: Robert Whelove, AMSIO-EQE
Portage County Combined General Health District, ATTN: Stephen Uecke
Landfill Ground Water Monitoring File
Reading File (w/o attachments)

Thermo Analytical, Inc.
387 Airport Industrial Drive
Ypsilanti, MI 48198-7812
Ph:(313)480-2500 Fax:480-2295

Mason & Hanger Co.
8451 State Route 5
Ravenna, OH 44266-9297

Attn: Lynnette Windland

Purchase Order: 940091
Invoice Number:

Order #: E6-08-014
Date: 08/23/96 11:59
Work ID: MH93
Date Received: 08/09/96
Date Completed: 08/23/96

Client Code: RVAAP

SAMPLE IDENTIFICATION

Sample Number	Sample Description
01	Landfill MW#3
02	Landfill MW#4
03	Landfill MW#5
04	Landfill MW#Dup (MW#4)

ABREVIATION KEY

SR = See Attached Report
ND = Nondetected at Reported Limit
* = The Average of Duplicate Analysis

Certified By
Steven D. Lambright

AUG 2 9 1996

Sample: 01A Landfill MW#3 Collected: 08/08/96

Test Description	Result	Limit	Units	Analyzed	By
Total Organic Carbon	310	0.60	mg/L	08/22/96	SL

Sample: 01B Landfill MW#3 Collected: 08/08/96

Test Description	Result	Limit	Units	Analyzed	By
Specific Conductivity	510		umhos	08/16/96	DB
Total Dissolved Solids	400	4	mg/L	08/16/96	RP

Sample: 02A Landfill MW#4 Collected: 08/08/96

Test Description	Result	Limit	Units	Analyzed	By
Total Organic Carbon	100	0.60	mg/L	08/22/96	SL

Sample: 02B Landfill MW#4 Collected: 08/08/96

Test Description	Result	Limit	Units	Analyzed	By
Specific Conductivity	640		umhos	08/16/96	DB
Total Dissolved Solids	480	4	mg/L	08/16/96	RP

Sample: 03A Landfill MW#5 Collected: 08/08/96

Test Description	Result	Limit	Units	Analyzed	By
Total Organic Carbon	50	0.60	mg/L	08/22/96	SL

Sample: 03B Landfill MW#5 Collected: 08/08/96

Test Description	Result	Limit	Units	Analyzed	By
Specific Conductivity	670		umhos	08/16/96	DB
Total Dissolved Solids	580	4	mg/L	08/16/96	RP

Sample: 04A Landfill MW#Dup Collected: 08/08/96

Test Description	Result	Limit	Units	Analyzed	By
Total Organic Carbon	48	0.60	mg/L	08/22/96	SL

Sample: 04B Landfill MW#Dup Collected: 08/08/96

Test Description	Result	Limit	Units	Analyzed	By
Specific Conductivity	830		umhos	08/16/96	DB
Total Dissolved Solids	480	4	mg/L	08/16/96	RP

Total Dissolved Solids, Gravimetric, USEPA Method 160.1

Specific Conductivity, USEPA Method 120.1

Total Organic Carbon, Combustion/Oxidation, USEPA Method 415.1

Attachment 2

Thermo Analytical, Inc.
387 Airport Industrial Drive
Ypsilanti, MI 48198-7812
Ph:(313)480-2500 Fax:480-2295

Mason & Hanger Co.
8451 State Route 5
Ravenna, OH 44266-9297

Attn: Lynnette Windland

Purchase Order: 940091
Invoice Number:

Order #: E6-09-007
Date: 09/23/96 14:07
Work ID: MH94
Date Received: 09/06/96
Date Completed: 09/23/96

Client Code: RVAAP

SAMPLE IDENTIFICATION

Sample Number	Sample Description
01	Landfill MW #3
02	Landfill MW #4
03	Landfill MW #5
04	Landfill MW Dup (MW#4)
05	Landfill Trip Blanks

ABREVIATION KEY

SR = See Attached Report
ND = Nondetected at Reported Limit
* = The Average of Duplicate Analysis

Certified By
Steven Lambright

OCT 2 1996

Sample: 01A Landfill MW #3 Collected: 09/05/96

Test Description	Result	Limit	Units	Analyzed	By
Total Organic Carbon	13	1.0	mg/L	09/17/96	SL

Sample: 01B Landfill MW #3 Collected: 09/05/96

Test Description	Result	Limit	Units	Analyzed	By
Specific Conductivity	640	10	umhos	09/20/96	WO
Total Dissolved Solids	450	4	mg/L	09/12/96	WO

Sample: 02A Landfill MW #4 Collected: 09/05/96

Test Description	Result	Limit	Units	Analyzed	By
Total Organic Carbon	9.1	1.0	mg/L	09/17/96	SL

Sample: 02B Landfill MW #4 Collected: 09/05/96

Test Description	Result	Limit	Units	Analyzed	By
Specific Conductivity	640	10	umhos	09/20/96	WO
Total Dissolved Solids	430	4	mg/L	09/12/96	WO

Sample: 03A Landfill MW #5 Collected: 09/05/96

Test Description	Result	Limit	Units	Analyzed	By
Total Organic Carbon	8.5	1.0	mg/L	09/17/96	SL

Sample: 03B Landfill MW #5 Collected: 09/05/96

Test Description	Result	Limit	Units	Analyzed	By
Specific Conductivity	640	10	umhos	09/20/96	WO
Total Dissolved Solids	480	4	mg/L	09/12/96	WO

Sample: 04A Landfill MW Dup Collected: 09/05/96

Test Description	Result	Limit	Units	Analyzed	By
Total Organic Carbon	7.9	1.0	mg/L	09/17/96	SL

Sample: 04B Landfill MW Dup Collected: 09/05/96

Test Description	Result	Limit	Units	Analyzed	By
Specific Conductivity	640	10	umhos	09/20/96	WO
Total Dissolved Solids	440	4	mg/L	09/12/96	WO

Sample: 05A Landfill Trip Blanks Collected:

Test Description	Result	Limit	Units	Analyzed	By
Total Organic Carbon	1.7	1.0	mg/L	09/17/96	SL

Sample: 05B Landfill Trip Blanks Collected:

Test Description	Result	Limit	Units	Analyzed	By
Specific Conductivity	<10	10	umhos	09/20/96	WO
Total Dissolved Solids	<4.0	4	mg/L	09/12/96	WO

Total Dissolved Solids, Gravimetric, USEPA Method 160.1

Specific Conductivity, USEPA Method 120.1

Total Organic Carbon, Combustion/Oxidation, USEPA Method 415.1

GROUND WATER DATA BASE PRINTOUT

FACILITY: RVAAP RAMSDELL LANDFILL,RAVENNA,OH WELL: MW-3
FCID: 67-00-06 NUMBER OF SAMPLE DATES: 24
PARAMETER: Total Organic Carbon

DATE	RESULT	UNITS	DATA QUAL	METHOD
11/22/88	8.000	MG/L		9060
06/15/89	4.800	MG/L		9060
12/14/89	20.000	MG/L		9060
06/21/90	19.000	MG/L		9060
12/06/90	1.000	MG/L		9060
06/20/91	7.000	MG/L		9060
11/07/91	8.000	MG/L		9060
02/27/92	6.000	MG/L		9060
06/25/92	6.000	MG/L		9060
10/01/92	4.300	MG/L		9060
02/25/93	4.800	MG/L		9060
07/15/93	5.700	MG/L		9060
02/21/94	3.600	MG/L		9060
02/21/94 - Dup A	3.600	MG/L		9060
05/05/94	4.200	MG/L		9060
07/28/94	3.900	MG/L		9060
12/22/94	3.800	MG/L		9060
12/22/94 - Dup A	2.500	MG/L		9060
02/28/95	4.500	MG/L		9060
06/28/95	3.700	MG/L		9060
08/30/95	3.800	MG/L		9060
12/14/95	3.500	MG/L		9060
02/15/96	4.600	MG/L		9060
06/20/96	2.900	MG/L		9060

GROUND WATER DATA BASE PRINTOUT

FACILITY: RVAAP RAMSDELL LANDFILL,RAVENNA,OH WELL: MW-4
FCID: 67-00-06 NUMBER OF SAMPLE DATES: 22
PARAMETER: Total Organic Carbon

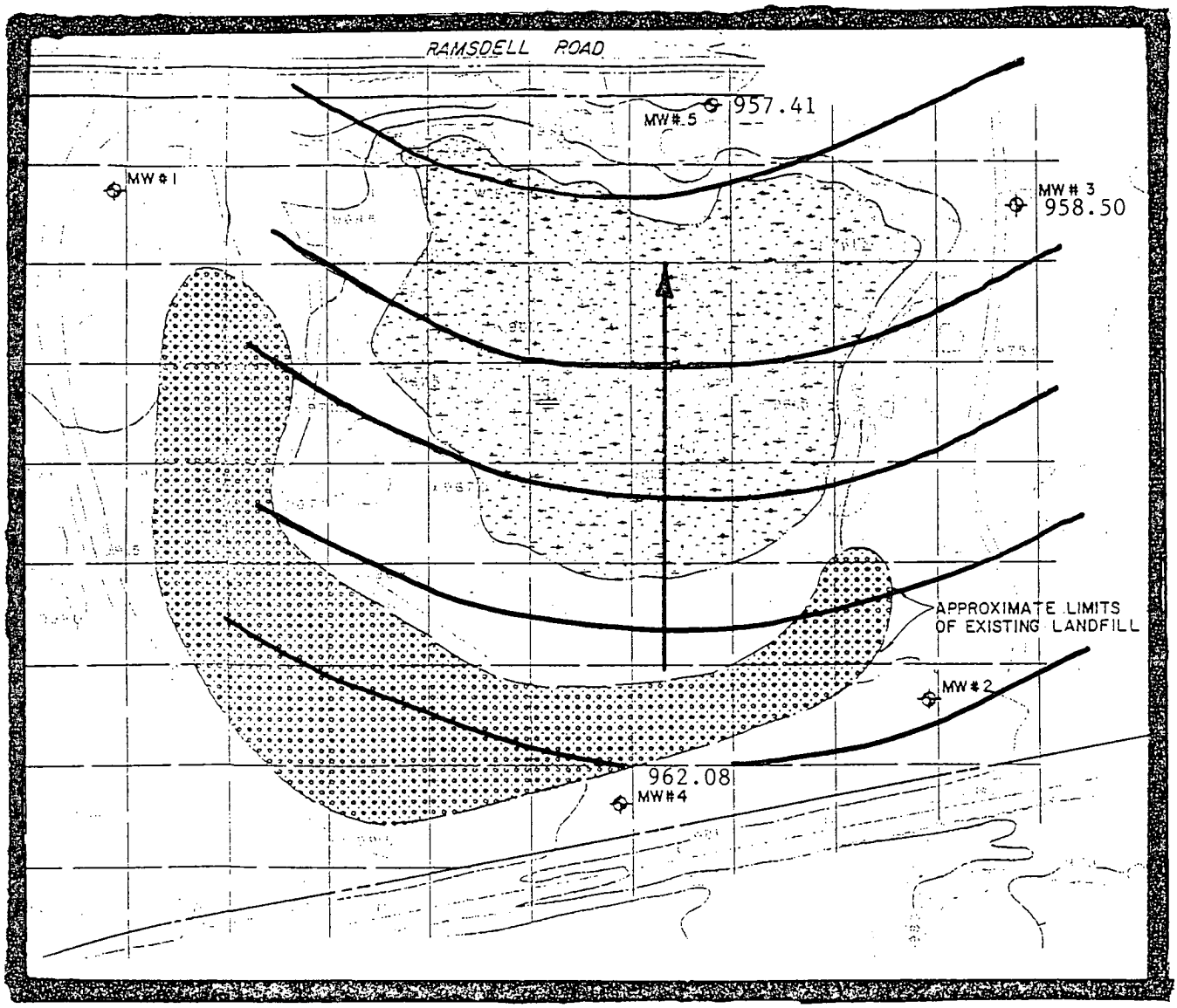
DATE	RESULT	UNITS	DATA QUAL	METHOD
11/22/88	5.900	MG/L		9060
06/15/89	ND<1.000	MG/L		9060
12/14/89	13.000	MG/L		9060
06/21/90	50.000	MG/L		9060
12/06/90	ND<1.000	MG/L		9060
06/20/91	5.000	MG/L		9060
11/07/91	ND<1.000	MG/L		9060
02/27/92	ND<1.000	MG/L		9060
06/25/92	ND<1.000	MG/L		9060
10/01/92	ND<1.000	MG/L		9060
02/25/93	4.100	MG/L		9060
07/15/93	ND<1.000	MG/L		9060
02/21/94	4.400	MG/L		9060
07/28/94	1.900	MG/L		9060
12/22/94	1.800	MG/L		9060
02/28/95	2.400	MG/L		9060
06/28/95	1.900	MG/L		9060
06/28/95 - Dup A	1.900	MG/L		9060
12/14/95	1.400	MG/L		9060
12/14/95 - Dup A	1.500	MG/L		9060
02/15/96	3.100	MG/L		9060
06/20/96	1.500	MG/L		9060

GROUND WATER DATA BASE PRINTOUT

FACILITY: RVAAP RAMSDELL LANDFILL,RAVENNA,OH WELL: MW-5
FCID: 67-00-06 NUMBER OF SAMPLE DATES: 22
PARAMETER: Total Organic Carbon

DATE	RESULT	UNITS	DATA QUAL	METHOD
11/22/88	4.600	MG/L		9060
06/15/89	1.500	MG/L		9060
12/14/89	7.000	MG/L		9060
06/21/90	7.000	MG/L		9060
12/06/90	ND<1.000	MG/L		9060
06/20/91	3.000	MG/L		9060
11/07/91	2.000	MG/L		9060
02/27/92	ND<1.000	MG/L		9060
06/25/92	2.000	MG/L		9060
10/01/92	3.000	MG/L		9060
02/25/93	3.000	MG/L		9060
07/15/93	1.500	MG/L		9060
02/21/94	3.200	MG/L		9060
07/28/94	2.300	MG/L		9060
12/22/94	3.200	MG/L		9060
02/28/95	19.000	MG/L		9060
06/28/95	3.900	MG/L		9060
08/30/95	3.700	MG/L		9060
12/14/95	4.400	MG/L		9060
02/15/96	4.500	MG/L		9060
06/20/96	2.500	MG/L		9060
06/20/96 - Dup A	2.400	MG/L		9060

RVAAP RAMSDELL LANDFILL

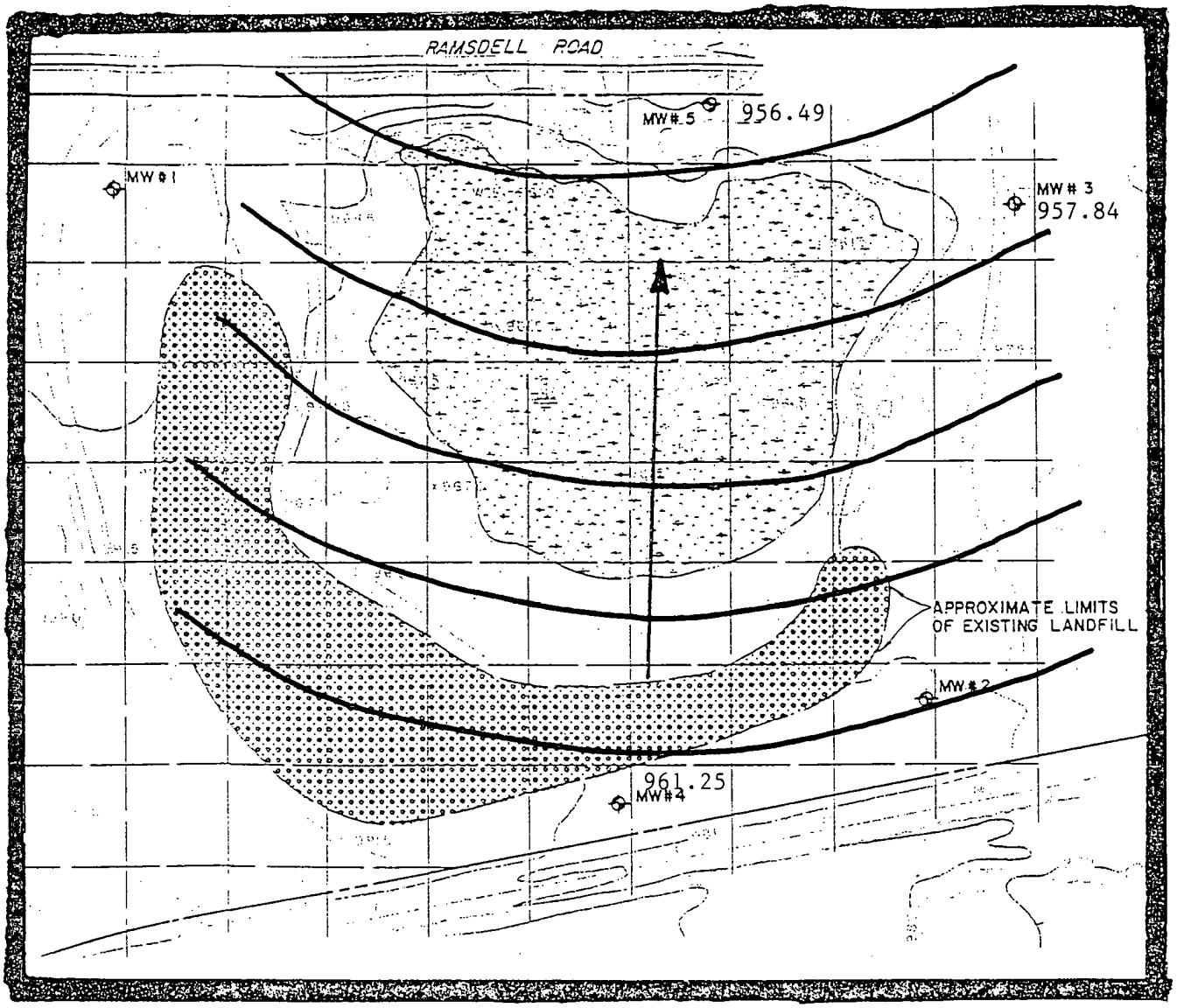


GROUNDWATER LEVEL ELEVATIONS

DATE: 8/8/1996

EXISTING MONITOR WELL LOCATIONS

RVAAP RAMSDELL LANDFILL



GROUNDWATER LEVEL ELEVATIONS

DATE: 9/5/96

EXISTING MONITOR WELL LOCATIONS

TMA
Thermo Analytical

CHAIN OF CUSTODY RECORD

cc: L Johnson

Thermo Analytical
387 Airport Industrial Drive
Ypsilanti, MI 48197

Attach. 5

PROJECT NUMBER	PROJECT NAME:	SAMPLERS: (SIGNATURE)
MH93	Samples To TMA Via Fed Ex	L Johnson / T Boyd

STATION NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	TOC	Conductivity	Total Diss Solids	REMARKS
Land Fill MW #3	8/5/96				Land Fill	10	✓	✓	✓	
Land Fill MW #4	8/5/96				"	SAME	✓	✓	✓	
Land Fill MW #5	8/5/96				"	SAME	✓	✓	✓	
Land Fill MW #Dup	8/5/96				"	SAME	✓	✓	✓	

RECEIVED
AUG 12 1996
BY

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)
L Johnson / T Boyd	8/6/96	Denise Erskine			BY
RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)

COMMENTS:

TMA
Thermo Analytical

cc: L Johnson

CHAIN OF CUSTODY RECORD

Thermo Analytical
387 Airport Industrial Drive
Ypsilanti, MI 48197

PROJECT NUMBER	PROJECT NAME:	SAMPLERS: (SIGNATURE)
MH94	SAMPLES TO TMA VIA FED EX	L Johnson / H Petrick

STATION NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	TOC	Cond	TOTAL DISS SOLIDS					REMARKS
LandFill MW #3	9/5	7/40AM		✓	LandFill	10	✓	✓	✓					
LandFill MW #4	9/5			✓	SAME	SAME	✓	✓	✓					
LandFill MW #5	9/5			✓	SAME	SAME	✓	✓	✓					
LandFill MW Dup	9/5			✓	SAME	SAME	✓	✓	✓					
LandFill Trip Blanks	9/5													

RECEIVED SEP 9 1996

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)
L Johnson / H Petrick	9/5/96	Rodney Pi			
RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)

COMMENTS:

Normality Tests
Report Printed: 10-11-1996 09:00

Facility:67-00-06 RVAAP RAMSDELL LANDFILL

Address:8451 STATE ROUTE 5

City:RAVENNA ST:OH Zip:44266
County:PORTAGE

Contact:MR. WILLIAM TALMON
Phone:(330)358-7400

Permit Type:Detection

Constituent:Cond_L Specific Conductivity, Lab

CAS Number: - -
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 0.000 ppb

Start Date:Nov 22 1988
End Date:Sep 05 1996

Normality Test on Observations for wells listed below:

Well:MW-4 Position:Upgradient Observations:24

Scale	Minimum	Maximum	Mean	Std Dev
Original:	270.000	640.000	487.958	110.589
Log:	5.598	6.461	6.163	0.243

Well:MW-1 Position:Downgradient Observations:19

Scale	Minimum	Maximum	Mean	Std Dev
Original:	310.000	670.000	482.368	96.363
Log:	5.737	6.507	6.159	0.207

Well:MW-2 Position:Downgradient Observations:13

Scale	Minimum	Maximum	Mean	Std Dev
Original:	365.000	593.000	489.462	71.003
Log:	5.900	6.385	6.183	0.151

Well:MW-3 Position:Downgradient Observations:25

Scale	Minimum	Maximum	Mean	Std Dev
Original:	250.000	847.000	642.000	144.554

Log:	5.521	6.742	6.434	0.267

Well:MW-5 Position:Downgradient Observations:24

Scale	Minimum	Maximum	Mean	Std Dev
Original:	300.000	860.000	588.292	107.356
Log:	5.704	6.757	6.359	0.201

Pooled Statistics
Observations: 105

Statistic	Original Scale	Log Scale
Mean:	546.743	6.274
Std Dev:	129.649	0.251
Skewness:	0.149	-0.573
Kurtosis:	-0.044	0.333
Minimum:	250.000	5.521
Maximum:	860.000	6.757
CV:	0.237	0.040

Shapiro-Francia Statistics

Scale	Test Statistic	5% Critical Value	1% Critical Value
Original:	0.9873	0.9760	0.9670
Log:	0.9700*	0.9760	0.9670

* Indicates statistically significant evidence of non-normality.

Kruskal-Wallace Test
Report Printed: 10-11-1996 09:02

Facility:67-00-06 RVAAP RAMSDELL LANDFILL

Address:8451 STATE ROUTE 5

City:RAVENNA ST:OH Zip:44266
County:PORTAGE

Contact:MR. WILLIAM TALMON
Phone:(330)358-7400

Permit Type:Detection

Constituent:Cond L Specific Conductivity, Lab

CAS Number: - -
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 0.000 ppb

Start Date:Nov 22 1988
End Date:Sep 05 1996

Data Mode:Log Transformed

Background Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-4	24	0	6.46	5.60	6.16	0.24

Compliance Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-1	19	0	6.51	5.74	6.16	0.21
MW-2	13	0	6.39	5.90	6.18	0.15
MW-3	25	0	6.74	5.52	6.43	0.27
MW-5	24	0	6.76	5.70	6.36	0.20

H Statistic: 29.6784
H Adjusted for Ties: 29.6886
Degrees of Freedom: 4
Chi-Squared: 9.4878
Zα/DF: 2.2414

* Indicates significant evidence of contamination

Well ID Crit. Diff. Rank Avg. Background Rank Avg. Difference

Normality Tests
Report Printed: 10-11-1996 09:06

Facility:67-00-06 RVAAP RAMSDELL LANDFILL

Address:8451 STATE ROUTE 5

City:RAVENNA ST:OH Zip:44266
County:PORTAGE

Contact:MR. WILLIAM TALMON
Phone:(330)358-7400

Permit Type:Detection

Constituent:TDS Total Dissolved Solids

CAS Number: - -
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 0.000 ppb

Start Date:Nov 22 1988
End Date:Sep 05 1996

Normality Test on Observations for wells listed below:

Well:MW-4 Position:Upgradient Observations:24

Scale	Minimum	Maximum	Mean	Std Dev
Original:	190000.000	450000.000	355416.656	73885.289
Log:	12.155	13.017	12.757	0.235

Well:MW-1 Position:Downgradient Observations:19

Scale	Minimum	Maximum	Mean	Std Dev
Original:	220000.000	430000.000	331473.656	73043.641
Log:	12.301	12.972	12.686	0.234

Well:MW-2 Position:Downgradient Observations:13

Scale	Minimum	Maximum	Mean	Std Dev
Original:	290000.000	505000.000	381230.781	70909.750
Log:	12.578	13.132	12.835	0.187

Well:MW-3 Position:Downgradient Observations:25

Scale	Minimum	Maximum	Mean	Std Dev
Original:	31000.000	742000.000	464239.969	149544.109

Log:	10.342	13.517	12.945	0.603

Well:MW-5 Position:Downgradient Observations:23

Scale	Minimum	Maximum	Mean	Std Dev
Original:	28000.000	670000.000	426260.813	122931.711
Log:	10.240	13.415	12.866	0.604

Pooled Statistics
Observations: 104

Statistic	Original Scale	Log Scale
Mean:	396096.125	12.823
Std Dev:	117004.500	0.444
Skewness:	-0.060	-3.560*
Kurtosis:	1.242	18.207
Minimum:	28000.000	10.240
Maximum:	742000.000	13.517
CV:	0.295	0.035

Shapiro-Francia Statistics

Scale	Test Statistic	5% Critical Value	1% Critical Value
Original:	0.9674*	0.9760	0.9670
Log:	0.6676*	0.9760	0.9670

* Indicates statistically significant evidence of non-normality.

Kruskal-Wallace Test
Report Printed: 10-11-1996 09:07

Facility:67-00-06 RVAAP RAMSDELL LANDFILL

Address:8451 STATE ROUTE 5

City:RAVENNA ST:OH Zip:44266
County:PORTAGE

Contact:MR. WILLIAM TALMON
Phone:(330)358-7400

Permit Type:Detection

Constituent:TDS Total Dissolved Solids

CAS Number: - -
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 0.000 ppb

Start Date:Nov 22 1988
End Date:Sep 05 1996

Data Mode:Log Transformed

Background Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-4	24	0	13.02	12.15	12.76	0.24

Compliance Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-1	19	0	12.97	12.30	12.69	0.23
MW-2	13	0	13.13	12.58	12.84	0.19
MW-3	25	0	13.52	10.34	12.94	0.60
MW-5	23	0	13.42	10.24	12.87	0.60

H Statistic: 23.3185
H Adjusted for Ties: 23.3413
Degrees of Freedom: 4
Chi-Squared: 9.4878
Zα/DF: 2.2414

* Indicates significant evidence of contamination

Well ID Crit. Diff. Rank Avg. Background Rank Avg. Difference

Normality Tests
Report Printed: 10-11-1996 09:11

Facility:67-00-06 RVAAP RAMSDELL LANDFILL

Address:8451 STATE ROUTE 5

City:RAVENNA ST:OH Zip:44266
County:PORTAGE

Contact:MR. WILLIAM TALMON
Phone:(330)358-7400

Permit Type:Detection

Constituent:TOC Total Organic Carbon

CAS Number: - -
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 1000.000 ppb

Start Date:Nov 22 1988
End Date:Sep 05 1996

Normality Test on Observations for wells listed below:

Well:MW-4 Position:Upgradient Observations:24

Scale	Minimum	Maximum	Mean	Std Dev
Original:	500.000	50000.000	5012.499	10097.021
Log:	6.215	10.820	7.651	1.236

Well:MW-1 Position:Downgradient Observations:19

Scale	Minimum	Maximum	Mean	Std Dev
Original:	500.000	50000.000	4484.211	11189.344
Log:	6.215	10.820	7.406	1.161

Well:MW-2 Position:Downgradient Observations:13

Scale	Minimum	Maximum	Mean	Std Dev
Original:	500.000	12000.000	2953.846	3195.991
Log:	6.215	9.393	7.597	0.898

Well:MW-3 Position:Downgradient Observations:25

Scale	Minimum	Maximum	Mean	Std Dev
Original:	1000.000	20000.000	6088.000	4655.312

Log:	6.908	9.903	8.513	0.624

Well:MW-5 Position:Downgradient Observations:23

Scale	Minimum	Maximum	Mean	Std Dev
Original:	500.000	19000.000	4052.174	3820.027
Log:	6.215	9.852	8.004	0.809

Pooled Statistics
Observations: 104

Statistic	Original Scale	Log Scale
Mean:	4704.808	7.885
Std Dev:	7414.815	1.032
Skewness:	4.666*	0.189
Kurtosis:	24.820	0.103
Minimum:	500.000	6.215
Maximum:	50000.000	10.820
CV:	1.576	0.131

Shapiro-Francia Statistics

Scale	Test Statistic	5% Critical Value	1% Critical Value
Original:	0.4653*	0.9760	0.9670
Log:	0.9624*	0.9760	0.9670

* Indicates statistically significant evidence of non-normality.

Kruskal-Wallace Test
Report Printed: 10-11-1996 09:12

Facility:67-00-06 RVAAP RAMSDELL LANDFILL

Address:8451 STATE ROUTE 5

City:RAVENNA ST:OH Zip:44266
County:PORTAGE

Contact:MR. WILLIAM TALMON
Phone:(330)358-7400

Permit Type:Detection

Constituent:TOC Total Organic Carbon

CAS Number: - -
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 1000.000 ppb

Start Date:Nov 22 1988
End Date:Sep 05 1996

Data Mode:Log Transformed

Background Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-4	24	29	10.82	6.21	7.65	1.24

Compliance Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-1	19	26	10.82	6.21	7.41	1.16
MW-2	13	15	9.39	6.21	7.60	0.90
MW-3	25	0	9.90	6.91	8.51	0.62
MW-5	23	9	9.85	6.21	8.00	0.81

H Statistic: 22.6045
H Adjusted for Ties: 22.6990
Degrees of Freedom: 4
Chi-Squared: 9.4878
Zα/DF: 2.2414

* Indicates significant evidence of contamination

Well ID Crit. Diff. Rank Avg. Background Rank Avg. Difference

since 1827
MASON & HANGER CORPORATION
RAVENNA ARMY AMMUNITION PLANT

December 3, 1996

THRU: Contracting Officer's Representative
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, Ohio 44266-9297

TO: State of Ohio
Environmental Protection Agency
Northeast District Office
2110 E. Aurora Road
Twinsburg, Ohio 44087-1969
ATTN: Ms. Virginia Wilson, Solid Waste

Subject: Groundwater Monitoring, Ramsdell Landfill,
Ravenna Army Ammunition Plant

Dear Ms. Wilson:

This letter will serve to confirm that we will be sampling the monitoring wells at the installation's closed landfill later this month. We currently plan to sample the wells in question on Thursday, December 19, 1996.

The writer will serve as Mason & Hanger's point of contact with respect to this matter, and can be reached at (330) 358-7400. The Army's point of contact is Mr. John A. Cicero, Jr., who can be reached at (330) 358-7311.

Sincerely,
Mason & Hanger Corporation

W. B. Talmon, Jr.
Site Manager

WBT/wbt/lfsamnot

cc: Larry Boggs
Portage County Health Department, ATTN: Stephen Uecke
Landfill GW Mon. File
Reading File

OhioEPA
State of Ohio Environmental Protection Agency
Northeast District Office
2110 E. Aurora Road
Twinsburg, Ohio 44087-1969
(216) 425-9171
FAX (216) 487-0769

TO 2/26/96
CR-COR
PROP ADM
LAND MGR
CONTRACTOR 2/26/96
RETURN FOR FILE

George V. Voinovich
Governor

February 23, 1996

RE: RAVENNA ARMY AMMUNITION PLANT
PORTAGE COUNTY
02-67-0209
OH5 210 020 736
GROUND WATER MONITORING

CERTIFIED MAIL

Mr. John Cicero, Commander Representative
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, Ohio 44266-9297

Dear Mr. Cicero:

This office has received your submittal dated July 7, 1995 in response to the Ohio EPA's June 2, 1995 letter regarding Ravenna Arsenal Ammunition Plant's (RVAAP) ground water monitoring information for 1992, 1993 and 1994.

Based upon a review of the submittal, this office has the following comments:

1. RVAAP has agreed to use only DET and OBG designations for the ground water monitoring wells at the open detonation and open burning grounds. This should enhance the clarity of future ground water monitoring reports.

2. In the original Ohio EPA comments, RVAAP was instructed to replace OBG-3 if it continued to supply insufficient water for sampling.

   In response, RVAAP agrees that OBG-3 should be replaced if it continues to supply insufficient water for sampling and requests Ohio EPA assistance in locating a replacement well.

   If OBG-3 continues to supply insufficient water for sampling and must be replaced, RVAAP shall submit a proposed location for the replacement well including documentation of the reasons the replacement site was chosen. The Ohio EPA can then offer an evaluation of the appropriateness of the proposed site.

3. In the original Ohio EPA comment, RVAAP was informed that, based on the detection of explosive compounds in ground water samples obtained from well OBG-1, it was not an appropriate background monitoring well and it should be replaced.

   In the response letter, RVAAP agrees that OBG-1 should be replaced. However, in subsequent discussions with facility representatives, it was indicated that the detection of explosives in ground water samples from the site may be due to problems in the protocol followed by the laboratory. If such problems are confirmed, replacement of OBG-1 may not be necessary.

RVAAP shall submit for review the supporting documentation for the conclusion that the detection of explosives in ground water samples was due to problems in laboratory protocol. If such documentation is not provided or if the documentation is insufficient to support the conclusion that the detection of explosives in OBG-1 was due to laboratory error, RVAAP shall proceed with the replacement of OBG-1 with a new upgradient well. The proposed site for the replacement well, along with documentation of why the site was chosen, shall be submitted to the Ohio EPA for review and approval.

4. Exceedences of the MCLs and or action levels for cadmium, antimony, arsenic, chromium, lead, and nickel occurred during 1992 and 1993. In discussions with the facility, it was indicated that the metals samples are not field filtered. Thus, the data report total metals concentrations. It was recommended by the Ohio EPA that during subsequent sampling events, dissolved metals samples be collected (field filtered and acidified) and analyzed rather than total metals samples. Dissolved metals data also will be more applicable if a risk assessment clean closure is sought.

RVAAP shall consider these comments and amend its groundwater monitoring program accordingly. If you have any questions regarding this letter, please do not hesitate to contact Ms. Diane Kurlich or myself at (216) 963-1200.

Sincerely,

Murat Tukel

Murat Tukel
Environmental Engineer
Division of Hazardous Waste
Management

MT/fwn

cc: Carolyn Princic, DHWM, NEDO
Diane Kurlich, DDAGW, NEDO
Alan Harness, DHWM, CO / CO File

OhioEPA
State of Ohio Environmental Protection Agency
Northeast District Office
2110 E. Aurora Road
Twinsburg, Ohio 44087-1969
(216) 425-9171
FAX (216) 487-0769

TO 2/26/96
CR-OOR
PROP ADM
LAND MGR
CONTRACTOR 2/26/96
RETURN FOR FILE

George V. Voinovich
Governor

February 23, 1996

RE: RAVENNA ARMY AMMUNITION PLANT
PORTAGE COUNTY
02-67-0209
OH5 210 020 736
GROUND WATER MONITORING

CERTIFIED MAIL

Mr. John Cicero, Commander Representative
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, Ohio 44266-9297

Dear Mr. Cicero:

This office has received the facility's Supplementary Annual Report Forms and the Ground Water Monitoring information for 1994 on February 28, 1995. Ravenna Army Ammunition Plant (RVAAP) also submitted its quarterly Ground Water Monitoring results for the first, second and third quarters of 1995 on May 3, 1995, August 18, 1995 and December 14, 1995 respectively. These reports were submitted in a timely manner.

Based upon a review of the submittals, this office has the following comments:

GENERAL COMMENTS CONCERNING ALL FOUR SUBMITTALS

1. Statistical analyses performed in the annual report and in the quarterly reports indicate that the company has triggered with respect to indicator parameters at both the open burning and open detonation areas. The statistical triggers are summarized below:

   1994 Annual, First Quarter 1995, and Third Quarter 1995 Reports- Statistical analysis of the data included in these reports indicate that there is a statistically significant increase in specific conductivity at the open burning area when the upgradient concentrations are compared to downgradient concentrations. Data from the open detonation area indicate that there is a statistically significant increase in specific conductivity and TOC when the upgradient concentrations are compared to the downgradient concentrations.

   Second Quarter 1995 Report- Statistical analysis of the data generated during the June 1995 sampling event indicates that there is a statistically significant increase in specific conductivity concentrations when upgradient concentrations are compared to downgradient concentrations in both the open burning and open detonation areas.

The statistical "triggers" cited above indicate that the facility may be affecting the quality of ground water in the vicinity of the open burning and open detonation areas. Based on the statistical analysis of the indicator parameters, the facility shall enter the assessment phase of monitoring as required by OAC 3745-65-93 (D). RVAAP shall immediately prepare and implement a ground water quality assessment plan (GWQAP) that meets the requirements of OAC 3745-65-93 (D)(3) and is capable of determining the full rate, extent, and concentration of contamination in the ground water at the site. Although Ohio EPA's approval of a GWQAP is not required for implementation, RVAAP shall submit its plan to this office for review.

2. The detection limits for some of the metals vary with sampling events. During some of the sampling events the detection limits for metals such as antimony, beryllium, cadmium, and thallium are greater than the respective MCLs. RVAAP shall ensure that the detection limits of all analytical parameters are less than or equal to any applicable MCL or action level during the analysis of samples collected during each sampling event.

   In addition, the detection limit for picric acid has varied from 5.3 ug/L to 106 ug/L. RVAAP shall explain this sizable increase in the detection limit for picric acid. If possible, RVAAP shall ensure that the lower detection is achieved during all future sampling events.

3. The direction of ground water flow at both the open detonation and open burning areas is stable and does not vary significantly from quarter to quarter. The ground water flow directions reported in the recent submittals are also consistent with the ground water flow directions reported historically.

4. The statistical analyses submitted for review should always include the analyses conducted to determine the normality of the data. Although this information is included in the First Quarter 1995 Report, it is not included in the Annual Report or in the Second and Third Quarter Reports. The appropriateness of the statistical methods used cannot be evaluated without an analysis of the normality of the data. RVAAP shall include the statistical analyses for normality determination in its future submittals.

5. Some of the results in the Quarterly Reports are flagged with an asterisk. The footnotes for the laboratory data sheets indicates that this signifies that the result reported is the average of duplicate analyses. Reporting an average of duplicate analyses is not an acceptable laboratory practice. RVAAP shall explain why this occurred and shall ensure that it does not happen in the future.

6. The laboratory data sheets for the analysis of VOCs do not include the analytical method used. Although the sheets have a space for the method to be specified, it has been left blank on the sheets submitted. For the future submittals, RVAAP shall specify the analytical methods used on its laboratory data sheets.

SPECIFIC COMMENTS CONCERNING THE THIRD QUARTER REPORT

7. The explosives HMX (1.1 ug/L) and RDX (3.3 ug/L) were detected in the duplicate sample collected at the open detonation area. The facility has not indicated at which well this sample was collected. Explosive compounds have periodically been detected in ground water samples collected from both the open detonation and open burning areas. The detection of explosive compounds in samples collected from site monitoring wells seems to confirm that the facility is affecting the quality of ground water at the site and reinforces the need for RVAAP to enter the assessment phase of ground water monitoring. In addition, in future submittals, RVAAP shall specify at which well the duplicate sample was obtained.

8. The compound 1,2-DCA was detected in samples obtained from the following wells during the third quarter sampling event: DET-1; DET-2; DET-4; DET-duplicate sample, no well specified; OBG-2; OBG-3; OBG-4; and OBG-duplicate sample, no well specified. The concentrations detected ranged from 0.53 ug/L to 0.81 ug/L. The detection of a volatile organic compound in ground water sample obtained from the monitoring wells at the site may confirm that the company is affecting the quality of ground water at the site and reinforces the need for RVAAP to enter the assessment phase of ground water monitoring. In addition, as mentioned above, RVAAP shall ensure that the well from which the duplicate sample is obtained is specified on the data submitted for review.

SPECIFIC COMMENTS CONCERNING THE 1994 ANNUAL REPORT

9. The report was submitted in a timely manner as required by OAC 3745-54-75.

10. The report included the information required by OAC 3745-65-94 (A)(2).

11. RVAAP has submitted the ground water data on computer disk and as hard copy as requested by the Ohio EPA.

On February 16, 1996, this office has received RVAAP's submittals of 1995 Supplementary Annual Report Forms for Ground Water Monitoring and ground water monitoring results for the fourth quarter of 1995 . These documents are currently being reviewed by this office and any findings and/or comments with regards to these documents will be forwarded to RVAAP with a separate letter.

Please respond to this letter by addressing the above comments and submit the requested documentation by April 1, 1996. If you have any questions regarding this letter, please do not hesitate to contact Ms. Diane Kurlich or myself at (216) 963-1200.

Sincerely,

Murat Tukel

Murat Tukel
Environmental Engineer
Division of Hazardous Waste
Management

MT/fwn

cc: Carolyn Princic, DHWM, NEDO
Diane Kurlich, DDAGW, NEDO
Alan Harness, DHWM, CO / CO File

COR

RAVENNA ARMY AMMUNITION PLANT

8451 STATE ROUTE 5 • RAVENNA, OHIO 44266-9297

TO	2/29/96	
1	CR-COR	
	PROP ADM	
	LAND MGR	
	CONTRACTOR	
☒	RETURN FOR FILE	

February 28, 1996

Mr. Jeffrey B. Radin
Laboratory Manager
Thermo Analytical/Ann Arbor
387 Airport Industrial Drive
Ypsilanti, MI 48198

Subject: Ohio EPA Comments Regarding OB/OD Ground Water Analytical Results

Dear Mr. Radin:

In accordance with Ohio EPA requirements, the analytical results of ground water monitoring well sampling conducted at the Ravenna Army Ammunition Plant Open Burning/Open Detonation areas have routinely been submitted to OEPA for their review. After a review of the submitted data, the Ohio EPA has issued a letter to the Ravenna Army Ammunition Plant requesting further explanation regarding specific analytical procedures or results.

Following are three specific comments issued by Ohio EPA regarding work performed by TMA. Please review these comments and provide Mason & Hanger a written response to each comment as soon as possible:

1. The detection limits for some of the metals vary with sampling events. During some of the sampling events the detection limits for metals such as antimony, beryllium, cadmium, and thallium are greater than the respective MCLs. RVAAP shall ensure that the detection limits of all analytical parameters are less than or equal to any applicable MCL or action level during the analysis of samples collected during each sampling event. In addition, the detection limit for picric acid has varied from 5.3 ug/l to 106 ug/l. RVAAP shall explain this sizable increase in the detection limit for picric acid. If possible, RVAAP shall ensure that the lower detection is achieved during all future sampling events.

2. Some of the results in the Quarterly Reports are flagged with an asterisk. The footnotes for the laboratory data sheets indicates that this signifies that the result reported is the average of duplicate analyses. Reporting an average of duplicate analyses is not an acceptable laboratory practice. RVAAP shall explain why this occurred and shall ensure that it does not happen in the future.

3. The laboratory data sheets for the analysis of VOCs do not include the analytical method used. Although the sheets have a space for the method to be specified, it has been

left blank on the sheets submitted. For the future submittals, RVAAP shall specify the analytical methods used on its laboratory data sheets.

In addition, Mason & Hanger has noticed on several laboratory reports that TMA has provided quantified results for a particular analyte, for example Thallium, that are less than the method detection limit listed for the analyte. Please explain why this occurs.

The Scope of Work provided to TMA by Mason & Hanger requires that all analyses be performed to the minimum detection limits set for the analytical methods specified for use. Also, it is further required that if variances to the specified analytical methods or techniques are necessary, a letter of explanation must be attached to the affected analytical report. Please insure that this procedure is followed in future reports.

If you have any questions regarding the comments, please contact me at (216) 358-7400.

Sincerely,
Mason & Hanger-Silas Mason Co., Inc.

W. B. Talmon, Jr.
Site Manager

WBT

cc: W. B. Talmon, Jr.
RVAAP/John A. Cicero, Jr.

RAVENNA ARMY AMMUNITION PLANT

8451 STATE ROUTE 5 • RAVENNA, OHIO 44266-9297

March 1, 1996

TO	3/1/96
	CB-OOR
	PROP ADM
	LAND MGR
	CONTRACTOR
	RETURN FOR FILE

Contracting Officer's Representative
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, Ohio 44266-9297

Subject: RAVENNA ARMY AMMUNITION PLANT
PORTAGE COUNTY
02-67-0209
OH5 210 020 736
GROUND WATER MONITORING

Reference: Certified letter from the Ohio EPA to the Commander's Representative dated February 23, 1996, subject as above

Dear Sir:

The referenced letter directed RVAAP to develop a Ground Water Quality Assessment Plan (GWQAP) and implement a ground water assessment program for the installation's Open Burning and Open Detonation Grounds. It also requested that the installation provide written responses to questions that the agency had with respect to the ground water data that the installation had previously submitted.

Following the receipt of such correspondence, it is necessary to establish a record within the enforcement tracking module of the ACTS database. Transmitted herewith are two (2) copies of the record that was developed in response to the receipt of the referenced letter. Please furnish a copy of the record to Mr. Dennis Versluys, AMSIO-EQM, and retain a copy for your files.

The writer will serve as Mason & Hanger's point of contact with respect to this matter, and can be reached at (216) 358-7400.

Sincerely,
MASON & HANGER-SILAS MASON CO., INC.

W. B. Talmon, Jr.
Site Manager

CF Versluys w/ back up documents) 3/4/96
Whelove w/o " "

WBT:wbt

cc: Robert Whelove/AMSIO-EQE
ACTS File
OB/OD Ground Water Monitoring File
Reading File

ENFORCEMENT ACTION TRACKING

OC NAME JOHN A. CICERO, JR. PH.(216) 358-7311

SC: IOC RECORD NUMBER : 31

INSTALLATION: RAVENNA AAP RECORD'S FY : 96

1. REGULATORY REQUIREMENT RCRA_C
2. ENFORCEMENT ACTION TYPE INOV IF CMPA, AGREEMENT TYPE
3. DATE OF ACTION 02/23/1996 4. ACTION # 20736-31-RCRA_C-INOV

5. FINDINGS:

FINDING # / TYPE OF FINDING	DESCRIPTION	STATUS	DATE	1383 NUMBER
0001 - O	QUESTIONS/CONCERNS ABOUT ANALYTICAL RESULTS	U	02/23/1996	
0002 - P	ASSESSMENT MONITORING OF GROUND WATER	U	02/23/1996	RVAP020996

FINDING SUMMARY

TOTAL :	2
ADMINISTRATIVE:	0
OPERATIONAL:	1
PROJECT:	1

6. STATUS OF ACTION STATUS DATE
UNRESOLVED 02/23/1996

7. ISSUING AGENCY(S) STATE

8. PREVIOUS OR REPEAT INOV's

9. CORRECTIVE ACTIONS MILESTONES

TARGET	ACTUAL	MILESTONE
04/01/1996	01/01/1900	SUBMIT WRITTEN RESPONSES REGARDING QUESTIONS/CONCERNS RE ANALYTICAL RESULTS
04/01/1996	01/01/1900	SUBMIT GROUND WATER QUALITY ASSESSMENT PLAN

10. REASON FOR NON-COMPLIANCE
STATISTICALLY SIGNIFICANT EVIDENCE OF GW CONTAMINATION HAS BEEN DEMONSTRATED AT THE INSTALLATION'S OB/OD GROUNDS. THE OHIO EPA HAS REQUESTED THAT A GW QUALITY ASSESSMENT PLAN BE DEVELOPED, AND A GW QUALITY ASSESSMENT PROGRAM BE IMPLEMENTED. THE OHIO EPA HAS ALSO REQUESTED THAT RVAAP PROVIDE WRITTEN RESPONSES TO ITS SPECIFIC QUESTIONS AND CONCERNS REGARDING THE ANALYTICAL RESULTS PROVIDED BY THE INSTALLATION.

RAVENNA ARMY AMMUNITION PLANT

8451 STATE ROUTE 5 • RAVENNA, OHIO 44266-9297

March 4, 1996

TO	3/4/96	
✓	CR-COE	
	PROP ADM	
	LAND MGR	
	CONTRACTOR	
✓	RETURN FOR FILE	

THRU: Contracting Officer's Representative
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, Ohio 44266-9297

TO: State of Ohio
Environmental Protection Agency
Northeast District Office
2110 E. Aurora Road
Twinsburg, Ohio 44087-1969
ATTN: Mr. Murat Tukel / Hazardous Wastes

Subject: Ground Water Monitoring at the Open Burning and Open Detonation Grounds, Ravenna Army Ammunition Plant

Reference: Your certified letters dated February 23, 1996, subject: RAVENNA ARMY AMMUNITION PLANT, PORTAGE COUNTY, 02-67-0209, OH5 210 020 736, GROUND WATER MONITORING

Dear Sir:

This letter will serve to confirm that we will be sampling the monitoring wells at the installation's Open Burning and Open Detonation Grounds later this month. The samples will be collected in accordance with the provisions of the installation's approved detection monitoring program. We currently plan to sample the wells in question on Thursday, March 21, 1996.

While personnel at the installation and at HQ IOC are addressing the issues raised in your letters dated February 23, 1996, the installation is not expected be in a position to implement a ground water quality assessment program prior to the collection of the required quarterly samples. Consequently, the samples in question will be collected in accordance with the detection monitoring program.

The writer will serve as Mason & Hanger's point of contact with regard to this matter, and can be reached at (216) 358-7400. The Government's point of contact is Mr. John A. Cicero, Jr., who can be reached at (216) 358-7311.

CF:
IMSIO-EQE
Bob Whelan 3/4/96

Sincerely,
Mason & Hanger-Silas Mason Co., Inc.

W. B. Talmon, Jr.
Site Manager

WBT:wbt

cc: Ground Water Monitoring File
Reading File

DEPARTMENT OF THE ARMY
HEADQUARTERS, U.S. ARMY INDUSTRIAL OPERATIONS COMMAND
ROCK ISLAND, ILLINOIS 61299-6000

REPLY TO ATTENTION OF

AMSIO-EQ (200-1a)

25 MAR 1996

MEMORANDUM FOR Commander's Representative, ATTN: SIORV-CR, 8451 State Route 5, Ravenna, OH 44266-8879

SUBJECT: Groundwater Monitoring at Open Burning (OB) and Open Detonation (OD) Grounds

1. References:

a. Letter, Ohio EPA, 23 Feb 96, subject: Groundwater Monitoring at RVAAP (1992, 93, and 94).

b. Letter, Ohio EPA , 23 Feb 96, subject: Groundwater Monitoring at RVAAP, (results from monitoring in first, second and third quarters FY 95).

c. A series of FONECONS between Mr. Robert Whelove, Jr., HQ, IOC, AMSIO-EQE, and Mr. Murat Tukel and Ms. Diane Kurlich, OEPA, during the timeframe from 3 to 15 Mar 96, subject was about groundwater monitoring requirements in reference 1a and 1b above.

2. This response can be used in your reply to the Ohio EPA regarding the two letters received from the Ohio EPA regarding the subject of past groundwater monitoring results at RVAAP and their requirements for us regarding future groundwater monitoring reporting. The reply to letter reference 1a. is at enclosure 1 and 1b is at enclosure 2. We have referenced the Ohio EPA in paragraphs in our responses.

3. We would like to thank Mr. Murat Tukel and Ms. Diane Kurlich of the Northeast office of the Ohio EPA for their assistance with some of the technical aspects of the above and their rapid responses for further information which has helped us greatly in our reply.

4. The POC for this action is Mr. Robert Whelove, Jr., AMSIO-EQE, (309)782-1092, E-mail rwhelove@ria-emh2.army.mil.

FOR THE COMMANDER:

Robert J. Radkiewicz

2 Encls
as

ROBERT J. RADKIEWICZ
DCS for Environmental Management

Enclosure 1 Reference 1a

1. Paragraph 1, Ref. 1a- We concur with the comment.

2. Paragraph 2, Ref. 1a- OBG- 3 has been supplying enough water since Mason and Hangaer initiated its procedures to draw water from the well for a total of one day prior to sampling the contents of the well. A previous contractor drew and sampled almost simultaneously and the well may not have had enough flow for this quick procedure. We do not foresee that we will have to replace the well in the foreseeable future. The well has supplied enough water for sampling since 1 October 1993.

3. Paragraph 3, Ref. 1a- We have not at this time received written confirmation that we have a problem with our protocol. However at this time we have verbal and informal fax information this is the case. We would like to delay replacing the background well until we can develop a history with an improved protocol which may negate the need for a replacement well. We expect this can be accomplished prior to the next sampling event on 20 June 96, subject to the availability of funds.

4. Paragraph 4., Ref. 1a.- We started field filtering and acidifying field samples and have been reporting dissolved metals beginning in the 14 Dec 95 reported results. A preliminary review of the data indicated we were still exceeding some MCL's. See response to paragraph 1, ref 1b. next page for further details to this response.

Enclosure 2. , Ref. 1b.

1. Paragraph 1, Ref. 1b. -. We are arranging for a statistical analysis between the up gradient background wells and the Downgradient sample wells ground water data for site specific parameters at the Open Burning Area and the Open Detonation Area starting with the 20 June 96 sampling event for four , once a quarter ,sampling events. The data will be normalized. The following site specific heavy metals, explosives, ands organic chemicals groundwater well sample data will be statistically analyzed for significant differences if they exist: (1) Heavy metals- Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cyanide, Iron, Magnesium, Manganese, Mercury, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Zinc, Nitrate as nitrogen, Nitrite as nitrogen, and Copper and Lead ; (2) Explosives- 2,4-Dinitrotoluene, 2,6-Dinitrotoluene, Cyclotrimethylenenitramine (HMX), Nitroquanadine, Picric Acid, Cyclotetramethylenetetranitramine (RDX), 1,3,5-Trinitrobenzene, and 2,4,6-Trinitrotoluene (TNT) ; Organic chemical- 1,2-Dichloroethane. This particular effort in this paragraph is subject to the availability of funds.

2. Paragraph 2, Ref. 1b- Our contracting laboratory reports some improvements in protocol procedures which will lead to a lower detection limit on picric acid of 2.5 ug/l (ppb).

3. Paragraph 3., Ref 1b.- No comment.

4. Paragraph 4., Ref. 1b. - The data will be normalized in the future quarterly reports and the next annual report: subject to the availability of funds..

5. Paragraph 5., Ref. 1b. - Asterisks will be eliminated from our data reporting. Our contracting laboratory reported that the Corps. of Engineers in conjunction with the US EPA was requiring this at another site and assumed those same procedures at RVAAP. Since the OEPA has taken exception to averaging two results, the practiced will be stopped.

6. Paragraph 6., Ref. 1b. - The laboratory sheets will include the laboratory test method in the future quarterly submittals.

7. Paragraph 7., Ref. 1b. - See response in paragraph 1. , above. Wells will be identified in the future.

8. Paragraph 8.,Ref. 1b. - See response in paragraph 1. , above. Wells will be identified in the future.

Closure File

OhioEPA
State of Ohio Environmental Protection Agency

STREET ADDRESS:
1800 WaterMark Drive
Columbus, OH 43215-1099

TELE: (614) 644-3020 FAX: (614) 644-2329

MAILING ADDRESS:
P.O. Box 1049
Columbus, OH 43216-1049

TO	11/14/96
CR.COR	
PROP ADM	
LAND MGR	
CONTRACTOR	
RETURN FOR FILE	

X for WBT

November 7, 1996

Re: Receipt of Closure Plan
U.S. EPA ID No.
OH5210020736

Ravenna Army Ammunition Plant
Attn: Mr. John A. Cicero, Jr.
8451 State Route 5
Ravenna, Ohio 44266-9297

Dear Mr. Cicero:

With this letter the Ohio EPA acknowledges receipt of the partial closure plan for the open detonation area located at your facility. A public notice concerning receipt of the closure plan will appear the week of November 11, 1996 in The Record Courier newspaper. The Director of Ohio EPA will act upon the closure plan request following the close of the public comment period on December 21, 1996.

A copy of the partial closure plan will be available for public review at the Reed Memorial Library, 167 East Main Street, Ravenna, Ohio 44266.

Please contact the Ohio EPA, Northeast District Office, 2110 E. Aurora Road, Twinsburg, Ohio, tel: (216) 963-1200, Attn: Sheila Abraham, if you have any questions on this matter.

Sincerely yours,

M. Lonnie Terry
Data Management Section
Division of Hazardous Waste Management

cc. Montee Suleiman, DHWM
Sheila Abraham, NEDO
file

PUBLIC NOTICE

PORTAGE COUNTY

RECEIPT OF HAZARDOUS WASTE PARTIAL CLOSURE PLAN

Notice is hereby given of the receipt on October 9, 1996 of a partial closure plan from the Ravenna Army Ammunition Plant, 8451 State Route 5, Ravenna Ohio 44266, U.S. EPA I.D. No. OH5210020736. The plan concerns the hazardous waste open detonation area at the site indicated above. A copy of the facility's closure plan will be available for public review at the Reed Memorial Library, 167 East Main Street, Ravenna, Ohio and at the Northeast District Office, 2110 E. Aurora Road, Twinsburg, Ohio 44087, tel: (216) 963-1200. Comments concerning the partial closure plan may be submitted within 30 days of this notice to the Ohio EPA, Division of Hazardous Waste Management, Attn: Data Management Section, 1800 Watermark Dr., P.O. Box 1049, Columbus, Ohio 43216-1049, tel: (614) 644-2977.

nioEPA
of Ohio Environmental Protection Agency
rtheast District Office
10 E. Aurora Road
winsburg, Ohio 44087-1969
,216) 425-9171
FAX (216) 487-0769

George V. Voinovich
Governor

December 6, 1996

Mr. John Cicero, Jr
Contracting Officer's Representative
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, OH 44266-9296

RE: Ground Water Monitoring at the Open Burning and Open Detonation Grounds, Ravenna Army Ammunition Plant

Dear Mr. Cicero:

Thank you for the December 3 letter from Mr. W.B. Talmon, Jr. confirming that the monitoring wells at the Ravenna Army Ammunition Plant's (RVAAP) Open Burning and Open Detonation Grounds will probably be sampled on December 19, 1996.

A preliminary review of previously submitted (September 1996) data on the monitoring wells indicated detection limits (assuming that the term "limits" referred to the detection limits) above the Maximum Contaminant Limits (MCLs) for antimony, beryllium and thallium. The issue was discussed with the Division of Ground Water. Based on their recommendations, RVAAP shall ensure the detection limits of all analytical parameters (during the analysis of samples collected during each sampling event) are set such that they are less than or equal to any applicable MCL or action level.

Further, when the September 1996 monitoring well data are compared with previous data (the December 1995 data, for example), there appear to be substantial increases in the detection limits. RVAAP shall respond, explaining the differences between the detection limits for the different sampling events. As stated above, RVAAP shall ensure that the appropriate detection limit is achieved during all future sampling events, including the one scheduled for December 19, 1996.

Please be aware that the monitoring well data submitted for 1996 have not been comprehensively reviewed, and that additional comments could be forthcoming when that task is completed.

In summary, RVAAP shall consider these comments, and modify their ground water monitoring protocol appropriately. If you have any questions regarding this letter, please do not hesitate to contact Ms. Diane Kurlich or myself at (216) 963-1200.

Sincerely,

Sheila Abraham
Environmental Specialist
Division of Hazardous Waste Management

SA:crh
cc: Diane Kurlich, DDAGW-NEDO
Eileen Mohr, DERR-NEDO
Mark Navarre, Legal
Carolyn Princic, DHWM-NEDO
Jarnal Singh, DSWM-NEDO
William B. Talmon, Jr., Mason and Hanger
Virginia Wilson, DSWM-NEDO

DEPARTMENT OF THE ARMY
RAVENNA ARMY AMMUNITION PLANT
8451 STATE ROUTE 5
RAVENNA, OHIO 44266-9297

REPLY TO
ATTENTION OF

June 20, 1996

SIORV-CR (200-1a)

Subject: Investigation-Derived Waste Disposal at the Load Line 12 Pink Wastewater Treatment Plant

Ms. Eileen Mohr, CPG
Ohio Environmental Protection Agency
Division of Emergency and Remedial Response
Northeast District Office
2110 East Aurora Road
Twinsburg, Ohio 44087

Dear Ms. Mohr:

As per our teleconference on April 8, 1996, concerning the request to dispose of liquid investigation-derived waste (IDW) from Areas of Concern (AOCs) at the Ravenna Army Ammunition Plant (RVAAP) at the Load Line 12 Pink Wastewater Treatment Plant (RVAAP-18), this letter is submitted as documentation of the requested IDW disposal. Disposal authorization is being requested for liquid IDW derived from equipment decontamination rinses (phosphate-free soap and water) and groundwater from monitoring well development and purging that is expected to be generated during the investigation of AOCs at RVAAP. Liquid IDW from acid and solvent decontamination rinses will be segregated from the soap and water decontamination rinses and will be disposed of by means other than at the Load Line 12 Pink Wastewater Treatment Plant. Prior to disposal of any liquid IDW at the Load Line 12 Pink Wastewater Treatment Plant, the waste will be sampled and analyzed for the potential chemicals of concern (PCOCs) at RVAAP or the analytical results from correlative environmental groundwater samples will be used to characterize the waste. The waste characterization results and recommended waste disposal will be submitted to the Ohio Environmental Protection Agency (OEPA) in an IDW Characterization and Disposal Plan for review and approval prior to disposal of any IDW. No hazardous waste will be disposed at the Load Line 12 Pink Wastewater Treatment Plant.

The volume of liquid IDW expected to be generated from decontamination activities is estimated at <500 gallons per week during field activities. The average duration of individual field investigation events is expected to be generally six weeks or less; therefore, 3,000 gallons or less of decontamination IDW is estimated for each field investigation. The volume of liquid IDW expected to be generated from developing and purging each monitoring well is estimated to be <55 gallons. This estimate is based on 2-inch diameter monitoring wells installed across the top of the water table zone. The amount of liquid IDW expected from each field investigation

JUN 24 1996

OHIO EPA NEDO

will be dependent on the number of wells installed (i.e., four monitoring wells will generate 220 gallons or less of groundwater IDW). The Load Line 12 Pink Wastewater Treatment Plant is an activated charcoal filter unit with a permitted capacity of 6,000 gallons per day.

The primary PCOCs at RVAAP that are expected to potentially occur in liquid IDW are explosives (TNT, DNT, RDX, and HMX) and metals (lead, mercury, chromium, arsenic). Other contaminants such as petroleum products and organic solvents may exist at RVAAP, but are not expected to be prevalent based on the history of the AOCs. The concentration of these chemicals in decontamination IDW are expected to be low (ug/l range) because of the dilution that naturally occurs from washing and rinsing potentially contaminated equipment. However, concentrations of these chemicals could be significantly higher in groundwater IDW depending on groundwater conditions at individual AOCs, which are currently not well defined. Concentrations in groundwater previously sampled at RVAAP have ranged from no detectable concentrations (Demolition Area #2, RVAAP-08) up to 2.5 ug/l of RDX (Ramsdell Quarry, RVAAP-01). The monitoring parameters for the Load Line 12 Wastewater Treatment Plant effluent include dissolved organic carbon, total non-filtered residue, TNT, and DNT.

If you have any questions or comments, please feel free to contact me at (330) 358-7311.

Sincerely,

John A. Cicero, Jr.
Commander's Representative

Copies Furnished:
Commander, U.S. Army Industrial Operations Command, ATTN: AMSIO-EQE (Mr. Robert Whelove), Rock Island, IL 61299-6000
Mr. Doug Webb, U.S. Army Corps of Engineers, Nashville District, P.O. Box 1070, Nashville, TN 37202
Mr. Steve Selecman, Science Applications International Corporation, P. O. Box 2502, Oak Ridge, TN 37831
Mr. William Talmon, Mason and Hanger-Silas Mason Company, Inc., Ravenna Army Ammunition Plant, 8451 State Route 5, Ravenna, OH 44266-9297

OhioEPA
State of Ohio Environmental Protection Agency
Northeast District Office
2110 E. Aurora Road
Twinsburg, Ohio 44087-1969
(216) 425-9171
FAX (216) 487-0769

7/17/96	
✓ CR-COR	
PROP ADM	
LAND MGR	
CONTRACTOR	7/17/96
RETURN FOR FILE	

CF: Mr. Winslow IEC
Mr Selleman SAIC
Mr. Webb ?
7/17/96

George V. Voinovich
Governor

July 15, 1996

RE:Investigation Waste Disposal

Mr. John Cicero
Commanders Representative
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, Ohio 44266-9297

Dear Mr. Cicero:

Your June 20, 1996, request to utilize the Load Line 12 wastewater treatment system has been reviewed by the Division of Surface Water.

The request indicates that investigation derived wastes will utilize the existing pink water treatment plant before the wastewater is discharged. It is anticipated that less than 500 gallons will be generated per week. A total volume estimation for each investigation is 3,000 gallons. Additional well purge water will also be treated up to 55 gallons per well.

This office does not object to utilization of the system as long as all parameters identified in the waste characterization are amenable to treatment by the pink water treatment plant. Prior to processing a volume of waste it is understood that a characterization will be sent to the district office. All wastewater effluent from the plant shall be reported in accordance with the RVAAP NPDES permit. In order to be protective of the environment and ensure full treatment, please collect and sample the treated wastewater. If it is found to be in compliance with the NPDES permit and will not result in a potential violation of Ohio Water Quality Standards, it may be released.

Should you have further questions please contact me at 216/963-1134.

Sincerely,

William J Zawiski

William J. Zawiski
Environmental Scientist
Division of Surface Water
WJZ:bp
cc. Eileen Mohr, NEDO-DERR
Dennis Lee, NEDO-DSW

Doug ??? Do we need to do anything with this?

OhioEPA
State of Ohio Environmental Protection Agency
Northeast District Office
2110 E. Aurora Road
Twinsburg, Ohio 44087-1969
(216) 425-9171
FAX (216) 487-0769

TO 12/19/96
CR-COR
PROP ADM
LAND MGR
CONTRACTOR
RETURN FOR FILE

Copy TO: Operations

George V. Voinovich
Governor

December 18, 1996

Re: DECON WATER

Mr. John Cicero
Department of the Army
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, OH 44266-9297

Dear Mr. Cicero:

This letter will document a phone conversation held on December 18, 1996 to discuss the treatment of water generated during field investigations at the Arsenal.

Currently there are several drums of water and a 1,000 gallon tank. The Decon 2 wastewater resulted from an acid rinse and must be neutralized prior to further treatment. The Decon 12 wastewater contained various amounts of organic contaminants.

All of the water contained in the IDW characterization may be treated through the existing pink water treatment system. Water from the Decon 12 should be processed first. All processing must be within the hydraulic capacity of the system. Please maintain a log of the dates and voulmes treated.

Should you have further questions please call me at 216/963-1134.

Sincerely,

William J. Zawiski
Environmental Scientist
Division of Surface Water

cc: Eileen Mohr, DERR

CF:
AMSIO-IRG (VERMOST/KEMPF)
AMSIO-EQE (WHELOVE)
USACE, LOUISVILLE (JASPER)
USACE, NASHVILLE (BOATMAN)

RECEIVED
DEC 19 1996
By

OhioEPA
State of Ohio Environmental Protection Agency
Southwest District Office
401 East Fifth Street
ayton, Ohio 45402-2911
13) 285-6357
FAX (513) 285-6249

George V. Voinovich
Governor

November 22, 1996

John Cicero
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, OH 44266-9297

Dear Mr. Cicero:

Please find enclosed the Ohio EPA's Quarterly Report for the period July 1, 1996 through September 30, 1996 detailing activities related to the DSMOA. Since your installation is covered under the DSMOA, we are providing you a copy of our report for your information.

If you have any questions or comments concerning this report, please contact me at (937) 285-6018 or Bonnie Buthker at (937) 285-6469.

Sincerely,

Bonnie B Buthker for

Graham Mitchell, Chief
Office of Federal Facilities Oversight

OHIO DSMOA

Quarterly Report

July 1, 1996 - September 30, 1996

During the past three months, the Ohio Environmental Protection Agency, Office of Federal Facilities Oversight (OFFO) and Division of Emergency and Remedial Response (DERR), performed or participated in the following services under the DSMOA:

ADMINISTRATION:

Personnel Services:

There were no changes in site coordinator assignments this quarter.

Training:

No training for activities under the DSMOA was attended this quarter.

Meetings:

On August 15, Ohio EPA, OFFO met with ACOE to discuss coordination on budgets and schedules for the Formerly Used Defense sites. The meeting was very successful, and coordination on these sites has improved. However, Ohio EPA still has concerns about budget priorities and using limited resources effectively. With continued communication, we feel that these issues will be resolved.

Programmatic Accomplishments:

OFFO and DERR have developed criteria for site coordinators to used to recommend approval of DoD Finding of Suitability to Lease or Transfer determinations. Working with U.S.EPA on Newark AFB, we also developed an approval letter that may be used as a template for future agency approvals of FOST/FOSLs.

OFFO and DERR also worked this quarter to resolve issues concerning the transfer of property at Newark AFB. We successfully resolved this issues, and on October 1, Newark AFB was transferred to the Heath-Newark-Licking County Port Authority. The Port Authority then leased the property to a contractor, which privatized the operation in place.

During this quarter, OFFO tracked two legislative issues that will affect our program. The first was the Devolution of the Defense Environmental Restoration Account into

four separate accounts. The second was the amendments to CERCLA, Section 120 concerning the transfer of federal property that requires some type of remedial action.

Current Programmatic Issues:

As are other states, we are concerned about what effects devolution will have on the DSMOA program for our states. We do not know when or at what levels funding will be received for the Cooperative Agreement this next fiscal year. As new information becomes available, we will work closely with our ACOE representative to ensure we receive adequate funding to maintain our program.

As we were finalizing the Quarterly Report, we found one error on the financial status report concerning expenses for the Lordstown Ordnance Plant. The financial status report states that the state has not incurred any expenses on this site. However, during this last quarter, the site coordinator has spent 64.5 hours on oversight of this facility. Once we correct this problem, we will forward a corrected the financial status report to you.

RAVENNA ARMY AMMUNITION PLANT:

Document Review:

The following documents were reviewed during this reporting period:

Final Phase I Remedial Investigation Sampling and Analysis Plan, Addendum for High Priority Areas of Concern for the Ravenna Army Ammunition Plant, Ravenna, Ohio. Comments submitted July 19, 1996.

Final Phase I Remedial Investigation Site Safety and Health Plan, Addendum for High Priority Areas of Concern for the Ravenna Army Ammunition Plant, Ravenna, Ohio. Comments submitted July 19, 1996.

Revised request for "Authorization under AOC 3745-27-13. Approval recommended on July 22, 1996. Letter from the Director sent out August 18,1996 to the RVAAP.

Sampling Plan and Schedule for Relative Risk Site Evaluation, Ravenna Army Ammunition Plant. Comments submitted August 8, 1996 and Final Copy submitted August 16, 1996.

Reviewed Restoration Advisory Board (RAB) Guidance as preparation for a public meeting.

Site Visits:

July 23-25:	Provided field oversight of Phase 1 Investigative activities.
July 29-31:	Provided field oversight of Phase 1 Investigative activities.
August 5-6:	Provided field oversight of Phase 1 Investigative activities.
August 8 & 14:	Provided field oversight of Phase 1 Investigative activities.
September 18:	On-site to discuss issues with RVAAP personnel.

Meetings:

July 3:	Conference call with SAIC and ACOE to resolve Phase 1 Workplan issues.
July 17:	Scheduled night public meeting at Ravenna High School to discuss the status of investigations at the RVAAP.
August 2:	Conference call with SAIC and ACOE regarding Investigation Derived Waste issues.
September 18:	Meeting at RVAAP to meet with public officials regarding the initiation of a RAB.

Accomplishments:

Fieldwork is finally underway for the Remedial Investigation at the Ravenna Arsenal. DERR approve the Area of Concern Specific Sampling and Analysis Plans and the Health and Safety Plans for the Arsenal on July 19. A Director's authorization has also been obtained to allow the Army to conduct intrusive activities at RVAAP. Field work (drilling of monitoring wells) began on July 22.

Current Issues:

RVAAP personnel held their first public meeting to discuss the investigation of

the facility, and approximately 150 people attended the meeting. Due to the strong public interest in this facility, DERR has requested OFFO's assistance in recommending methods for increased stakeholder involvement and formation of a Restoration Advisory Board for RVAAP.

WRIGHT-PATTERSON AIR FORCE BASE:

Document Review:

The following documents were reviewed during this period:

Draft Red-lined version of Feasibility Study for Operable Unit 2. Received on June 14, 1996. Comments were submitted on July 29, 1996.

Draft Record of Decision for 21 No Further Action Sites. Received on July 2. 1996. Comments were submitted on August 2, 1996.

Draft Final Remedial Investigation Report for Operable Unit 9. Received on July 8, 1996. Comments were submitted on August 7, 1996.

Draft Final Remedial Investigation Report for Operable Unit 8. Received on July 11, 1996. Comments were submitted on September 5, 1996.

Conceptual Design for Removal Action at Operable Unit 8. Received on July 18, 1996. Comments were submitted on August 5, 1996.

Draft Final Action Memorandum for Operable Unit 4. Received on July 17, 1996. Comments were submitted on August 5, 1996.

Work Plan for the Removal Action at Munitions Burial Site 1. Received on August 13, 1996. Approval letter submitted on August 14, 1996.

Draft Final Action Memorandum for Landfills 1 and 2. Received on July 29, 1996. Approval letter submitted on August 1, 1996.

Recommendation for Upgrades to the OU2 Free Product Recovery System. Received on July 29, 1996. Approval letter submitted on August 14, 1996.

Draft Final Background Technical Memorandum for the Basewide Monitoring Program. Received on August 16, 1996. Approval letter submitted on September 4, 1996.

Draft Ground Water Flow Model Report for the Basewide Monitoring Program. Received on August 6, 1996. Approval letter submitted on September 5, 1996.

Draft Final Remedial Investigation Report for Operable Unit 7. Received on August 6, 1996. Comment letter submitted on September 7, 1996.

Final Action Memorandum for Operable Unit 4. Received on September 24, 1996. Approval letter submitted on September 30, 1996

Final Feasibility Study for Operable Unit 2. Received on August 30, 1996. Approval letter submitted on September 16, 1996.

Draft Proposed Plan for Spill Sites 2, 3, and 10. Received on September 12, 1996. Currently under review.

Draft Addendum for the Site Specific Work Plan for Operable Unit 4. Received on September 18. Currently under review.

Site Visits:

July 16-17:	Ohio EPA personnel observed well abandonment and checked on the status of landfill caps at Landfills 5, 8, and 10.
July 26:	Ohio EPA personnel observed well abandonment.
August 21:	Ohio EPA personnel attended Media Day at the Munitions Burial Site 1 excavation.
August 28:	Ohio EPA personnel observed the excavation and sampling of bomblets at Munitions Burial Site 1.
September 19:	Completion of Bomblet-Ceremony. Ceremony for Completion of removal action at munitions Burial Site 1.
September 26:	Ohio EPA personnel checked on the status of landfill caps at Landfills 5, 8, and 10.

Meetings:

Participated in the following meetings related to current and future clean-up activities:

July 3:	Meeting between City of Dayton, Ohio EPA, WPAFB,

	and U.S.EPA concerning the startup of the Huffman Dam wellfield.
July 8:	Meeting between Ohio EPA and WPAFB to discuss monitoring various issues concerning environmental restoration.
July 24:	Meeting between the city of Dayton, Ohio EPA and WPAFB to develop a coordination and data collection strategy for the startup of the Huffman Dam wellfield.
August 5:	Conference call between Ohio EPA, U.S.EPA, and WPAFB on the OU2 Feasibility Study Report.
August 12:	Conference call between Ohio EPA, U.S.EPA, and WPAFB on the OU8 RI Report.
August 13:	Meeting between WPAFB, U.S.EPA, and Ohio EPA to resolve issues with the OU2 Feasibility Study and discuss the revised scope of the Basewide Monitoring Program.
August 13:	Meeting between Ohio EPA, U.S.EPA, and WPAFB concerning the release of the Repogal report and the scheduled excavation of the bomblets at Munitions Burial Site 1.
August 19:	Conference call between WPAFB and Ohio EPA concerning the ROD for the 21 No Action Sites at WPAFB.
August 21:	Environmental Advisory Board Meeting.
August 23:	Joint meeting between the city of Dayton's Environmental Advisory Board and the WPAFB Environmental Advisory Board concerning Ohio EPA's pending approval of the Huffman Dam wellfield.
August 28:	Conference call between WPAFB and Ohio EPA concerning the ROD for the 21 No Action Sites at WPAFB.
September 6:	Conference call between WPAFB, Ohio EPA, and U.S.EPA concerning the PAH issue at OU9.
September 25:	Conference call between Ohio EPA, U.S.EPA, and WPAFB concerning the OU2 Proposed Plan.

Accomplishments:

There were significant developments this quarter on the Munitions Burial Site 1 at WPAFB. On August 13, WPAFB released Dr. Repogal's report concerning the biological weapons program at WPAFB. Also on August 13, WPAFB submitted the Work Plan for removal of the bomblets, and requested expedited review so the excavation could begin on August 19. Ohio EPA reviewed and approved the work plan on August 14. On August 21, WPAFB officials held a media day for the local newspapers and television to observe the excavation and ask questions about the project. The removal action was completed on September 19, 1996.

The Record of Decision for No Further Action at 21 Sites was signed on September 30. This is the third ROD that was signed for WPAFB.

Landfill caps were completed at Landfills 5, 8, and 10.

Current Issues:

On August 23, a joint meeting between WPAFB's Environmental Advisory Board and the city of Dayton's Environmental Advisory Board to discuss the pending Ohio EPA approval of the city of Dayton's Huffman Dam wellfield. This wellfield has the potential to impact the ground water extraction system at the WPAFB boundary. On July 3, a separate meeting between the Ohio EPA, U.S.EPA, WPAFB and the city of Dayton was held to discuss this issue. At this meeting, the city of Dayton and WPAFB reached consensus that they would coordinate the start-up of the Huffman dam wellfield , so that WPAFB can collect real time data on what effect, if any, the operation of the wellfield has on the ground water at WPAFB. This information will be used to assist in the selection of the final remediation for the ground water at WPAFB.

On August 26, Ohio EPA received a letter from Headquarters Air Force Material Command (AFMC) responding to our letter to DoD Headquarters concerning the role of Headquarters, Air Force Matériel Command (AFMC) in the restoration program at WPAFB. In this letter, they stated that they wished to work together with both Ohio EPA and the Environmental Advisory Board to solve the restoration issues at WPAFB. They also requested a meeting between Ohio EPA and AFMC to discuss our concerns. Representatives from AFMC are scheduled to attend the next meeting of WPAFB's EAB to discuss their concerns. Based on the results from that meeting, we will evaluate whether a separate meeting between AFMC and Ohio EPA is needed.

AIR FORCE PLANT #85:

Document Review:

The following documents were reviewed during this reporting period:

Draft Public Health Assessment, US Air Force Plant 85, Columbus, Ohio, Franklin County, July 1996. Ohio EPA had no significant comments.

Surface and Ground water Monitoring Work Plan, Air Force Plant 85, Columbus, Ohio. This document was approved September 27, 1996.

Site Visits:

There were no site visits during this reporting period.

Meetings:

There were no meetings concerning the current or future clean-up during this reporting period.

Accomplishments:

Hydrogeologic investigation work plan approved September 27, 1996.

Current Issues:

Final closure of the Site 3 PCB spill has been delayed until additional funding can be obtained from the FY 1997 budget.

Air Force was unable to secure a contract to complete a risk assessment at Site 4 Fire Training Area because the contractors bid exceeded project funding.

SPRINGFIELD MPT (BECKLEY):

Document Review:

The following documents were reviewed during this reporting period:

Draft Relative Risk Site Evaluation Work Sheets and the Department of Defense Relative Risk Site Evaluation Primer, Summer 1996. No comments were submitted.

Site Visits:

There were no site visits during this reporting period.

Meetings:

There were no meetings concerning the current or future clean-up during this reporting period.

Current Issues:

We have received no word as to when environmental investigations will continue at this facility. A work plan for a remedial investigation was scheduled to be submitted for Ohio EPA review.

BLUE ASH NGS:

Document Review:

The following documents were reviewed during this reporting period:

Reviewed the Request for a No Further Response Action (NFRAP) recommendation for the Blue Ash Air National Guard Base, Cincinnati, Ohio. Comments submitted August 20, 1996

Site Visits:

There were no site visits during this reporting period.

Meetings:

There were no meetings concerning the current or future clean-up during this reporting period.

RICKENBACKER AGB:

Document Review:

The following documents were reviewed during this reporting period:

Risk Assessment Assumptions Document. Comments submitted June 26, 1996.

Site 25/27 Addendum Report. Comments submitted July 16, 1996.

UST Closure Reports for Building 406 (Site 45) and Building 430 (Site 6) were reviewed in conjunction with the *Site Assessment Work Plan*. Comments submitted July 17, 1996.

Final FOSL and Supplemental EBS for Parcels D1 and D2 was received June 5, 1996. Comments submitted July 19, 1996.

Final EBS Phase II Report. Comments submitted August 8, 1996.

Final Close Fuel Hydrant System Technical Report. Comments submitted August 2, 1996.

Risk Assessment Assumptions Document. Oral comments were given and discussed at the August 20, 1996 Project Team meeting in Chicago. The meeting minutes have recorded the discussions and decisions.

Soil Removal Report for Sites 21 and 22. Comments submitted on August 12, 1996.

Final Project Summary Report. Comments submitted August 2, 1996.

Revised Clay Layer Study. No comments were generated.

Revised Risk Assessment Assumptions Document. No comments were generated.

Revised Early Action Risk Assessment for Sites 9, 19, and 20. Comments submitted September 17, 1996.

Site Visits:

June 27:	Visited the base to observe ground water sample collection. IT Corp had some difficulty with the pump during purging. One hose was effected by the heat and stopped working.
June 28:	Participated in VSIs for Building 550.
July 1:	Participated in VSIs for Building 874.
July 24 & 25:	Observed the pilot testing of hydrofracturing as a possible remedial method.

Meetings

Participated in the following meetings related to current and future clean-up activities:

July 22:	Meeting was held at the base between AFBCA, Rickenbacker Port Authority (RPA), USEPA and Ohio EPA to discuss the concerns that RPA has with the property that they will be receiving through a lease.
July 23:	Attended a Project Team meeting at the base. Several topics were discussed including background for the ditch system.
July 23:	RAB meeting was held in the evening at the Hamilton Township Community.
July 30:	Met with DERR/CO/EAU to discuss strategy for background in the ditch system. A position paper was generated to be discussed at the next Project Team Meeting.
August 19:	The Consensus Group met with Jerry Arcaro (facilitator) in Chicago for a partnering session. The main topic was setting up a process to update the 12-18 month work schedule.
August 20:	Project Team Meeting was held in Chicago at US EPA.
September 25:	Project Team Meeting was held at the base.

Accomplishments:

The background issue for the ditch system was resolved at the Project Team meeting in Chicago held on August 20, 1996.

Current Issues:

A conference call will be held early in October to discuss outstanding issues on risk assessment for the September 25, 1996 Project Team meeting.

NEWARK AFB:

Document Review:

The following documents were reviewed during this reporting period:

Supplemental Remedial Investigation with Ecological/Baseline Risk Assessment, Newark Air Force Base, June 1996 (SRI). Comments were submitted to the Air Force on July 26, 1996. Comments were resolved and an *Addendum to the SRI* was received on August 22. The *SRI* was approved on September 9, 1996.

Draft Basewide Environmental Baseline Survey, Newark Air Force Base, Ohio, June 1996. Comments were submitted on July 26, 1996.

Final Basewide Environmental Baseline Survey, Newark Air Force Base, Ohio, August 22, 1996. The EBS was approved on September 9, 1996.

Draft finding of Suitability to Transfer (FOST), August 22, 1996. Comments were submitted on August 2, 1996. Ohio EPA received AFBCA's response on September 20. Ohio EPA concurred with U.S. EPA, Region 5 regarding the requirements on the transfer of the facility and concurrence with the FOST on September 23. The Ohio EPA received the final FOST on September 27, 1996.

Site Visits:

There were no site visits during this reporting period.

Meetings:

Participated in the following meetings related to current and future clean-up activities:

September 19: Presentation of the Final SRI and EBS to the Restoration Advisory Board.

Accomplishments:

Completion of the SRI, and EBS and FOST on schedule. The transfer of the property to the Newark-Heath Licking County Port Authority was accomplished on October 1, 1996. The Newark-Heath Licking County Port Authority could then lease the property to a contractor, allowing privatization in place to occur. This retained the jobs associated with the former Newark AFB, and creation of additional jobs is projected to occur.

TOLEDO AIR NATIONAL GUARD BASE:

Document Review:

There were no documents reviewed during this reporting period.

Site Visits:

There were no site visits during this reporting period.

Meetings:

There were no meetings concerning the current or future clean-up during this reporting period.

MANSFIELD LANHAM:

Document Review:

The following documents were reviewed during this reporting period:

Draft Relative Risk Site Evaluation Primmer Summer 1996 (Revised Edition). Comments were requested by October 15, 1996.

Site Visits:

There were no site visits during this reporting period.

Meetings:

There were no meetings concerning the current or future clean-up during this reporting period.

DEFENSE ELECTRONICS SUPPLY CENTER (DESC) (GENTILE AFS):

Document Review:

The following documents were reviewed during this reporting period:

Draft RI Report. Comments submitted July 2, 1996.

Site Visits:

There were no site visits during this reporting period.

Meetings:

July 24 & 25:	RI comment resolution, and Phase II RI Scoping.
August 6:	Participated in data quality conference call with USEPA, AFCEE, and URS consultant.
August 22:	BCT meeting.
August 26:	Conference call on the Phase II RI comment resolution.
September 5:	Restoration Advisory Board Meeting.
September 26:	BCT meeting.
September 27:	Meeting with Regional Air Pollution Control Agency and Air Force to resolve asbestos streamline issue.

Accomplishments:

A partnering session for the Defense Electronics Supply Center in Kettering was held on July 1-2, 1996 at Pollen Farm in Kettering. The session was very productive. Team members (including representatives form the city of Kettering) developed a very aggressive schedule for the restoration program at DESC. If the schedule can be met, the majority of the work will be completed by April 1997. Additional facilitated meeting on agency comments on the Phase I RI Report were held on July 24-26. Most major issues concerning the RI report were resolved.

Demolition of buildings began on September 30, 1996 initiating infrastructure improvements for re-development. To date, all milestones on the accelerated schedule have been met. We will continue to work with the Air Force, city of Kettering, and U.S.EPA to ensure that the cleanup and reuse of DESC proceeds on schedule.

DEFENSE CONSTRUCTION SUPPLY CENTER (DCSC):

Document Review:

Final Phase II Contamination Evaluation, Roosevelt Ave. Dump, Defense

Construction Supply Center, March 1996. Ohio EPA had no comments.

Site Visits:

There were no site visits during this reporting period.

Meetings:

There were no meetings concerning the current or future clean-up during this reporting period.

YOUNGSTOWN AIR RESERVE STATION:

Document Review:

There were no documents reviewed during this reporting period.

Site Visits:

August 7 & 8: Provided field oversight.

Meetings:

There were no site visits during this reporting period.

PLUM BROOK ORDNANCE WORKS:

Document Review:

The following documents were reviewed during this reporting period:

Site Investigations and Ground water Investigation. Well logs and construction diagrams were received in October 1996. Comments were not submitted.

Site Visits:

September 11: This visit was to familiarize personnel of NWDO (DERR and DDAGW) with the facility and areas that are to be investigated in the proposed work plan.

Meetings:

September 11: Informal meeting with NASA, ACOE, Ohio EPA/OFFO and NWDO personnel. This meeting was to discuss the

proposed work to be completed and receive a brief history of the facility. A tour of the facility followed the meeting.

SHARONVILLE ENGINEERING DEPOT:

Document Review:

The following documents were reviewed during this reporting period:

Sharonville Engineering Depot Limited Remedial Investigation Report. Received on April 22, 1996. Comments were submitted on June 26, 1996.

Site Visits:

There were no site visits during this reporting period.

Meetings:

There were no meetings concerning the current or future clean-up during this reporting period.

Accomplishments:

A focused remedial investigation report detailed the results of field work will be submitted to Ohio EPA next quarter.

FORMER LOCKBOURNE AIR FORCE BASE:

Document Review:

The following documents were reviewed during this reporting period:

Draft Sampling and Analysis Plan and Health and Safety Plan. Comments were submitted August 14, 1996.

Site Visits:

There were no site visits during this reporting period.

Meetings:

August 21: Ohio EPA personnel met to begin setting up the sampling of domestic wells in Lockbourne.

NIKE CD-78:

Document Review:

There were no documents reviewed during this reporting period.

Site Visits:

There were no site visits during this reporting period.

Meetings:

There were no meetings concerning the current or future clean-up during this reporting period.

AIR FORCE PLANT 36:

Document Review:

There were no documents reviewed during this reporting period.

Site Visits:

There were no site visits during this reporting period.

Meetings:

There were no meetings concerning the current or future clean-up during this reporting period.

FORMER ERIE ARMY DEPOT:

Document Review:

There were no documents reviewed during this reporting period.

Site Visits:

There were no site visits during this reporting period.

Meetings:

There were no meetings concerning the current or future clean-up during this reporting period.

FORMER SCIOTO ORDNANCE PLANT:

Document Review:

There were no documents reviewed during this reporting period.

Site Visits:

There were no site visits during this reporting period.

Meetings:

There were no meetings concerning the current or future clean-up during this reporting period.

LORDSTOWN ORDNANCE PLANT:

Document Review:

Addendum to Project Sampling and Analysis Plan, Site Investigation the Former Lordstown Ordnance Depot, Lordstown, Ohio. Comments submitted September 11, 1996.

Received Authorization request under OAC 3745-27-13 on August 30, 1996. Comments submitted September 11, 1996.

Site Visits:

September 17 & 18: Oversight of investigative activities were provided.

Meetings:

September 17: Onsite meeting to discuss outstanding workplan issues.

COLUMBUS NAVAL AIR STATION:

Document Review:

There were no documents reviewed during this reporting period.

Site Visits:

There were no site visits during this reporting period.

Meetings:

There were no meetings concerning the current or future clean-up during this reporting period.

RIDGEWOOD WEAPONS PLANT:

Document Review:

Draft Site History Report for the Former Ridgewood Ordnance Plant, received on July 19. Comments were submitted on August 23, 1996.

Site Visits:

There were no site visits during this reporting period.

Meetings:

There were no meetings concerning the current or future clean-up during this reporting period.

[redacted]

Fax to cy

RAVENNA ARMY AMMUNITION PLANT

8451 STATE ROUTE 5 • RAVENNA, OHIO 44266-9297

March 15, 1996

Contracting Officer's Representative
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, Ohio 44266-9297

Subject: RAVENNA ARMY AMMUNITION PLANT
PORTAGE COUNTY
02-67-0209
OH5 210 020 736
GROUND WATER MONITORING

Reference: February 23, 1996 Letter from the Ohio Environmental Protection Agency, subject as above

Dear Sir:

Please incorporate the information and comments provided below into your written response to the Ohio EPA. The information and comments are keyed to the paragraph numbers of the referenced letter.

Paragraph 2.

TMA/Ann Arbor will ensure that all detection limits correspond to the minimum limits set for the method specified. TMA reports that, due to the purchase of new metals instrumentation, they can now detect many metals at much lower detection limits than they could before. They also report that the increase in the picric acid detection limit was due to limited volume. The limited volume was reportedly the result of a laboratory mishandling error. The error has been corrected and future reports will reflect the lowest possible detection limit.

Paragraph 4.

In the future, all statistical analyses submitted for review will include the analyses conducted to determine the normality of the data.

Paragraph 5.

TMA/Ann Arbor has indicated that the practice of reporting the average of duplicate analyses resulted from their application of laboratory practices for current work for the U. S. Army Corps of Engineers (USACE)-Detroit District. The practice was reportedly requested by EPA Region V. In the future, TMA will not report the average of duplicate analyses, but will report the initial value determined.

Paragraph 6.

A new report format has been instituted at TMA/Ann Arbor since September 1995. This report format allows for the printing of an attached sheet which lists all of the test method numbers utilized in analyzing samples. All future reports will include this methodology summary.

Paragraphs 7 and 8.

In the future, all submittals will specify the well at which the duplicate sample was obtained.

The writer will serve as Mason & Hanger's point of contact with respect to this matter and can be reached at (330) 358-7400. Please contact me at your convenience if you have any questions.

Sincerely,
MASON & HANGER-SILAS MASON CO., INC.

W. B. Talmon, Jr.
Site Manager

WBT:wbt

cc: Robert Whelove, AMSIO-EQE
OB/OD GW Monitoring File
Reading File

DEPARTMENT OF THE ARMY
RAVENNA ARMY AMMUNITION PLANT
8451 STATE ROUTE 5
RAVENNA, OHIO 44266-9297

REPLY TO ATTENTION OF

March 27, 1996

ED 3/28/96

✓	CR-COR	CR
	PROP ADM	
	LAND MGR	
	CONTRACTOR	
	RETURN FOR FILE	

SIORV-CR (200-1a)

Subject: Groundwater Monitoring Ravenna AAP

Mr. Murat Tukel
State of Ohio Environmental Protection Agency
Northeast District Office
2110 East Aurora Road
Twinsburg, Ohio 44087-1969

Dear Mr. Tukel:

This is in response to the following letters received from your office.

a. Ohio EPA letter of February 23, 1996, subject: Groundwater Monitoring at RVAAP (1992, 93, and 94).

b. Ohio EPA letter, February 23, 1996, subject: Groundwater Monitoring at RVAAP, (results from monitoring in first, second and third quarters Fiscal Year (FY) 95).

Enclosed are responses to your comments concerning groundwater monitoring at Ravenna Army Ammunition Plant. For your convenience, responses to comments in reference 1a above are contained in Enclosure (1) and responses to comments in reference 1b above are contained in Enclosure (2).

Your concurrence with our proposed actions is requested.

Point of contact is Mr. John Cicero, (330) 358-7311.

Sincerely,

John A. Cicero, Jr.
Commander's Representative

Enclosures

Copies Furnished:
Cdr, IOC, AMSIO-EQE (Mr. Whelove)
Cdr, IOC, AMSIO-IRG (Major Hurley)
OHARNG Site Rep, RVAAP (Major Tadsen)
Mason and Hanger, RVAAP
CoE (Doug Wiebe)

mailed 3/28/96

ENCLOSURE 1, Reference 1a

1. Paragraph 1 - We concur with the comment.

2. Paragraph 2 - OBG-3 has been supplying enough water since Mason and Hanger initiated its procedures to draw water from the well for a total of one day prior to sampling the contents of the well. A previous contractor drew and sampled almost simultaneously and the well may not have had enough flow for this quick procedure. We do not foresee that we will have to replace the well in the foreseeable future. The well has supplied enough water for sampling since October 1, 1993.

3. Paragraph 3 - We have not at this time received written confirmation that we have a problem with out protocol. However, at this time we have verbal and informal fax information that this is the case. We would like to delay replacing the background well until we can develop a history with an improved protocol which may negate the need for a replacement well. We expect this can be accomplished prior to the next sampling event on June 20, 1996, subject to the availability of funds.

4. Paragraph 4 - We started field filtering and acidifying field samples and have been reporting dissolved metals beginning in the December 14, 1995 reported results. A preliminary review of the data indicated we were still exceeding some MCL's. See response to paragraph 1, reference 1b., of Enclosure 2 for further details to this response.

Encl 1

ENCLOSURE 2, Reference 1b

1. Paragraph 1 - We are arranging for a statistical analysis between the upgradient background wells and the downgradient sample wells groundwater data for site specific parameters at the Open Burning Area and the Open Detonation Area starting with the June 20, 1996 sampling event for four, once a quarter, sampling events. The data will be normalized. The following site specific heavy metals, explosives, and organic chemicals groundwater well sample data will be statistically analyzed for significant differences if they exist; (1) Heavy metals - Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cyanide, Iron, Magnesium, Manganese, Mercury, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Zinc, Nitrate as nitrogen, Nitrite as nitrogen, and Copper and Lead; (2) Explosives - 2,4-Dinitrotoluene, 2,6-Dinitrotoluene, Cyclotrimethylenenitramine (HMX), Nitroguanidine, Picric Acid, Cyclotetramethylenetetranitramine (RDX), 1,3,5-Trinitrobenzene, and 2,4,6-Trinitrotoluene (TNT); Organic chemical - 1,2-Dichloroethane. This particular effort in this paragraph is subject to availability of funds.

2. Paragraph 2 - Our contracting laboratory reports some improvements in protocol procedures which will lead to a lower detection limit on picric acid of 2.5 ug/l (ppb).

3. Paragraph 3 - No comment.

4. Paragraph 4 - The data will be normalized in the future quarterly reports and the next annual report: subject to availability of funds.

5. Paragraph 5 - Asterisks will be eliminated from our data reporting. Our contracting laboratory reported that the Corps of Engineers, in conjunction with the USEPA, was requiring this at another site and assumed those same procedures at RVAAP. Since the OEPA has taken exception to averaging two results, the practice will be stopped.

6. Paragraph 6 - The laboratory sheets will include the laboratory test method in the future quarterly submittals.

7. Paragraph 7 - See response in paragraph 1 above. Wells will be identified in the future.

8. Paragraph 8 - See response in paragraph 1 above. Wells will be identified in the future.

Encl(2)

OhioEPA
State of Ohio Environmental Protection Agency
Northeast District Office
2110 E. Aurora Road
Twinsburg, Ohio 44087-1969
(216) 425-9171
FAX (216) 487-0769

George V. Voinovich
Governor

May 21, 1996

RE: RAVENNA ARMY AMMUNITION PLANT
PORTAGE/TRUMBULL COUNTIES

Mr. Doug Webb
Department of the Army
Nashville District, Corps of Engineers
Engineering Management Branch
P.O. Box 1070
Nashville TN 37202-1070

Dear Mr. Webb:

The Ohio Environmental Protection Agency (OEPA) has received and reviewed the following document related to the Ravenna Army Ammunition Plant (RVAAP):

1. "Facility-Wide Sampling and Analysis Plan for the Ravenna Army Ammunition Plant, Ravenna, Ohio."

This document was prepared for the U.S. Army Corps of Engineers (ACOE), Nashville District, by Science Applications International Corporation (SAIC), Oak Ridge, TN under contract number DACA62-94-D-0029, and represents a revision of a document that was previously submitted to, and reviewed by OEPA. The revised document was received by OEPA on 04/22/96 and was reviewed by personnel in the Division of Emergency and Remedial Response (DERR). The revised document was reviewed with respect to Agency comments previously submitted to ACOE on 11/03/95, the 11/27/95 ACOE draft comment resolution document, and correspondence from OEPA dated 01/16/96.

Comments on the revised preliminary assessment and the facility-wide health and safety plan were previously submitted to your attention in correspondence dated 03/11/96. Comments on the revised action plan were submitted to your attention in correspondence dated 03/25/96.

Subsequent to the resolution of the following issues to the Agency's satisfaction, the OEPA will consider the above-referenced document to be an acceptable submission. The issues presented in this correspondence must be resolved prior to the initiation of on-site investigative activities, and must be memorialized in writing. Especially critical is that resolution is reached regarding the outstanding risk assessment issues.

FIELD SAMPLING PLAN GENERAL COMMENTS

General Comment # 1:

Section 3.0 (Scope and Objectives) was sent to OEPA Central Office (CO) DERR Ecological Assessment Unit (EAU) for review and comment. The EAU is responsible for the review of risk assessments and ecological assessments for the DERR.

In previous OEPA comment documents and during meetings, the OEPA has clearly indicated the need for EAU personnel to review any documents (or portions of documents) and to be present at any meetings that involve risk assessment discussions. As such, the above-referenced section was sent to EAU for review and comment. Comments from EAU are incorporated into this correspondence, and can be found in Section 3.0 "Scope and Objectives" below.

General Comment # 2:

Appendix C of the field sampling plan (FSP) contains the generic request for authorization under Ohio Administrative Code (OAC) 3745-27-13 ("Rule 13"). Please refer to correspondence from OEPA DERR NEDO dated 05/06/96 for Agency concerns regarding the generic Rule 13 request. This issue needs to be resolved prior to the initiation of on-site intrusive activities.

SPECIFIC COMMENTS

Introduction:

A Remedial Investigation/Feasibility Study (RI/FS) characterizes the nature and extent of contamination existing at and *emanating from* a site. Adjust the text accordingly. (pg. ix)

Section 3.0 Scope and Objectives:

Provide clarification on how the till with hydraulic conductivities greater than 10^{-6} cm/sec (this wording indicates 10^{-5} cm/sec and up) is considered to be "somewhat impermeable." (pgs. 3-2 and 3-3)

Although the public has limited access to the installation at the present time, the future land use options and potential receptors must be considered. (pg. 3-4)

The risk goals are cumulative for all chemicals and pathways. The analytical levels (detection limits/sample quantitation limits) are chemical/sample specific and are not based on the risk goal, but rather are based on the instrument sensitivity, sample preparation and the skill of the technician operating the instrument; and should not be based on the risk goal, rather should be more sensitive than the cumulative risk goal in order to accommodate the multiple chemicals that contribute to the risk. (pg. 3-4)

The Wright-Patterson Air Force Base (WPAFB) has a documented consensus statement describing a stream-lined approach for risk assessment in order to expedite remedial action decision making for an area within an operable unit at the base. A similar approach has been adopted at the Rickenbacker ANGB, as well as the Newark AFB, and it is the opinion of EAU personnel that this approach would also be acceptable at the RVAAP. In this approach, a semi-quantitative risk assessment is performed to identify areas (sites) which have contaminants at concentrations that either:

1. exceed a carcinogenic risk of 10^{-4} or hazard index of 1, or
2. are below a carcinogenic risk of 10^{-6} or hazard index of 1, or
3. are between a carcinogenic risk of 10^{-4} and 10^{-6}.

The sites that are in category "1" are proposed for early action, with several options for implementing such an action. The sites that are in category "2", complete a full semi-quantitative risk assessment and are proposed for no further action. The sites that are in category "3" complete a traditional baseline risk assessment. For the sites that perform a baseline risk assessment, the number of chemicals of concern is reduced by applying several criteria, one of which includes the comparison of the chemical concentration to the risk-based concentration table (USEPA Region IX), at 10^{-7} risk, or a hazard quotient of 0.1. The chemicals with a concentration below the above-referenced criteria are eliminated from the baseline risk assessment. The baseline risk assessment is followed by a Feasibility Study (FS), etc. However, the proposed use of Phase 1 results to determine a "no action" option may not be adequate, and further discussion is warranted. (pg. 3-6)

Provide clarification of the terms "risk modelling output" and "modelling error" as used in the text of Section 3.2.8. (pg. 3-6)

Provide clarification on the following sentences: "project data will be based on a reduced set of level 3 validation criteria..." and "The data validation criteria listed in Table 3-2 are a subset of the level 3 data validation criteria that....positive or negative results." At what level will the majority of the data be validated? (pg. 3-7)

The detection limit requirements, based upon a carcinogenic risk level of 10^{-6} and a hazard index of 1, are not acceptable. Refer to the previous comment on Section 3.6.2 above. (pg. 3-7)

Refer to "Risk Assessment Guidance for Superfund" (RAGS) chapter 5 for guidance on the applicability of the quantitation/detection limits to be used for chemical data used in the risk assessment. (Risk Assessment Guidance for Superfund: Human Health Evaluation Manual, Volume I, PART A; EPA/540/1-89/002, 1989.) (Table 3-3)

Provide clarification on the use of "screening level data" to determine the extent of a source. (pg. 3-10)

Section 3.2 Facility-Wide Data Quality Objectives:

The facility-wide FSP should indicate that the relationship between the buried glacial valley and the Areas of Concern (AOCs) will be determined during the hydrogeologic investigations which are to take place at the RVAAP. This was previously requested in Agency correspondence. (pg. 3-3)

The Ramsdell Quarry (RVAAP-01) is regulated by the Division of Solid and Infectious Waste Management, not RCRA, as is indicated in the text. (pg. 3-3)

With respect to Table 3-3 - refer to previous risk assessment comments. The Secondary Maximum Contaminant Level (SMCL) for manganese is 50 ug/l, as such, the required detection level should be below this benchmark. (pg. 3-9)

Section 4.3 Groundwater:

Sections 4.3.2.3.7, 4.3.2.3.8, and 4.3.2.3.9 were not modified in accordance with previous OEPA comments. In the monitor well construction section, the text still indicates that a cement/bentonite grout will be utilized to the ground surface. The Agency recommends that concrete be utilized, from below the frost line to the ground surface, and this should extend into a concrete apron.

With respect to heaving sands, the OEPA recommends the addition of potable water to the borehole, which allows for the continuation of split spoon sampling. In addition, if this technique is utilized, it is readily apparent when heaving stops. If the above technique does not control the heaving sands, split spoon sampling should cease, and a plugged auger should be utilized. The above two alternatives are recommended in areas where the spread of contamination is not a concern. The text, as written, is a good option if the heaving sands are contaminated, as this would help prevent the contamination from spreading upwards.

If the existing monitoring wells are determined to be of questionable integrity, they should be abandoned in accordance with the OEPA "Monitoring Well and Borehole Abandonment" document found in Appendix D of the FSP. (pgs. 4-23 and 4-37)

In the decontamination procedures, provide the rationale for utilizing a 2% hydrochloric (HCl) acid rinse, instead of a 10% solution. The concern is that a 2% solution may be too dilute to be effective. (pgs. 4-40 and 4-46)

Section 4.4 Subsurface Soil:

Provide confirmation that trenching activities are scheduled to occur only at RVAAP - 19, the Landfill North of Winklepeck Burning Grounds. (pg. 4-41)

Section 5.7 Monthly Reports:

Does the information which is be included in the monthly reports, also include copies of Non - Conformance Reports (NCRs)? (pgs. 5-10 and 10-3)

The text indicates that "copies of the Monthly Reports will subsequently be sent to the OEPA - Northeast District Site Coordinator." The Agency requests clarification as to the definition of "subsequent", as the reports should be received by the OEPA as close to the 10th day of the month as possible. (pg. 5-10)

Section 7.4 IDW Characterization and Classification for Disposal:

The text indicates that the Investigation-Derived Waste (IDW) Characterization and Disposal Plan will be based upon numerous criteria, including risk-based action levels. As the Agency and the other stakeholders in this process have not discussed or agreed upon any risk-based action levels, this criteria should not be developed in the waste characterization and disposal plan. In addition to the OEPA Divisions already cited, a copy of this plan should also be submitted to the Division of Hazardous Waste Management (DHWM) for review and approval. (pg. 7-5)

Remove superscript and subscript "c" from Table 7-1 (Maximum Concentration of Contaminants for the Toxicity Characteristic - 40 CFR 261.24), as it is not acceptable to raise established regulatory Levels. (pg. 7-7)

Provide more clarification on the proposed solid and liquid IDW compositing scheme, i.e. the potential number of samples that will be composited. (pg. 7-8)

In the section describing the liquid IDW composite sampling procedure, the text should indicate that, wherever possible, the IDW will be characterized based upon analytical results from environmental sampling. In addition, samples obtained for volatile organic compound (VOC) analyses should not be "shaken or stirred", as this may result in the volatilization of compounds from the sample. (pg. 7-8)

Appendix A (References):

The OEPA generic Statement of Work (SOW) should be referenced in this section.

Appendix C (Ohio Administrative Code 3745-27-13, Generic Request for Authorization:

Refer to general comment # 2 and OEPA correspondence dated 05/06/96 for Agency comments on this outstanding issue.

QUALITY ASSURANCE PROJECT PLAN

Section 3.2 Level of Quality Control Effort:

Table 3-3 should also reference Ohio's Water Quality Standards (OAC 3745-1). The applicable standards for the Mahoning River Basin are found in OAC 3745-1-25. The detection limits for any surface water samples which are obtained must be less than the established regulatory limits. (pgs. 3-4 through 3-12)

Section 8.3 Laboratory Analysis:

Provide clarification on the criteria referenced in the following statement: "Method blank levels should be below these levels for all analytes, criteria are established at 2x these levels." (pg. 8-2)

If you have any questions concerning this correspondence, please do not hesitate to contact me at 216-963-1221.

Sincerely,

Eileen T. Mohr
Site Coordinator
Division of Emergency and Remedial Response

ETM:ddb

cc: Bob Princic, NEDO DERR
Rod Beals, NEDO DERR
Murat Tukel, NEDO DHWM
Virginia Wilson, NEDO DSiWM
Diane Kurlich, NEDO DDAGW
Manjusha Bhide, CO DERR EAU
Bonnie Buthker, OFFO SWDO
Catherine Stroup, CO Legal
Bob Whelove, U.S. Army IOC
Todd Boatman, ACOE
Steve Selecman, SAIC Oak Ridge
Dave Mentzer, SAIC Columbus
John Cicero, RVAAP
Tim Morgan, RVAAP
Bill Talmon, Mason and Hangar
Dave Seely, USEPA Region V

cc: Jim Pic... 3B/2D ... File

OhioEPA

State of Ohio Environmental Protection Agency

STREET ADDRESS:
1800 WaterMark Drive
Columbus, OH 43215-1099

TELE: (614) 644-3020 FAX: (614) 644-2329

MAILING ADDRESS:
P.O. Box 1049
Columbus, OH 43216-1049

CONTRACTOR
FWD FOR
☐ Information
☑ Compliance as applicable
☐ Reply NLT________

TO 3/13/96
CR-COR
PROP ADM
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RETURN FOR FILE

March 7, 1996

Mr. Don E. Lappin
Chief, General Law/Congressional Affairs Division
Department of the Army
Headquarters, U.S. Army Armament, Munitions and Chemical Command
Rock Island, Illinois 61299-6000

Re: Ravenna Army Ammunition Plant, Ravenna, Ohio

Dear Mr. Lappin:

This letter follows my July 7, 1995 response to your your letter of April 27, 1995 regarding the above-referenced matter and the accompanying proposed revisions to the proposed administrative consent order which accompanied the Director's March 16, 1995 letter to Robert J. Kasper at the Ravenna Army Ammunition Plant ("RVAAP"). I regret the delay in since my July 7th correspondence, and can assure you that the Ohio EPA remains committed to working with the United States Army to address environmental issues at the RVAAP in an expeditious manner. As you know, discussions between Ohio EPA Northeast District Office officials and RVAAP representatives have continued during the past several months regarding various environmental remediation issues at the RVAAP. Ohio EPA staff have reviewed the proposed closure orders in light of these associated remediation issues, as well as the requested revisions which accompanied your April 27th correspondence; the enclosed revised administrative consent order proposal reflects our consideration of these issues as well as the requested revisions.

I understand that Ohio EPA and RVAAP representatives plan to meet at the RVAAP on March 27th and 28th. I propose that the agenda for this meeting be revised to include a three hour discussion of the enclosed proposal. Please inform me if this would be acceptable to you and the appropriate RVAAP representatives. Should you have any questions in this regard, please feel free to contact me at (614) 644-3037. Thank you for your cooperation in this regard.

Sincerely,

Mark J. Navarre

Mark J. Navarre
Supervising Attorney

cc: Murat Tukel/Diane Kurlich/Eileen Mohr, NEDO
Alan Harness/Ed Lim, DHWM, CO
Dan Lukovic/Montee Suleiman, DHWM, CO

Robert J. Kasper, Ravenna Army Ammunition Plant
John A. Rock, U.S. Army Armament, Rock Island

DRAFT

Issuance Date _____

Effective Date _____

BEFORE THE
OHIO ENVIRONMENTAL PROTECTION AGENCY

In the Matter of

~~Ravenna Arsenal, Inc.~~		
U.S. Department of the Army	:	
Ravenna Army Ammunition Plant	:	Director's Final
8451 State Route 5	:	Findings and Orders
Ravenna, Ohio 44266-9297	:	

PREAMBLE

It is hereby agreed by and among the parties hereto as follows:

I. JURISDICTION

The Director's Final Findings and Orders ("Orders") are hereby issued to ~~Ravenna Arsenal, Inc. ("Ravenna Arsenal")~~ the United States Department of the Army/Ravenna Army Ammunition Plant ("RVAAP") pursuant to the authority vested in the Director of the Ohio Environmental Protection Agency ("Ohio EPA"), by Ohio Revised Code ("ORC") sections 3734.02(G), 3734.13 and 3745.01.

II. PARTIES

These Orders shall apply to and be binding upon ~~Ravenna Arsenal~~ RVAAP, its agents, assigns, and successors in interest. No change in ownership or operation of the ~~Ravenna Army Ammunition Plant~~ Facility shall in any way alter ~~Ravenna Arsenal's~~ RVAAP's responsibilities under these Orders.

III. DEFINITIONS

Unless otherwise stated, all terms used in these Orders shall have the same meaning as in ORC Chapter 3734 and the rules promulgated thereunder.

IV. FINDINGS OF FACT

The Director hereby makes the following Findings of Fact:

1. ~~Ravenna Arsenal, Inc. ("Ravenna Arsenal")~~ ~~operates~~ The U.S. Department of the Army owns the Ravenna Army Ammunition Plant ("RVAAP" or "Facility") located at 8451 State Route 5, Ravenna, Portage County, Ohio, a facility ~~owned by the United States Army and~~ engaged in the storage and treatment of munitions and munition derivatives.

2. From April 1, 1950 through September 30, 1993, Ravenna Arsenal, Inc. ("Ravenna Arsenal") operated the RVAAP. Since October 1, 1993, Mason & Hanger-Silas Mason Co., Inc. has operated the RVAAP.

3. The RVAAP includes an open burning ("OB") area/unit, an open detonation ("OD") area/unit, a hazardous waste deactivation furnace unit, a greater-than-90-day hazardous waste storage building (Building 1601), and three less-than-90-day hazardous waste accumulation areas/units (Buildings W221, X232, U202).

4. On November 8, 1988, RVAAP/Ravenna Arsenal submitted a RCRA Part B permit application for the Facility to Ohio EPA, and on June 22, 1992, ~~RVAAP/~~ Ravenna Arsenal submitted a revised Part B permit application to Ohio EPA.

5. On March 22, 1990, Ravenna Arsenal submitted a RCRA closure plan for the hazardous waste deactivation furnace unit, as required by OAC Rules 3745-55-12/3745-66-12. Closure of this unit was required since RVAAP could not upgrade this unit in order to meet hazardous waste incinerator standards for Class A and Class B explosives.

6. On November 1, 1990, the Director approved the closure plan for the hazardous waste deactivation furnace unit.

7. On July 30, 1992, the Director issued Final Findings & Orders which exempted Ravenna Arsenal from the permitting requirements for ~~open burning/open detonation (OB/OD)~~ OB and OD hazardous waste treatment activities conducted at the RVAAP, and for storage ~~at the RVAAP~~ of all hazardous wastes generated from such treatment at the RVAAP.

8. The July 30, 1992 Findings and Orders state that the exemption provided therein would be effective until the Hazardous Waste Facility Board makes a final determination on RVAAP/Ravenna Arsenal's Part B permit application.

9. On July 27, 1993, Ravenna Arsenal submitted an amended closure plan for the deactivation furnace unit at the Facility since RVAAP had failed to demonstrate that the soils adjacent to the unit meet the clean closure standards set forth in the approved closure plan and Ohio Administrative Code ("OAC") Rules 3745-55-11/3745-66-11.

10. On September 29, 1993, Ohio EPA issued a Notice of Deficiency ("NOD") to RVAAP for its revised RCRA Part B permit application, dated June 22, 1992. RVAAP did not respond to the NOD.

11. By letter dated, ~~On~~ April 11, 1994, RVAAP ~~Ravenna Arsenal~~ notified ~~transmitted a letter to~~ Ohio EPA ~~notifying the Ohio EPA~~ of ~~Ravenna Arsenal's~~ RVAAP's intent to withdraw its RCRA Part B permit application for treatment and storage of hazardous waste at the Facility, and to cease OB/OD treatment activities at the Facility.

12. On April 14, 1994, Ohio EPA and RVAAP ~~Ravenna Arsenal~~ representatives met at the Facility to discuss ~~Ravenna Arsenal~~ RVAAP's permit application withdrawal and subsequent closure activities for the ~~OB/OD treatment and storage areas~~ hazardous waste management units at the Facility.

13. On April 19, 1994, Ohio EPA received a letter from RVAAP ~~Ravenna Arsenal~~ which confirmed ~~Ravenna Arsenal~~ RVAAP's intention to withdraw its Part B permit application for the Facility, and to cease operation of the ~~OB/OD~~ OB and OD units at the Facility.

14. On May 3, 1994, Ohio EPA issued a NOD to RVAAP regarding the July 27, 1993 amended closure plan for the deactivation furnace unit.

15. On September 6, 1994, RVAAP submitted a revised amended closure plan for the deactivation furnace unit; Ohio EPA notified RVAAP that the revised amended closure plan did not meet the Agency's administrative protocol for re-submittal.

16. On November 2, 1994, RVAAP resubmitted a revised amended closure plan for the deactivation furnace. Since November 2, 1994, Ohio EPA has discussed the revised amended closure plan with RVAAP representatives.

17. Ohio EPA has informed RVAAP that the closure plan for the deactivation furnace unit, must satisfactorily address the Agency's comments on the revised amended closure plan, set forth in Ohio EPA's NODs, dated September 29, 1993 and May 3, 1994, and that the revised amended closure plan must be expanded to include the greater-than-90-day hazardous waste storage building (Building 1601), the OB area and the OD area.

18. Since September of 1993, the following explosive compounds have been periodically detected in ground water samples obtained from monitoring wells installed in the OB and OD areas: TNB; TNT; HMX; 2,6-DNT; and RDX.

19. On February 28, 1995, RVAAP submitted a Supplementary Annual Report Form for Ground Water Monitoring Information for 1994. On May 3, 1995, August 18, 1995 and December 14, 1995, RVAAP submitted Ground Water Monitoring Data for the first, second and third quarters of 1995, respectively.

20. Statistical analyses of indicator parameter data submitted with the above-described ground water monitoring documentation indicate that, when upgradient concentrations are compared to downgradient concentrations, there are significant increases in specific conductance at the OB area and significant increases in specific conductance and TOC at the OD area. Also, during the third quarter of ground water monitoring in 1995, the volatile organic compound, 1,2-dichloroethane, was detected in ground water samples collected from OB

and OD areas. These results indicate that the Facility may be affecting the quality of ground water in the vicinity of the OB and OD areas.

21. OAC Rule 3745-66-12(D)(3) provides that the owner or operator of a hazardous waste facility shall submit a closure plan to the Director no later than fifteen days after issuance by the Director of an order to close the hazardous waste facility.

22. Pursuant to ORC Section 3734.02(G) and OAC Rule 3745-50-31, the Director may by order exempt any person generating, storing, treating, or disposing of hazardous wastes in such quantities or under such circumstances that, in the determination of the Director, it is unlikely that the public health or safety or the environment will be adversely affected thereby, from any requirement to obtain a permit or license, or comply with the manifest system or other requirements of ORC Chapter 3734.

23. The Director has determined that if RVAAP submits an approvable closure plan for the greater-than-90-day hazardous waste storage building (Building 1601), the OB area, the OD area, and the hazardous waste deactivation furnace unit, within ninety (90) days from the effective date of these Orders, it is unlikely that the public health or safety or the environment will be adversely affected.

V. ORDERS

The Director hereby issues the following Orders:

1. Within thirty (30) days from the effective days of these Orders, RVAAP shall submit to Ohio EPA for approval, an interim decontamination, characterization and remediation plan and schedule ("interim remediation plan"), which shall include the following activities:

   a) Decontamination of the interior of the greater-than-90-day hazardous waste storage building (Building 1601) and the proper characterization and disposal of the residues and rinseates generated by decontamination;

   b) Decontamination, dismantling and proper disposal of the open burn trays and equipment at the OB area;

   c) Characterization of the contaminated media at the OD area, including but not limited to the horseshoe shaped area, using historical analytical data. Any materials which meet the definition of hazardous waste, as specified in OAC rules 3745-51-21 through 3745-51-33, shall be removed and properly disposed. RVAAP shall also take appropriate action, such as temporary vegetative cover, to control erosion at the OD area; and

   d) Characterization of the contaminated media at the deactivation furnace unit using historical analytical data. Any materials which meet the definition of hazardous waste, as specified in OAC rules 3745-51-21 through 3745-51-33, shall be removed and properly disposed.

Upon receipt of the proposed interim remediation plan, Ohio EPA will notify RVAAP of its acceptance or acceptance with modification. RVAAP shall implement the accepted interim remediation plan in accordance with the compliance schedule contained therein.

2. An exemption from the requirement that a closure plan be submitted to the Director no later than fifteen (15) days after issuance by the Director of an order to close a hazardous waste facility, as required by OAC rule 3745-66-12(D)(3), is hereby granted to RVAAP, provided that RVAAP complies with these Orders.

3. Within ~~fifteen (15)~~ ninety (90) days from the effective date of these Orders, RVAAP ~~Ravenna Arsenal~~ shall submit to Ohio EPA an approvable closure plan for the deactivation furnace unit, greater-than-90-day hazardous waste storage building (Building 1601), OB area and OD area ~~OB/OD treatment and storage areas~~ at the Facility, in accordance with OAC Rule 3745-~~66-12~~ 55-12 and 3745-54-90 through 3745-55-02. The closure plan shall satisfactorily address the Ohio EPA's September 29, 1993 and May 3, 1994 NODs.

4. If the Director does not approve the closure plan submitted by RVAAP ~~Ravenna Arsenal~~ pursuant to Order No. 3 of these Orders, and provides RVAAP ~~Ravenna Arsenal~~ with a written statement of deficiencies in the plan, RVAAP ~~Ravenna Arsenal~~ shall modify the plan or resubmit a new plan for approval that addresses the deficiencies, within thirty (30) days of receiving such written statement, unless otherwise specified by Ohio EPA. If the Director modifies the closure plan, this modified plan shall become the approved closure plan.

5. Upon approval by the Director of RVAAP's ~~Ravenna Arsenal's~~ closure plan, RVAAP ~~Ravenna Arsenal~~ shall implement the approved closure plan in the manner and pursuant to the time frames set forth in the approved plan and OAC Rules 3745-~~66-13.~~ 55-13/3745-66-13.

6. Within sixty (60) days of completion of closure, RVAAP ~~Ravenna Arsenal~~ shall submit to Ohio EPA a certification of closure of the deactivation furnace unit, Building 1601, the OB area and the OD area ~~OD treatment and storage areas~~ at the Facility, pursuant to OAC Rules 3745-~~66-15.~~ 55-15/3745-66-15.

7. RVAAP shall continue to monitor ground water at the OB and OD areas, in accordance with OAC rules 3745-65-90 through 3745-65-94, until the Director's approval of the closure plan required by these Orders.

8. Within thirty (30) days from the effective date of these Orders, RVAAP shall institute ground water quality assessment programs at the OB and OD areas, in accordance with OAC rules 3745-65-93(D) and 3745-65-94(B).

9. The Director's Final Findings and Orders issued to Ravenna Arsenal on July 30, 1992, are hereby revoked. RVAAP shall cease OB and OD treatment activities at the Facility.

10. RVAAP ~~Ravenna Arsenal~~ shall comply with the hazardous waste management requirements applicable to generators of hazardous waste under Chapter 3734 of the ORC and the

regulations adopted thereunder. All shipment of hazardous waste shall be documented by manifest and copies of the manifest shall be maintained at the Facility for a period of at least three (3) years from the date of delivery, as required by OAC Rule 3745-52-20.

11. Within ninety (90) days from the effective date of these Orders, RVAAP shall complete closure of the less-than-90-day hazardous waste accumulation units (Buildings W221, X232 and U202), in accordance with OAC rules 3745-55-11/3745-66-11 (A) & (B) and 3745-55-14/3745-66-14. Within thirty (30) days after completion of closure and disposal or decontamination activities, RVAAP shall submit to Ohio EPA documentation sufficient to demonstrate closure of Buildings W221, X232 and U202, in accordance with OAC rules 3745-55-11/3745-66-11 (A) & (B) and 3745-55-14/3745-66-14. All shipments of hazardous waste shall be documented by manifest and copies of the manifests shall be maintained on-site at the Facility for a period of at least three (3) years from the date of delivery, as required by OAC rule 3745-52-20.

VI. OTHER CLAIMS

Nothing in these Orders shall constitute or be construed as a release of any claim, cause of action or demand in law or equity against any person, firm, partnership or corporation, not a signatory to these Orders, for any liability arising out of or relating to the operation of ~~Ravenna Arsenal~~ RVAAP's hazardous waste facility.

VII. OTHER APPLICABLE LAWS

All actions required to be taken pursuant to these Orders shall be undertaken in accordance with the requirements of all applicable laws and regulations. Nothing in these Orders shall be construed as waiving or compromising the applicability and enforcement of any other statutes or regulations applicable to ~~Ravenna Arsenal's~~ the operation of the RVAAP. The Ohio EPA reserves all rights and privileges except as specified herein.

VIII. NOTICE

All documents demonstrating compliance with these Orders, and other documents required under these Orders to be submitted to the Ohio EPA shall be addressed to:

Ohio Environmental Protection Agency
Northeast District Office
Attn: RCRA Group Leader, DHWM
2110 East Aurora Road
Twinsburg, Ohio 44087

AND

Ohio Environmental Protection Agency
Attn: Manager, Data Management Section
Division of Hazardous Waste Management
1800 WaterMark Drive, P.O. Box 1049
Columbus, Ohio 43216-1049

or to such persons and addresses as may be hereafter be otherwise specified in writing by the Ohio EPA.

IX. RESERVATION OF RIGHTS

Nothing contained herein shall be construed to prevent the Ohio EPA from seeking legal or equitable relief to enforce the terms of these Orders or from taking other administrative, legal or equitable action as deemed appropriate and necessary, including seeking penalties against ~~Ravenna Arsenal~~ RVAAP, for noncompliance with these Orders. Nothing contained herein shall be construed to prevent Ohio EPA from exercising its lawful authority to require RVAAP to perform additional activities at the Facility, pursuant to ORC chapter 3734 or any other applicable law in the future. Nothing contained herein shall restrict the right of ~~Ravenna Arsenal~~ RVAAP to seek administrative or judicial review, or to raise any administrative, legal or equitable claim or defense with respect to such further actions which the Ohio EPA may seek to require of ~~Ravenna Arsenal~~ RVAAP, including any modification or disapproval by the Director of the closure plan required by these Orders.

It is the position of Ohio EPA that the federal Anti-Deficiency Act, 31 U.S.C. section 1341, as amended, does not apply to any obligations set forth in these Orders, and that obligations hereunder are unaffected by RVAAP's failure to obtain adequate funds or appropriations from Congress. It is the position of RVAAP that the obligations set forth in these Orders are subject to the provisions of the Anti-Deficiency Act and are subject to the availability of funding. Ohio EPA and RVAAP agree that it is premature to raise and resolve the validity of such positions at this time.

IT IS SO ORDERED:

_____ _____
Donald R. Schregardus, Director Date

X. SIGNATORIES

Each undersigned representative of a signatory to these Orders certifies that he or she is fully authorized to enter into these Orders and to legally bind such signatory to this document.

XI. WAIVER

~~Ravenna Arsenal~~ RVAAP agrees that these Orders are lawful and reasonable, that the times provided for compliance herein are reasonable and that ~~Ravenna Arsenal~~ RVAAP agrees to comply with these Orders.

~~Ravenna Arsenal~~ RVAAP hereby waives the right to appeal the issuance, terms and service of these Orders and it hereby waives any and all rights it might have, either in law or equity, to seek administrative or judicial review of these Orders, but not as to any modification or disapproval by the Director of the closure plan required by these Orders.

Notwithstanding the preceding, the Ohio EPA and ~~Ravenna Arsenal~~ RVAAP agree that, in the event that these Orders are appealed by any other party to the Environmental Board of Review or any court, ~~Ravenna Arsenal~~ RVAAP retains the right to intervene and participate in such appeal. In such event, ~~Ravenna Arsenal~~ RVAAP shall continue to comply with these Orders notwithstanding such appeal and intervention unless these Orders are stayed, modified or vacated.

IT IS SO AGREED:

~~Ravenna Arsenal, Inc.~~ U.S. Department of the Army, Ravenna Army Ammunition Plant

_____ _____
By Robert J. Kasper Date
Commanding Officer's Representative

Ohio Environmental Protection Agency

_____ _____
Donald R. Schregardus Date
Director

AMSIO-IOA-I (AMSIO-EQ/24 Jan 96) (740(B)) 1st End
SUBJECT: Last Production Order at Ravenna AAP

27 FEB 1996

AMSIO-IOA

FOR AMSIO-EQ

1. We have researched available records and queried production managers, the contract specialist and the contract administrator at the plant to determine the last production order. We found the last production occurred during the Vietnam era. The items produced were primers, 40mm, 155mm and 175mm munitions; however, no information was found to identify the specific orders on which they were produced. Therefore, we have not nor plan to budget for the requested funds.

2. The POC is Mr. James Bertelsen, AMSIO-IOA-I, extension 24698, E-mail jbertels.

MURRAY S. BICKNELL
Chief, Ammunition Production and
Logistics Division

6

5

Encl

DEPARTMENT OF THE ARMY
RAVENNA ARMY AMMUNITION PLANT
8451 STATE ROUTE 5
RAVENNA, OHIO 44266-9297

TO	4/1/96	
✓	CR-COR	
	PROP ADM	
	LAND MGR	
	CONTRACTOR	
X	RETURN FOR FILE	

REPLY TO
ATTENTION OF

April 1, 1996

SIORV-CR (200-1a)

Trumbull County Health Department
176 Chestnut NE
Warren, Ohio 44483

Dear Sir or Madam:

This correspondence serves as notice, as required, under the Ohio Administrative Code (OAC) 3745-27-13 (authorization to engage in filling, grading, excavating, building, drilling, or mining on land where a hazardous waste facility or solid waste facility was operated) that a generic authorization is being requested from the Ohio Environmental Protection Agency (OEPA), Northeast District, to conduct investigative activities (drilling and soil sampling, monitoring well installation and groundwater sampling, trenching to collect waste material an soil samples, piezometer and well point installation, surface water and sediment sampling, and surface soil sampling) necessary to characterize Areas of Concern (AOCs) at the Ravenna Army Ammunition Plant, Ravenna, Ohio, under Comprehensive Environmental Response, Compensation, and Liability Act leading to the environmental restoration of AOCs under the U.S. Department of Defense Installation Restoration Program. The request for authorization is submitted as part of the Facility-wide Sampling and Analysis Plan for the Ravenna Army Ammunition Plant, Ravenna, Ohio, (U.S. Army Corps of Engineers, Nashville District, 1996).

The Ravenna Army Ammunition Plant is located in northeastern Ohio within Portage and Trumbull Counties, approximately 4.8 kilometers (3 miles) east/northeast of the Town of Ravenna and approximately 1.61 kilometers (1 mile) northwest of the Town of Newton Falls. The installation consists of 21,419 acres (8668 hectares) contained in a 17.7-kilometers-long (11-mile-long), 5.63-kilometers-wide (3.5 mile wide) tract bounded by State Route 5, the Michael J. Kirwan Reservoir, and the CSX System Railroad on the south; State Route 534 on the east; the Garrettsville and Berry Roads on the west; and the CONRAIL Railroad on the north. The land use surrounding the installation is primarily farmland with sparse private residences. The Michael J. Kirwan Reservoir is located immediately south of the facility. A map of the facility is attached to this correspondence.

The Ravenna Army Ammunition Plant is a government-owned, contractor-operated U.S. Army Industrial Operations Command facility. Currently, the Ravenna Army Ammunition Plant is an inactive facility maintained by a contracted caretaker, Mason and Hanger-Silas Mason Company, Inc.

Attachment I

If you have questions or concerns pertaining to this request for authorization under OAC 3745-27-13, you may contact me at (330) 358-7311, or Ms. Eileen Mohr with the OEPA in Twinsburg, Ohio, at (216) 963-1221.

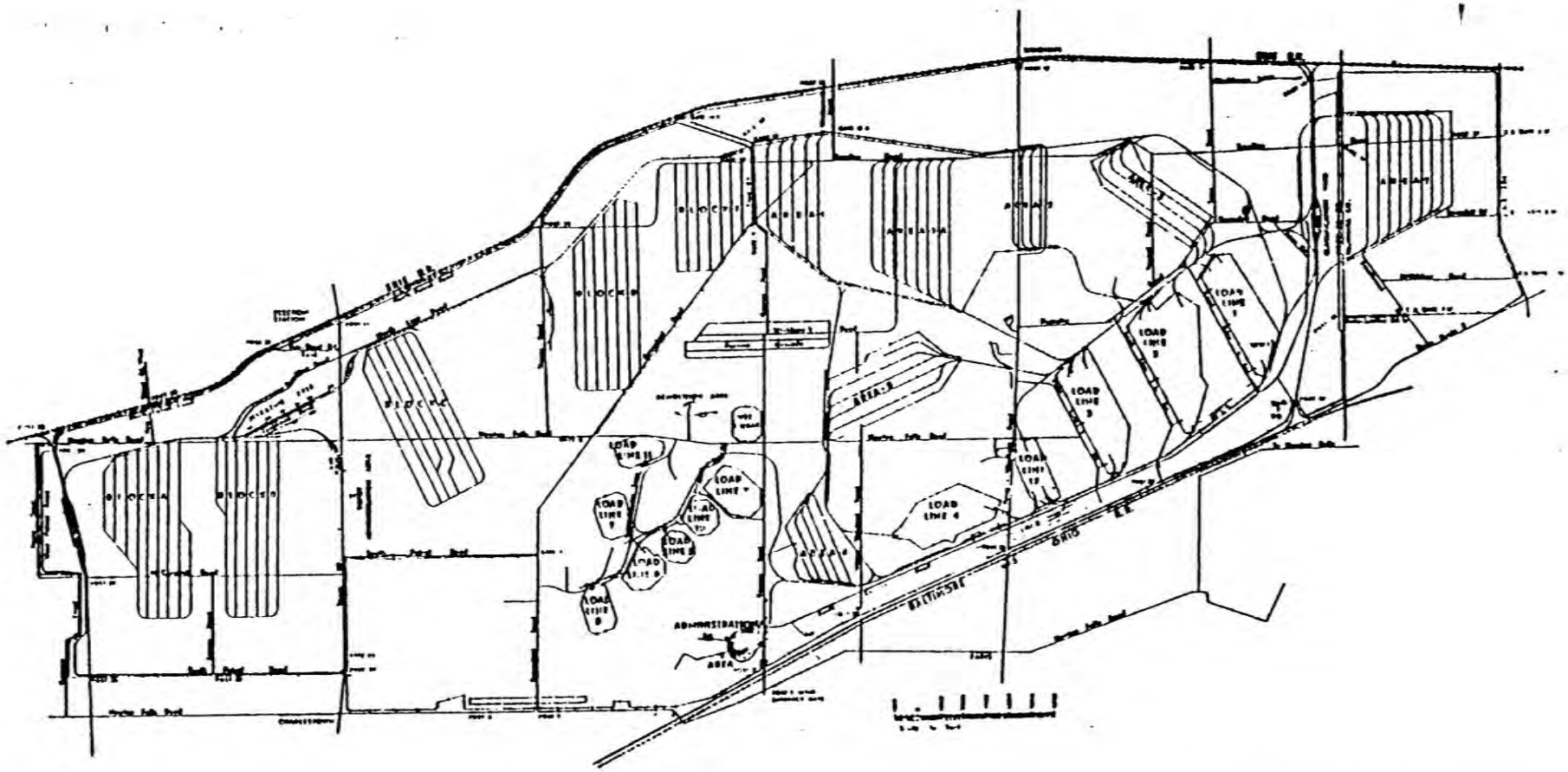
Sincerely,

John A. Cicero, Jr.
Commander's Representative

Enclosure

Copies Furnished:

Commander, U.S. Army Industrial Operations Command, ATTN: AMSIO-EQE (Mr. Whelove), Rock Island, IL 61299-6000
Commander, U.S. Army Industrial Operations Command, ATTN: AMSIO-IRI (Ms. Vermost), Rock Island, IL 61299-6000
Mr. Doug Webb, U.S. Army Corps of Engineers, Nashville District, CEORN-ER-M, 110 Ninth Street South, Nashville, TN 37203-3863
Mr. Steve Selecman, Science Applications International Corporation, P.O. Box 2502, Oak Ridge, TN 37830
Mr. William Talmon, Mason and Hanger-Silas Mason Company, Inc., 8451 State Route 5 Ravenna, OH 44266-9297
Ohio Army National Guard Site Representative, Major Tom Tadsen, 8451 State Route 5, Ravenna, OH 44266-9297



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RAVENNA ARMY AMMUNITION PLANT

APPROVED	SIGNATURE	DATE

TITLE: GENERAL AREA MAP

A-109

DEPARTMENT OF THE ARMY
RAVENNA ARMY AMMUNITION PLANT
8451 STATE ROUTE 5
RAVENNA, OHIO 44266-9297

REPLY TO
ATTENTION OF

April 1, 1996

TO	4/1/96
	CR-COR
	PROP ADM
	LAND MGR
	CONTRACTOR
	RETURN FOR FILE

SIORV-CR (200-1a)

Portage County Health Department
449 South Meridian Street
Ravenna, Ohio 44266

Dear Sir or Madam:

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Attachment II

If you have questions or concerns pertaining to this request for authorization under OAC 3745-27-13, you may contact me at (330) 358-7311, or Ms. Eileen Mohr with the OEPA in Twinsburg, Ohio, at (216) 963-1221.

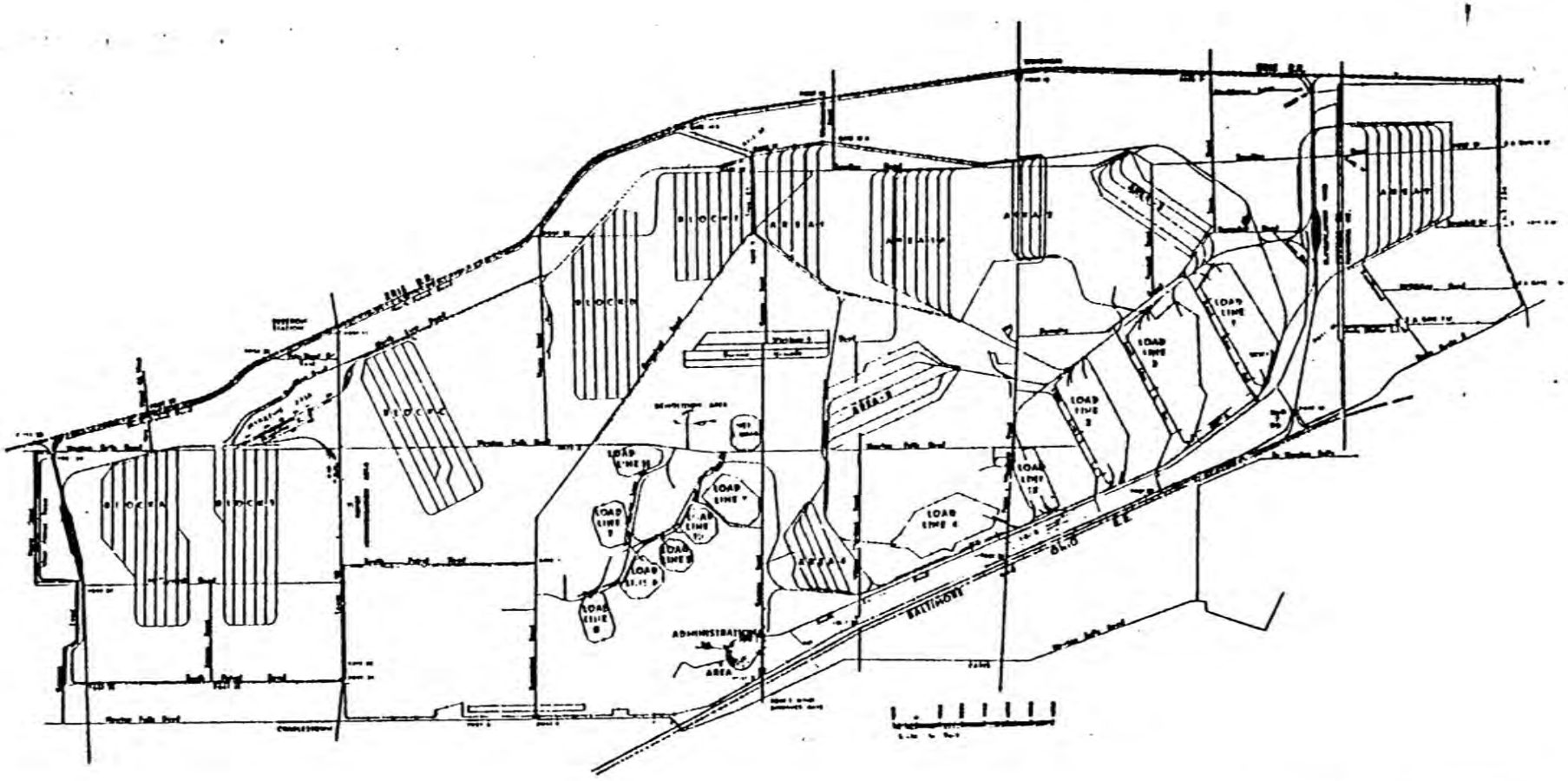
Sincerely,

John A. Cicero, Jr.
Commander's Representative

Enclosure

Copies Furnished:

Commander, U.S. Army Industrial Operations Command, ATTN: AMSIO-EQE (Mr. Whelove), Rock Island, IL 61299-6000
Commander, U.S. Army Industrial Operations Command, ATTN: AMSIO-IRI (Ms. Vermost), Rock Island, IL 61299-6000
Mr. Doug Webb, U.S. Army Corps of Engineers, Nashville District, CEORN-ER-M, 110 Ninth Street South, Nashville, TN 37203-3863
Mr. Steve Selecman, Science Applications International Corporation, P.O. Box 2502, Oak Ridge, TN 37830
Mr. William Talmon, Mason and Hanger-Silas Mason Company, Inc., 8451 State Route 5 Ravenna, OH 44266-9297
Ohio Army National Guard Site Representative, Major Tom Tadsen, 8451 State Route 5, Ravenna, OH 44266-9297



RAVENNA ARMY AMMUNITION PLANT

GENERAL AREA MAP

A-109

OhioEPA
State of Ohio Environmental Protection Agency

STREET ADDRESS:
1800 WaterMark Drive
Columbus, OH 43215-1099

TELE: (614) 644-3020 FAX: (614) 644-2329

MAILING ADDRESS:
P.O. Box 1049
Columbus, OH 43216-1049

June 6, 1996

Robert Whelove
Commander, U.S. Army
Industrial Operations Command
Attn: AMSIO-EQE
Rock Island, IL 61299-6000

Re: Ravenna Arsenal - Director's Authorization to Dig in accordance with Ohio Revised Code Section 3734.02(H)

Dear Commander Whelove:

The purpose of this letter is to follow up on the discussion that took place during a conference call on May 28, 1996. During this call, the concern was raised that if a particular area of the Ravenna Arsenal is designated as requiring an authorization form the Director of the Ohio Environmental Protection Agency (Ohio EPA) before filling, grading, excavating, building, drilling, or mining can occur, in accordance with Ohio Revised Code Section 3734.02(H), that such authorization will be required for any and all future digging-type activities that take place within the designated areas.

In response to the concerns raised, I suggest that the Army, or whoever is responsible for the Ravenna Arsenal in the future, follow the process or procedure outlined below. When the remediation of the Ravenna Arsenal is completed, the party who is responsible for the Arsenal should contact the Ohio EPA about any digging-type activities that are proposed for areas that have been designated as requiring the Director's authorization. At that time, if Ohio EPA agrees that the remediation has been conducted in a manner that has addressed all threats to public health or safety, then it is likely that the Ohio EPA will offer the opinion that the Director's authorization is no longer required for the area that has been designated as requiring an authorization in the past. Once the Ohio EPA has made a determination that a Director's authorization is no longer required for activities in a particular area, then further contact with the Ohio EPA will not be necessary. It should be understood that until such time as the remediation is completed, the Director's authorization for digging in designated areas will continue to be necessary.

I hope this addresses the concern that was raised during the conference call. Please feel free to contact me at (614) 644-3037 if you have any questions concerning this matter.

Sincerely,

Catherine A. Stroup

Catherine A. Stroup
Staff Attorney

cc: John Cicero, Dept. of the Army
Eileen Mohr, DERR, NEDO

From: <RAVENNA-AAP@ria-emh2.army.mil>
To: Central-Office.NEDO(Emohr),Central-Office.INTERNET...
Date: Fri, Jul 11, 1997 10:07 am
Subject: Phase I RI Public Meeting

To All,

I've reserved the Ravenna High School auditorium for Wednesday, September 3, 1997, for subject meeting. The room is reserved from 5:00 PM until 9:00 PM. I plan to start the meeting at 6:00 PM and end it at 8:00 PM. This will give us an hour before the meeting for setup and an hour after to field questions. We will not be able to get in during the afternoon because school will be in session. This schedule will make it imperative that we have clear and concise presentations. I do not want to run over and want to have a full hour for questions and answers. I'm confident that Steve and Samantha can put together appropriate presentations. We need to have a conference call to discuss this sometime soon.

Tim

Eileen, could you contact Dave Seely at EPA Region 5 and inform him about this meeting?

OHIO EPA
State of Ohio Environmental Protection Agency

Director's Office Number 520

COVER MEMO

96 JUL 25 PM 2:22

(X) Director's Signature (DRAFT)
( ) DRAFT - Governor's Signature
( ) Background Investigation Report - CONFIDENTIAL
( ) Assistant Director's Signature
( ) Deputy Director's Signature RECEIVED

(OAC 3745-27-13)

Subject: (MCR#______) RAVENNA ARMY AMMUNITION PLANT - RULE 13 AUTHORIZATION

Prepared by: EILEEN MOHR Division: DERR Date: 07/22/96

Blind Copies: ______

NECESSARY APPROVALS		APPROVED BY	DATE
( )	Assistant Director		
( )	Deputy Director, Legal		
( )	Deputy Director, Programs		
( )	Deputy Director, Policy		
(X)	Other / Legal	~~[illegible]~~	
( )	Other J. Hurdle	Catherine Stroup	
		Catherine A. Stroup	8/6/96

District Personnel Information	Division Personnel Information
Approvals:	Approvals:
Unit Supervisor Robert Klincik	Unit Supervisor ______
Date: 7/22/96	Date: _/_/_
Section Manager Rodney W. Beals RTP	Section Manager ______
Date: 7/22/96	Date: _/_/_
Assistant Dist. Chief Robert Wysenski	Assistant Chief [signature]
Date: 7/22/96	Date: 7/26/96
District Chief [signature]	Chief Anne A. Cat[illegible]
Date: 7/22/96	Date: 7/26/96
Date Sent: ______	Date Sent: ______
District Number: ______	Division Number: ______

RETURN ALL SUPPORTING DOCUMENTS TO:

Name: EILEEN MOHR Division: DERR NEDO

IRP File

403-1

OhioEPA
State of Ohio Environmental Protection Agency
Northeast District Office
2110 E. Aurora Road
Twinsburg, Ohio 44087-1969
(216) 425-9171
FAX (216) 487-0769

George V. Voinovich
Governor

July 19, 1996

RE: RAVENNA ARMY AMMUNITION PLANT
PORTAGE/TRUMBULL COUNTIES

Mr. Doug Webb
Department of the Army
Nashville District, Corps of Engineers
Engineering Management Branch
P.O. Box 1070
Nashville TN 37202-1070

Dear Mr. Webb:

The Ohio EPA (OEPA) has received the following documents related to the Ravenna Army Ammunition Plant (RVAAP):

1. "Final, Phase 1 Remedial Investigation Sampling and Analysis Plan, Addendum for High Priority Areas of Concern for the Ravenna Army Ammunition Plant, Ravenna, Ohio."

2. "Final, Phase 1 Remedial Investigation Site Safety and Health Plan, Addendum for High Priority Areas of Concern for the Ravenna Army Ammunition Plant, Ravenna, Ohio."

These documents were prepared for the U.S. Army Corps of Engineers (ACOE), Nashville District, by Science Applications International Corporation (SAIC), Oak Ridge, TN under contract number DACA62-94-D-0029. The above-referenced documents were received by the OEPA on July 15, 1996, and the comment resolution document was received on July 19, 1996.

It is this Agency's understanding that the only changes (with the exception of potential SAIC personnel changes) made from the draft to the final documents were the revisions previously requested by the OEPA. In light of this, in order to expedite the review process, the only portions of the revised documents that were reviewed were those sections of the text previously commented on by the OEPA. If this understanding is not correct, please notify this writer. The review was facilitated by referring to the original OEPA comment letter (dated June 21, 1996), a conference call held between OEPA, SAIC and the ACOE on July 3, 1996, and the above-referenced comment resolution document.

JUL 22 1996

The issues presented in the June 21, 1996 OEPA comment letter on the above-referenced documents have been resolved to the Agency's satisfaction. The OEPA considers the Area of Concern (AOC) specific sampling and analysis plan and the health and safety plan to be acceptable submissions.

If you have any questions concerning this correspondence, please do not hesitate to contact me at (216) 963-1221.

Sincerely,

Eileen T. Mohr
Site Coordinator
Division of Emergency and Remedial Response

ETM:ddb

cc: Rod Beals, NEDO DERR
Bob Princic, NEDO DERR
Diane Kurlich, NEDO DDAGW
Sheila Abraham, NEDO DHWM
Virginia Wilson, NEDO DHWM
Manjusha Bhide, CO DERR
Catherine Stroup, CO Legal
Bonnie Buthker, OFFO SWDO
Bob Whelove, U.S. Army IOC
Todd Boatman, ACOE Nashville
Steve Selecman, SAIC Oak Ridge
Dave Mentzer, SAIC Columbus
John Cicero, RVAAP
Tim Morgan, RVAAP
Bill Talmon, Mason and Hangar
David Seely, USEPA Region V

INTER - OFFICE COMMUNICATION

TO: **Bill Skowronski, District Chief, NEDO and Jan Carlson, Chief, DERR CO**

FROM: **Eileen T. Mohr, NEDO DERR, through Bob Princic, Group Leader and Rod Beals, Unit Supervisor, NEDO DERR**

DATE: **July 22, 1996**

RE: **Request for Authorization Under Ohio Administrative Code (OAC) 3745-27-13 at the Ravenna Army Ammunition Plat (RVAAP)**

INTRODUCTION:

On April 15, 1996 representatives for the RVAAP submitted a request for authorization to fill, grade, excavate, drill, build or mine pursuant to OAC 3545-27-13 at the RVAAP. The request was disapproved by DERR NEDO on May 6, 1996 due to a number of deficiencies in the submission. The request was revised and re-submitted to OEPA NEDO DERR on July 11, 1996.

The current request is to conduct intrusive activities at 11 high priority Areas of Concern (AOCs) at the RVAAP consisting of soil, surface water and sediment sampling, the installation of geoprobe borings and monitor wells and trenching (at one AOC). The intent of the sampling efforts (termed a "Phase 1 Remedial Investigation" which is comparable to a Site Investigation) is to determine the presence or absence of contaminants at the 11 high priority AOCs and to determine the nature of the Potential Contaminants of Concern (PCOCs). On-site work is being conducted in accordance with CERCLA.

INSTALLATION BACKGROUND:

The RVAAP installation is located within Portage and Trumbull in northeastern Ohio, and consists of 21,419 acres. RVAAP is a government-owned, contract-operated (GOCO) facility, and is currently inactive. Over the years (since its establishment in 1941), the RVAAP handled and stored strategic and critical materials for various government agencies and received, stored, maintained, transported, and demilitarized military ammunition and explosive items. RVAAP maintained the capabilities to load, assemble and pack military ammunition; however, these operations are inactive. As part of the RVAAP mission, the inactive facilities were maintained on a standby status by keeping equipment in a condition to permit resumption of production within a prescribed time limitation, if necessary.

OHIO EPA DERR INVOLVEMENT:

DERR NEDO is involved with activities at the installation under the Defense-State Memorandum of Understanding (DSMOA). As such, the designated DERR project manager has reviewed and commented upon numerous documents including: the Preliminary Assessment (PA); sitewide sampling and analysis plans (SAPs) and health and safety plans (HASPs); AOC specific SAPs and HASPs; as well as the installation Action Plan.

RECOMMENDATIONS:

DERR NEDO recommends, based upon the above-referenced documents, that the authorization request to conduct intrusive activities at the RVAAP be approved by the Director. A Director's approval letter for this request has been drafted and is attached to this memo.

If you have any questions, please do not hesitate to contact Eileen Mohr at 216-963-1221.

OhioEPA
State of Ohio Environmental Protection Agency
Northeast District Office
[illegible]10 E. Aurora Road
[illegible]nsburg, Ohio 44087-1969
[illegible]6) 425-9171
FAX (216) 487-0769

8/21/96
COR
PROP ADM
LAND MGR
CONTRACTOR 8/21/96

George V. Voinovich
Governor

August 16, 1996

RE: RAVENNA ARMY AMMUNITION PLANT
PORTAGE/TRUMBULL COUNTIES

Mr. Doug Webb
Department of the Army
Nashville District, Corps of Engineers
Engineering Branch
P.O. Box 1070
Nashville TN 37202-1070

Dear Mr. Webb:

I would like to take this opportunity to provide input to the Army Corps of Engineers (ACOE) on the Phase 1 Remedial Investigation (RI) field investigative activities currently being conducted at eleven high priority Areas of Concern (AOCs) at the Ravenna Army Ammunition Plant (RVAAP).

Since field work commenced on July 22, 1996, I have had many opportunities to provide Ohio EPA field oversight of the various investigative activities. I have been impressed with the organization, professionalism, and positive attitudes of both the ACOE and the Science Applications International Corporation (SAIC) personnel. This has translated into high quality work being performed in the field, which will greatly aid all stakeholders in future decision-making.

Please convey my appreciation to all those involved with this project. I look forward to a continued positive working relationship with the ACOE and SAIC as this project continues.

Sincerely,

Eileen T. Mohr
Site Coordinator
Division of Emergency and Remedial Response

ETM:ddb

cc: Rod Beals, NEDO DERR
Bob Princic, NEDO DERR
Bob Whelove, IOC
John Cicero, RVAAP
Steve Selecman, SAIC

Installation Restoration File

OhioEPA
State of Ohio Environmental Protection Agency
Northeast District Office
2110 E. Aurora Road
Twinsburg, Ohio 44087-1969
(216) 425-9171
FAX (216) 487-0769

TO 10/7/96
CO-COR
PROP ADM
LAND MGR
CONTRACTOR
RETURN FOR FILE

George V. Voinovich
Governor

October 4, 1996

RE: RAVENNA ARMY AMMUNITION PLANT
PORTAGE/TRUMBULL COUNTIES
PROPOSED PHASE 1 RI REPORT OUTLINE

Mr. Steve Selecman
Science Applications International Corporation
800 Oak Ridge Turnpike
P.O. Box 2502
Oak Ridge TN 37831

Dear Mr. Selecman:

The Ohio Environmental Protection Agency (OEPA) has received and reviewed correspondence from SAIC dated September 18, 1996, in which a proposed outline for the draft Phase 1 Remedial Investigation (RI) report is presented.

The OEPA has the following comments on the proposed outline:

1. Provide more details on the proposed inclusion of RCRA groundwater monitoring results into the Phase 1 RI report. For example, will this include a discussion of the relationship between the "RCRA-regulated" portion of an Area of Concern (AOC) with the "CERCLA-regulated" portion? How many quarters of data will be presented in the document, etc.?

2. Refer to previous Agency correspondence, specifically those dated 11/03/95, 01/16/96, and 05/21/96, regarding risk evaluation issues. The comments previously made on sitewide workplans regarding these issues will be applicable to the Phase 1 RI report. An additional copy of the Phase 1 RI report should be transmitted to my attention, as it will necessarily need to be reviewed by personnel in OEPA's Central Office, Division of Emergency and Remedial Response, Environmental Assessment Unit (CO DERR EAU). The total number of Phase 1 RI reports requested by this Agency is three (3).

3. Provide clarification as to what will be included in the project quality assurance summary and the data quality assessment. For example, in addition to receiving copies of the data sheets, the OEPA would like to see the data presented in tabular form. Copies of chain of custody forms, quality assurance/quality control information (ex. date sample obtained, date received at the laboratory, date analyzed; trip blank and field blank information; information on surrogate recoveries, etc.) should also be included.

I appreciate knowing that the report is scheduled to be received by this office on or about 12/20/96, as that will assist the Agency in scheduling the necessary reviews.

If you have any questions concerning this correspondence, please do not hesitate to contact me at 216-963-1221.

Sincerely,

Eileen T. Mohr
Site Coordinator
Division of Emergency and Remedial Response

ETM:ddb

cc: Bob Princic, NEDO, DERR
Diane Kurlich, NEDO, DDAGW
Bonnie Buthker, OFFO, SWDO
Manjusha Bhide, CO, DERR, EAU
Doug Webb, ACOE
Bob Whelove, IOC
John Cicero, RVAAP

OhioEPA
State of Ohio Environmental Protection Agency
Northeast District Office
2110 E. Aurora Road
Twinsburg, Ohio 44087-1969
(216) 425-9171
FAX (216) 487-0769

George V. Voinovich
Governor

cc: J. Higgins

January 16, 1995

RE: Ravenna Army Ammunition Plant
Portage/Trumbull Counties

Mr. Doug Webb
Department of the Army
Nashville District, Corps of Engineers
Engineering Management Branch
P.O. Box 1070
Nashville, TN 37202-1070

Dear Mr. Webb:

The Ohio Environmental Protection Agency (OEPA) has reviewed the Army Corps of Engineers (ACOE) and Science Application International Corporation (SAIC) responses to Agency comments on the workplans submitted for the Ravenna Army Ammunition Plant (RVAAP). The responses to comments were received by the Agency during a November 27, 1995 meeting held at the Agency's Northeast District Office.

Agency comments on the responses, follow the same format as the ACOE and SAIC response document. Although many of the responses are acceptable to the Agency, there are many outstanding issues that warrant further discussion. Please contact the Agency Site Coordinator to schedule a mutually convenient meeting or conference call date and time, such that the outstanding issues can be discussed in further detail.

GENERAL COMMENTS

1. Response acceptable to the Agency. As agreed to during the 11/27/95 meeting, an introductory section will be added to the Action Plan and the Sampling and Analysis Plan to explain the agreed-upon approach that will be implemented at the RVAAP.

2. Response acceptable to the Agency. The Agency reiterates its position that the RVAAP should be pro-active when approaching the issue of community relations. This would potentially include developing fact sheets, press releases, hosting public information sessions, etc. in addition to establishing a Restoration Advisory Board (RAB).

3. Response acceptable to the Agency. However, the OEPA reiterates that if an Area of Concern (AOC) has a high potential to release contaminants to the groundwater system, it should remain a high priority, i.e. it should not be changed to a medium priority.

4. Response acceptable to the Agency. OEPA appreciates the receipt of the two USACE documents cited in this comment.

5. The ACOE/SAIC response delineated in the 11/27/95 document warrants further discussion. Any discussions concerning this issue will necessarily include risk assessment personnel from OEPA's Central Office. However, some preliminary comments can be made. The Agency requests assurance that the data which will be obtained during this study is sufficient in quality to support a risk assessment (i.e. Level III or higher). Detection limits normally refer to laboratory/actual data and are different from risk scenarios. In addition, it is unclear as to the standard assumptions that are to be used - i.e., exposure pathways, daily intake rate, exposure frequency and duration, body weight, etc. Contaminants cannot be looked at on an individual basis - the cumulative risk needs to be considered. The Agency reiterates that it is premature to utilize the generated numbers for the disposal of investigation derived wastes (IDW).

6. Response acceptable to the Agency.

7. With respect to the issue of Ohio Administrative Code (OAC) 3745-27-13 applicability at the RVAAP, the Agency has received and reviewed correspondence from the RVAAP Commander's Representative dated January 4, 1996. This correspondence memorializes discussions and agreements reached during numerous phone calls between representatives from OEPA and SAIC. The correspondence accurately reflects the previous phone conversations, and as such, the Agency accepts the 01/04/96 correspondence as the official RVAAP response to this issue.

8. Response acceptable to the Agency. It is requested that this response be added to the facility Action Plan. In addition, the Agency requests a copy of the 1995 correspondence from the Nuclear Regulatory Commission (NRC) that is referenced in this response.

PRELIMINARY ASSESSMENT

General Comments:

1. Response acceptable to the Agency.

2. Response acceptable to the Agency. The OEPA appreciates the willingness of the ACOE to supply the referenced documents.

3. The response to the Agency's comment regarding determining the integrity of the on-site sumps indicates that it is "not considered necessary because they are inactive." This response does not does not take into consideration the fact that these sumps may have potentially contaminated the environmental media (ex. soil, groundwater. etc.) in their vicinity during the time that they were operative. Any sampling conducted in the vicinity of the sumps must be sufficient in scope to determine whether or not the integrity of the sumps is intact.

Specific Comments:

1. This response cannot be reviewed, as the response provided is not complete.

2. Response acceptable to the Agency.

3. Response acceptable to the Agency.

4. Response acceptable to the Agency. However, if any historical records for the Ramsdell Quarry Landfill (RVAAP-01) are found for the years 1950-1976, please provide those to the Agency.

5. Response acceptable to the Agency.

6. The Agency notes that this response does not cover the concerns delineated by the OEPA in the original comment. Provide the Agency with a time-frame for the requested list of existing monitoring wells, which includes an assessment of the condition of existing monitoring wells and any proposed action (repair or abandonment). Provide assurance that the procedures for any wells proposed for repair will be submitted to the Agency for review and approval. Indicate in the text, that the OEPA methodology for monitoring well abandonment will be adhered to throughout the proposed studies.

7. The Agency appreciates the ACOE's description of the mixture Amatol.

8. Response acceptable to the Agency. If any of the historical records are found in the future, please provide them to the Agency.

9. Response acceptable to the Agency. Please provide the referenced documents at your convenience.

10. Response acceptable to the Agency.

11. Response partially acceptable to the Agency. Refer to general comment #3 in the Preliminary Assessment section for further discussion of this issue.

12. Response acceptable to the Agency.

13. Response acceptable to the Agency.

14. Response acceptable to the Agency.

15. Response acceptable to the Agency.

ACTION PLAN

General Comments:

1. Refer to previous Agency response to General Comment # 1. The Agency does not object to selecting a cost-effective remedial response as long as it is as equally protective of human health and the environment as other remedial alternatives.

2. Response partially acceptable to the Agency. The first part of the ACOE/SAIC response indicates that clarification of prioritization methodology will be provided, and how those designations translate into the numerical values found on Table 2-2. This is acceptable. However, the response then states that Table 2-2 will be eliminated. This is confusing in light of the first portion of the response. No further explanation as to whether Upper and Lower Cobbs Pond is routinely fished by local residents was provided and, if it is, this AOC is to remain a high priority. In addition, although it is acceptable to have uncertainty as to whether or not there may be a release from an AOC to the groundwater, it is not acceptable to automatically reduce potential groundwater issues to a medium priority because of this uncertainty.

Specific Comments:

1. The Agency appreciates the willingness of the ACOE to provide the requested documents.

2. Response partially acceptable to the Agency. The Preliminary Assessment (PA) indicates that RVAAP-14 (Load Line 6 Evaporation Unit) is subject to RCRA closure. If this is the case, there should be information on file that confirms the clean-closure of this unit. In addition, the only data provided (in the PA) indicates the presence of significant soil contamination with respect to TNT and RDX.

3. The ACOE's willingness to provide to the Agency any existing information concerning asbestos removal at the facility is appreciated.

4. Response acceptable to the Agency.

5. Response acceptable to the Agency.

6. Response acceptable to the Agency.

7. Response acceptable to the Agency. Adjust the text accordingly.

8. If "comment noted" means that the groundwater will be included in AOC-specific workplans and investigated at the identified AOCs, this response is acceptable to the Agency.

9. Response acceptable to the Agency.

10. Response acceptable to the Agency.

11. Response partially acceptable to the Agency. Were enough samples obtained from this area and at the proper depths to adequately describe RVAAP-06?

12. The response indicates that No Further Action (NFA) designations were recommended as part of the USEPA RCRA Facility Assessment (RFA). Were these based on the potential for release, or some other criteria? Provide this information in the revised text.

13. The Agency appreciates the ACOE's willingness to provide the information requested.

14. Response acceptable to the Agency.

15. Response acceptable to the Agency.

16. Response acceptable to the Agency. It is noted, however, that during the AOC specific investigation to be conducted at RVAAP-26, the existing monitoring wells will be sampled for all potential contaminants of concern (i.e., including explosives), not just metals.

17. Response acceptable to the Agency.

18. Response acceptable to the Agency. Please refer to Agency responses to General Comments # 1 and # 3 for further discussion.

19. Response acceptable to the Agency.

20. Response acceptable to the Agency.

21. The Agency appreciates the ACOE's willingness to provide the requested information.

22. Response acceptable to the Agency.

23. Refer to OEPA's response to General Comment # 2 in this section.

24. Refer to the OEPA's response to General Comment # 5 in the beginning portion of this correspondence. Again, the Agency requires assurance that "focussed" Level III data is equivalent to Level III data and will be sufficient to support risk assessment efforts. Risk management is not equivalent to risk assessment. The text should indicate, with respect to Table 3-1, that further information is found in the Quality Assurance Project Plan (QAPP).

25. Response acceptable to the Agency. Refer to OEPA's response to General Comment #1.

SAMPLING AND ANALYSIS PLAN

Specific Comments:

1. Response acceptable to the Agency.

2. The Agency notes that information pertaining to the relationship between the buried glacial valley and the AOCs will be collected during the hydrogeologic investigations to be conducted at the RVAAP. That this investigation will take place should be noted in the facility-wide plan.

3. Response acceptable to the Agency.

4. The response to OEPA's initial comment would suggest that off-site work may occur during Phase 2 work. Please confirm that this is a possibility.

5. Response acceptable to the Agency.

6. Refer to OEPA's response to General Comment # 5 in the beginning portion of this correspondence.

7. The Agency requests further clarification of the "screening tools" that may be utilized, and how these tools will determine the "extent" of contamination at the RVAAP.

8. Assure the Agency that "focussed" Level III data is sufficient to support risk assessment. Although this concern was presented numerous times in the Agency's initial correspondence, it has not been addressed in any of the ACOE responses.

9. Response acceptable to the Agency. Determination of ARARs will be made in consultation with the appropriate Agencies.

10. Response partially acceptable to the Agency (i.e. with respect to drill rigs, rods, etc. - equipment that will not come into contact with samples). However, see comment # 33 below for further detailed discussion of the decontamination issue.

11. Subsequent to reviewing the provided documentation, the Agency is willing to accept the use of Type I water instead of Type II water. However, if organic contamination is found in any analytical samples (surface water, groundwater, soil or sediment), the Agency will assume that this contamination is present in the sampled medium, and will not entertain the explanation that it is a potential result of using Type I water.

12. Response acceptable to the Agency.

13. Response acceptable to the Agency.

14. Response acceptable to the Agency.

15. It is assumed that a single source of potable water will be utilized throughout the investigative activities at the RVAAP. Therefore, it should not be difficult to provide the Agency with the results of the analytical testing of the potable water prior to the commencement of investigative activities. This is a standard request: that the Agency receive, review, and approve the results prior to commencing investigative activities. The rationale behind the request is to ensure that the water which is utilized during the investigation (for purposes such as decontamination) is contaminant-free.

16. Response acceptable to the Agency. However, the Agency reiterates that, wherever possible, above-ground completions for monitoring wells should be utilized.

17. Response acceptable to the Agency.

18. Response acceptable to the Agency.

19. Response acceptable to the Agency.

20. Response acceptable to the Agency.

21. Response acceptable to the Agency.

22. Response acceptable to the Agency. If monitoring wells are encountered that are of questionable integrity, and if they will not be used for future sampling, the wells should be abandoned in accordance with the provided OEPA procedure.

23. Cross-referencing the handling of well development waters to the section detailing the disposition of IDW is acceptable to the Agency. However, refer to Agency comments on the IDW section.

24. Response acceptable to the Agency.

25. If a well fails the alignment test, it should be abandoned in accordance with the procedure provided by the OEPA.

26. The Agency appreciates being added to the distribution list for monthly reports. However, assure the Agency that the information requested in this comment is routinely found in the generated monthly reports.

27. Response acceptable to the Agency.

28. Response acceptable to the Agency.

29. Response acceptable to the Agency.

30. Refer to response # 33 below.

31. The issue of trenching as an investigative tool was discussed during the 11/27/95 meeting. During the meeting, it was indicated that this technique is only proposed for RVAAP-19 (Landfill North of Winklepeck Burning Ground). The NEDO DERR is also aware that this technique has been utilized in another district at a federal facility. The NEDO DERR is willing to allow trenching to occur at RVAAP-19 subject to the following conditions:

    a. ensure that there isn't any potential for unexploded ordnance (UXO) to exist at this AOC, prior to commencing trenching. Health and safety concerns of on-site workers is of utmost importance, and 29 CFR 1910.120 must be strictly adhered to during on-site operations. The Agency assumes no liability for problems that may be encountered.

    b. authorization under OAC 3745-27-13 must be granted prior to the commencement of trenching.

    c. the installation of piezometers must occur prior to trenching. This is requested in order to ensure that perched groundwater will not be encountered during these operations.

    d. solid waste may be placed back into the trench (in the order in which it was removed) as long as it is not co-mingled with hazardous waste. If hazardous waste is encountered, it must be containerized and characterized and disposed of in accordance with all applicable State and Federal regulations. The solid wastes when placed into the trench must be compacted. The Ohio EPA Division of Solid an Infectious Waste Management (DSIWM) may have additional requirements.

    e. if as a result of the trenching any problems arise (for example, leachate outbreaks), corrective measures to abate the problem must be enacted immediately - it is not acceptable to wait until final remediation of the AOC.

32. Response acceptable to the Agency.

33. The Agency requests that the ACOE and SAIC provide documentation supporting the decontamination procedures presented in the sampling plan. Specifically, the Agency requests documentation to support the deletion of an acid rinse and a pesticide grade hexane or methanol rinse. Any decontamination method that this Agency has seen (including Ohio EPA Standard Operating Procedures and USEPA

Emergency Response Team procedures, etc.) indicates that both of this rinses should be included during decontamination procedures. Currently, based upon all the decontamination documents and procedures reviewed by this writer, the Agency cannot support the decontamination procedure detailed in the sampling plan.

34. If sediment samples are taken during Phase 1 investigative activities, the Agency requests that grain size and Total Organic Carbon (TOC) be added to the specific analyses that will be detailed in the AOC-specific sampling plan.

35. Response acceptable to the Agency.

36. Response acceptable to the Agency.

37. The entire issue of IDW needs to be discussed. It is not apparent to this Agency why there is disagreement on several of the issues that were raised in the initial OEPA correspondence. These issues include: adherence to State and Federal regulations, segregating saturated from un-saturated wastes from individual boreholes, containerizing IDW in closed-top drums, etc. If the ACOE and SAIC want input from the Agency on this issue, please provide the Site Coordinator with an idea as to which issues specifically are a source of disagreement.

38. The Agency appreciates receiving copies of the monthly report. Please indicate whether non-conformance reports are included in the monthly reports.

QUALITY ASSURANCE PROJECT PLAN

Specific Comments:

1. Please provide a discussion on how many laboratories will be utilized. The response to the initial OEPA comment would seem to indicate that there could be a different lab for each AOC. Provide the rationale for this. Consistent use of the same laboratory or laboratories (if more than one is needed to handle all the constituents that will be analyzed for) is important.

2. Response partially acceptable to the Agency. If ACOE/SAIC wishes to be more efficient, a statement needs to be included in the text indicating that all Quality Control (QC) parameters stated in the specific SW-846 method (i.e. percent recoveries) will be adhered to for each chemical listed.

3. Response acceptable to the Agency.

4. Response acceptable to the Agency.

5. Response acceptable to the Agency.

6. Response acceptable to the Agency.

7. Response acceptable to the Agency.

8. It appears to this Agency that it would be more cost-effective to determine up-front which field instrumentation will most likely be utilized during the AOC-specific investigations, and include the maintenance procedures and calibration procedures/frequencies in the facility-wide plan. However, if it is the preference of the ACOE and SAIC to include this information each time in the AOC-specific plan, that is acceptable also.

9. Response partially acceptable to the Agency. The text also needs to document if standard additions are utilized for matrix problems.

HEALTH AND SAFETY PLAN

Specific Comments:

1. Response acceptable to the Agency.

2. Response acceptable to the Agency.

3. Response acceptable to the Agency.

4. Response acceptable to the Agency. However, the OEPA still recommends adherence to USEPA action levels for determining whether or not an upgrade in Personal Protective equipment (PPE) is warranted.

5. Response acceptable to the Agency.

6. With respect to trenching issues and the potential to contact UXO, please refer to OEPA comment # 31 in the sampling plan section.

7. Response acceptable to the Agency.

8. Response acceptable to the Agency.

9. Response acceptable to the Agency. Please refer to previous Agency comment # 33 on the sampling plan.

10. Response acceptable to the Agency.

11. Response acceptable to the Agency.

Please do not hesitate to contact me at 216-963-1221 if you have any comments or questions concerning this correspondence. In addition, please contact me with potential meeting dates and times such that the outstanding issues presented in this correspondence can be discussed and resolved.

Sincerely,

Eileen T. Mohr
Site Coordinator
Division of Emergency and Remedial Response

ETM:ddb

cc: Bob Princic, NEDO DERR
Nancy Zikmanis, NEDO DERR
Murat Tukel, NEDO DHWM
Diane Kurlich, NEDO DDAGW
Graham Mitchell, SWDO OFFO
Bonnie Buthker, OFFO SWDO
Dave Seely, USEPA Region V
John Cicero, RVAAP
Tim Morgan, RVAAP
Bob Whelove, AMCCOM
Todd Boatman, USACE
Bill Talmon, Mason and Hanger
Dave Mentzer, SAIC
Steve Selecman, SAIC

OhioEPA
State of Ohio Environmental Protection Agency
Northeast District Office
2110 E. Aurora Road
Twinsburg, Ohio 44087-1969
(216) 425-9171
FAX (216) 487-0769

George V. Voinovich
Governor

March 25, 1996

RE: RAVENNA ARMY AMMUNITION PLANT
PORTAGE/TRUMBULL COUNTY

Mr. Doug Webb
Department of the Army
Nashville District, Corps of Engineers
Engineering Management Branch
P.O. Box 1070
Nashville, TN 37202-1070

Dear Mr. Webb:

The Ohio Environmental Protection Agency (OEPA) has received and reviewed the following document related to the Ravenna Army Ammunition Plant (RVAAP):

1. "Action Plan for the Ravenna Army Ammunition Plant, Ravenna, Ohio."

This document was prepared for the U.S. Army Corps of Engineers (ACOE), Nashville District, by Science Applications International Corporation (SAIC), Oak Ridge, TN under contract number DACA62-94-D-0029, and represents a revision of a document that was previously submitted to, and reviewed by, the OEPA. The revised document was received by OEPA on 03/13/96 and was reviewed by personnel in the Division of Emergency and Remedial Response (DERR). The revised document was reviewed with respect to Agency comments previously submitted to ACOE on 11/03/95, the 11/27/95 ACOE draft comment resolution document, and correspondence from OEPA dated 01/16/96.

Comments on the revised preliminary assessment and the facility-wide health and safety plan were previously submitted to your attention in correspondence dated 03/11/96. The facility-wide field sampling plan and quality assurance project plan will be reviewed when they are received by this Agency, and comments will be forwarded to you under separate cover.

It is this Agency's understanding that the Action plan is updated on an annual basis. An acceptable alternative to having to re-submit the above-referenced document would be to incorporate the following comments into the next annual Action Plan. However, in the interim, the Agency would request correspondence from the ACOE or Department of the Army which would state that the document will be revised in accordance with the OEPA's comment letter. Subsequent to the receipt of this correspondence, the OEPA will consider the above-referenced document to be approved with modifications.

APR 9 1996

Specific Comments:

1. As previously requested, please provide the OEPA with the following documents:

    a. the correspondence from the Nuclear Regulatory Commission (NRC, 1995) regarding the ore stockpiles at RVAAP (p. 1-3);

    b. the September, 1993 Report of Excess (ROE); and,

    c. the 1978 and 1982 documents from the U.S. Army Toxic and Hazardous Materials Agency (USATHMA) which discuss groundwater issues at the installation.

    If the documents are not readily available, please provide the Agency with an approximate time-frame for receipt of the documents.

2. Any site or Area of Concern (AOC) that lists surface water as a potential media of concern should also list sediment as a media of concern. This would include RVAAP-02, RVAAP-05, and RVAAP-36. (pgs. 1-7, 1-11, and 1-19)

3. In Section 1.3.1 (Site Descriptions), if analytical data is noted, please reference the document in which the data can be found. For example, at RVAAP-05 it is indicated that there are soil borings, but the text also states that it is "not certain that the borings were placed in the correct locations." In addition, descriptions of RVAAP-08, RVAAP-09, RVAAP-10, RVAAP-12, RVAAP-29, and RVAAP-31 reference analytical data, but the text does not provide the pertinent reference.

4. In Section 1.3.1 (Site Descriptions), provide an explanation for deleting mercury as a potential contaminant of concern (PCOC) at RVAAP-08, RVAAP-09, RVAAP-10, and RVAAP-11.

5. In Section 1.3.1 (Site Descriptions), at AOCs where both CERCLA and RCRA issues are of concern, the Agency notes that the designated areas are only approximate. For example, at RVAAP-05, it is stated that the CERCLA area consists of 199 acres and the RCRA area is 1 acre in size. Since no exact determination of areas has been made, the numbers that appear in the Action Plan are approximate.

6. In Section 1.3.1 (Site Descriptions):

    a. groundwater should be added as a medium of concern at RVAAP-06;

    b. it should be added that there is a potential for release to soils at RVAAP-10;

    c. provide information to the OEPA on the approvals for the spreading of sludge at RVAAP-20, and RVAAP-22; and

d. add to the text the description the PCOCs for RVAAP-21 and RVAAP-22.

7. In Section 1.3.1, the description of RVAAP-28 indicates that mustard gas may have been disposed of in this area reportedly before 1969. The first draft of the Action Plan indicated that this date was 1950. Please confirm which date is correct. In addition, please provide the Agency with the details of previous Army work conducted in this area, specifically the excavation that was conducted at this AOC.

8. The Action Plan has a designated "regulatory program" associated with each site (Table 1-3). This is currently being evaluated to ensure that the appropriate OEPA division, and/or other state agencies are involved. For example, there may be the potential for OEPA's Division of Solid and Infectious Waste Management (DSIWM) to be involved at more sites, or involvement from the Office of the State Fire Marshall, Bureau of Underground Storage Tank Regulations may be warranted.

9. Adjust the text on pg. 1-22 to indicate that the objective of a Phase II Remedial Investigation (RI) at the RVAAP is to determine the nature and extent of contamination at and emanating from an AOC and to assess the risk posed to human health and the environment.

10. The following is noted on Table 2-2 (Prioritization Score for RVAAP AOCs):

    a. subsequent to the determination of the appropriate regulatory status (see comment # 8), additional AOCs may need to be listed on this table;

    b. the OEPA requests that the potential to impact upon groundwater be increased at the following AOCs: RVAAP-06 (based upon wastes being disposed in an un-lined quarry); RVAAP-14 (based upon confirmed soil contamination); RVAAP-26 (based upon unknown tank integrity); and RVAAP-33 (based upon the assumption that this facility's operation - i.e. effluent settling ponds - is similar to other load lines); and

    c. the OEPA requests that investigation as to the presence or absence of RVAAP-28 (Mustard Agent Burial Site) be given a higher priority than what is assigned on Table 2-2.

11. The Agency reiterates that we should be having discussions now on Data Quality Objectives (DQOs) for the RVAAP investigations. In addition, DQOs are not tied to future land use issues. (pgs. 3-1 and 3-2)

12. Data of sufficient analytical quality must be generated throughout the course of all RVAAP investigations, such that accurate and appropriate decisions can be made. For example, the OEPA will not accept the use of field screening data alone in determining whether or not further investigative work (i.e. moving into a Phase II RI) is warranted. There should be further discussion between all involved parties on this issue. (p. 3-2)

13. Provide further explanation for the following sentence which is found on pg. 3-2 of the text: "The Focussed Level III validation process... eliminates from consideration the criteria that infrequently drive data qualification." What are these criteria that are to be eliminated? Further comments on the analytical data quality levels may be forthcoming subsequent to reviewing the field sampling plan and the quality assurance project plan.

14. With respect to Table 3-2 (Summary of RVAAP Sites):

    a. refer to previous comments # 8 and # 10;

    b. check to ensure that all listed sites follow the criteria described on pg. 2-3 which indicates that medium priority sites are sites that scored between 10-20, and low priority sites scored less than 10. For example, RVAAP-06 is listed as low priority site, even though it scored an 11;

    c. indicate what the future work phase is for RVAAP-28 (Mustard Agent Burial Site); and

    d. potential inconsistencies between this table and Table 1-3 are noted. For example, Table 1-3 indicates that RVAAP-15 and RVAAP-18 are AOCs that are regulated by programs other than CERCLA, yet, on Table 3-2, it is indicated that Phase I and Phase II work is proposed. Is this work to be conducted under the Installation Restoration Program (IRP), or is it to be conducted under another program?

15. The schedules presented in the text (Table 3-3 and Figure 3-1) do not appear to allow for delays such as are normally encountered on remedial projects. Given the proposed schedules:

    a. are concurrent reviews of documents by regulatory agencies and the Army being assumed? If so, it will be necessary for each Agency and the Army to receive copies of each others comments and comment resolution documents, such that there can be discussion (if there isn't agreement on the comments or the resolution of the comments), and to clarify why changes are made in the subsequent documents; and,

    b. the schedule presented in Figure 3-1 assumes that the next draft of the field sampling plan and quality assurance project plan will be approved by the Agency. This is an unknown at this time, as there are several outstanding issues including: areas where a Rule 13 will be necessary, decontamination issues, etc.

    Figure 3-1 indicates that there are 11 high priority AOCs at the RVAAP. Tables 2-3 and 3-2 indicate that there are 10 high priority AOCs. Adjust either the figure or the tables such that they are consistent.

16. Appendix A - Chronology of RVAAP RCRA Closure Plan Events - was not reviewed for accuracy by the DERR site coordinator.

Please provide the Agency with the above-requested information and clarifications. If you have any questions concerning this correspondence, please do not hesitate to contact me at (216) 963-1221.

Sincerely,

Eileen T. Mohr
Site Coordinator
Division of Emergency and Remedial Response

ETM:ddb

cc: Bob Princic, NEDO DERR
Murat Tukel, NEDO DHWM
Diane Kurlich, NEDO DDAGW
Virginia Wilson, NEDO DSIWM
Bonnie Buthker, OFFO SWDO
Dave Seely, USEPA Region V
John Cicero, RVAAP
Tim Morgan, RVAAP
Bob Whelove, AMCCOM
Todd Boatman, USACE
Dave Mentzer, SAIC
Steve Selecman, SAIC
Bill Talmon, Mason and Hangar

DEPARTMENT OF THE ARMY
RAVENNA ARMY AMMUNITION PLANT
8451 STATE ROUTE 5
RAVENNA, OHIO 44266-9297

REPLY TO
ATTENTION OF

April 15, 1996

SIORV-CR (200-1a)

Subject: Ohio Administrative Code 3745-27-13 - Generic Request for Authorization for the Ravenna Army Ammunition Plant

Ms. Eileen Mohr
Ohio Environmental Protection Agency
Division of Emergency and Remedial Response
Northeast District Office
2110 East Aurora Road
Twinsburg, Ohio 44087

Dear Ms. Mohr:

Please find enclosed a generic request for authorization to conduct investigative activities at Areas of Concern (AOCs) at RVAAP that are regulated under the Ohio Administrative Code 3745-27-13.

This request is forwarded for your review and concurrence.

Point of contact is Mr. John Cicero, (330) 358-7311.

Sincerely,

John A. Cicero, Jr.
Commander's Representative

Enclosures

Copies Furnished:

Commander, U.S. Army Industrial Operations Command, ATTN: AMSIO-EQE (Mr. Whelove), Rock Island, IL 61299-6000
Commander, U.S. Army Industrial Operations Command, ATTN: AMSIO-IRI (Ms. Vermost), Rock Island, IL 61299-6000
Mr. Doug Webb, U.S. Army Corps of Engineers, Nashville District, P.O. Box 1070, Nashville, TN 37202
Mr. Steve Selecman, Science Applications International Corporation, P.O. Box 2502, Oak Ridge, TN 37830
Mr. William Talmon, Mason and Hanger-Silas Mason Company, Inc., 8451 State Route 5, Ravenna, OH 44266-9297
Major Tom Tadsen, Ohio Army National Guard Site Representative, 8451 State Route 5, Ravenna, OH 44266-9297

OHIO ADMINISTRATIVE CODE 3745-27-13

GENERIC REQUEST FOR AUTHORIZATION FOR THE RAVENNA ARMY AMMUNITION PLANT RAVENNA, OHIO

1. INTRODUCTION

This is a generic request for authorization from the Ohio Environmental Protection Agency (OEPA) to conduct investigative activities at Areas of Concern (AOCs) at the Ravenna Army Ammunition Plant (RVAAP) that are regulated under the Ohio Administrative Code (OAC) 3745-27-13 (Authorization to engage in filling, grading, excavating, building, drilling, or mining on land where a hazardous waste facility or solid waste facility was operated), hereinafter referred to OAC Rule 13. An agreement between the RVAAP and the OEPA, Northeast District, (documented in a letter from the RVAAP to the OEPA, Northeast District, dated January 4, 1996) stipulates that a generic OAC Rule 13 authorization request be developed according to the requirements of the rule and presented in the Facility-wide Sampling and Analysis Plan (SAP) covering the AOCs at RVAAP where a hazardous waste facility or solid waste facility was operated. The request for authorization under OAC Rule 13 addresses measures necessary to ensure that investigative activities (drilling and soil sampling, monitoring well installation and groundwater sampling, trenching to collect waste materials and soil samples, surface water and sediment sampling, etc.) necessary to characterize these AOCs under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) are protective of human health and the environment.

This generic request for OAC Rule 13 authorization applies only to AOCs being addressed under CERCLA at RVAAP where a hazardous waste facility or solid waste facility was operated based on currently available information. AOCs where there is no reasonable expectation that a solid or hazardous waste have been deposited are not proposed under this authorization request. However, as more information is learned about environmental conditions at AOCs at RVAAP, additional AOCs, not designated under this authorization request, may become applicable areas under OAC Rule 13 if evidence indicates that additional safeguards are needed to protect human health and the environment. Should it be determined by the OEPA and RVAAP that additional AOCs are applicable under OAC Rule 13, then a formal request will be submitted to the OEPA requesting authorization under this generic request. Any additional safeguards, if necessary, will be addressed in the supplemental request for each AOC. The AOCs currently proposed under this generic request for authorization are listed in Table 1-1. The status, plans, and schedule for current characterization activities of AOCs at RVAAP is presented in the *Action Plan for the Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 1996). The facility Action Plan is revised annually to reflect current and planned environmental activities at RVAAP.

Table 1-1 Proposed OAC Rule 13 Applicable AOCs

AOC Number	AOC Name
RVAAP-16	Quarry Landfill
RVAAP-19	Landfill North of Winklepeck Burning Ground
RVAAP-28	Mustard Agent Burial Site
RVAAP-34	Sand Creek Disposal Road Landfill

The following sections include the information required under OAC Rule 13 authorization request, in the order in which it is specified. Because much of the information required under the provisions of OAC Rule 13 is contained in existing facility documents and CERCLA work plans developed for conducting investigations of AOCs at RVAAP, references to existing documentation are used where appropriate to meet the requirements of the rule.

2. LOCATION AND DESCRIPTION - OAC 3745-27-13(C)(1)

RVAAP is located in northeastern Ohio within Portage and Trumbull Counties, approximately 4.8 kilometers (3 miles) east/northeast of the Town of Ravenna and approximately 1.61 kilometers (1 mile) northwest of the Town of Newton Falls. The installation consists of 21,419 acres (8668 hectares) contained in a 17.7-kilometers-long (11-mile-long), 5.63-kilometers-wide (3.5-mile-wide) tract bounded by State Route 5 and the CSX System Railroad on the south; State Route 534 on the east; the Garrettsville and Berry Roads on the west; and the CONRAIL Railroad on the north. The land use surrounding the installation is primarily farmland with sparse private residences. The Michael J. Kirwan Reservoir is located immediately south of the facility.

RVAAP is a government-owned, contractor-operated U.S. Army Industrial Operations Command (IOC) facility. Currently, RVAAP is an inactive facility maintained by a contracted caretaker, Mason and Hanger-Silas Mason Co., Inc. Table 2-1 presents the RVAAP Command Organization, IRP executing agencies, and lead regulatory agencies.

Table 2-1. RVAAP Organizational Responsibilities

Command Organization
Major Command: U.S. Army Materiel Command Major Subordinate Command: U.S. Army Industrial Operations Command Installation: RVAAP, Commander's Representative Installation Contractor: Mason & Hanger-Silas Mason Co., Inc.
Installation Restoration Program Executing Agency
U.S. Army Corps of Engineers, Nashville District
Regulatory Agencies
Ohio Environmental Protection Agency, Northeast District U.S. Environmental Protection Agency, Region V

Over the years, RVAAP handled and stored strategic and critical materials for various government agencies and received, stored, maintained, transported, and demilitarized military ammunition and explosive items. RVAAP maintained the capabilities to load, assemble, and pack military ammunition; however, these operations are inactive. As part of the RVAAP mission, the inactive facilities were maintained in a standby status by keeping equipment in a condition to permit resumption of production within the prescribed time limitations.

The location of the RVAAP facility on a 7.5 minute USGS topographic map is provided in the *Preliminary Assessment for The Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 1996). The location, description, and operating history for the AOCs at RVAAP, including those currently covered under this OAC Rule 13 generic request for authorization, are also included in the Preliminary Assessment. Figures 2-1, 2-2, 2-3 and 2-4 are large scale (1 inch equals 200 feet) maps of the AOCs currently proposed under this generic request for authorization, as required.

3. INVESTIGATION ACTIVITIES - OAC 3745-27-13(C)(2)

The activities for which authorization is requested (drilling and soil sampling, monitoring well installation and groundwater sampling, trenching to collect waste material and soil samples, piezometer and well point installation, surface water and sediment sampling) are necessary to characterize the AOCs under CERCLA leading to the environmental restoration of these under the U.S. Department of Defense (DoD) Installation Restoration Program (IRP). The approach to implementing CERCLA under the IRP is described in Section 1 of the *Facility-wide Sampling and Analysis Plan for the Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 1996) and in the facility Action Plan. The characterization of the AOCs under this generic authorization request are expected to include investigative activities to evaluate the nature of buried solid waste materials and the potential impact from leachate of contaminants from these disposal sites on adjacent soils, groundwater, surface water, and sediment. The specific investigation activities for each AOC will be defined in a investigation-specific SAP addendum to the Facility-wide SAP and submitted in draft for OEPA review and comment, and as a final document for OEPA approval prior to conducting any investigative activities at an AOC.

Planned investigative activities at the AOCs addressed under this generic request for authorization are: (1) drilling and soil sampling, (2) monitoring well installation and groundwater sampling, (3) piezometer and well point installation, (4) trenching to collect waste material and soil samples, (5) surface water and sediment sampling, and (6) surface soil sampling. Following is a brief description of each investigative activity:

Drilling and soil sampling - Soil borings may be drilled in and adjacent to the former disposal areas in order to collect subsurface soil samples for laboratory analysis to characterize potential contaminants in the soils associated with these AOCs.

Monitoring well installation and groundwater sampling - Boreholes may also be drilled to install monitoring wells in and adjacent to these AOCs to collect groundwater samples for laboratory analysis to characterize groundwater associated with these AOCs.

Piezometer and well point installation - Piezometers and well points may be installed at these AOCs to determine the depth to shallow groundwater and the potentiometric surface at these AOCs, and to collect groundwater samples to screen for potential contamination. This information will be used to determine the depth of trenches so as not to intersect the water table during trenching operations to mitigate the potential for cross-contamination of media and the creation of a preferential flow path. This information will additionally be used to locate monitoring wells to monitor groundwater downgradient of these areas.

Trenching and waste material and soil sampling - Trenches may be excavated in these disposal areas to evaluate the nature of buried waste in former landfill areas because burial records are limited or unavailable. Samples of waste materials and subsurface soils adjacent to the burials will be collected for laboratory analysis to characterize potential source materials and contamination resulting from the leaching of buried materials. Trenches will be small excavations (~2 feet wide x ~10 feet long) and will not intersect groundwater zones (perched or water table).

Surface water and sediment sampling - Surface water and sediment samples may be collected from surface streams and drainage adjacent to the former disposal areas and submitted for laboratory analysis to characterize the impact of the disposal areas on these media.

Surface soil sampling - Surface soil samples may be collected from surface soils adjacent to former disposal areas and submitted for laboratory analysis to characterize the potential impact of disposal practices on these areas.

4. PREVIOUS AND EXISTING PERMITS, APPROVALS, AND ORDERS - OAC 3745-27-13(C)(3)

There are no previous or existing permits, approvals, or orders pertaining to the AOCs for which authorization under OAC Rule 13 is being requested. The regulatory history of AOCs at RVAAP are presented in the Preliminary Assessment, and the facility Action Plan that contains additional information on the regulatory history of the installation.

5. LETTERS OF ACKNOWLEDGMENTS - OAC 3745-27-13(C)(4)

All parcels of land to which this generic request for authorization pertains are owned by the U.S. Army. Because of the interior location of the AOCs within the boundaries of the 21,419 acre (8668 hectares) RVAAP facility, all adjacent parcels are similarly owned by the U.S. Army. Consequently, no letters of acknowledgement are included in this request for authorization under OAC Rule 13.

6. LETTERS OF NOTICE - OAC 3745-27-13(C)(5)

Letters of notice of this generic request for authorization are required, under the provisions of the OAC Rule 13, to be sent to the board of health for the health district and the local zoning authority for the area within which the facility is located. The Department of Health for both Trumbull and Portage Counties, Ohio, have been notified and the copies of the letters of notice are attached to this request for authorization as Attachments I and II. Because the Federal Government owns the RVAAP, local zoning authorities do not have jurisdiction over the facility; therefore, notices of this request for authorization were not sent to these agencies. The local zoning authorities were contacted to confirm their jurisdiction at RVAAP.

7. HISTORY OF HAZARDOUS WASTE OR SOLID WASTE TREATMENT, STORAGE OR DISPOSAL OPERATIONS - OAC 3745-27-13(C)(6)

A summary of all currently known hazardous waste and solid waste treatment, storage and disposal facilities at RVAAP are presented in the Preliminary Assessment. The histories of the AOCs proposed under this generic authorization request are included in this document.

8. CLOSURE ACTIVITIES - OAC 3745-27-13(C)(7)

No formal closure activities have previously been initiated at the AOCs covered under this generic request for authorization. However, hazardous waste and solid waste treatment, storage and disposal operations have ceased at all AOCs at RVAAP. Under the CERCLA process, as presented in Section 1 (Introduction) of the Facility-wide SAP, the investigation of potentially contaminated AOCs is the first step in the remediation and closure process. A summary of all known previous closure activities for AOCs at RVAAP is presented in the Preliminary Assessment, and additional closure information is also presented in the facility Action Plan.

9. INVESTIGATION METHODS AND PROCEDURES - OAC 3745-27-13(C)(8)

The investigation of AOCs at RVAAP will be conducted in accordance with facility-wide work plans and investigation-specific work plan addenda developed to meet the requirements established by the OEPA and the United States Environmental Protection Agency (EPA), Region V, under CERCLA. These plans contain detailed methods and procedures for performing the described investigation activities. Facility-wide work plans consist of a Facility-wide SAP and a *Facility Safety and Health Plan for the Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 1996). The intent of the facility-wide documents are to guide the investigation activities, to the extent practical, expected to be common to the investigation of all AOCs at RVAAP. For each AOC-specific investigation, addenda to the facility-wide work plans will be developed that contain additional project-specific information regarding the investigation activities and implementing methods and procedures. The investigation of an AOC cannot be implemented without the Facility-wide SAP, FSHP, and a investigation-specific addendum for each plan. The contents and relationship of the facility-wide work plans and investigation-specific addenda are addressed in greater detail in Section 1 (Introduction) of the Facility-wide SAP. The facility-wide work plans and their addenda will be approved by the OEPA and EPA prior to initiating investigation activities.

Detailed procedures describing the investigative methods are contained in the Field Sampling Plan (FSP) part of either the Facility-wide SAP or the AOC-specific SAP addenda as follows:

Drilling and soil sampling - Facility-wide SAP, FSP Section 4.4 Subsurface Soil.

Monitoring well installation and groundwater sampling - Facility-wide SAP, FSP Section 4.3 Groundwater.

Piezometer and well point installation - Investigation-specific SAP Addenda, FSP Section 4.3 Groundwater.

Trenching and waste material and soil sampling - Facility-wide SAP, FSP Section 4.4 Subsurface Soil.

Surface water and sediment sampling - Facility-wide SAP, FSP Sections 4.6 and 4.5.

Surface soil sampling - Facility-wide SAP, FSP Section 4.5.

10. ENVIRONMENTAL PROTECTION - OAC 3745-27-13(C)(9)

As previously described in Section 9 of this generic request for authorization, the investigation of AOCs at RVAAP will be conducted in accordance with facility-wide work plans and investigation-specific work plan addenda developed to meet the requirements established by the OEPA and the EPA, Region V, under CERCLA. These plans contain detailed methods and procedures for performing the described investigation activities. The primary focus of these documents are to produce legally defensible investigation results and ensure protection of human health and the environment. Consequently, the investigation methods and procedures cited in Section 9 are prepared to be compliant with applicable state and federal laws and regulations for conducting CERCLA investigations. These procedures contain provisions for protection of the environment resulting from investigative activities. In addition, the Facility-wide SAP and it's addenda contain provisions (Section 7, FSP) for the management of Investigation-Derived Waste (IDW) in accordance with applicable state and federal laws and regulations. Provisions are included for the treatment, storage, and disposal (TSD) of IDW in accordance with applicable state and federal laws and regulations.

11. REMOVAL OF SOLID OR HAZARDOUS WASTE, OR POTENTIALLY CONTAMINATED SOILS - OAC 3745-27-13(C)(10)

During the investigation of AOCs at RVAAP, it is expected that only contaminated or hazardous IDW generated as a result of characterization activities (excess soil and drill cuttings from soil borings and monitoring well boreholes; purged groundwater from monitoring well development; hazardous waste, if any, from characterization trenches; and sampling equipment decontamination water) will potentially be removed from an AOC. Section 7 of the FSP in the Facility-wide SAP and the investigation-specific SAP addenda contain provisions for representative sampling and analysis and TSD of IDW in accordance with applicable state and federal laws and regulations. Section 7 of the FSP in the Facility-wide SAP requires submittal of a copy of a letter of acceptance from a disposal facility be submitted to the OEPA prior to removal of IDW for disposal from an AOC.

12. CLOSURE PROCEDURES - OAC 3745-27-13(C)(11)

The formal process for completing regulatory closure of AOCs at RVAAP, regulated under CERCLA, is described in Section 1 (Introduction) of the Facility-wide SAP, and additional information regarding closure/remediation of AOCs under CERCLA is presented in

the Action Plan (USACE 1996). Because the CERCLA process is iterative, and, therefore, requires a considerable amount of time in which to implement a remediation, the FSP part of the Facility-wide SAP and investigation-specific SAP addenda contain provisions for reestablishing AOC conditions following completion of characterization activities to mitigate the impact on human health and the environment from these activities until such time that the AOC can be remediated, if necessary, under the CERCLA process. These reestablishment measures are described for each investigative activity presented in the FSP part of the Facility-wide SAP and investigation-specific addenda.

13. OAC RULE 13 GENERIC AUTHORIZATION REQUEST SIGNATURES - OAC 3745-27-13(C)(12)(D)(1)(d)

The statements and assertions of fact made in this application are true and complete to my knowledge and comply fully with applicable state requirements as stated in OAC Rule 3745-27-13.

John A. Cicero, Jr.
Commander's Representative
Ravenna Army Ammunition Plant

Signed in my presence this 15th day of April, 1996.

Notary Public My commission expires 4-22-97.

OhioEPA
State of Ohio Environmental Protection Agency
Northeast District Office
2110 E. Aurora Road
Twinsburg, Ohio 44087-1969
(216) 425-9171
FAX (216) 487-0769

George V. Voinovich
Governor

May 6, 1996

RE: RAVENNA ARMY AMMUNITION PLANT
PORTAGE/TRUMBULL COUNTIES

Mr. John A. Cicero, Jr.
Commander's Representative
Department of the Army
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna OH 44266-9297

Dear Mr. Cicero:

The Ohio Environmental Protection Agency (OEPA) has received and reviewed the draft generic request for authorization to conduct investigative activities at Areas of Concern (AOCs) at the Ravenna Army Ammunition Plant (RVAAP) which are regulated under the Ohio Administrative Code (AOC) Section 3745-27-13 (hereinafter referred to as Rule 13).

The Agency has the following comments on the draft generic request for authorization under Rule 13:

1. Table 1-1 (pg. 1) indicates that the following AOCs are being proposed for the Rule 13 authorization:

RVAAP - 16	Quarry Landfill
RVAAP - 19	Landfill North of Winklepeck Burning Ground
RVAAP - 28	Mustard Agent Burial Site
RVAAP - 34	Sand Creek Disposal Road Landfill

Please provide the OEPA with an explanation and the criteria as to how these specific AOCs were determined. It is the position of the OEPA that the proposed list is not complete, especially in light of the following regulatory definitions. The RVAAP is directed to the following definitions in Ohio Revised Code (ORC) 3734.01:

Facility: means any site, location, tract of land, installation, or building used for incineration, composting, sanitary landfilling, or other methods of disposal of solid wastes; for the transfer of solid wastes; for the treatment of infectious wastes; or for the storage, treatment, or disposal of hazardous waste.

Disposal: means the discharge, deposit, injection, dumping, spilling, leaking, emitting, or placing of any solid wastes or hazardous waste into or on any land or ground or surface water or into the air, except if the disposition or placement constitutes storage or treatment.

MAY 7 1996

Further discussion on the AOC's, which should be included in the revised request for authorization, is warranted.

2. The text indicates that "the characterization of the AOCs under this generic authorization request are expected to include investigative activities to evaluate the nature of buried solid waste materials and the potential impact from leachate of contaminants from these disposal sites on adjacent soils, groundwater, surface water and sediment." Rule 13 authorizations includes hazardous waste facilities in addition to solid waste facilities. This section should be expanded subsequent to the addition of AOCs to the list found in Table 1-1. (pg. 3)

3. In discussions during the 11/27/95 meeting held at OEPA, it was indicated to the Agency that trenching was proposed solely for RVAAP - 19 (Landfill North of Winklepeck Burning Ground). In correspondence from the OEPA dated January 16, 1996, the Agency indicated its willingness to allow trenching to occur at RVAAP - 19 subject to several conditions. The proposed generic Rule 13 would seem to indicate that trenching is now proposed for more than RVAAP - 19. Please provide clarification as to whether this is actually the case. (pg. 4)

4. Section 9 on page 5 needs to be modified with respect to the described role of the U.S. EPA at the RVAAP installation. Currently, the U.S. EPA is not taking an active role in the activities being conducted at the RVAAP.

Subsequent to additional discussions between the Agency and the RVAAP, and the satisfactory resolution of the above-referenced issues, the installation is reminded that the final application for the Rule 13 authorization should be sent to the attention of the Director of the OEPA.

If you have any questions concerning this correspondence, please do not hesitate to contact me at (216) 963-1221.

Sincerely,

Eileen T. Mohr
Site Coordinator
Division of Emergency and Remedial Response

ETM:ddb

cc: Bob Princic, NEDO DERR
Rod Beals, NEDO DERR
Murat Tukel, NEDO DHWM
Virginia Wilson, NEDO DSIWM
Diane Kurlich, NEDO DDAGW
Bonnie Buthker, OFFO SWDO
Catherine Stroup, CO Legal
Bob Whelove, U.S. Army IOC
Ms. Vermost, U.S. Army IOC
Doug Webb, ACOE Nashville
Steve Selecman, SAIC Oak Ridge
Dave Mentzer, SAIC Columbus
Bill Talmon, Mason and Hangar
Tom Tadsen, ONG Site Representative

OhioEPA
State of Ohio Environmental Protection Agency
Northeast District Office
2110 E. Aurora Road
Twinsburg, Ohio 44087-1969
(216) 425-9171
FAX (216) 487-0769

George V. Voinovich
Governor

June 21, 1996

RE: RAVENNA ARMY AMMUNITION PLANT
PORTAGE/TRUMBULL COUNTIES
OEPA ID # 267-0859

Mr. Doug Webb
Department of the Army
Nashville District, Corps of Engineers
Engineering Management Branch
P.O. Box 1070
Nashville TN 37202-1070

Dear Mr. Webb:

The Ohio Environmental Protection Agency (OEPA) has received and reviewed the following documents related to the Ravenna Army Ammunition Plant (RVAAP):

1. "Draft, Phase 1 Remedial Investigation Sampling and Analysis Plan, Addendum for High Priority Areas of Concern for the Ravenna Army Ammunition Plant, Ravenna, Ohio."

2. "Draft, Phase 1 Remedial Investigation Site Safety and Health Plan, Addendum for High Priority Areas of Concern for the Ravenna Army Ammunition Plant, Ravenna, Ohio."

The documents were prepared for the U.S. Army Corps of Engineers (ACOE), Nashville District, by Science Applications International Corporation (SAIC), Oak Ridge, TN under contract number DACA62-94-D-0029. The documents were received by OEPA on 05/23/96, and were reviewed by personnel in the Division of Emergency and Remedial Response (DERR) and the Division of Drinking and Ground Waters (DDAGW).

In addition, the following documents were received on 05/23/96 and placed into the permanent DERR file on the RVAAP:

1. "Quality Assurance Manual for Southwest Laboratory of Oklahoma, Inc." prepared for SAIC and dated 05/31/95.

2. "Southwest Laboratory of Oklahoma, Inc., Standard Operating Procedures" dated 01/19/95.

The documents were reviewed in light of the approach presented in the most recent Action Plan. That is, that the work that is to be conducted at the RVAAP constitute Site Investigation (SI) type activities, although they are termed Phase 1 Remedial Investigation (RI) activities. The primary objective of the Phase 1 RI activities at the eleven (11) high priority Areas of Concern (AOCs) is to collect environmental samples from potentially impacted media to confirm if contamination is present and is being released to the environment, and to determine the nature

of the potential chemicals of concern (PCOCs). Although the proposed activities are of a SI nature, the resulting data must be of sufficient quality to support future risk assessments, additional CERCLA activities, and ultimately any environmentally-based decisions that are made regarding this installation.

Subsequent to the resolution of the following issues to the Agency's satisfaction, the OEPA will consider the AOC specific sampling and analysis plan and the health and safety plan to be acceptable submissions. The issues presented in this correspondence must be resolved prior to the initiation of investigative activities, and must be memorialized in writing. In addition, the outstanding issues/comments detailed in previous Agency correspondence (dated 03/11/96, 03/25/95, 05/06/96, and 05/21/96) must be resolved (in writing) prior to the initiation of intrusive investigative activities at the installation.

Comments on the addenda to the sampling and analysis plan and the health and safety plan are detailed below and follow the same general format as the documents.

SAMPLING AND ANALYSIS PLAN

1. In Section 1.1 - AOC History and Contaminants:

   a. RVAAP-04 (Demolition Area 2) - the preliminary assessment (PA) also indicates that bombs may be a potential waste constituent. (pg. 1-5)

   b. RVAAP-05 (Winklepeck Burning Grounds) -

      1. the PA indicates that the RCRA portion of this AOC is 1 acre in size, not 15 acres; and,

      2. is there confidence that proposed analytical testing will include any potential by-products from the incomplete combustion of the unknown laboratory chemicals, PCBs, and explosive wastes disposed of at this AOC and others? (pg. 1-5). This comment is applicable to the entire investigation.

   c. RVAAP-08 (Load Line 1 and Dilution/Settling Pond) - provide clarification for the sentence "The loading of these wells are not known, however, they reportedly were sampled for heavy metals." (pg. 1-6)

   d. RVAAP -11 (Load Line 4 and Dilution/Settling Pond) - the text indicates that an additional unknown waste stream was disposed of in this AOC. Are there any existing records that could potentially shed light on the nature of this waste stream? (pg. 1-7)

e. Table 1- 2 indicates that no contamination was detected in the groundwater obtained from the RCRA monitor wells at Demolition Area # 2 and the Winklepeck Burning Grounds. The occurrence of contamination in the RCRA monitor wells at these two AOCs is still being investigated. During 1995, statistical triggers of indicator parameters have been documented at both of these AOCs. In addition, the explosives HMX and RDX were detected in a duplicate sample from the open detonation area. Explosive compounds have periodically been detected in groundwater samples collected at both Demolition Area # 2 and the Winklepeck Burning Grounds. The compound 1,2 - DCA was also detected in wells at both of these AOCs in 1995. Thus, to state that no contamination was detected is misleading. Table 1 - 2 should be modified accordingly. (This comment also applies to Section 3.2.2)

2. Section - 3.0 Scope and Objectives:

a. the text should note that wherever there is the potential for sediment contamination, that there is also the potential for surface water contamination (pgs. 3-1 and 3-2);

b. groundwater is also of concern at the following AOCs - RVAAP-05, RVAAP - 13, RVAAP - 18, and RVAAP - 29 (pgs. 3-1 and 3-2); and,

c. previous Agency comments regarding risk assessment issues and identifying decision rules are still applicable. The ACOE is referred, especially, to correspondence from the OEPA dated 05/21/96 for further information regarding this issue.

3. In the performance of any intrusive investigative activities, the OEPA cautions the ACOE that potential confining layers should not be breached. (pg. 4-1 and subsequent)

4. Section 4.3 - Groundwater:

a. In addition to the high priority AOCs listed, there is a potential for groundwater contamination to exist at (not inclusive): RVAAP - 04, RVAAP - 13, and RVAAP - 18. Provide the rationale for not investigating groundwater at all high priority AOCs. (pg. 4-6)

b. Table 4-1 does not list all the types of explosives that can be determined by Method 8330. Further discussion on a potentially modified list of explosive PCOCs is warranted prior to the commencement of investigative activities. At this time, the OEPA position is that all types of explosives that can be detected by Method 8330 should be analyzed and reported.

In addition to these compounds, the explosives data submitted for the RCRA monitoring program includes nitroguanidine, and picric acid. This discrepancy in the list of analytes should clarified and justified. In addition, the text should define the acronym "NA."

c. At least one subsurface soil sample should be obtained from each temporary well point or monitor well boring and submitted to the laboratory for analysis. The sample chosen for analysis can be determined in the field, and should be based on visual observations, field meter readings, etc. The analytical parameters should include the entire suite listed on Table 4-1. (Table 4-1 and pg. 4-13)

d. Temporary well points should be installed in the vicinity of Lower Cobbs Pond. (pg. 4-8)

e. In addition for the potential for shallow groundwater contamination to exist at the RVAAP, the OEPA notes that there is the potential for deeper contamination to exist at the installation. However, it is acknowledged that the installation of monitor wells into deeper zones at the RVAAP is outside the scope of these initial SI activities. Further investigation of the deeper aquifer(s) will be warranted in future investigations. (pg. 4-8)

f. In Section 4.3, the text states that one of the objectives of the proposed investigative activities is to "evaluate the nature and concentration of any potential contamination in the shallow groundwater." As was previously stated by OEPA personnel in meetings with the ACOE, IOC, etc., the results obtained from the analysis of groundwater samples collected from temporary sampling points, rather than from properly installed and developed monitor wells, will be considered to represent minimum values. As a result, the failure to detect contamination in such samples will not necessarily be accepted as proof that no such contamination exists. (pg. 4-8)

g. In Section 4.3.1.1, the text states that temporary well points will not be installed at Load Line 1 because 4 monitor wells will be installed in the area. The locations of the monitor wells were chosen to give general perimeter coverage for the Load Line 1 AOC. In addition, possible well locations were evaluated with respect to accessibility of the AOC to the drill rig. Well points at other AOCs were installed downgradient of the surface water bodies that received process effluent from the units. Griggy's Pond is the surface water body that received process effluent from Load Line 1. None of the monitor well locations are in the vicinity of Griggy's Pond. Because the area around Griggy's Pond may be more easily accessible by the Geoprobe or similar equipment than it is by a drill rig, several temporary well points should be installed and sampled in this area.

h. On pg. 4-9, the text indicates that the temporary well points will be installed to the first occurrence of groundwater or until refusal, whichever comes first. The text further states that it is anticipated that groundwater will be encountered within 15 feet below ground surface (BGS). The last sentence in the same paragraph, however, states that "the maximum depth of each well point will be limited to 15 feet BGS." In the event that groundwater nor refusal is encountered within 15 feet BGS, the last sentence in this paragraph indicates that the

installation of the well point will still be halted. The last sentence in this paragraph should be omitted. If neither groundwater nor refusal are encountered within 15 feet BGS, advancement of the well point should continue.

i. The text on pg. 4-9 indicates that "temporary well points will be field screened for VOCs using a hand-held photo-ionization detector (PID) or a flame ionization detector organic vapor analyzer during groundwater sample collection." It is unclear as to what will be screened (i.e., soils, ambient air, water). This should be clarified.

j. The text on page 4-11 should specify that any Volatile Organic Compound (VOC) samples should be obtained via the bailer method.

k. If a well point can not be utilized as a sampling point, specify the abandonment method that will be utilized. (pg. 4-11)

l. If groundwater is not encountered in the well points, it is noted that the text indicates that additional attempts to obtain shallow groundwater will be made. The OEPA requests consultation with the ACOE prior to any determination being made to suspend attempts to obtain groundwater samples from any well points at high priority AOCs. (pg. 4-11)

m. Section 4.3.2.5.1.1 should be modified to indicate that boring logs will be completed for the four monitor wells installed during the Phase 1 investigative activities.

n. Groundwater samples that are obtained for metals analyses should be filtered. (pg. 4-15)

o. Duplicate groundwater samples should be collected at a frequency of 10%, as was previously specified in the installation-wide FSP. (pg. 4-15)

5. Section 4.4 - Subsurface Soil:

a. Provide the rationale for selecting only RVAAP - 04 and RVAAP - 19 for subsurface soil sampling. (pg. 4-16)

b. On Table 4-2:

1. Refer to comment 4(b) for previous comments on the modified list of explosives.

2. Provide the rationale behind the Target Analyte List (TAL) metals list vs. the metals short list. Even if the Agency agrees with the rationale behind the shortened metals list, a certain percentage of the samples obtained from the Landfill North of Winklepeck Burning Ground should be analyzed for TAL metals. In addition, how will it be determined which samples will be analyzed for TAL or for the short list?

3. A certain percentage of the samples at the Demolition Area # 2 also need to be analyzed for VOCs, Semi-Volatile Organic Compounds (SVOCs), Pesticides/PCBs and Cyanide.

6. Section 4.5 - Surface Soil and Sediment:

a. What analytical method will be utilized to determine the presence/absence of white phosphorous? (pg. 4-18)

b. On Table 4-3, refer to comment 5(b)(2) above regarding metals analyses.

c. Provide the rationale for the lack of subsurface soil samples at Load Lines 1,2,3,4,12 and the Winklepeck Burning Grounds. (pgs. 4-25 and 4-26)

d. On Table 4-5:

1. Provide the rationale behind the lack of VOC, SVOC, Pesticide/PCB and Cyanide samples downstream of the settling pond outfalls, Lower Cobbs Pond, and downstream of Lower Cobbs Pond.

2. Refer to previous comments on the modified explosives list and the TAL metals vs. the short list of metals.

7. Refer to previous OEPA comments on Investigation-Derived Waste (IDW) issues. The most recent comments are found in OEPA correspondence dated 05/21/96 to the ACOE. (pg. 7-1)

8. On Table 8-3 (pg. 8-8) it appears that footnotes 2 and 3 are switched. For example, footnote 2 is referenced in the Field Duplicate Samples column, however, it concerns blank samples. Footnote 3 is referenced in the Field Blanks column, however, it concerns duplicate samples. This should be corrected.

9. The project schedule appears to be fairly ambitious and does not allow for normal investigative-type delays, or sufficient review time for the involved regulatory agencies. In addition, it is noted that the AOC specific workplans were received several working days subsequent to the time delineated on the gant chart. (Figure 11-1, pg. 11-2)

3. Refer to comment 1(b)(2) of the AOC specific sampling plan regarding the potential by-products of the incomplete combustion of various PCOCs at the installation. (pg. 1-3)

4. Table 1 - 1 - Contaminants - This table does not agree with the PCOCs that are to be analyzed for at the various AOCs. For example, at some high priority AOCs, there is the potential for laboratory wastes to be present. In addition, lead azide, is potentially present at one of the AOCs. All known PCOCs should appear on this table. (pg. 1-4)

If you have any questions concerning this correspondence, please do not hesitate to contact me at 216-963-1221.

Sincerely,

Eileen T. Mohr
Site Coordinator
Division of Emergency and Remedial Response

ETM:ddb

cc: Bob Princic, NEDO DERR
Rod Beals, NEDO DERR
Sheila Abraham, NEDO DHWM
Virginia Wilson, NEDO DSIWM
Diane Kurlich, NEDO DDAGW
Manjusha Bhide, CO DERR EAU
Bonnie Buthker, OFFO SWDO
Catherine Stroup, CO Legal
Bob Whelove, U.S. Army IOC
Todd Boatman, ACOE
Steve Selecman, SAIC Oak Ridge
Dave Mentzer, SAIC Columbus
John Cicero, RVAAP
Tim Morgan, RVAAP
Bill Talmon, Mason and Hangar
Dave Seely, USEPA Region V

DEPARTMENT OF THE ARMY
RAVENNA ARMY AMMUNITION PLANT
8451 STATE ROUTE 5
RAVENNA, OHIO 44266-9297

REPLY TO
ATTENTION OF

July 11, 1996

SIORV-CR (200-1a)

Subject: Ohio Administrative Code 3745-27-13 - Generic Request for Authorization for the Ravenna Army Ammunition Plant

Director
Ohio Environmental Protection Agency
P.O. Box 1049
Columbus, Ohio 43216-1049

Dear Sir:

Please find enclosed the revised generic request for authorization to conduct investigative activities at Areas of Concern (AOCs) at RVAAP that are regulated under the Ohio Administrative Code 3745-27-13.

This request is forwarded for your review and concurrence.

Point of contact is Mr. John Cicero, (330) 358-7311.

Sincerely,

John A. Cicero, Jr.
Commander's Representative

Enclosures

Copies Furnished:
Ms. Eileen Mohr, Ohio Environmental Protection Agency, Division of Emergency and Remedial Response, Northeast District Office, 2110 East Aurora Road, Twinsburg, Ohio 44087
Commander, U.S. Army Industrial Operations Command, ATTN: AMSIO-EQE (Mr. Whelove), Rock Island, IL 61299-6000
Commander, U.S. Army Industrial Operations Command, ATTN: AMSIO-IRI (Ms. Vermost), Rock Island, IL 61299-6000
Mr. Doug Webb, U.S. Army Corps of Engineers, Nashville District, P.O. Box 1070, Nashville, TN 37202
Mr. Steve Selecman, Science Applications International Corporation, P.O. Box 2502, Oak Ridge, TN 37830
Mr. William Talmon, Mason and Hanger-Silas Mason Company, Inc., 8451 State Route 5, Ravenna, OH 44266-9297
Major Tom Tadsen, Ohio Army National Guard Site Representative, 8451 State Route 5, Ravenna, OH 44266-9297

OHIO ADMINISTRATIVE CODE 3745-27-13

REQUEST FOR AUTHORIZATION
FOR THE
RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OHIO

1. INTRODUCTION

This is a generic request for authorization from the Ohio Environmental Protection Agency (OEPA) to conduct investigative activities at high priority Areas of Concern (AOCs) at the Ravenna Army Ammunition Plant (RVAAP) that are regulated under the Ohio Administrative Code (OAC) 3745-27-13 (Authorization to engage in filling, grading, excavating, building, drilling, or mining on land where a hazardous waste facility or solid waste facility was operated), hereinafter referred to OAC Rule 13. An agreement between the RVAAP and the OEPA, Northeast District, (documented in a letter from the RVAAP to the OEPA, Northeast District, dated January 4, 1996) stipulates that a generic OAC Rule 13 authorization request be developed according to the requirements of the rule and presented in the Sampling and Analysis Plan (SAP) covering the AOCs at RVAAP where a hazardous waste facility or solid waste facility was operated. The request for authorization under OAC Rule 13 addresses measures necessary to ensure that investigative activities (drilling and soil sampling, monitoring well installation and groundwater sampling, trenching to collect waste materials and soil samples, surface water and sediment sampling, etc.) necessary to characterize these AOCs under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) are protective of human health and the environment.

This generic request for OAC Rule 13 authorization includes the high priority AOCs being addressed under CERCLA at RVAAP where a hazardous waste facility or solid waste facility is known to have operated based on currently available information. AOCs where there is no current evidence that a solid or hazardous waste have been deposited are not proposed under this authorization request. However, as more information becomes available about environmental conditions at AOCs at RVAAP, additional AOCs, not designated under this authorization request, may become applicable areas under OAC Rule 13 if evidence indicates that additional safeguards are needed to protect human health and the environment. Should it be determined by the OEPA and RVAAP that additional AOCs are applicable under OAC Rule 13, then a formal request will be submitted to the OEPA requesting authorization for additional AOCs. Any additional safeguards for additional AOCs, if necessary, will be addressed in the supplemental request for each AOC. Conversely, if AOCs are determined to be non-contaminated (i.e., chemical concentrations below regulatory limits), based on the results of characterization investigations, then a request will be made to the OEPA to remove these AOCs from the OAC Rule 13 status.

The AOCs currently proposed under this generic request for authorization are listed in Table 1-1. The AOCs proposed under this OAC Rule 13 request are those that have been identified as high priority AOCs in the *Action Plan for the Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 1996).

Table 1-1 Proposed OAC Rule 13 Applicable AOCs

AOC Number	AOC Name
RVAAP-04	Demolition Area #2
RVAAP-05	Winklepeck Burning Grounds
RVAAP-08	Load Line 1 and Dilution Settling Ponds
RVAAP-09	Load Line 2 and Dilution Settling Ponds
RVAAP-10	Load Line 3 and Dilution Settling Ponds
RVAAP-11	Load Line 4 and Dilution Settling Ponds
RVAAP-12	Load Line 12 and Dilution Settling Ponds
RVAAP-13	Building 1200 and Dilution Settling Pond
RVAAP-18	Load Line 12 Pink Wastewater Treatment Plant
RVAAP-19	Landfill North of Winklepeck Burning Ground
RVAAP-29	Upper and Lower Cobbs Ponds

Following is a brief summary of the rationale for the AOCs included in the OAC Rule 13 authorization request:

RVAAP-04 Demolition Area #2 - Used to detonate munitions and explosives. Thermal destruction of explosives and explosive wastes at 0.25 acre Resource Conservation and Recovery Act (RCRA) burning area. Reported burials of scrap bombs and explosives along with visual evidence of burial areas. Stressed vegetation observed. 1983 U.S. Army Environmental Hygiene Agency (USAEHA) investigation of RCRA area detected high concentrations of explosives and metals in surface soils. 1995 RCRA groundwater monitoring has detected no contamination in groundwater. 1992 USAEHA investigation detected low concentrations of explosives and metals in surface soils.

RVAAP-05 Winklepeck Burning Grounds - Widely used for the thermal destruction of explosives on earthen "open burning pads". Thermal destruction process used waste oils poured on starter materials on the ground surface as an ignition source. 1983 USAEHA investigation of 11 active burning pads found significant concentrations of explosives and metals in surface soils and in one drainage ditch.

RVAAP-08 Load Line 1 and Dilution Settling Ponds - Potential for surface soil contamination adjacent to process buildings from washout of explosive and metal residues. Potential for surface soil and sediment contamination from the release of large volumes of process effluent (pink water) containing explosive and metal constituents into unlined earthen ditches. Potential for sediment and shallow groundwater contamination from earthen settling ponds receiving process effluent. Sediment samples detected explosives. Settling ponds located in close

proximity to the facility boundary.

RVAAP-09 Load Line 2 and Dilution/Settling Ponds - Potential for surface soil contamination adjacent to process buildings from washout of explosive and metal residues. Potential for surface soil and sediment contamination from the release of large volumes of process effluent (pink water) containing explosive and metal constituents into unlined earthen ditches. Potential for sediment and shallow groundwater contamination from earthen settling pond receiving process effluent. Sediment samples detected explosives. Settling pond located in close proximity to the facility boundary.

RVAAP-10 Load Line 3 and Dilution/Settling Pond - Potential for surface soil contamination adjacent to process buildings from washout of explosive and metal residues. Potential for surface soil and sediment contamination from the release of large volumes of process effluent (pink water) containing explosive and metal constituents into unlined earthen ditches. Potential for sediment and shallow groundwater contamination from earthen settling pond receiving process effluent. Sediment samples detected explosives in settling ponds (Cobbs Ponds).

RVAAP-11 Load Line 4 and Dilution/Settling Ponds - Potential for surface soil contamination adjacent to process buildings from washout of explosive and metal residues. Potential for surface soil and sediment contamination from the release of large volumes of process effluent (pink water) containing explosive and metal constituents into unlined earthen ditches. Potential for sediment and shallow groundwater contamination from earthen settling pond receiving process effluent. Sediment samples detected explosives. Settling pond located in close proximity to the facility boundary.

RVAAP-12 Load Line 12 and Dilution/Settling Ponds - Potential for surface soil contamination adjacent to process buildings from washout of explosive and metal residues. Potential for surface soil and sediment contamination from the release of large volumes of process effluent (pink water) containing explosive and metal constituents into unlined earthen ditches. Potential for sediment and shallow groundwater contamination from earthen settling pond receiving process effluent. Red surface soil stains indicating explosives adjacent to Building FJ-905. Sediment samples detected explosives in settling ponds (Cobbs Ponds).

RVAAP-13 Building 1200 and Dilution Settling Pond - Potential for surface soil and sediment contamination from process effluent (pink water) containing explosive and metal constituents from ammunition sectionalizing operations released to earthen ditch and settling pond.

RVAAP-18 Load Line 12 Pink Wastewater Treatment Plant - Potential for surface soil and sediment contamination from the processing of effluent (pink water) containing explosive and metal constituents. Adjacent to Load Line 12 Building FJ-905 where red surface soil stains have been observed.

RVAAP-19 Landfill North of Winklepeck Burning Grounds - Potential for soil and groundwater contamination from leaching of wastes buried in unlined trenches. Explosive waste residue from Winklepeck Burning Ground reported to be buried. Potential impact to adjacent stream. Location of burial trenches and waste inventory are un-documented.

RVAAP-29 Upper and Lower Cobbs Ponds - Potential for sediment contamination from process effluent containing explosive and metal constituents from Load Line #3 and #12. Explosives detected in sediment and fish kill reported in 1966.

The status, plans, and schedule for current characterization activities of AOCs at RVAAP is presented in the *Action Plan for the Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 1996). The facility Action Plan is revised annually to reflect current and planned environmental activities at RVAAP.

The following sections include the information required under OAC Rule 13 authorization request, in the order in which it is specified. Because much of the information required under the provisions of OAC Rule 13 is contained in existing facility documents and CERCLA work plans developed for conducting investigations of AOCs at RVAAP, references to existing documentation are used where appropriate to meet the requirements of the rule.

2. LOCATION AND DESCRIPTION - OAC 3745-27-13(C)(1)

RVAAP is located in northeastern Ohio within Portage and Trumbull Counties, approximately 4.8 kilometers (3 miles) east/northeast of the Town of Ravenna and approximately 1.61 kilometers (1 mile) northwest of the Town of Newton Falls. The installation consists of 21,419 acres (8668 hectares) contained in a 17.7-kilometers-long (11-mile-long), 5.63-kilometers-wide (3.5-mile-wide) tract bounded by State Route 5 and the CSX System Railroad on the south; State Route 534 on the east; the Garrettsville and Berry Roads on the west; and the CONRAIL Railroad on the north. The land use surrounding the installation is primarily farmland with sparse private residences. The Michael J. Kirwan Reservoir is located immediately south of the facility.

RVAAP is a government-owned, contractor-operated U.S. Army Industrial Operations Command (IOC) facility. Currently, RVAAP is an inactive facility maintained by a contracted caretaker, Mason and Hanger-Silas Mason Co., Inc. Table 2-1 presents the RVAAP Command Organization, IRP executing agencies, and lead regulatory agencies.

Over the years, RVAAP handled and stored strategic and critical materials for various government agencies and received, stored, maintained, transported, and demilitarized military ammunition and explosive items. RVAAP maintained the capabilities to load, assemble, and pack military ammunition; however, these operations are inactive. As part of the RVAAP mission, the inactive facilities were maintained in a standby status by keeping equipment in a condition to permit resumption of production within the prescribed time limitations.

The location of the RVAAP facility on a 7.5 minute USGS topographic map is provided in the *Preliminary Assessment for The Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 1996). The location, description, and operating history for the AOCs at RVAAP, including those currently covered under this OAC Rule 13 request for authorization, are also included in the Preliminary Assessment. Figures 2-1 through 2-10 are large scale (1 inch equals 200 feet) maps of the AOCs currently proposed under this generic request for authorization, as required.

Table 2-1. RVAAP Organizational Responsibilities

Command Organization
Major Command: U.S. Army Materiel Command Major Subordinate Command: U.S. Army Industrial Operations Command Installation: RVAAP, Commander's Representative Installation Contractor: Mason & Hanger-Silas Mason Co., Inc.
Installation Restoration Program Executing Agency
U.S. Army Corps of Engineers, Nashville District
Regulatory Agencies
Ohio Environmental Protection Agency, Northeast District U.S. Environmental Protection Agency, Region V

3. INVESTIGATION ACTIVITIES - OAC 3745-27-13(C)(2)

The activities for which authorization is requested (drilling and soil sampling, monitoring well installation and groundwater sampling, trenching to collect waste material and soil samples, piezometer and well point installation, surface water and sediment sampling) are necessary to characterize the AOCs under CERCLA leading to the environmental restoration of these under the U.S. Department of Defense (DoD) Installation Restoration Program (IRP). The approach to implementing CERCLA under the IRP is described in Section 1 of the *Facility-wide Sampling and Analysis Plan for the Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 1996) and in the facility Action Plan. The characterization of the AOCs under this generic authorization request are expected to include investigative activities to evaluate potential sources of contamination and their impact on adjacent soils, groundwater, surface water, and sediment. The specific investigation activities for each AOC will be defined in a investigation-specific SAP addendum to the Facility-wide SAP and submitted in draft for OEPA review and comment, and as a final document for OEPA approval prior to conducting any investigative activities at an AOC.

Planned investigative activities at the AOCs addressed under this generic request for authorization are: (1) drilling and soil sampling, (2) monitoring well installation and groundwater sampling, (3) piezometer and well point installation, (4) trenching to collect waste material and soil samples, (5) surface water and sediment sampling, and (6) surface soil sampling. Following is a brief description of each investigative activity:

Drilling and soil sampling - Soil borings may be drilled in and adjacent to the former disposal areas in order to collect subsurface soil samples for laboratory analysis to characterize potential contaminants in the soils associated with these AOCs.

Monitoring well installation and groundwater sampling - Boreholes may also be drilled to install monitoring wells in and adjacent to these AOCs to collect groundwater samples for laboratory

analysis to characterize groundwater associated with these AOCs.

Piezometer and well point installation - Piezometers and well points may be installed at these AOCs to determine the depth to shallow groundwater and the potentiometric surface at these AOCs, and to collect groundwater samples to screen for potential contamination. This information will be used to determine the depth of trenches so as not to intersect the water table during trenching operations to mitigate the potential for cross-contamination of media and the creation of a preferential flow path. This information will additionally be used to locate monitoring wells to monitor groundwater downgradient of these areas.

Trenching and waste material and soil sampling - Trenches may be excavated in these disposal areas to evaluate the nature of buried waste in former landfill areas because burial records are limited or unavailable. Samples of waste materials and subsurface soils adjacent to the burials will be collected for laboratory analysis to characterize potential source materials and contamination resulting from the leaching of buried materials. Trenches will be small excavations ($\sim$2 feet wide x $\sim$10 feet long) and will not intersect groundwater zones (perched or water table). Currently, trenching is planned only at the Landfill North of Winklepeck Burning Grounds (RVAAP-19).

Surface water and sediment sampling - Surface water and sediment samples may be collected from surface streams and drainage adjacent to the former disposal areas and submitted for laboratory analysis to characterize the impact of the disposal areas on these media.

Surface soil sampling - Surface soil samples may be collected from surface soils adjacent to former disposal areas and submitted for laboratory analysis to characterize the potential impact of disposal practices on these areas.

4. PREVIOUS AND EXISTING PERMITS, APPROVALS, AND ORDERS - OAC 3745-27-13(C)(3)

There are no previous or existing permits, approvals, or orders pertaining to the AOCs for which authorization under OAC Rule 13 is being requested. The regulatory history of AOCs at RVAAP are presented in the Preliminary Assessment, and the facility Action Plan that contains additional information on the regulatory history of the installation.

5. LETTERS OF ACKNOWLEDGMENTS - OAC 3745-27-13(C)(4)

All parcels of land to which this request for authorization pertains are owned by the U.S. Army. Because of the interior location of the AOCs within the boundaries of the 21,419 acre (8668 hectares) RVAAP facility, all adjacent parcels are similarly owned by the U.S. Army. Consequently, no letters of acknowledgement are included in this request for authorization under OAC Rule 13.

6. LETTERS OF NOTICE - OAC 3745-27-13(C)(5)

Letters of notice of this request for authorization are required, under the provisions of

the OAC Rule 13, to be sent to the board of health for the health district and the local zoning authority for the area within which the facility is located. The Department of Health for both Trumbull and Portage Counties, Ohio, have been notified and the copies of the letters of notice are attached to this request for authorization as Attachments I and II. Because the Federal Government owns the RVAAP, local zoning authorities do not have jurisdiction over the facility; therefore, notices of this request for authorization were not sent to these agencies. The local zoning authorities were contacted to confirm their jurisdiction at RVAAP.

7. HISTORY OF HAZARDOUS WASTE OR SOLID WASTE TREATMENT, STORAGE OR DISPOSAL OPERATIONS - OAC 3745-27-13(C)(6)

A summary of all currently known hazardous waste and solid waste treatment, storage and disposal facilities at RVAAP are presented in the Preliminary Assessment. The histories of the AOCs proposed under this authorization request are included in this document.

8. CLOSURE ACTIVITIES - OAC 3745-27-13(C)(7)

No formal closure activities have previously been initiated at the AOCs covered under this request for authorization. However, hazardous waste and solid waste treatment, storage and disposal operations have ceased at all AOCs at RVAAP. Under the CERCLA process, as presented in Section 1 (Introduction) of the Facility-wide SAP, the investigation of potentially contaminated AOCs is the first step in the remediation and closure process. A summary of all known previous closure activities for AOCs at RVAAP is presented in the Preliminary Assessment, and additional closure information is also presented in the facility Action Plan.

9. INVESTIGATION METHODS AND PROCEDURES - OAC 3745-27-13(C)(8)

The investigation of AOCs at RVAAP will be conducted in accordance with facility-wide work plans and investigation-specific work plan addenda developed to meet the requirements established by the OEPA and the United States Environmental Protection Agency (EPA), Region V, under CERCLA. These plans contain detailed methods and procedures for performing the described investigation activities. Facility-wide work plans consist of a Facility-wide SAP and a *Facility Safety and Health Plan for the Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 1996). The intent of the facility-wide documents are to guide the investigation activities, to the extent practical, expected to be common to the investigation of all AOCs at RVAAP. For each AOC-specific investigation, addenda to the facility-wide work plans will be developed that contain additional project-specific information regarding the investigation activities and implementing methods and procedures. The investigation of an AOCs cannot be implemented without the Facility-wide SAP, FSHP, and a investigation-specific addendum for each plan. The contents and relationship of the facility-wide work plans and investigation-specific addenda are addressed in greater detail in Section 1 (Introduction) of the Facility-wide SAP. The facility-wide work plans and their addenda will be approved by the OEPA prior to initiating investigation activities.

Detailed procedures describing the investigative methods are contained in the Field Sampling Plan (FSP) part of either the Facility-wide SAP or the AOC-specific SAP addenda as

follows:

Drilling and soil sampling - Facility-wide SAP, FSP Section 4.4 Subsurface Soil.

Monitoring well installation and groundwater sampling - Facility-wide SAP, FSP Section 4.3 Groundwater.

Piezometer and well point installation - Investigation-specific SAP Addenda, FSP Section 4.3 Groundwater.

Trenching and waste material and soil sampling - Facility-wide SAP, FSP Section 4.4 Subsurface Soil.

Surface water and sediment sampling - Facility-wide SAP, FSP Sections 4.6 and 4.5.

Surface soil sampling - Facility-wide SAP, FSP Section 4.5.

10. ENVIRONMENTAL PROTECTION - OAC 3745-27-13(C)(9)

As previously described in Section 9 of this request for authorization, the investigation of AOCs at RVAAP will be conducted in accordance with facility-wide work plans and investigation-specific work plan addenda developed to meet the requirements established by the OEPA and the EPA, Region V, under CERCLA. These plans contain detailed methods and procedures for performing the described investigation activities. The primary focus of these documents are to produce legally defensible investigation results and ensure protection of human health and the environment. Consequently, the investigation methods and procedures cited in Section 9 are prepared to be compliant with applicable state and federal laws and regulations for conducting CERCLA investigations. These procedures contain provisions for protection of the environment resulting from investigative activities. In addition, the Facility-wide SAP and it's addenda contain provisions (Section 7, FSP) for the management of Investigation-Derived Waste (IDW) in accordance with applicable state and federal laws and regulations. Provisions are included for the treatment, storage, and disposal (TSD) of IDW in accordance with applicable state and federal laws and regulations.

11. REMOVAL OF SOLID OR HAZARDOUS WASTE, OR POTENTIALLY CONTAMINATED SOILS - OAC 3745-27-13(C)(10)

During the investigation of AOCs at RVAAP, it is expected that only contaminated or hazardous IDW generated as a result of characterization activities (excess soil and drill cuttings from soil borings and monitoring well boreholes; purged groundwater from monitoring well development; hazardous waste, if any, from characterization trenches; and sampling equipment decontamination water) will potentially be removed from an AOC. Section 7 of the FSP in the Facility-wide SAP and the investigation-specific SAP addenda contain provisions for representative sampling and analysis and TSD of IDW in accordance with applicable state and federal laws and regulations. Section 7 of the FSP in the Facility-wide SAP requires submittal of a copy of a letter of acceptance from a disposal facility be submitted to the OEPA prior to

removal of IDW for disposal from an AOC.

12. CLOSURE PROCEDURES - OAC 3745-27-13(C)(11)

The formal process for completing regulatory closure of AOCs at RVAAP, regulated under CERCLA, is described in Section 1 (Introduction) of the Facility-wide SAP, and additional information regarding closure/remediation of AOCs under CERCLA is presented in the Action Plan (USACE 1996). Because the CERCLA process is iterative, and, therefore, requires a considerable amount of time in which to implement a remediation, the FSP part of the Facility-wide SAP and investigation-specific SAP addenda contain provisions for reestablishing AOC conditions following completion of characterization activities to mitigate the impact on human health and the environment from these activities until such time that the AOC can be remediated, if necessary, under the CERCLA process. These reestablishment measures are described for each investigative activity presented in the FSP part of the Facility-wide SAP and investigation-specific addenda.

13. OAC RULE 13 AUTHORIZATION REQUEST SIGNATURES - OAC 3745-27-13(C)(12)(D)(1)(d)

The statements and assertions of fact made in this application are true and complete to my knowledge and comply fully with applicable state requirements as stated in OAC Rule 3745-27-13.

John A. Cicero, Jr.
Commander's Representative
Ravenna Army Ammunition Plant

Notary Public
My commission expires 4-22-97

FILE MEMO

TO: **1996 RAVENNA ARMY AMMUNITION PLANT FILE**

FROM: **EILEEN T. MOHR, DERR NEDO**

DATE: **JULY 12, 1996**

RE: **RAVENNA ARMY AMMUNITION PLANT PUBLIC MEETING (07/17/96) PREPARATION**

The following information was prepared by utilizing existing file information, the DSMOA, the Preliminary Assessment, CERCLA guidance, the RVAAP action plan, and the RVAAP sampling plans. It was prepared for the 07/17/96 public meeting.

DSMOA:

Defense/State Memorandum of Agreement - signed in 1992.

Purpose: to facilitate and expedite the clean-up of hazardous waste Areas of Concern (AOCs) at Department of Defense (DOD) installations in Ohio, and to ensure compliance with the applicable State laws and regulations.

Provides for reimbursement of costs to the State.

Services rendered by the State include:

1. technical review of documents and data... provide comments and recommendations

2. identify applicable or relevant and appropriate requirements (ARARs) related to response actions (actions need to be in compliance with Federal and State requirements - especially if the State requirements are more stringent)

3. conduct site visits to review response actions and ensure consistency with appropriate State requirements

4. participate in public education, community relations, technical review committees, etc.

The OEPA accepts the Relative Risk Site Evaluation (RRSE) method that ranks and prioritizes AOCs. This method looks at three major issues: contaminants present, migration pathways (ex. surface water, soil, groundwater, etc.) and receptors. The

Agency participates in ranking the various AOCs.

Dispute resolution - follows a hierarchy.... from the site coordinator level all the way to the governor's office and Secretary of the Army.

Again... the common goal is for cost-effective clean-ups that are protective of human health and the environment. Where appropriate, an additional goal is to promote rapid re-use of contaminated federal property.

REGULATORY ISSUES/INVOLVEMENT INCLUDES:

Conducting work in accordance with CERCLA (Comprehensive Environmental Response and Liability Act, 1980) and the SARA (Superfund Re-Authorization Act, 1986).

CERFA (Comprehensive Environmental Response Facilitation Act - October 1992.... was passed in order to facilitate base closure and re-use. This amends Section 120 of CERCLA and "directs federal agencies to identify uncontaminated parcels, with regulatory concurrence, and allows for transfer by deed of remediated parcels at the point when the successful operation of an approved remedy has been demonstrated to EPA."

CERCLA APPROACH:

Site Identification
Preliminary Assessment (PA)
Site Investigation (SI)
Remedial Investigation/Feasibility Study (RI/FS) - characterize site conditions, determine nature of the waste, assess risk to human health and the environment, conduct treatability testing of potential technologies, support the design of selected remedies.
Record of Decision (ROD) - documents the remedy selection
Remedial Design/Remedial Action (RD/RA)
Operations and Maintenance (O&M)
Five year review

There is community involvement throughout the process - i.e. meetings, public repository set-up, fact sheets, etc.

If necessary, interim measures (to handle imminent threats) can be implemented at any point in the process.

APPROACH TAKEN AT THE RVAAP:

The process will generally follow the CERCLA process with some modifications. In addition, there are terminology differences between the programs (CERCLA and IRP).

Facility-wide PA
Action Plan/Facility-Wide Workplans
Phase 1 Workplans for Specific AOCs
Phase 1 RI
Phase 2 RI
Feasibility Studies
Proposed Remedial Plan
ROD
RD/RA
Post remedial report and report on documented clean-up

At any point in the process, interim measures can be instituted to handle imminent threats to human health and the environment.

A "fenceline to fenceline" study is not being conducted... as it is cost prohibitive and technically not very feasible due to the size of the installation. However, remember CERFA..... this will allow for investigation of areas that aren't ranked or identified as an AOC prior to transfer.

38 AOCs have been identified at the RVAAP. The work is to be conducted in Phases, starting with the 11 highest priority AOCs. This phased approach is being conducted due to funding issues. A phased approach is also consistent with the CERCLA process.

The Site Investigation is termed a Phase 1 Remedial Investigation for funding purposes.

The purpose of the Phase 1 is to collect environmental samples from potentially impacted media and confirm if contamination is present and being released to the environment. It will also determine the nature of the Potential Contaminants of Concern (PCOCs).

The purpose of a Phase 2 is to determine the nature and extent of contamination existing at and emanating from an AOC, and to assess the potential risk to human health and the environment.

HIGH PRIORITY AOCs TO BE STUDIED IN PHASE 1:

RVAAP NUMBER	AOC NAME	MEDIA PROJECTED FOR SAMPLING/ACTIVITIES
RVAAP-04	Demolition Area # 2	30 subsurface borings - 2 samples each boring 3 pond/stream sediment samples
RVAAP-05	Winklepeck Burning Grounds	99 surface soil/drainage sediment samples
RVAAP-08	Load Line 1 and Dilution/Settling pond	4 monitor wells 52 surface soil/drainage sediment samples 10 pond/stream sediment samples
RVAAP-09	Load Line 2 and Dilution/Settling Pond	3 temporary well points 51 surface soil/drainage sediment samples 4 pond/stream sediment samples
RVAAP-10	Load Line 3 and Dilution/Settling Pond	3 temporary well points 53 surface soil/drainage sediment samples
RVAAP-11	Load Line 4 and Dilution/Settling Pond	3 temporary well points 51 surface soil/drainage sediment samples 7 pond/stream sediment samples
RVAAP-12	Load Line 12 and Dilution/Settling Pond	3 temporary well points 50 surface soil/drainage sediment samples 5 pond/stream sediment samples

RVAAP-13	Building 1200 and Dilution/Settling Pond	7 surface soil/drainage sediment samples 2 pond/stream sediment samples
RVAAP-18	Load Line 12 Pink Wastewater Treatment Plant	Included in other AOCs - especially RVAAP-12 and RVAAP-29
RVAAP-19	Landfill North of Winklepeck Burning Grounds	6 temporary well points 10 trenches - 3 samples each trench 6 pond/stream sediment samples
RVAAP-29	Upper and Lower Cobbs Pond	10 pond/stream sediment samples

ANALYSES AND DATA QUALITY:

Analyses that will be conducted during Phase 1: explosives, volatile organic compounds, semi-volatile organic compounds, pesticides/PCBs, target analyte list metals, "short list metals" - i.e. metals specific to the RVAAP. Not every sample obtained will have the entire list detailed above - but at least 10% of the samples per each medium in each AOC will have the entire suite.

Any data generated from sampling efforts must be of sufficient quality to support future risk assessments, additional CERCLA activities and any environmentally-based decisions.

REMEDIATION:

Any remediation that would be conducted, or remedies implemented, must be protective of human health and the environment, highly reliable, in compliance with other applicable laws and regulations, and cost-effective (among other issues).

GENERAL PHYSIOGRAPHIC SETTING:

SURFACE WATER: Mahoning River drainage basin - the West Branch of the Mahoning River is the major stream in the area. The stream flows adjacent to the west end of the installation (generally trending N-S) before discharging into the Michael J. Kirwan Reservoir. The reservoir discharges into the Mahoning River, east of the installation.

Three primary drainage ways from the installation: the South Fork of Eagle Creek, Sand Creek and Hinckley Creek.

GEOLOGY:

Allegheny Plateau

Glacial: Kent Till: (sand and silt) overlies the entire installation
Hiram Till: (sand, silt, clay) overlies the eastern 2/3 of the installation
Buried valley: trends SW to NE in the central portion of the installation

Bedrock: Pottsville Formation (sandstones, conglomerates and shales) underlain by the Cuyahoga Group.

Groundwater: most people probably have wells drilled into and developed into one of the local sandstones.

OFF- INSTALLATION SAMPLING:

The Army cannot go off installation until it has been determined that contamination may be leaving the post. The initial phased investigations will provide information as to whether or not this is a possibility.

The OEPA is currently looking into whether or not a representative sampling of residential wells can occur. Issues include: funding and whether OEPA contract labs can perform analyses of interest - i.e. explosives, and whether or not accurate well logs exist for this area.

IF sampling would occur, the following procedures would be utilized:

Obtain and evaluate existing well logs for the following:
- location of the residence with respect to the installation
- integrity and accuracy of the well logs (including geologic record, address, etc.)
- geologic strata that the well is developed into

Evaluate well accessibility and ability to bypass treatment systems
Owner cooperation in order to inspect the well systems and sample

PHASE 1 FIELD WORK:

Commences 07/22/96

OhioEPA
State of Ohio Environmental Protection Agency

STREET ADDRESS:
800 WaterMark Drive
Columbus, OH 43215-1099

TELE: (614) 644-3020 FAX: (614) 644-2329

MAILING ADDRESS:
P.O. Box 1049
Columbus, OH 43216-1049

August 14, 1996

RE: Ravenna Army Ammunition Plant
Portage/Trumbull Counties

Mr. John Cicero
Commander's Representative
Department of the Army
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, OH 44266-9297

Dear Mr. Cicero:

By written submittals dated April 15, 1996 and revised July 11, 1996, the Ravenna Army Ammunition Plant (RVAAP) has requested authorization, pursuant to Ohio Administrative Code (OAC) 3745-27-13, to fill, grade, excavate, drill, build, or mine at eleven (11) high priority Areas of Concern (AOCs) on the installation property. The eleven (11) high priority AOCs to be investigated are as follows:

RVAAP-04	Demolition Area # 2
RVAAP-05	Winklepeck Burning Grounds
RVAAP-08	Load Line 1 and Dilution Settling Ponds
RVAAP-09	Load Line 2 and Dilution Settling Ponds
RVAAP-10	Load Line 3 and Dilution Settling Ponds
RVAAP-11	Load Line 4 and Dilution Settling Ponds
RVAAP-12	Load Line 12 and Dilution Settling Ponds
RVAAP-13	Building 1200 and Dilution Settling Pond
RVAAP-18	Load Line 12 Pink Wastewater Treatment Plant
RVAAP-19	Landfill North of Winklepeck Burning Ground
RVAAP-29	Upper and Lower Cobbs Pond

The activities to be undertaken include: drilling and soil sampling; monitoring well installation and groundwater sampling; piezometer and well point installation; trenching at (RVAAP-19) and waste material and soil sampling; surface water and sediment sampling and sub-surface/surface soil sampling. These activities are being conducted under the Department of Defense (DOD) Installation Restoration Program (IRP). The Ohio EPA (OEPA) Division of Emergency and Remedial Response (DERR) is providing technical assistance to the Department of the Army, as specified under the Defense - State Memorandum of Understanding (DSMOA).

As part of the technical assistance provided by OEPA DERR, the following documents prepared by Science Applications International Corporation (SAIC), on behalf of the Army Corps of Engineers (ACOE), have been reviewed and found to be acceptable submissions:

CF:
COE NASHVILLE (MR WEBB)
IOC, AMSIO-EQE (MR WHELCHEL)
AMSIO-IRI (MR. KEMP)
} 5/19/96

1. Final (March, 1996), "Action Plan for the Ravenna Army Ammunition Plant, Ravenna, Ohio";

2. Final (February, 1996), "Preliminary Assessment for the Ravenna Army Ammunition Plant, Ravenna, Ohio";

3. Final (April, 1996), "Facility-Wide Sampling and Analysis Plan for the Ravenna Army Ammunition Plant, Ravenna, Ohio";

4. Final (February, 1996), "Facility-Wide Safety and Health Plan for the Ravenna Army Ammunition Plant, Ravenna, Ohio";

5. Final (July, 1996), "Phase 1 Remedial Investigation Sampling and Analysis Plan, Addendum for High Priority Areas of Concern for the Ravenna Army Ammunition Plant, Ravenna, Ohio", and;

6. Final (July, 1996), "Phase 1 Remedial Investigation Site Safety and Health Plan, Addendum for High Priority Areas of Concern for the Ravenna Army Ammunition Plant, Ravenna, Ohio."

Based upon the review of the above-mentioned documents submitted to the DERR Northeast District Office (NEDO), I have determined that the proposed investigative activities will not result in violation of applicable laws and regulations, will not create a nuisance, and are unlikely to adversely affect the public safety, human health, or the environment. Therefore, you are hereby authorized to perform the above actions in accordance with the above-referenced documents. This action does not relieve you of any obligation under other state/federal requirements.

This approval is subject to the following conditions:

1. Any activities conducted at the eleven (11) high priority AOCs must be accomplished in compliance with all applicable state and federal laws and regulations pertaining to environmental protection, including but not limited to control of air emissions, control of leachate, surface water run-on and run-off, and protection of groundwater.

2. Any activities undertaken shall not create a nuisance and shall not adversely affect public safety, human health, or the environment.

3. Ohio EPA NEDO DERR must be given seventy-two (72) hours notice prior to any work commencing on-site.

4. All solid and/or hazardous wastes removed during intrusive activities shall be containerized and securely stored until such time as these materials are properly characterized and disposed of in accordance with Chapter 3734 of the Ohio Revised Code (ORC) and regulations promulgated thereunder. Wastes generated as part of trenching activities conducted at RVAAP-I9 must follow the protocols specified in the above-referenced workplans.

5. All liquids, semi-solids, industrial wastes and other wastes regulated by ORC Chapter 6111 removed during intrusive activities shall be containerized and securely stored until such time as these materials are characterized and disposed of in accordance with ORC Chapter 6111 and regulations promulgated thereunder.

6. As per Section C(10) of OAC 3745-27-13, upon selection of appropriate disposal facility(ies), the RVAAP must submit to Ohio EPA a copy of a letter of acceptance from the disposal facility(ies).

7. This approval shall allow the RVAAP to conduct the described investigative activities in accordance with the above-referenced documents. The RVAAP must obtain prior approval from the Ohio EPA to perform any other additional activities at the eleven (11) high priority AOCs beyond those being approved under this authorization, and prior to commencing intrusive activities at the other AOCs identified at the installation.

You are hereby notified that this action of the Director is final and may be appealed to the Environmental Board of Review pursuant to ORC Section 3745.04. The appeal must be in writing and set forth the action complained of and the ground upon which the appeal is based. It must be filed with the Environmental Board of Review within thirty (30) days after notice of the Director's action. A copy of the appeal must be served on the Director of Environmental Protection within three (3) days of filing with the Board. An appeal may be filed with the Environmental Board of Review at the following address:

Environmental Board of Review
236 East Town Street
Room 300
Columbus, OH 43215

Sincerely,

Donald R. Schregardus
Director

cc: Bonnie Buthker, OEPA SWDO OFFO
Bob Princic, OEPA NEDO DERR
Eileen T. Mohr, OEPA NEDO DERR
Jan Carlson, OEPA CO DERR
Catherine Stroup, OEPA Legal

IRP File

Ohio EPA

State of Ohio Environmental Protection Agency

TO	12/3/96
✓	CR-COR
	PROP ADM
✓	LAND MGR
	CONTRACTOR
	RETURN FOR FILE

STREET ADDRESS:

1800 WaterMark Drive
Columbus, OH 43215-1099

TELE: (614) 644-3020 FAX: (614) 644-2329

MAILING ADDRESS:

P.O. Box 1049
Columbus, OH 43216-1049

November 04, 1996

RE: RAVENNA ARMY AMMUNITION PLANT
PORTAGE/TRUMBULL COUNTIES

Mr. John Cicero
Commander's Representative
Department of the Army
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna OH 44266-9279

Dear Mr. Cicero:

By written submittals dated October 4, 1996 and revised October 17, 1996, the Ravenna Army Ammunition Plant (RVAAP) has requested authorization, pursuant to Ohio Administrative Code (OAC) 3745-27-13, to fill, grade, excavate, drill, build, or mine at the previously unranked Areas of Concern (AOCs) on the installation property. The unranked AOCs to be investigated are as follows:

RVAAP-02	Erie Burning Grounds
RVAAP-03	Demolition Area #1
RVAAP-06	C-Block Quarry
RVAAP-15	Load Line 6 Treatment Plant
RVAAP-16	Quarry Landfill/Former Fuze and Booster Burning Pits
RVAAP-18	Load Line 12 Treatment Plant
RVAAP-26	Fuze and Booster Area Settling Tanks
RVAAP-28	Mustard Agent Burial Site
RVAAP-30	Load Line 7 Pink Water Treatment Plant
RVAAP-32	40 and 60 mm Firing Range
RVAAP-33	Firestone Test Facility
RVAAP-34	Sand Creek Disposal Road Landfill
RVAAP-35	Building 1037-Laundry Wastewater Sump
RVAAP-36	Pistol Range
RVAAP-37	Pesticide Building, S-4452
RVAAP-38	NACA Test Area

The activities to be undertaken include: surface and sub-surface soil sampling; well point installation and groundwater sampling; and, surface water and sediment sampling. These activities are being conducted under the Department of Defense (DOD) Installation Restoration Program (IRP). The Ohio EPA (OEPA) Division of Emergency and Remedial Response is providing technical assistance to the Department of the Army, as specified under the Defense - State Memorandum of Agreement (DSMOA).

As part of the technical assistance provided by OEPA, DERR, the following documents prepared by Science Applications International Corporation (SAIC), on behalf of the Army Corps of Engineers (ACOE), have been reviewed and found to be acceptable submissions:

1. Final (March, 1996), "Action Plan for the Ravenna Army Ammunition Plant, Ravenna, Ohio";

2. Final (February, 1996), "Preliminary Assessment for the Ravenna Army Ammunition Plant, Ravenna, Ohio";

3. Final (April, 1996), "Facility-Wide Sampling and Analysis Plan for the Ravenna Army Ammunition Plant, Ravenna, Ohio";

4. Final (February, 1996), "Facility-Wide Safety and Health Plan for the Ravenna Army Ammunition Plant, Ravenna, Ohio";

5. Final (July, 1996), "Phase 1 Remedial Investigation Sampling and Analysis Plan, Addendum for High Priority Areas of Concern for the Ravenna Army Ammunition Plant, Ravenna, Ohio";

6. Final (July, 1996), "Phase 1 Remedial Investigation Site Safety and Health Plan, Addendum for High Priority Areas of Concern for the Ravenna Army Ammunition Plant, Ravenna, Ohio"; and,

7. "Sampling Plan, Relative Risk Site Evaluation for Ravenna Army Ammunition Plant, Project Number 37-EF-5360-97, Ravenna, Ohio, 28 October - 4 November 1996"

Based upon the review of the above-mentioned documents submitted to the DERR Northeast District Office (NEDO), I have determined that the proposed investigative activities will not result in violation of applicable laws and regulations, will not create a nuisance, and are unlikely to adversely affect the public safety, human health, or the environment. Therefore, you are hereby authorized to perform the above actions in accordance with the above-referenced documents. This action does not relieve you of any obligation under other state/federal requirements.

This approval is subject to the following conditions:

1. Any activities conducted at the above-referenced AOCs, must be accomplished in compliance with all applicable state and federal laws and regulations pertaining to environmental protection, including, but not limited to, control of air emissions, control of leachate, surface water run-on and run-off, and protection of groundwater.

2. Any activities undertaken shall not create a nuisance and shall not adversely affect public safety, human health, or the environment.

3. Ohio EPA, DERR, NEDO, must be given seventy-two (72) hours notice prior to any work commencing on-site.

4. All solid and/or hazardous wastes removed during intrusive activities shall be containerized and securely stored until such time as these materials are properly characterized and disposed of in accordance with Chapter 3734 of the Ohio Revised Code (ORC) and regulations promulgated thereunder.

5. All liquids, semi-solids, industrial wastes and other wastes regulated by ORC Chapter 6111 removed during intrusive activities shall be containerized and securely stored until such time as these materials are characterized and disposed of in accordance with ORC Chapter 6111 and regulations promulgated thereunder.

6. As per Section C(10) of OAC 3745-27-13, upon selection of appropriate disposal facility(ies), the RVAAP must submit to Ohio EPA a copy of a letter of acceptance from the disposal facility(ies).

7. This approval shall allow the RVAAP to conduct the described investigative activities in accordance with the above-referenced documents. The RVAAP must obtain prior approval from the Ohio EPA to perform any other additional activities at the above referenced AOCs beyond those being approved under this authorization, and prior to commencing intrusive activities at the other AOCs identified at the installation.

You are hereby notified that this action of the Director is final, and may be appealed to the Environmental Board of Review pursuant to ORC Section 3745.04. The appeal must be in writing and set forth the action complained of and the ground upon which the appeal is based. It must be filed with the Environmental Board of Review within thirty (30) days after notice of the Director's action. A copy of the appeal must be served on the Director of Environmental Protection within three (3) days of filing with the Board. An appeal may be filed with the Environmental Board of Review at the following address:

Environmental Board of Review
236 East Town Street
Room 300
Columbus OH 43215

Sincerely,

Donald R. Schregardus
Director

DRS:ddb

cc: Bonnie Buthker, OEPA, SWDO, OFFO
Bob Princic, OEPA, NEDO, DERR
Eileen T. Mohr, OEPA, NEDO, DERR

Jim B.

AMSIO-EQ (1-200a) — 24 JAN 1996

MEMORANDUM FOR AMSIO-IOA

SUBJECT: Last Production Order at Ravenna AAP

1. During a meeting on 11 December about the proposed transfer of the RVAAP property to the National Guard Bureau, the comptroller gave guidance that the last production order at RVAAP is to be used as the source of funds for the RCRA closures. We currently have four RCRA closures at RVAAP for which we will seek funds.

2. Request identification of the last production order at RVAAP. Further request your office budget for $12.8M to be obligated in FY 97 for executing the RCRA closures and determine whether there are any funds left in that last production order.

3. The POC for this action is Mr. Robert Whelove Jr., AMSIO-EQE, extension 21092, E-mail rwhelove.

Robert J. Radkiewicz

ROBERT J. RADKIEWICZ
DCS for Environmental Management

CF:
Commander's Representative, Ravenna Army Ammunition Plant,
ATTN: SIORV-CR (J. Cicero), 8451 State Route 5, Ravenna,
OH 44266-9297
AMSIO-ACG-I (Ms. Mary Adams)
AMSIO-DSM
AMSIO-EQM (Mr. Tony Livingston)
AMSIO-IRI (Mr. R. Vermost/Mr. C. King)
AMSIO-ISR (Mr. T. Mickley)
AMSIO-RM (Mr. T. Olsen)

FAX TRANSMITTAL | # of pages ▸ 1

To BILL TALMON	From BOB WHELOVE
Dept./Agency RVAAP IN EH	Phone # 1092
Fax # 330 388 2414	Fax # 1379

NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

1. INTERIM REMEDIATION PLAN to be submitted within 30 days of the Orders for the following activities:

- Building 1601 (Hazardous Waste Storage Building)
- Open Burn Trays at the OB area.
- Characterization of the OD Area, including the horseshoe area and erosion control (vegatative cover).
- Characterization of the contaminated media at the deactivation furnace using historical data.

2. APPROVABLE CLOSURE PLANS, addressing the NODs issued by OEPA, to be submitted within 90 days of the Order for the following activities:

- Deactivation furnace unt.
- Building 1601
- Open Burning Area (OB)
- Open Detonation Area (OD)

3. If the closure plans are not approved, the plans are to be modified within 30 days of NODs.

4. Implement the approved closure plans in the manner of and in the time frame in the closure plan.

5. Submit cerification of closure within 60 days of closure.

6. Continue to monitor groundwater at the OB and OD area.

7. Institue groundwater assessment programs at the OB and OD areas within 30 days of the Orders.

8. Cease OB and OD treatment at these facilities.

9. Complete closure of Buildings W221, X232, and U202 within 90 days of the Order.

$20,000 SAIC

$10,000 COE

$25,000 SAIC

$5000 COE

W221 U202 BLDG 1601 DEACT $600,000
OB 200,000
OD-HS 4,000,000
8,000,000
12,800,000
1,250,000
1,280,000
$15,360,000
CLOSURES

BLDG 1601 & TRAYS OB
15,000 DESIGN
75,000 CONSTRUCTION

30,000 VEGATIVE COVER OD

16,000 FOR COE OVERSIGHT FOR BOTH AREAS

28,000 COE $105,000 CONTRACTOR

RCRA REQUIREMENTS
FOR RAVENNA ARMY AMMUNITION PLANT

1. INTERIM REMEDIATION PLANS (Building 1601, OB Area, OD Area, Deactivation Furnace)

The Interim Remediation Plans will include the following information :

- Facility background
- Regulatory background
- Background of each SWMU
- Geology and hydrogeology of the area
- Extent of impact of each SWMU if known
- Objectives of the Interim Measure
- Technical approach (details of how the Interim Measures will be accomplished)
- Health and Safety Plan
- Site plans and figures as necessary

CONTRACTOR
FWD FOR
☒ Information
☐ Compliance as applicable
☐ Reply NLT_____

The Interim Remediation Plans can be ready for submission to OEPA 75 days following the notice to proceed.

Estimated costs are $30,000 contract and $10,000 S&A

SEE ATTACHMENT FOR BUILDING 1601

2. APPROVABLE CLOSURE PLANS

The Closure Plans will consist of re-writing the closure plans contained in the Part B Application to address the Notice of Deficiencies issued by OEPA and to bring these closure into compliance with current regulations and guidelines. The Closure Plans must be written to be 'stand alone' documents. The Closure Plans will include the following SWMUs:

- Deactivation furnace unit.
- Building 1601
- Open Burning Area (OB)
- Open Detonation Area (OD)

The Closure Plans can be ready for submission to OEPA 90 days following the notice to proceed.

Estimated costs are $25,000 contract and $5,000 S&A

3. IMPLEMENTATION OF INTERIM REMEDIATION

- Building 1601 and Burn Trays at the OB area - The Interim Actions at these SWMUs will be similar and should be done together.

The cost estimate for the Interim Measures is $15,000 design and $125,000 RA.
The Interim Measures could be implemented 120 days following notice to proceed.

- Deactivation Furnace - Interim Remedial Measures would include removal of two soil areas identified as 'hot spots'.

Estimated costs for this removal are $30,000 design and $400,000 RA.
The Interim Measures could be implemented 120 days following notice to proceed.

4. IMPLEMENTATION OF CLOSURES

- Deactivation furnace unit. Estimated costs are $600,000

Building 1601 Estimated costs are $200,000 SEE ATTACHMENT FOR BUILDING 1601

- Open Burning Area (OB) Estimated costs are $4,000,000

- Open Detonation Area (OD) Estimated costs are $8,000,000

The closure schedule will be in the approved Closure Plans.

BUILDING 1601

The Interim Remedial Measures required are very similar to the closure requirements. The most economical approach would be to attempt clean closure during the interim actions. The building can be steam cleaned and sampling performed underneath the building during the interim actions. If the final rinse from the cleaning is clean and no contamination is found beneath the building, the OEPA may grant final closure.

We should request that OEPA allow us to submit interim closure plans, implement the interim actions, and determine the course of action following receipt of the data.

If contamination is found, the closure plans can be submitted within 60 days of the receipt of the data. If no contamination is found, a certification of closure can be submitted within 60 days of receipt of the data.

It would be economical to include the closure of buildings W221 and U202 with building 1601 since the requirements would be the same. No closure plans are required for these two buildings since they are not regulated.

RCRA Closure File

4/25/96

CR/COR
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CONTRACTOR
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S: 26 Apr 96

CONTRACTOR
FWD FOR
☒ Information
☐ Compliance as applicable
☐ Reply NLT

23 APR 1996

AMSIO-EQE (200-1a)

MEMORANDUM FOR AMSIO-RM

SUBJECT: Identification of Fund Sources for non-Defense Environmental Restoration Account (DERA) Resource Conservation Recovery Act (RCRA) Efforts

1. References:

a. 1st Endorsement, AMSIO-IOA-I, 27 Feb 96, subject: Last Production Order at Ravenna AAP and memorandum, AMSIO-EQ, 24 Jan 96, SAB (encl).

b. Letter, Ohio EPA, 7 Mar 96, subject: Draft Consent Order.

c. FONECON between Ohio EPA staff, RVAAP, COE Nashville District, and various IOC offices, 10 Apr 96, subject: Draft RCRA Consent Order.

2. As a result of the draft consent order negotiations, reference 1c, we are faced with programming funds for RCRA closures at Ravenna AAP. Mr. Ted Olson was present at this meeting. Reference 1a indicated the last production order was during the Vietnam era and cannot be identified. We urgently need a fund source for the RCRA closures at Ravenna AAP which are estimated to be approximately $15M. We indicated to the Ohio EPA FY 98 will probably be the year we can program and obtain the funds. Programming actions are ongoing at this time and we urgently need to take advantage of this window of opportunity.

3. Request you provide us with identification of the appropriate funding source by 26 April 1996.

4. The POC is Mr. Bob Whelove, Jr., AMSIO-EQE, extension 21092, E-mail rwhelove.

Robert J. Radkiewicz

ROBERT J. RADKIEWICZ
DCS for Environmental Management

Encl

CF:
Commander's Representative, Ravenna Army Ammunition Plant,
ATTN: SIORV-CR, 8451 State Route 5, Ravenna, OH 44266-9297
(w/encl)
AMSIO-IR (w/encl)
AMSIO-IOA (wo/encl)

APR 25 1996

RVAAP Admin File

DEPARTMENT OF THE ARMY
HEADQUARTERS, U.S. ARMY INDUSTRIAL OPERATIONS COMMAND
ROCK ISLAND, ILLINOIS 61299-6000

REPLY TO ATTENTION OF
AMSIO-GCE

29 April 1996

TO 5/1/96
CR-COR
PROP ADM
LAND MGR
CONTRACTOR
RETURN FOR FILE

CONTRACTOR
FWD FOR
☑ Information
☐ Compliance as applicable
☐ Reply NLT_____

Mr. Mark J. Navarre
Supervisory Attorney
Ohio EPA
P.O. Box 1049
Columbus, OH 43216-1049

Dear Mr. Navarre:

This responds to your March 7, 1996 letter and our conference call of April 10, 1996. During the telephone conference, you requested the provision of anticipatory schedules regarding various matters that will ultimately be addressed in the Administrative Consent Order for Ravenna Army Ammunition Plant (RVAAP). The following RCRA action schedules are provided for your information and consideration.

By September 1, 1996, RVAAP will submit RCRA interim action plans as follows:

a) Vegetative cover;

b) Burn trays;

c) Data characterization using existing data for the OD Grounds and Horseshoe Area; and

d) Data characterization using existing data for the OB Grounds.

By October 1, 1996, RVAAP will submit revised RCRA Closure Plans for the:

a) Deactivation Furnace Unit Area;

b) Building 1601, Hazardous Waste Storage;

MAY 2 1996

c) Open Burning Area; and

d) Open Detonation Area.

FY 1998 funds are being requested to accomplish the above closures, to close the 90 day accumulation areas contained in buildings W221 and U202 and the decontamination of burn trays to coincide with the closure of building 1601.

If the foregoing is not totally responsive to your request, please contact me for further clarification. My telephone number is (309) 782-8440.

Your assistance and cooperation with respect to the matters addressed in the draft Consent Order are greatly appreciated.

Sincerely,

SIGNED

JOHN A. ROCK
Acting Chief, Environmental/
Safety Law Division

CF:
AMSIO-IRG (Major Hurley)
AMSIO-EQE (Mr. Whelove)
AMSIO-RMC (Mr. Olson)
AMSIO-ISR (Mr. Agy)
Cdr, Ravenna AAP, ATTN: SIROV-CR (Mr. Cicero)
COE, ATTN: CEORN-ER-M (Mr. Doug Webb)

CONCURRENCE:

AMSIO-EQE _____ Henry Crain _____ 4/29/96
(concur/~~nonconcur~~) (signature) (date)

RCRA Closure File

S: 30 Apr 96

23 APR 1996

AMSIO-EQE (200-1a)

MEMORANDUM FOR AMSIO-ISR

SUBJECT: Draft Resource Conservation and Recovery Act (RCRA) Consent Order

1. Reference FONECON between Ohio EPA staff, RVAAP, COE Nashville District, and various IOC offices, 10 Apr 96, SAB.

2. During the referenced FONECON, this office promised to send a reply to the Ohio EPA draft order by 30 April 1996 which would commit RVAAP to certain initial actions. The Louisville COE has estimated these actions to cost $89.5K. The actions include interim actions such as correcting erosion at the open detonation area and preparing closure plans for the OB/OD grounds, the hazardous waste storage facility and the deactivation furnace area.

3. This office believes these efforts would be eligible for the use of Industrial Lease funds since they involve environmental restoration-type activities for permitted facilities at RVAAP. Major Hurley, Commander of RVAAP, has given his concurrence to use the funds for this purpose.

4. Request your immediate assistance to release these funds to the COE so that they can initiate their contract effort. Our reply to the Ohio EPA is predicated on completion dates which require the COE to receive the funds by 30 April 1995. We also request you MIPR the COE, Mr. Gary Chisolm at (502)675-7010, directly.

5. The POC for this action is Mr. Bob Whelove, Jr., AMSIO-EQE, extension 21092, E-mail rwhelove.

Cyril Onewokae.

CYRIL ONEWOKAE
Acting Chief, Restoration &
Engineering Division

CF:
Commander, Ravenna Army Ammunition Plant, ATTN: SIORV-CR,
8451 State Route 5, Ravenna, OH 44266-9297
AMSIO-GCE
AMSIO-IRG
AMSIO-IRS
AMSIO-RMP

RCRA Closure File

4431

TO 4/30/96
CR,COR
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Message 15

Date Received: TUE, 30 APR 96 11:31:23 CDT
Forward-Path: <ORVAAP@RIA-EMH1.ARMY.MIL>
Return-Path: <RWHELOVE@ria-emh2.army.mil>
Date: Tue, 30 Apr 1996 11:04:46 -0500
Message-Id: <1863ad80@RIA-EMH2.ARMY.MIL>
From: RWHELOVE@ria-emh2.army.mil
Subject: RCRA Actions at RVAAP
To: ronald.d.webb@usace.army.mil, ORVAAP@RIA-EMH1.ARMY.MIL

The following is more of a work breakdown than is contained in our basic memo to you:

RCRA Interim Action Plans
Vegatative Cover Plan
Open Burn Trav Plan
Data Characterization,using existing data. OD Grounds and Horseshoe area
Data Characterization,using existing data. OB Grounds
For the four above $5000 COE. $20,000 Contractor
Deliverables due OEPA 1 Sept 96

RCRA Closure Plans
Deactivation Furnace Unit Area
Building 1601. hazardous waste storage building
Open Burning Area
Open Detonation Area to include the horseshoe area
For four above $5000 COE. $25,000 contractor funds
Deliverables due the OEPA on 1 Oct 96

Vegatative Cover to be applied to the OD area after the plan is approved by OEPA
For one above $4500 COE and $30,000 Contractor

Corps will write scopes of work provide executor function and oversight of the contractor's work for the above tasks. The total funds for the above are $89.5K as asked for in the previously signed memo. Contractor is chosen as Scientific Applications International Corproation (SAIC). COE has a task order contract with them for about $20m work which we can add these tasks with a Delivery Order.The Louisville District handles the funds (MIPR's) but the Nashville District will be the executor.

Hope this helps . Bob Whelove Jr.. AMSIO-EQE. 21092

********** END OF MESSAGE **********

MAY 1 1996
By_____

RCRA Closure File

OhioEPA
State of Ohio Environmental Protection Agency

STREET ADDRESS:
1800 WaterMark Drive
Columbus, OH 43215-1099

TELE: (614) 644-3020 FAX: (614) 644-2329

MAILING ADDRESS:
P.O. Box 1049
Columbus, OH 43216-1049

TO 6/27/96
1 ~~OR-COR~~
~~PROP ADM~~
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June 21, 1996

Mr. John A. Rock, Esq.
Acting Chief, Environmental/Safety Law Division
United States Department of the Army
Headquarters, U.S. Army Industrial Operations Command
Rock Island, Illinois 61299-6000

Re: Ravenna Army Ammunition Plant, Ravenna, Ohio

Dear Mr. Rock:

This letter follows my receipt of your April 29, 1996 letter regarding the above-referenced matter as well as our April 10th telephone conference regarding the closure of certain hazardous waste management units at the Ravenna Army Ammunition Plant ("RVAAP"). As you know, during our April 10th conference, we discussed the Agency's March 7th proposed administrative consent order regarding certain hazardous waste management and closure issues at the RVAAP, as well as the United States Army's anticipated schedule for submittal of interim action plans and revised closure plans for specified hazardous waste management units at the RVAAP.

According to your April 29th letter, the Army projects that by September 1, 1996, the Army will submit an interim action plan (or plans) for the Open Burning ("OB") grounds and the Open Detonation ("OD") grounds, including but not limited to the "horseshoe shaped" area. As set forth in Ohio EPA's March 7th proposed administrative consent order and discussed in our April 10th conference call, the interim action plan shall address the following maintenance, characterization and remediation activities:

- o dismantling and characterization of the burn trays and equipment at the OB grounds; in addition, the plan shall explain in detail the Army's storage of the burn trays and equipment prior to decontamination and disposal.
- o characterization of the contaminated media at the OB grounds, using existing analytical data; in addition, the plan shall include any necessary interim remediation activities.
- o characterization of the contaminated media at the OD grounds, using existing analytical data; in addition, the plan shall include any necessary interim remediation activities.
- o appropriate maintenance activities, i.e., vegetative cover, necessary to control soil erosion at the OD grounds.

JUN 27 1996

Your April 29th letter also projects that by October 1, 1996, the Army will submit a revised closure plan (or plans) for the Deactivation Furnace Unit area and the greater-than-90-day hazardous waste storage building (Building 1601) as well as the OB grounds and the OD grounds. As set forth in the Agency's March 7th proposed administrative consent order, the revised closure plan shall comply with Ohio Administrative Code rules 3745-55-12 and 3745-54-90 through 3745-55-02, and shall satisfactorily address the deficiencies and comments set forth in Ohio EPA's September 29, 1993 and May 3, 1994 Notices of Deficiencies.

Your April 29th letter concludes that 1998 Federal Fiscal Year ("FY 98") funds are being requested to close the above-referenced units as well as the less-than-90-day accumulation areas within Buildings W221 and U202 and to conduct decontamination of the burn trays to coincide with the closure of Building 1601. Based upon a FY 98 projected funding appropriation, it is my understanding that, upon Ohio EPA approval of the Army's forthcoming revised closure plan(s), the Army would be not be able to spend FY 98 funds to commence closure activities until October 1, 1997. Is this correct ? If so, is there any possibility that the FY 97 funds (which presumably will be available on October 1, 1996) could be used to commence closure activities ?

The administrative consent order we have discussed, as well as the revised closure plan(s) to be submitted, should set forth the schedule for commencement and completion of closure activities. The Agency has agreed to postpone further discussion and negotiation of the proposed administrative consent order until the Agency's receipt and review of the Army's interim action plan(s) and revised closure plan(s) later this year. However, upon such review, the Agency expects to reconvene our discussions of the proposed administrative consent order and, if necessary, the forthcoming plans, with the objective of completing negotiations and issuing an agreed order, as well as plan approvals, before the end of this calendar year. If the Army is able to dedicate FY 97 funds to implement the approved RVAAP closure plans, work could begin in the spring of 1997 and perhaps be completed one year sooner than would be the case with FY 98 funding. I would appreciate your thoughts as well as any information the Army could provide on this subject.

Should you have any questions in this regard, please feel free to contact me at (614) 644-3037. Thank you for your cooperation in this regard.

Sincerely,

Mark J. Navarre
Supervising Attorney

cc: Murat Tukel/Sheila Abraham/Carolyn Princic, NEDO
Diane Kurlich/Eileen Mohr, NEDO
Alan Harness/Ed Lim, DHWM, CO
Dan Lukovic/Montee Suleiman, DHWM, CO
Katie Crowell, DDAGW
Bonnie Buthker, OFFO, SWDO

John Cicero, Ravenna Army Ammunition Plant