Ohio Environmental Protection Agency (OEPA)

And

Ravenna Army Ammunition Plant (RVAAP)

1997 Correspondences

since 1827
MASON & HANGER CORPORATION
RAVENNA ARMY AMMUNITION PLANT

31 Jan 97 January 30, 1997

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 December, 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).

According to the laboratory results, the explosives RDX and HMX were detected in monitoring wells # 1 and #4. The statistical analyses for these parameters did not indicate evidence of contamination.

In accordance with OAC 3745-27-10, the affected wells will be re-sampled for the above constituents within 15 days of the date of this letter. We currently plan to conduct this sampling on Thursday, February 6, 1997.

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/lfgm1296

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 #: E6-12-036
Date: 01/17/97 13:38
Work ID: Ramsdell Landfill
Date Received: 12/20/96
Date Completed: 01/15/97

Client Code: RVAAP

SAMPLE IDENTIFICATION

Sample Number	Sample Description
01	Landfill M.Wells 1
02	Landfill M. Wells 2
03	Landfill M.Well 3
04	Landfill M.Well 4
05	Landfill M.Well 5
06	Landfill M.Well Dup. (Well 3)

ABREVIATION KEY

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

Certified By
Steven D. Lambright

RECEIVED
JAN 21 1997
By

Sample: 01A Landfill M.Wells 1 Collected: 12/19/96
Job: LNDEXP Landfill Explosives

Test Description	Result	Limit	Units	Analyzed	By
2,4-DINITROTOLUENE	<10	10	ug/L	01/06/97	DB
2,6-DINITROTOLUENE	<10	10	ug/L	01/06/97	DB
HMX IN WATER	27	10	ug/L	01/06/97	DB
RDX in Water	15	10	ug/L	01/06/97	DB
Trinitrotoluene in Water	<10	10	ug/L	01/06/97	DB

Sample: 01B Landfill M.Wells 1 Collected: 12/19/96
Job: LNDPHE Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Phenols in Water	<0.010	0.010	mg/L	01/02/97	WAO
Total Organic Carbon	1.4	1.0	mg/L	12/31/96	SL

Sample: 01C Landfill M.Wells 1 Collected: 12/19/96
Job: LNDUNP Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Chloride in Water	2.2	1	mg/L	12/29/96	WAO
Specific Conductivity	360	10	umhos	01/02/97	SL
Sulfate in Water	79	1.0	mg/L	01/02/97	SL
Total Alkalinity in Water	110	2	mg/L	01/04/97	WAO
Total Dissolved Solids	310	4	mg/L	12/23/96	SL
Turbidity in Water	58	1.0	NTU	12/20/96	MR
pH in Water	6.4		s.u.	12/20/96	MR

Sample: 01E Landfill M.Wells 1 Collected: 12/19/96
Job: LND_CN Landfill Cyanide

Test Description	Result	Limit	Units	Analyzed	By
Cyanide Analysis in Water	<0.005	0.005	mg/L	12/29/96	WAO

Sample: 01F Landfill M.Wells 1 Collected: 12/19/96
Job: LND_ME Landfill Metals

Test Description	Result	Limit	Units	Analyzed	By
Arsenic in Water	<0.003	0.003	mg/L	01/06/97	LL
Barium in Water	0.014	0.001	mg/L	01/06/97	LL
Cadmium in Water	<0.0005	0.0005	mg/L	01/06/97	LL
Calcium in Water	34	0.10	mg/L	01/06/97	LL
Chromium in Water	<0.001	0.001	mg/L	01/06/97	LL
Copper in Water	<0.001	0.001	mg/L	01/06/97	LL
Hg Prep	12/27/96		date complete		LL
Iron in Water	11	0.10	mg/L	01/06/97	LL
Lead in Water	<0.002	0.002	mg/L	01/06/97	LL
Magnesium in Water	18	0.006	mg/L	01/06/97	LL
Manganese in Water	2.5	0.004	mg/L	01/06/97	LL
Mercury in Water	<0.0002	0.0002	mg/L	12/27/96	LL

Test Description	Result	Limit	Units	Analyzed	By
Nickel in Water	0.14	0.005	mg/L	01/06/97	LL
Potassium in Water	3.1	0.10	mg/L	01/06/97	LL
Prep for ICAP - Water	01/03/97		date complete		LL
Selenium in Water	<0.002	0.002	mg/L	01/06/97	LL
Silver in Water	<0.001	0.001	mg/L	01/06/97	LL
Sodium in Water	2.1	0.10	mg/L	01/06/97	LL
Zinc in Water	0.17	0.009	mg/L	01/06/97	LL

Sample: 01G Landfill M.Wells 1 Collected: 12/19/96
Job: LND_SA Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Ammonia in Water	0.067	0.020	mg/L	01/02/97	WAO
Chemical Oxygen Demand	<2	2	mg/L	12/29/96	WAO
Nitrate-Nitrite in Water	0.085	0.01	mg/L	12/27/96	WAO
Total Phosphorous in Water	0.036	0.03	mg/L	12/29/96	WAO

Sample: 02A Landfill M. Wells 2 Collected: 12/19/96
Job: LNDEXP Landfill Explosives

Test Description	Result	Limit	Units	Analyzed	By
2,4-DINITROTOLUENE	<10	10	ug/L	01/06/97	DB
2,6-DINITROTOLUENE	<10	10	ug/L	01/06/97	DB
HMX IN WATER	<10	10	ug/L	01/06/97	DB
RDX in Water	<10	10	ug/L	01/06/97	DB
Trinitrotoluene in Water	<10	10	ug/L	01/06/97	DB

Sample: 02B Landfill M. Wells 2 Collected: 12/19/96
Job: LNDPHE Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Phenols in Water	<0.010	0.010	mg/L	01/02/97	WAO
Total Organic Carbon	2.3	1.0	mg/L	12/31/96	SL

Sample: 02C Landfill M. Wells 2 Collected: 12/19/96
Job: LNDUNP Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Chloride in Water	1.8	1	mg/L	12/29/96	WAO
Specific Conductivity	400	10	umhos	01/02/97	SL
Sulfate in Water	83	1.0	mg/L	01/02/97	SL
Total Alkalinity in Water	120	2	mg/L	01/04/97	WAO
Total Dissolved Solids	250	4	mg/L	12/23/96	SL
Turbidity in Water	46	1.0	NTU	12/20/96	MR
pH in Water	6.2		s.u.	12/20/96	MR

Sample: 02E Landfill M. Wells 2 Collected: 12/19/96
Job: LND_CN Landfill Cyanide

Test Description	Result	Limit	Units	Analyzed	By
Cyanide Analysis in Water	<0.005	0.005	mg/L	12/29/96	WAO

Sample: 02F Landfill M. Wells 2 Collected: 12/19/96
Job: LND_ME Landfill Metals

Test Description	Result	Limit	Units	Analyzed	By
Arsenic in Water	<0.003	0.003	mg/L	01/06/97	LL
Barium in Water	0.022	0.001	mg/L	01/06/97	LL
Cadmium in Water	<0.0005	0.0005	mg/L	01/06/97	LL
Calcium in Water	54	0.10	mg/L	01/06/97	LL
Chromium in Water	<0.001	0.001	mg/L	01/06/97	LL
Copper in Water	<0.001	0.001	mg/L	01/06/97	LL
Hg Prep	12/27/96		date complete		LL
Iron in Water	0.27	0.10	mg/L	01/06/97	LL
Lead in Water	<0.002	0.002	mg/L	01/06/97	LL
Magnesium in Water	11	0.006	mg/L	01/06/97	LL
Manganese in Water	0.19	0.004	mg/L	01/06/97	LL
Mercury in Water	<0.0002	0.0002	mg/L	12/27/96	LL
Nickel in Water	0.016	0.005	mg/L	01/06/97	LL
Potassium in Water	2.7	0.10	mg/L	01/06/97	LL
Prep for ICAP - Water	01/03/97		date complete		LL
Selenium in Water	<0.002	0.002	mg/L	01/06/97	LL
Silver in Water	<0.001	0.001	mg/L	01/06/97	LL
Sodium in Water	2.1	0.10	mg/L	01/06/97	LL
Zinc in Water	0.10	0.009	mg/L	01/06/97	LL

Sample: 02G Landfill M. Wells 2 Collected: 12/19/96
Job: LND_SA Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Ammonia in Water	0.032	0.020	mg/L	01/02/97	WAO
Chemical Oxygen Demand	<2	2	mg/L	12/29/96	WAO
Nitrate-Nitrite in Water	0.13	0.01	mg/L	12/27/96	WAO
Total Phosphorous in Water	0.040	0.03	mg/L	12/29/96	WAO

Sample: 03A Landfill M.Well 3 Collected: 12/19/96
Job: LNDEXP Landfill Explosives

Test Description	Result	Limit	Units	Analyzed	By
2,4-DINITROTOLUENE	<10	10	ug/L	01/03/97	DB
2,6-DINITROTOLUENE	<10	10	ug/L	01/06/97	DB
HMX IN WATER	<10	10	ug/L	01/06/97	DB
RDX in Water	<10	10	ug/L	01/06/97	DB
Trinitrotoluene in Water	<10	10	ug/L	01/06/97	DB

Sample: 03B Landfill M.Well 3 Collected: 12/19/96
Job: LNDPHE Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Phenols in Water	<0.010	0.010	mg/L	01/02/97	WAO
Total Organic Carbon	3.4	1.0	mg/L	12/31/96	SL

Sample: 03C Landfill M.Well 3 Collected: 12/19/96
Job: LNDUNP Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Chloride in Water	1.8	1	mg/L	12/29/96	WAO
Specific Conductivity	470	10	umhos	01/02/97	SL
Sulfate in Water	120	1.0	mg/L	01/02/97	SL
Total Alkalinity in Water	120	2	mg/L	01/04/97	WAO
Total Dissolved Solids	290	4	mg/L	12/23/96	SL
Turbidity in Water	<1.0	1.0	NTU	12/20/96	MR
pH in Water	6.5		s.u.	12/20/96	MR

Sample: 03E Landfill M.Well 3 Collected: 12/19/96
Job: LND_CN Landfill Cyanide

Test Description	Result	Limit	Units	Analyzed	By
Cyanide Analysis in Water	<0.005	0.005	mg/L	12/29/96	WAO

Sample: 03F Landfill M.Well 3 Collected: 12/19/96
Job: LND_ME Landfill Metals

Test Description	Result	Limit	Units	Analyzed	By
Arsenic in Water	<0.003	0.003	mg/L	01/06/97	LL
Barium in Water	0.020	0.001	mg/L	01/06/97	LL
Cadmium in Water	<0.0005	0.0005	mg/L	01/06/97	LL
Calcium in Water	65	0.10	mg/L	01/06/97	LL
Chromium in Water	<0.001	0.001	mg/L	01/06/97	LL
Copper in Water	<0.001	0.001	mg/L	01/06/97	LL
Hg Prep	12/27/96		date complete		LL
Iron in Water	<0.10	0.10	mg/L	01/06/97	LL
Lead in Water	<0.002	0.002	mg/L	01/06/97	LL
Magnesium in Water	13	0.006	mg/L	01/06/97	LL
Manganese in Water	<0.004	0.004	mg/L	01/06/97	LL
Mercury in Water	<0.0002	0.0002	mg/L	12/27/96	LL
Nickel in Water	<0.005	0.005	mg/L	01/06/97	LL
Potassium in Water	5.5	0.10	mg/L	01/06/97	LL
Prep for ICAP - Water	01/03/97		date complete		LL
Selenium in Water	<0.002	0.002	mg/L	01/06/97	LL
Silver in Water	<0.001	0.001	mg/L	01/06/97	LL
Sodium in Water	2.3	0.10	mg/L	01/06/97	LL
Zinc in Water	<0.009	0.009	mg/L	01/06/97	LL

Sample: 03G Landfill M.Well 3 Collected: 12/19/96
Job: LND_SA Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Ammonia in Water	<0.020	0.02	mg/L	01/02/97	WAO
Chemical Oxygen Demand	3.6	2	mg/L	12/29/96	WAO
Nitrate-Nitrite in Water	0.59	0.01	mg/L	12/27/96	WAO
Total Phosphorous in Water	0.034	0.03	mg/L	12/29/96	WAO

Sample: 04A Landfill M.Well 4 Collected: 12/19/96
Job: LNDEXP Landfill Explosives

Test Description	Result	Limit	Units	Analyzed	By
2,4-DINITROTOLUENE	<10	10	ug/L	01/06/97	DB
2,6-DINITROTOLUENE	<10	10	ug/L	01/06/97	DB
HMX IN WATER	<10	10	ug/L	01/06/97	DB
RDX in Water	39	10	ug/L	01/06/97	DB
Trinitrotoluene in Water	<10	10	ug/L	01/06/97	DB

Sample: 04B Landfill M.Well 4 Collected: 12/19/96
Job: LNDPHE Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Phenols in Water	<0.010	0.010	mg/L	01/02/97	WAO
Total Organic Carbon	1.4	1.0	mg/L	12/31/96	SL

Sample: 04C Landfill M.Well 4 Collected: 12/19/96
Job: LNDUNP Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Chloride in Water	2.1	1	mg/L	12/29/96	WAO
Specific Conductivity	580	10	umhos	01/02/97	SL
Sulfate in Water	75	1.0	mg/L	01/02/97	SL
Total Alkalinity in Water	250	2	mg/L	01/04/97	WAO
Total Dissolved Solids	370	4	mg/L	12/23/96	SL
Turbidity in Water	23	1.0	NTU	12/20/96	MR
pH in Water	6.6		s.u.	12/20/96	MR

Sample: 04E Landfill M.Well 4 Collected: 12/19/96
Job: LND_CN Landfill Cyanide

Test Description	Result	Limit	Units	Analyzed	By
Cyanide Analysis in Water	<0.005	0.005	mg/L	12/29/96	WAO

Sample: 04F Landfill M.Well 4 Collected: 12/19/96
Job: LND_ME Landfill Metals

Test Description	Result	Limit	Units	Analyzed	By
Arsenic in Water	<0.003	0.003	mg/L	01/06/97	LL
Barium in Water	0.044	0.001	mg/L	01/06/97	LL
Cadmium in Water	<0.0005	0.0005	mg/L	01/06/97	LL
Calcium in Water	90	0.10	mg/L	01/06/97	LL
Chromium in Water	<0.001	0.001	mg/L	01/06/97	LL
Copper in Water	<0.001	0.001	mg/L	01/06/97	LL
Hg Prep	12/27/96		date complete		LL
Iron in Water	3.1	0.10	mg/L	01/06/97	LL
Lead in Water	<0.002	0.002	mg/L	01/06/97	LL
Magnesium in Water	17	0.006	mg/L	01/06/97	LL
Manganese in Water	3.4	0.004	mg/L	01/06/97	LL
Mercury in Water	<0.0002	0.0002	mg/L	12/27/96	LL

Test Description	Result	Limit	Units	Analyzed	By
Nickel in Water	0.006	0.005	mg/L	01/06/97	LL
Potassium in Water	1.2	0.10	mg/L	01/06/97	LL
Prep for ICAP - Water	01/03/97		date complete		LL
Selenium in Water	<0.002	0.002	mg/L	01/06/97	LL
Silver in Water	<0.001	0.001	mg/L	01/06/97	LL
Sodium in Water	1.4	0.10	mg/L	01/06/97	LL
Zinc in Water	<0.009	0.009	mg/L	01/06/97	LL

Sample: 04G Landfill M.Well 4 Collected: 12/19/96
Job: LND_SA Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Ammonia in Water	0.053	0.020	mg/L	01/02/97	WAO
Chemical Oxygen Demand	<2	2	mg/L	12/29/96	WAO
Nitrate-Nitrite in Water	0.37	0.01	mg/L	12/27/96	WAO
Total Phosphorous in Water	<0.03	0.03	mg/L	12/29/96	WAO

Sample: 05A Landfill M.Well 5 Collected: 12/19/96
Job: LNDEXP Landfill Explosives

Test Description	Result	Limit	Units	Analyzed	By
2,4-DINITROTOLUENE	<10	10	ug/L	01/06/97	DB
2,6-DINITROTOLUENE	<10	10	ug/L	01/06/97	DB
HMX IN WATER	<10	10	ug/L	01/06/97	DB
RDX in Water	<10	10	ug/L	01/06/97	DB
Trinitrotoluene in Water	<10	10	ug/L	01/06/97	DB

Sample: 05B Landfill M.Well 5 Collected: 12/19/96
Job: LNDPHE Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Phenols in Water	<0.010	0.010	mg/L	01/02/97	WAO
Total Organic Carbon	2.5	1.0	mg/L	12/31/96	SL

Sample: 05C Landfill M.Well 5 Collected: 12/19/96
Job: LNDUNP Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Chloride in Water	11	1	mg/L	12/29/96	WAO
Specific Conductivity	560	10	umhos	01/02/97	SL
Sulfate in Water	140	1.0	mg/L	01/02/97	SL
Total Alkalinity in Water	140	2	mg/L	01/04/97	WAO
Total Dissolved Solids	340	4	mg/L	12/23/96	SL
Turbidity in Water	27	1.0	NTU	12/20/96	MR
pH in Water	6.6		s.u.	12/20/96	MR

Sample: 05E Landfill M.Well 5 Collected: 12/19/96
Job: LND_CN Landfill Cyanide

Test Description	Result	Limit	Units	Analyzed	By
Cyanide Analysis in Water	<0.005	0.005	mg/L	12/29/96	WAO

Sample: 05F Landfill M.Well 5 Collected: 12/19/96
Job: LND_ME Landfill Metals

Test Description	Result	Limit	Units	Analyzed	By
Arsenic in Water	<0.003	0.003	mg/L	01/06/97	LL
Barium in Water	0.014	0.001	mg/L	01/06/97	LL
Cadmium in Water	<0.0005	0.0005	mg/L	01/06/97	LL
Calcium in Water	57	0.10	mg/L	01/06/97	LL
Chromium in Water	<0.001	0.001	mg/L	01/06/97	LL
Copper in Water	<0.001	0.001	mg/L	01/06/97	LL
Hg Prep	12/27/96		date complete		LL
Iron in Water	2.4	0.10	mg/L	01/06/97	LL
Lead in Water	<0.002	0.002	mg/L	01/06/97	LL
Magnesium in Water	29	0.006	mg/L	01/06/97	LL
Manganese in Water	7.9	0.004	mg/L	01/06/97	LL
Mercury in Water	<0.0002	0.0002	mg/L	12/27/96	LL
Nickel in Water	0.019	0.005	mg/L	01/06/97	LL
Potassium in Water	3.6	0.10	mg/L	01/06/97	LL
Prep for ICAP - Water	01/03/97		date complete		LL
Selenium in Water	<0.002	0.002	mg/L	01/06/97	LL
Silver in Water	<0.001	0.001	mg/L	01/06/97	LL
Sodium in Water	6.3	0.10	mg/L	01/06/97	LL
Zinc in Water	0.021	0.009	mg/L	01/06/97	LL

Sample: 05G Landfill M.Well 5 Collected: 12/19/96
Job: LND_SA Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Ammonia in Water	0.29	0.02	mg/L	01/02/97	WAO
Chemical Oxygen Demand	7.0	2	mg/L	12/29/96	WAO
Nitrate-Nitrite in Water	0.42	0.01	mg/L	12/27/96	WAO
Total Phosphorous in Water	<0.03	0.03	mg/L	12/29/96	WAO

Sample: 06B Landfill M.Well Collected: 12/19/96
Job: LNDEXP Landfill Explosives

Test Description	Result	Limit	Units	Analyzed	By
2,4-DINITROTOLUENE	<10	10	ug/L	01/06/97	DB
2,6-DINITROTOLUENE	<10	10	ug/L	01/06/97	DB
HMX IN WATER	<10	10	ug/L	01/06/97	DB
RDX in Water	<10	10	ug/L	01/06/97	DB
Trinitrotoluene in Water	<10	10	ug/L	01/06/97	DB

Sample: 06C Landfill M.Well Collected: 12/19/96
Job: LNDPHE Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Phenols in Water	<0.010	0.010	mg/L	01/02/97	WAO
Total Organic Carbon	3.1	1.0	mg/L	12/31/96	SL

Sample: 06D Landfill M.Well Collected: 12/19/96
Job: LNDUNP Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Chloride in Water	2.0	1	mg/L	12/29/96	WAO
Specific Conductivity	470	10	umhos	01/02/97	SL
Sulfate in Water	130	1.0	mg/L	01/02/97	SL
Total Alkalinity in Water	120	2	mg/L	01/04/97	WAO
Total Dissolved Solids	210	4	mg/L	12/23/96	SL
Turbidity in Water	<1.0	1.0	NTU	12/20/96	MR
pH in Water	6.3		s.u.	12/20/96	MR

Sample: 06E Landfill M.Well Collected: 12/19/96
Job: LND_CN Landfill Cyanide

Test Description	Result	Limit	Units	Analyzed	By
Cyanide Analysis in Water	<0.005	0.005	mg/L	12/29/96	WAO

Sample: 06F Landfill M.Well Collected: 12/19/96
Job: LND_ME Landfill Metals

Test Description	Result	Limit	Units	Analyzed	By
Arsenic in Water	<0.003	0.003	mg/L	01/06/97	LL
Barium in Water	0.020	0.001	mg/L	01/06/97	LL
Cadmium in Water	<0.0005	0.0005	mg/L	01/06/97	LL
Calcium in Water	66	0.10	mg/L	01/06/97	LL
Chromium in Water	<0.001	0.001	mg/L	01/06/97	LL
Copper in Water	<0.001	0.001	mg/L	01/06/97	LL
Hg Prep	12/27/96		date complete		LL
Iron in Water	<0.10	0.10	mg/L	01/06/97	LL
Lead in Water	<0.002	0.002	mg/L	01/06/97	LL
Magnesium in Water	13	0.006	mg/L	01/06/97	LL
Manganese in Water	<0.004	0.004	mg/L	01/06/97	LL
Mercury in Water	<0.0002	0.0002	mg/L	12/27/96	LL
Nickel in Water	<0.005	0.005	mg/L	01/06/97	LL
Potassium in Water	5.5	0.10	mg/L	01/06/97	LL
Prep for ICAP - Water	01/03/97		date complete		LL
Selenium in Water	<0.002	0.002	mg/L	01/06/97	LL
Silver in Water	<0.001	0.001	mg/L	01/06/97	LL
Sodium in Water	2.2	0.10	mg/L	01/06/97	LL
Zinc in Water	<0.009	0.009	mg/L	01/06/97	LL7

Sample: 06G Landfill M.Well Collected: 12/19/96
Job: LND_SA Landfill Wet Chem Analyses

Test Description	Result	Limit	Units	Analyzed	By
Ammonia in Water	0.020	0.020	mg/L	01/02/97	WAO
Chemical Oxygen Demand	6.2	2	mg/L	12/29/96	WAO
Nitrate-Nitrite in Water	0.55	0.01	mg/L	12/27/96	WAO
Total Phosphorous in Water	<0.03	0.03	mg/L	12/29/96	WAO

Thermo Analytical, Inc.
TEST RESULTS BY SAMPLE

Sample Description: Landfill M.Wells 1
Test Description: 8260 IN WATER
Collected: 12/19/96

Lab No: 01D
Method: 8260

Test Code: 8260_W

PARAMETER	RESULT
Acrolein	<5.0
Acrylonitrile	<5.0
Benzene	<5.0
Bromoform	<5.0
Carbon Tetrachloride	<5.0
Chlorobenzene	<5.0
Chlorodibromomethane	<5.0
Chloroethane	<5.0
Dichlorobromomethane	<5.0
1,1-Dichloroethane	<5.0
1,2-Dichloroethane	<5.0
1,2-Dichloroethylene	<5.0
1,2-Dichloropropane	<5.0
1,2-Dichloropropylene	<5.0
Ethylbenzene	<5.0
Methyl Bromide	<5.0
Methyl Chloride	<5.0
Methylene Chloride	<5.0
1,1,2,2-Tetrachloroethane	<5.0
Tetrachloroethylene	<5.0
Toluene	<5.0
1,2-Trans Dichloroethylene	<5.0
1,1,1-Trichloroethane	<5.0
1,1,2-Trichloroethane	<5.0
Trichloroethylene	<5.0
Vinyl Chloride	<5.0

Notes and Definitions for this Report:

DATE RUN 12/30/96
ANALYST LL
UNITS ug/L

387 Airport Industrial Drive, Ypsilanti, MI 48198-7812 (313) 480-2500 Fax: (313) 480-2295

Sample Description: Landfill M. Wells 2
Test Description: 8260 IN WATER
Collected: 12/19/96

Lab No: 02D
Method: 8260

Test Code: 8260_W

PARAMETER	RESULT
Acrolein	<5.0
Acrylonitrile	<5.0
Benzene	<5.0
Bromoform	<5.0
Carbon Tetrachloride	<5.0
Chlorobenzene	<5.0
Chlorodibromomethane	<5.0
Chloroethane	<5.0
Dichlorobromomethane	<5.0
1,1-Dichloroethane	<5.0
1,2-Dichloroethane	10
1,2-Dichloroethylene	<5.0
1,2-Dichloropropane	<5.0
1,2-Dichloropropylene	<5.0
Ethylbenzene	<5.0
Methyl Bromide	<5.0
Methyl Chloride	<5.0
Methylene Chloride	<5.0
1,1,2,2-Tetrachloroethane	<5.0
Tetrachloroethylene	<5.0
Toluene	<5.0
1,2-Trans Dichloroethylene	<5.0
1,1,1-Trichloroethane	<5.0
1,1,2-Trichloroethane	<5.0
Trichloroethylene	<5.0
Vinyl Chloride	<5.0

Notes and Definitions for this Report:

DATE RUN 12/30/96
ANALYST LL
UNITS ug/L

Sample Description: Landfill M.Well 3
Test Description: 8260 IN WATER
Collected: 12/19/96

Lab No: 03D
Method: 8260

Test Code: 8260_W

PARAMETER	RESULT
Acrolein	<5.0
Acrylonitrile	<5.0
Benzene	<5.0
Bromoform	<5.0
Carbon Tetrachloride	<5.0
Chlorobenzene	<5.0
Chlorodibromomethane	<5.0
Chloroethane	<5.0
Dichlorobromomethane	<5.0
1,1-Dichloroethane	<5.0
1,2-Dichloroethane	<5.0
1,2-Dichloroethylene	<5.0
1,2-Dichloropropane	<5.0
1,2-Dichloropropylene	<5.0
Ethylbenzene	<5.0
Methyl Bromide	<5.0
Methyl Chloride	<5.0
Methylene Chloride	<5.0
1,1,2,2-Tetrachloroethane	<5.0
Tetrachloroethylene	<5.0
Toluene	<5.0
1,2-Trans Dichloroethylene	<5.0
1,1,1-Trichloroethane	<5.0
1,1,2-Trichloroethane	<5.0
Trichloroethylene	<5.0
Vinyl Chloride	<5.0

Notes and Definitions for this Report:

DATE RUN 12/30/96
ANALYST LL
UNITS ug/L

Thermo Analytical, Inc.
TEST RESULTS BY SAMPLE

Sample Description: Landfill M.Well 4
Test Description: 8260 IN WATER
Collected: 12/19/96

Lab No: 04D
Method: 8260

Test Code: 8260_W

PARAMETER	RESULT
Acrolein	<5.0
Acrylonitrile	<5.0
Benzene	<5.0
Bromoform	<5.0
Carbon Tetrachloride	<5.0
Chlorobenzene	<5.0
Chlorodibromomethane	<5.0
Chloroethane	<5.0
Dichlorobromomethane	<5.0
1,1-Dichloroethane	<5.0
1,2-Dichloroethane	<5.0
1,2-Dichloroethylene	<5.0
1,2-Dichloropropane	<5.0
1,2-Dichloropropylene	<5.0
Ethylbenzene	<5.0
Methyl Bromide	<5.0
Methyl Chloride	<5.0
Methylene Chloride	<5.0
1,1,2,2-Tetrachloroethane	<5.0
Tetrachloroethylene	<5.0
Toluene	<5.0
1,2-Trans Dichloroethylene	<5.0
1,1,1-Trichloroethane	<5.0
1,1,2-Trichloroethane	<5.0
Trichloroethylene	<5.0
Vinyl Chloride	<5.0

Notes and Definitions for this Report:

DATE RUN 12/30/96
ANALYST LL
UNITS ug/L

Sample Description: Landfill M.Well 5
Test Description: 8260 IN WATER
Collected: 12/19/96

Lab No: 05D
Method: 8260

Test Code: 8260_W

PARAMETER	RESULT
Acrolein	<5.0
Acrylonitrile	<5.0
Benzene	<5.0
Bromoform	<5.0
Carbon Tetrachloride	<5.0
Chlorobenzene	<5.0
Chlorodibromomethane	<5.0
Chloroethane	<5.0
Dichlorobromomethane	<5.0
1,1-Dichloroethane	<5.0
1,2-Dichloroethane	<5.0
1,2-Dichloroethylene	<5.0
1,2-Dichloropropane	<5.0
1,2-Dichloropropylene	<5.0
Ethylbenzene	<5.0
Methyl Bromide	<5.0
Methyl Chloride	<5.0
Methylene Chloride	<5.0
1,1,2,2-Tetrachloroethane	<5.0
Tetrachloroethylene	<5.0
Toluene	<5.0
1,2-Trans Dichloroethylene	<5.0
1,1,1-Trichloroethane	<5.0
1,1,2-Trichloroethane	<5.0
Trichloroethylene	<5.0
Vinyl Chloride	<5.0

Notes and Definitions for this Report:

DATE RUN 12/30/96
ANALYST LL
UNITS ug/L

387 Airport Industrial Drive, Ypsilanti, MI 48198-7812 (313) 480-2500 Fax: (313) 480-2295

Thermo Analytical, Inc.
TEST RESULTS BY SAMPLE

Sample Description: Landfill M.Well
Test Description: 8260 IN WATER
Collected: 12/19/96

Lab No: 06A
Method: 8260

Test Code: 8260_W

PARAMETER	RESULT
Acrolein	<5.0
Acrylonitrile	<5.0
Benzene	<5.0
Bromoform	<5.0
Carbon Tetrachloride	<5.0
Chlorobenzene	<5.0
Chlorodibromomethane	<5.0
Chloroethane	<5.0
Dichlorobromomethane	<5.0
1,1-Dichloroethane	<5.0
1,2-Dichloroethane	6.0
1,2-Dichloroethylene	<5.0
1,2-Dichloropropane	<5.0
1,2-Dichloropropylene	<5.0
Ethylbenzene	<5.0
Methyl Bromide	<5.0
Methyl Chloride	<5.0
Methylene Chloride	<5.0
1,1,2,2-Tetrachloroethane	<5.0
Tetrachloroethylene	<5.0
Toluene	<5.0
1,2-Trans Dichloroethylene	<5.0
1,1,1-Trichloroethane	<5.0
1,1,2-Trichloroethane	<5.0
Trichloroethylene	<5.0
Vinyl Chloride	<5.0

Notes and Definitions for this Report:

DATE RUN 12/30/96
ANALYST LL
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

Normality Tests
Report Printed: 01-30-1997 10:50

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: 10.000 ppb

Start Date:Nov 22 1988
End Date:Dec 19 1996

Normality Test on Observations for wells listed below:

Well:MW-4 Position:Upgradient Observations:25

Scale	Minimum	Maximum	Mean	Std Dev
Original:	270.000	640.000	491.640	109.814
Log:	5.598	6.461	6.171	0.242

Well:MW-1 Position:Downgradient Observations:20

Scale	Minimum	Maximum	Mean	Std Dev
Original:	310.000	670.000	476.250	97.703
Log:	5.737	6.507	6.145	0.210

Well:MW-2 Position:Downgradient Observations:14

Scale	Minimum	Maximum	Mean	Std Dev
Original:	365.000	593.000	483.071	72.286
Log:	5.900	6.385	6.169	0.154

Well:MW-3 Position:Downgradient Observations:27

Scale	Minimum	Maximum	Mean	Std Dev
Original:	250.000	847.000	629.259	146.273

Log:	5.521	6.742	6.414	0.268

Well:MW-5 Position:Downgradient Observations:25

Scale	Minimum	Maximum	Mean	Std Dev
Original:	300.000	860.000	587.160	105.248
Log:	5.704	6.757	6.358	0.197

Pooled Statistics
Observations: 111

Statistic	Original Scale	Log Scale
Mean:	542.775	6.267
Std Dev:	128.482	0.248
Skewness:	0.192	-0.520
Kurtosis:	-0.027	0.261
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
riginal:	0.9872	0.9760	0.9670
Log:	0.9743*	0.9760	0.9670

* Indicates statistically significant evidence of non-normality.

Kruskal-Wallace Test
Report Printed: 01-30-1997 10:51

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: 10.000 ppb

Start Date:Nov 22 1988
End Date:Dec 19 1996

Data Mode:Log Transformed

Background Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-4	25	0	6.46	5.60	6.17	0.24

Compliance Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-1	20	0	6.51	5.74	6.15	0.21
MW-2	14	0	6.39	5.90	6.17	0.15
MW-3	27	0	6.74	5.52	6.41	0.27
MW-5	25	0	6.76	5.70	6.36	0.20

H Statistic: 28.5572
H Adjusted for Ties: 28.5675
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	21.6432	38.90	44.02	-5.12
MW-2	24.0823	38.32	44.02	-5.70
*MW-3	20.0239	76.30	44.02	32.28
*MW-5	20.4054	69.64	44.02	25.62

Normality Tests
Report Printed: 01-30-1997 15:02

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:pH pH

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

Start Date:Nov 22 1988
End Date:Dec 19 1996

Normality Test on Observations for wells listed below:

Well:MW-4 Position:Upgradient Observations:21

Scale	Minimum	Maximum	Mean	Std Dev
Original:	6.500	7.410	7.097	0.242
Log:	1.872	2.003	1.959	0.035

Well:MW-1 Position:Downgradient Observations:19

Scale	Minimum	Maximum	Mean	Std Dev
Original:	6.170	7.500	6.905	0.321
Log:	1.820	2.015	1.931	0.047

Well:MW-2 Position:Downgradient Observations:13

Scale	Minimum	Maximum	Mean	Std Dev
Original:	6.200	7.210	6.793	0.275
Log:	1.825	1.975	1.915	0.041

Well:MW-3 Position:Downgradient Observations:22

Scale	Minimum	Maximum	Mean	Std Dev
Original:	6.300	7.280	6.686	0.289

pH

Log:	1.841	1.985	1.899	0.043

ell:MW-5 Position:Downgradient Observations:20

Scale	Minimum	Maximum	Mean	Std Dev
Original:	6.130	7.500	6.763	0.369
Log:	1.813	2.015	1.910	0.054

Pooled Statistics
Observations: 95

Statistic	Original Scale	Log Scale
Mean:	6.851	1.923
Std Dev:	0.333	0.049
Skewness:	0.072	-0.021
Kurtosis:	-0.724	-0.703
Minimum:	6.130	1.813
Maximum:	7.500	2.015
CV:	0.049	0.025

Shapiro-Francia Statistics

Scale	Test Statistic	5% Critical Value	1% Critical Value
riginal:	0.9862	0.9740	0.9650
Log:	0.9868	0.9740	0.9650

* Indicates statistically significant evidence of non-normality.

Kruskal-Wallace Test
Report Printed: 01-30-1997 15:02

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:pH pH

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

Start Date:Nov 22 1988
End Date:Dec 19 1996

Data Mode:Log Transformed

Background Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-4	21	0	2.00	1.87	1.96	0.03

Compliance Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-1	19	0	2.01	1.82	1.93	0.05
MW-2	13	0	1.98	1.82	1.92	0.04
MW-3	22	0	1.99	1.84	1.90	0.04
MW-5	20	0	2.01	1.81	1.91	0.05

H Statistic: 21.5981
H Adjusted for Ties: 21.7023
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

PH

MW-1	19.5646	52.21	69.57	-17.36
MW-2	21.8064	44.85	69.57	-24.73
MW-3	18.8512	33.30	69.57	-36.28
MW-5	19.3061	39.58	69.57	-30.00

Normality Tests
Report Printed: 01-30-1997 10:52

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: 4000.000 ppb

Start Date:Nov 22 1988
End Date:Dec 19 1996

Normality Test on Observations for wells listed below:

Well:MW-4 Position:Upgradient Observations:25

Scale	Minimum	Maximum	Mean	Std Dev
Original:	190000.000	450000.000	356000.000	72388.422
Log:	12.155	13.017	12.759	0.231

Well:MW-1 Position:Downgradient Observations:20

Scale	Minimum	Maximum	Mean	Std Dev
Original:	220000.000	430000.000	330399.969	71257.422
Log:	12.301	12.972	12.684	0.228

Well:MW-2 Position:Downgradient Observations:14

Scale	Minimum	Maximum	Mean	Std Dev
Original:	250000.000	505000.000	371857.156	76625.820
Log:	12.429	13.132	12.806	0.210

Well:MW-3 Position:Downgradient Observations:27

Scale	Minimum	Maximum	Mean	Std Dev
Original:	31000.000	742000.000	448370.344	155033.531

Log:	10.342	13.517	12.906	0.598

Well:MW-5 Position:Downgradient Observations:24

Scale	Minimum	Maximum	Mean	Std Dev
Original:	28000.000	670000.000	422666.625	121512.102
Log:	10.240	13.415	12.861	0.591

Pooled Statistics
Observations: 110

Statistic	Original Scale	Log Scale
Mean:	390581.781	12.810
Std Dev:	116729.234	0.437
Skewness:	0.018	-3.452*
Kurtosis:	1.126	17.849
Minimum:	28000.000	10.240
Maximum:	742000.000	13.517
CV:	0.299	0.034

Shapiro-Francia Statistics

Scale	Test Statistic	5% Critical Value	1% Critical Value
riginal:	0.9703*	0.9760	0.9670
Log:	0.6863*	0.9760	0.9670

* Indicates statistically significant evidence of non-normality.

Kruskal-Wallace Test
Report Printed: 01-30-1997 10:53

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: 4000.000 ppb

Start Date:Nov 22 1988
End Date:Dec 19 1996

Data Mode:Log Transformed

Background Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-4	25	0	13.02	12.15	12.76	0.23

Compliance Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-1	20	0	12.97	12.30	12.68	0.23
MW-2	14	0	13.13	12.43	12.81	0.21
MW-3	27	0	13.52	10.34	12.91	0.60
MW-5	24	0	13.42	10.24	12.86	0.59

H Statistic: 19.5764
H Adjusted for Ties: 19.5937
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	21.4438	36.55	45.44	-8.89
MW-2	23.8605	50.36	45.44	4.92
*MW-3	19.8395	70.94	45.44	25.50
*MW-5	20.4269	67.40	45.44	21.96

Normality Tests
Report Printed: 01-30-1997 10:55

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:Dec 19 1996

Normality Test on Observations for wells listed below:

Well:MW-4 Position:Upgradient Observations:25

Scale	Minimum	Maximum	Mean	Std Dev
Original:	500.000	50000.000	4867.999	9910.799
Log:	6.215	10.820	7.635	1.212

Well:MW-1 Position:Downgradient Observations:20

Scale	Minimum	Maximum	Mean	Std Dev
Original:	500.000	50000.000	4330.000	10912.721
Log:	6.215	10.820	7.398	1.131

Well:MW-2 Position:Downgradient Observations:14

Scale	Minimum	Maximum	Mean	Std Dev
Original:	500.000	12000.000	2907.143	3075.577
Log:	6.215	9.393	7.608	0.863

Well:MW-3 Position:Downgradient Observations:27

Scale	Minimum	Maximum	Mean	Std Dev
Original:	1000.000	20000.000	5877.778	4536.547

Log:	6.908	9.903	8.481	0.610

Well:MW-5 Position:Downgradient Observations:24

Scale	Minimum	Maximum	Mean	Std Dev
Original:	500.000	19000.000	3987.500	3749.471
Log:	6.215	9.852	7.997	0.792

Pooled Statistics
Observations: 110

Statistic	Original Scale	Log Scale
Mean:	4576.365	7.875
Std Dev:	7230.059	1.008
Skewness:	4.805*	0.217
Kurtosis:	26.407	0.238
Minimum:	500.000	6.215
Maximum:	50000.000	10.820
CV:	1.580	0.128

Shapiro-Francia Statistics

Scale	Test Statistic	5% Critical Value	1% Critical Value
riginal:	0.4563*	0.9760	0.9670
Log:	0.9624*	0.9760	0.9670

* Indicates statistically significant evidence of non-normality.

Kruskal-Wallace Test
Report Printed: 01-30-1997 10:55

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:Dec 19 1996

Data Mode:Log Transformed

Background Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-4	25	28	10.82	6.21	7.64	1.21

Compliance Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-1	20	25	10.82	6.21	7.40	1.13
MW-2	14	14	9.39	6.21	7.61	0.86
MW-3	27	0	9.90	6.91	8.48	0.61
MW-5	24	8	9.85	6.21	8.00	0.79

H Statistic: 25.1494
H Adjusted for Ties: 25.2411
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	21.4438	36.28	47.14	-10.86
MW-2	23.8605	44.89	47.14	-2.25
*MW-3	19.8395	78.48	47.14	31.34
MW-5	20.4269	60.56	47.14	13.42

Normality Tests
Report Printed: 01-30-1997 10:57

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: 10.000 ppb

Start Date:Nov 22 1988
End Date:Dec 19 1996

Normality Test on Observations for wells listed below:

Well:MW-4 Position:Upgradient Observations:17

Scale	Minimum	Maximum	Mean	Std Dev
Original:	0.500	5.000	0.841	1.117
Log:	-0.693	1.609	-0.482	0.622

Well:MW-1 Position:Downgradient Observations:15

Scale	Minimum	Maximum	Mean	Std Dev
Original:	0.500	27.000	2.307	6.833
Log:	-0.693	3.296	-0.375	1.036

Well:MW-2 Position:Downgradient Observations:15

Scale	Minimum	Maximum	Mean	Std Dev
Original:	0.500	5.000	1.500	1.315
Log:	-0.693	1.609	0.081	0.823

Well:MW-3 Position:Downgradient Observations:21

Scale	Minimum	Maximum	Mean	Std Dev
Original:	0.500	5.000	1.005	1.353

Log:	-0.693	1.609	-0.385	0.723

Well:MW-5 Position:Downgradient Observations:16

Scale	Minimum	Maximum	Mean	Std Dev
Original:	0.500	5.000	0.781	1.125
Log:	-0.693	1.609	-0.549	0.576

Pooled Statistics
Observations: 84

Statistic	Original Scale	Log Scale
Mean:	1.250	-0.351
Std Dev:	3.063	0.775
Skewness:	7.305*	2.450*
Kurtosis:	58.042	5.937
Minimum:	0.500	-0.693
Maximum:	27.000	3.296
CV:	2.450	-2.208

Shapiro-Francia Statistics

Scale	Test Statistic	5% Critical Value	1% Critical Value
riginal:	0.2207*	0.9720	0.9610
Log:	0.5000*	0.9720	0.9610

* Indicates statistically significant evidence of non-normality.

Kruskal-Wallace Test
Report Printed: 01-30-1997 10:58

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: 10.000 ppb

Start Date:Nov 22 1988
End Date:Dec 19 1996

Data Mode:Log Transformed

Background Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-4	17	94	1.61	-0.69	-0.48	0.62

Compliance Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-1	15	87	3.30	-0.69	-0.37	1.04
MW-2	15	53	1.61	-0.69	0.08	0.82
MW-3	21	90	1.61	-0.69	-0.39	0.72
MW-5	16	100	1.61	-0.69	-0.55	0.58

H Statistic: 6.6684
H Adjusted for Ties: 19.4038
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	19.3679	42.60	39.44	3.16
MW-2	19.3679	56.77	39.44	17.33
MW-3	17.8376	38.90	39.44	-0.54
MW-5	19.0437	37.00	39.44	-2.44

Normality Tests
Report Printed: 01-30-1997 10:59

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: 10.000 ppb

Start Date:Nov 22 1988
End Date:Dec 19 1996

Normality Test on Observations for wells listed below:

Well:MW-4 Position:Upgradient Observations:18

Scale	Minimum	Maximum	Mean	Std Dev
Original:	0.500	39.000	3.000	9.024
Log:	-0.693	3.664	-0.174	1.150

Well:MW-1 Position:Downgradient Observations:15

Scale	Minimum	Maximum	Mean	Std Dev
Original:	0.500	15.000	2.267	3.918
Log:	-0.693	2.708	-0.033	1.174

Well:MW-2 Position:Downgradient Observations:15

Scale	Minimum	Maximum	Mean	Std Dev
Original:	0.500	8.300	1.913	2.180
Log:	-0.693	2.116	0.179	0.963

Well:MW-3 Position:Downgradient Observations:22

Scale	Minimum	Maximum	Mean	Std Dev
Original:	0.500	9.500	1.741	2.354

Log:	-0.693	2.251	-0.059	1.018

Well:MW-5 Position:Downgradient Observations:17

Scale	Minimum	Maximum	Mean	Std Dev
Original:	0.500	5.000	1.071	1.261
Log:	-0.693	1.609	-0.306	0.763

Pooled Statistics
Observations: 87

Statistic	Original Scale	Log Scale
Mean:	1.991	-0.085
Std Dev:	4.629	1.011
Skewness:	6.316*	1.508*
Kurtosis:	45.932	1.439
Minimum:	0.500	-0.693
Maximum:	39.000	3.664
CV:	2.325	-11.829

Shapiro-Francia Statistics

Scale	Test Statistic	5% Critical Value	1% Critical Value
riginal:	0.3106*	0.9720	0.9610
Log:	0.6564*	0.9720	0.9610

* Indicates statistically significant evidence of non-normality.

Kruskal-Wallace Test
Report Printed: 01-30-1997 10:59

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: 10.000 ppb

Start Date:Nov 22 1988
End Date:Dec 19 1996

Data Mode:Log Transformed

Background Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-4	18	78	3.66	-0.69	-0.17	1.15

Compliance Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-1	15	73	2.71	-0.69	-0.03	1.17
MW-2	15	53	2.12	-0.69	0.18	0.96
MW-3	22	77	2.25	-0.69	-0.06	1.02
MW-5	17	82	1.61	-0.69	-0.31	0.76

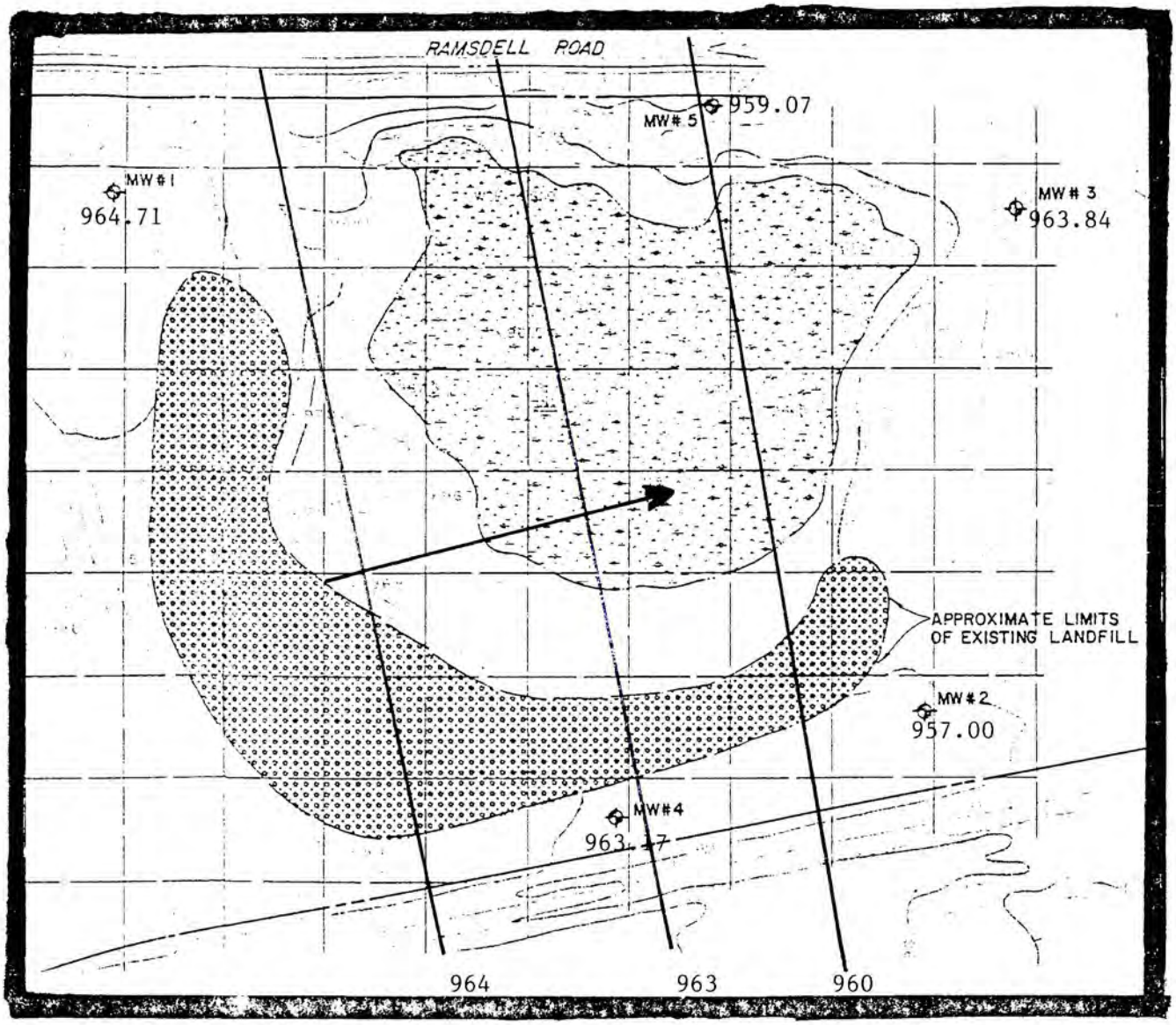
H Statistic: 2.0184
H Adjusted for Ties: 3.3535
Degrees of Freedom: 4
Chi-Squared: 9.4878
Zα/DF: 2.2414

Indicates significant evidence of contamination

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

MW-1	19.7927	45.77	42.47	3.29
MW-2	19.7927	51.33	42.47	8.86
MW-3	17.9934	42.52	42.47	0.05
MW-5	19.1471	39.50	42.47	-2.97

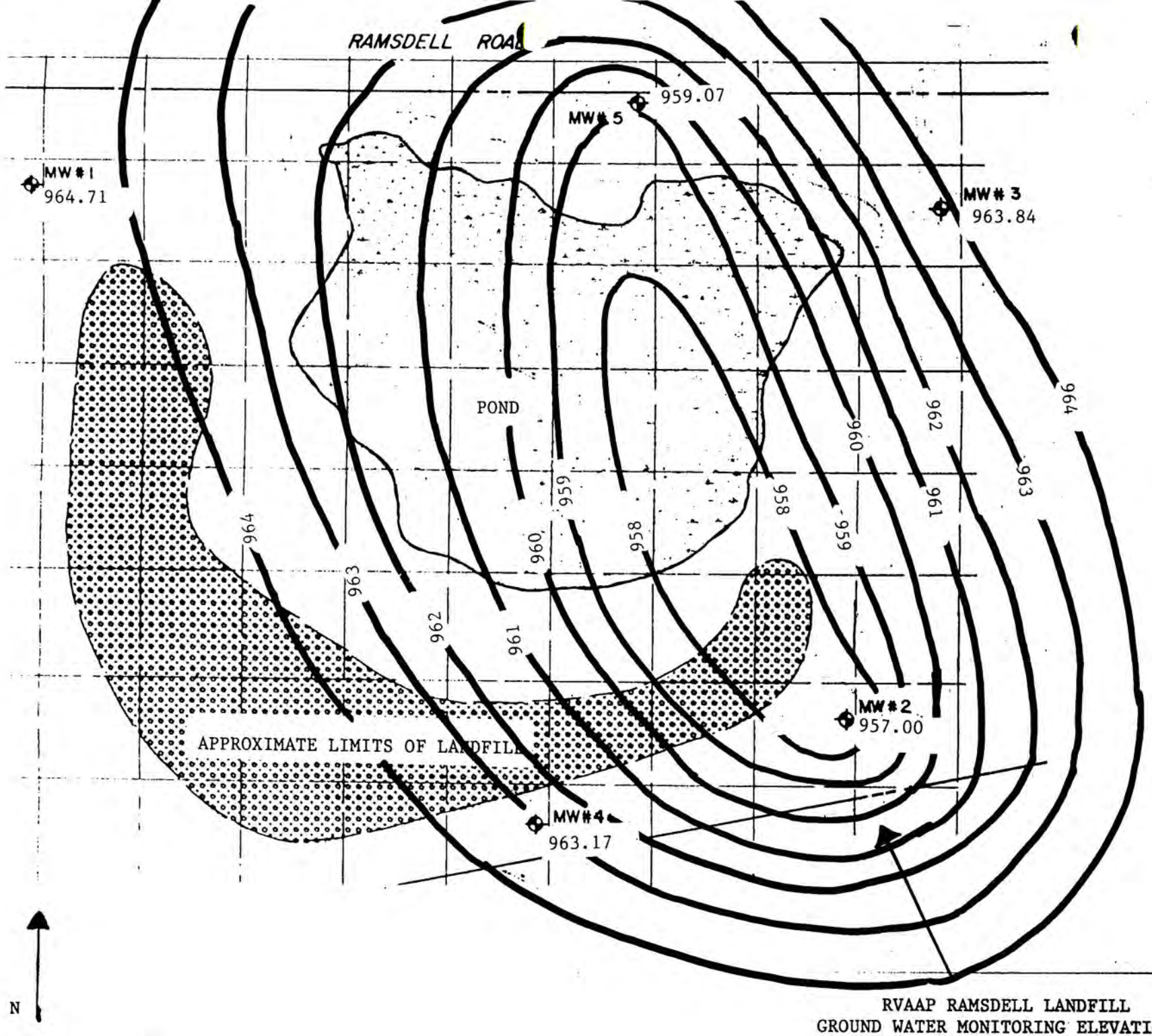
RVAAP RAMSDELL LANDFILL



GROUNDWATER LEVEL ELEVATIONS

DATE: 12/19/96

EXISTING MONITOR WELL LOCATIONS



RVAAP RAMSDELL LANDFILL
GROUND WATER MONITORING ELEVATIONS

SCALE: 1" = 125'

DATE: 12/19/96

INTER-OFICE COMMUNICATION

TO: JARNAL SINGH, ENVIRONMENTAL SPECIALIST, DSIWM-NEDO

FROM: DIANE KURLICH, HYDROGEOLOGIST, DDAGW-NEDO DK

SUBJECT: RAMSDELL LANDFILL (67-00-06), RAVENNA ARMY AMMUNITION PLANT, PORTAGE COUNTY:

1. DECEMBER 1995, SEMI-ANNUAL GROUND WATER SAMPLING RESULTS;
2. FEBRUARY 1996, GROUND WATER RESAMPLING RESULTS;
3. JUNE 1996, SEMI-ANNUAL GROUND WATER SAMPLING RESULTS;
4. SEPTEMBER 1996, GROUND WATER RESAMPLING RESULTS;
5. DECEMBER 1996, SEMI-ANNUAL GROUND WATER SAMPLING RESULTS; AND
6. FEBRUARY 1997, GROUND WATER RESAMPLING RESULTS.

DATE: JULY 30, 1997

INTRODUCTION

The Ravenna Army Ammunition Plant (RAAP) operated a sanitary landfill at the Ramsdell Quarry until September 1989. A closure plan dated November 1988 was approved as meeting the requirements of OAC 3745-27-10 effective July 29, 1976, in a March 6, 1990, letter from the Ohio EPA to the facility. An extension for the completion of closure activities by June 30, 1990, was also included in the closure plan approval letter. In August 1990, the Ohio EPA conducted an inspection of the landfill and concluded in a September 17, 1990, letter to the facility that the closure had been successfully completed under the requirements of OAC 3745-27-10 effective July 29, 1976. The company is currently monitoring ground water at the site under OAC 3745-27-10 effective March 1, 1990. Generally, MW-4 is the upgradient monitoring well at the site. Wells MW-1 and MW-2 are

also upgradient to the landfill, however, the facility has included them as downgradient wells in the statistical analyses preformed. Well MW-3 is sometimes marginally downgradient of the landfill, although it normally is in more of a side gradient position. The only well at the site that is truly downgradient of the landfill is MW-5. However, as is explained in the General Comments Section below, based on the most current water level elevation data, the ground water flow direction at the site may have changed. If it is confirmed that the flow direction has changed, the designation of up and downgradient wells may need to be revisited. At the request of the DSIWM, the DDAGW has reviewed the above cited documents and has the following comments. The comments are divided into several sections. The first section includes general comments concerning the ground water monitoring network in general and also citations of violations and deficiencies noted in several of the above submittals. Following the general comments are several sections concerning specific information contained in each of the individual submittals.

GENERAL COMMENTS

1. The relationship between the pond in the quarry and the ground water at the site has not been defined. It appears that the pond may be the surficial expression of the ground water table. This relationship should be determined. If there appears to be a movement of water from the pond into the ground water, it may be prudent to determine if the "triggers" of the indicator parameters that have been documented in MW-3 and MW-5 may be due at least in part to this relationship rather than to the landfill. This investigation should include, but not necessarily be limited to, the installation and surveying of a staff gauge(s) in the pond so that the surface elevations of the pond can be compared to the surface elevations of the ground water in the monitoring wells. Regular measurements of the pond surface elevation versus the ground water elevations in the monitoring wells should be completed to determine if there are seasonal or temporal variations in the interactions between the surface water and the ground water.

2. It is unclear whether the "triggers" in indicator parameters that have been noted in MW-5 are due to the landfill or to the variation in the sandstone in which the wells are screened. The upgradient well (MW-4) is screened in a white sandstone while the downgradient well (MW-5) is screened in gray to brown sandstone. In addition, well logs for the monitoring wells indicate that distinct water bearing zones exist within the sandstone aquifer. A determination should be made as to whether the upgradient and the downgradient wells monitor the same zone in the aquifer. Part of this determination may include a study of the general water chemistry in these two wells (e.g., Piper diagrams). In addition, because the well logs do

indicate that there are several distinct water bearing zones, monitoring of additional zones of significant saturation may be necessary (OAC 3745-27-10 B (1)). A determination should be made as to whether there are significant zones of saturation that also should be monitored Whether the wells presently installed at the site monitor the same zone of the aquifer also should be determined. The rationale for the locations of the screened intervals for the present wells should be documented.

3. According to the majority of the ground water flow maps submitted, there is only one downgradient well at the site (MW-5). At times, the ground water flow changes slightly and MW-3 is marginally downgradient of the site. There are no downgradient monitoring wells located immediately downgradient of the toe of the landfill. A pond in the quarry lies between the toe of the landfill and the monitoring wells. In order to meet the requirements of OAC 3745-27-10 B (1)(b) and 3745-27-10 B(4)(a) and (b), additional downgradient monitoring wells are needed at the site. If possible, several of these wells should be installed between the toe of the landfill and the pond in the quarry. If it is physically impossible to install wells in this area, the additional wells should be installed as close to the limits of waste placement as possible.

4. The GritsStat well information indicates that the top of casing elevation for MW-5 is 978.49 while the surface elevation is 981.00. This indicates that MW-5 is a flush mounted completion. However, the well construction diagrams historically submitted do not indicate that any of the wells are flush mounted. **Please clarify whether MW-5 has a stick-up completion or is flush mounted.** If this well has a stick up completion, please submit the correct elevations for the top of casing and the surface. In addition, the well depth indicated in the GritsStat well data table indicates that the depths of wells MW-1 through MW-4 range from 165 to 175 feet. Although these wells were advanced to these depths, they were backfilled with bentonite prior to the setting of the well casings and screens. Please submit the total depths of these wells after the backfilling. 53, 43, 42, 56, 46 ADD TO GRITS

5. It is unclear whether the metals samples are being field filtered. This should be clarified.

6. In the report, Installation Assessment of Ravenna Army Ammunition Plant, Report No. 132, November 1978, there are several discussions concerning the disposal of wastes into the Ramsdell Quarry. These discussions include the burning of napalm bombs at the Ramsdell Quarry and the pouring of

residue wastes from the annealing of cartridge bases during reclaiming into the Ramsdell Quarry. The facility should provide information as to whether these activities or similar activities took place within the excavation area of the quarry or whether they occurred in the area now known as the Ramsdell Quarry Landfill. The possibility that these types of activities may be contributing to the detection of explosive compounds in the ground water also should be explored. If activities such as the ones cited above were conducted in the quarry itself. being able to locate monitoring wells immediately downgradient of the landfill will become even more important so that the affects the landfill may be having on ground water can be separated from the possible affects the other activities that may have been carried out in the quarry may be having on ground water.

7. The ground water flow maps submitted by the facility are not acceptable. The following concerns should be addressed in the future:

   a. A north arrow should be added to the maps;

   b. A scale should be added to the maps. Without a scale, it is impossible to judge distances within and around the landfill; and

   c. Standard geologic procedures for the construction of a contour map should be followed. This includes the labeling of contour lines and keeping one contour interval throughout the same map. For example, if the contour interval is two feet, it is inappropriate to have contours labeled 961, 959, 957, blank, and 956 on the same map (see the December 1995 submittal). Contours between two data points also should be evenly spaced and parallel;

In addition, the flow maps for the December 1996 and the February 1997 sampling events indicate that ground water is flowing from an area of lower head to an area of higher head. This error should be corrected and the maps should be recontoured and the correct ground water flow direction(s) indicated. The corrected maps should be submitted for review. Looking at the water level elevation data on the maps, however, it appears that there has been a change in the ground water flow direction. During the December 1996 sampling event, the lowest ground water elevation was measured in MW-2, a well that has historically been upgradient of the landfill. During the February 1997 sampling event, the lowest ground water elevation was measured in MW-4, the well historically used as the upgradient, background well. In June 1996, the ground water elevation data collected for MW-2 also

was the lowest of the five wells. At that time. the facility remeasured the static water levels in July obtaining measurements more consistent with historical data. The facility concluded that the June 1996 data were in error. However, with the data submitted for December 1996 and February 1997, there is now some question concerning whether direction of ground water flow at the site has changed. The facility should determine whether an error was made in the collection and/or calculation of the water level elevations. The ground water flow maps for these two sampling events should be reconstructed following generally accepted hydrogeologic procedures and resubmitted for review. If the direction of ground water flow has changed, the adequacy of the monitoring network should be reviewed and modified, if necessary, as required by OAC 3745-27-10 B(5).

8. Starting with the June 1996 sampling event, the list of parameters included in the VOC analyses do not include all of the parameters in Appendix I as required by OAC 3745-27-10 D(1)(gg). The following parameters were omitted: acetone; cis-1,3-dichloropropene; trans-1,3-dichloropropene; ethyl methacrylate; 2-butanone; carbon disulfide; 2-chloroethyl vinyl ether; chloroform; dichlorodifluoromethane; 2-hexanone; 4-methyl-2-pentanone; 1,1-dichloroethene; styrene; trichlorofluromethane; 1,2,3-trichloropropane; vinyl acetate; and xylene. In the future, the VOC analyses should include all of the parameters required by OAC 3745-27-10 D(1)(gg).

9. The statistical analyses preformed by the facility appear to be erroneous. The following problems were observed:

   a. The facility does not always include the analysis of distribution with its data reports. In the future, the facility should submit the results of its analysis of data distribution (i.e., Is the data normal, lognormal, or skewed?) as part of these semi-annual reports.

   b. When toluene was detected in a sample, the value used in the statistical analysis for non-detects was 2.5 ug/L. The detection limit actually achieved was 1 ug/L, thus, the value used for non-detects should have been 0.5 ug/L or the facility could have chosen to use the PQL listed in Appendix I as allowed by OAC 3745-27-10 C(5) and the non-detects could have been replaced by 1 ug/L. In the future, non-detects should be replaced by one half the detection limit or with one half of the PQL listed in Appendix I.

c. In some of the recent data sets, the values for the indicator parameters obtained for MW-3 and/or MW-5 have been less than the value obtained for MW-4, however, statistical analyses still indicate that MW-3 and/or MW-5 have "triggered." In several other instances, the values for the indicator parameters in MW-1 and/or MW-2 are higher than the values in MW-3 and/or MW-5, however, only MW-3 and/or MW-5 trigger. The facility should reevaluate the statistical data it has compiled to date and determine why these errors are occurring. Provisions should be made in all future statistical analyses to ensure that such errors no longer occur.

d. It appears that the facility is using a pool of downgradient data that includes all of the historic data in addition to the data obtained during each sampling event. Although it is acceptable when using the Kruskal-Wallace test to pool the current downgradient data, it is not acceptable to pool the complete set of downgradient data from 1988 through the present. It is imperative that this error be corrected in all future data submittals. In addition, because the facility has been triggering for a number of years for the indicator parameters, TOC, SC, and TDS, it is recommended that the historical data also be reevaluated to determine whether these triggers are false positives related to the use of unacceptable statistical procedures. It also is unclear why the data from MW-1 and MW-2 are included in the downgradient pooled data since these two wells have historically been hydraulically upgradient of the landfill. This should be clarified. Two US EPA guidance documents, Guidance Document on the Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, April 1989 and Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Addendum to Interim Final Guidance, July 1992, may be of assistance in reevaluating the historical data and in developing acceptable statistical procedures for use in the future.

e. Because of the large number of non-detects in the explosives data, the Kruskal-Wallace test may not be appropriate (See Section 3.2, page 45, of the Statistical Analysis of Ground-Water Data at RCRA Facilities, Addendum to Interim Final Guidance, July 1992). This should be evaluated by the facility and a different statistical test should be proposed.

Basic errors in the statistical analyses used by the facility are occurring. Because of these errors, it is not possible to determine whether the statistical triggers documented to date are false positives. The facility should reevaluate the statistical methods it is using. The historic data should be revisited and a determination made as to whether the triggers documented to date are false positives caused by inappropriate statistical procedures. If the triggers cannot be explained by errors in the statistical analyses, a ground water quality assessment monitoring program plan as per OAC 3745-27-10 E should be developed and an submitted to the Ohio EPA. In addition, because of the uncertainties surrounding the statistical analyses of the data at the site, a computer disk containing all of the ground water data collected at the site up to and including the most recent sampling event should be submitted to the Ohio EPA for review. This submittal should be in a GritsStat format.

10. The chain of custody forms are not completed in their entirety. Quite typically, the time and/or date that the custody is relinquished or received is blank. In the future, the facility should ensure that the chain of custody forms are fully and accurately completed.

11. Normally the facility does not indicate from which well the duplicate sample was collected. It is impossible to review the reproducibility of the data if the identity of the source of the duplicate sample is unknown. In the future, the facility should identify the well from which the duplicate sample is collected.

12. Detection limits are not consistent throughout the data reports. For example, in December 1995, the detection limit for TNT increased from 1 ug/L to 5 ug/L. In June 1996, the detection limits for VOCs increased from 1 ug/L to 10 ug/L. The detection limits achieved should not vary between sampling events. The facility should ensure that the lowest possible detection limits are achieved. In addition, it is imperative that the detection limits achieved are at or below any applicable MCL or action limit. If the laboratory fails to achieve historic detection limits, the facility should document in the data reports the reasons why the analyses resulted in higher detection limits.

COMMENTS: DECEMBER 1995 DATA

1. The facility reports that MW-3 has triggered for specific conductance (SC), total organic carbon (TOC), and total dissolved solids (TDS); and MW-5 has triggered for SC. See above comments concerning the adequacy of the statistical analyses preformed by the facility. These triggers may or may not be valid.

2. The compound RDX was detected in MW-3 at a concentration of 1.3 ug/L. This is the only well in which an explosive compound was detected during this sampling event. Statistical analyses indicate that this is not statistically significant. However, note the above comment concerning the validity of the statistical tests conducted by the facility.

3. Nickel may be somewhat elevated in MW-1 and cadmium and lead appear to be somewhat elevated in MW-2. The company, however, does not conduct statistical analyses on metals data. In addition, these two wells are upgradient of the landfill.

4. For the purposes of statistical analyses, the concentrations for the TOC data have been multiplied by a factor of 1,000. It is unclear why this was done. This should be clarified.

5. It is unclear where the maximum value of 3.3 ug/L used for MW-4 in the statistical analyses of RDX was obtained. The maximum historical value appears to be 2.3 ug/L. The facility should submit the data sheets for the sampling event in which the concentration of RDX was determined to be 3.3 ug/L. If this is an error, it should be corrected and the statistical analyses should be repeated.

Toluene was detected in the duplicate sample collected from MW-4 at a concentration of 2.9 ug/L. Statistical analyses indicated that this was not statistically significant, however, as noted above, the statistical analyses conducted by the facility may not be valid.

COMMENTS: FEBRUARY 1996 DATA

1. This is a resampling of MW-3, MW-4, and MW-5. The resampling was conducted because of the statistical triggers documented in MW-3 and MW-5 during the December 1995 sampling event. Well MW-4 also was resampled for toluene and MW-3 was resampled for RDX.

2. Statistical analyses appear to confirm the statistical triggers in wells MW-3 and MW-5. Note, however, the concerns above regarding the validity of the statistical analyses. The presence of toluene in MW-4 and RDX in MW-3 was not confirmed.

COMMENTS: JUNE 1996 DATA

1. Statistical analyses indicate that there has been a statistically significant increase in SC, TOC, and TDS in MW-3 and SC and TDS in MW-5. Note, however, the comments in the General Comments Section above concerning the validity of the statistical analyses preformed by the facility.

2. The concentrations of nickel in MW-1 (0.11 ug/L) and cadmium in MW-2 (0.003 ug/L) appear to be somewhat elevated. However, statistical analyses are not preformed by the facility on metals data. In addition, water level elevation data have historically indicated that these two wells are hydraulically upgradient of the landfill.

3. Statistical analyses were conducted on HMX, 2,4,6-TNT, and RDX even though these compounds were not detected in any of the wells. Statistical analyses were not conducted on 2,4 DNT or 2,6 DNT. In the past, statistical analyses have only been conducted on compounds detected in one or more of the downgradient wells. It is unclear why these analyses were conducted. This should be clarified.

4. According to the water level data collected in July, the ground water flow direction has varied slightly and MW-3 is marginally downgradient of the landfill. Also, MW-5 continues to be downgradient of the landfill.

COMMENTS: SEPTEMBER 1996 DATA

1. This sampling event was conducted because of the statistical triggers documented in MW-3 and MW-5 during the June 1996 sampling event. This was actually the second resampling event conducted as a result of the June 1996 sampling event. Samples were originally collected on August 8, 1996. The preliminary TOC results were much higher (one to two orders of magnitude) than the concentrations recorded historically. The facility resampled the wells on September 5, 1996. The results from the September 5, 1996, sampling are more consistent with historical data, however, the September results are still about two times the historically obtained TOC concentrations.

2. Statistical analyses appear to confirm that statistical triggers for SC, TDS, and TOC in MW-3 and SC and TDS in MW-5. However, these results should be viewed in light of the above comments concerning the validity of the statistical analyses conducted by the facility.

COMMENTS: DECEMBER 1996 DATA

1. Statistical analyses indicate that triggers have occurred for SC, TOC, and TDS in MW-3 and for SC and TDS in MW-5. See the above comments concerning the validity of the facility's statistical analyses.

2. It appears that the nickel concentration (0.14 ug/L) detected in MW-1 is slightly elevated. however. the company does not preform statistical analyses on metals data. Historical water level elevation data have indicated that this well is upgradient of the landfill.

3. The compounds HMX (27 ug/L) and RDX (15 ug/L) were detected in MW-1. RDX (39 ug/L) also was detected in MW-4. The facility has indicated that these are not statistically significant increases in concentration. However, it is unclear how increases of more than an order of magnitude in the concentrations of HMX and RDX in MW-1 from the background value in MW-4 is not statistically significant. In addition, the concentration of RDX in MW-4 has also increased by more than an order of magnitude from the historic data for that well. This should be explained or corrected.

4. The compound 1,2-dichloroethane (1,2-DCA) was detected at a concentration of 10 ug/L in MW-2. This was not discussed in the letter accompanying the data, nor were statistical analyses conducted on this parameter.

5. In the statistical anlayses of the data, it is unclear where the maximum values for HMX in MW-2, 3, 4, and 5 and the maximum values for RDX in MW-1 and MW-5 were obtained. The values used are not the same values used historically. The source of these values should be documented.

6. The chain of custody indicates that VOCs were resampled in MW-1 in January 1997, however, no explanation was offered nor was the resulting data submitted. This should be clarified and the resulting data should be submitted.

7. It is unclear to what the January 1, 1997, date on the top of the first page of the chain of custody refers. This should be clarified.

COMMENTS: FEBRUARY 1997 DATA

1. This is a resampling event due to the statistical triggers documented during the December 1996 sampling event.

2. RDX (20 ug/L) and 2,6-DNT (24 ug/L) were detected in MW-1. HMX (16 ug/L) was detected in MW-4. The facility states that these detections were not statistically significant. As mentioned above, it is unclear how concentrations an order of magnitude greater than historical background could be detected and it not be statistically significant. In addition, this is the first time 2,6-DNT has been detected above a detection limit that normally is 1 ug/L. The statistical analysis should be recalculated to confirm whether the concentrations of explosives are statistically significant.

3. Although 1,2-DCA was detected in MW-2 during the December sampling event, this well was not resampled for VOCs. This omission should be explained by the facility.

4. Unlike previous resampling events, SC, TDS, and TOC samples were not collected from upgradient well MW-4. This omission should be explained.

Reviewed by Scott Williams, Lead Worker, DDAGW-NEDO

DK:bo

pc: Lindsay Taliaferro, Unit Supervisor, DDAGW-CO
Christopher Khourey, Unit Supervisor, DDAGW-NEDO
John Watkins, Group Leader, DSIWM-NEDO

Tracking ID #s:

	Ground Water	Solid Waste
1.	03-05-96-03-1-11-3	1438
2.	04-17-96-03-1-14-3	1478
3.	08-14-96-03-1-08-3	1582
4.	01-19-96-03-1-06-3	1663
5.	02-12-97-03-1-05-3	1748
6.	04-03-97-03-1-08-1	1787

since 1827
MASON & HANGER CORPORATION
RAVENNA ARMY AMMUNITION PLANT

August 1, 1997

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, 1997 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).

According to the laboratory results, the explosives RDX and TNT were detected in monitoring wells # 1, #2 and #3. The statistical analyses for these parameters did not indicate evidence of contamination.

In accordance with OAC 3745-27-10, the affected wells will be re-sampled for the above constituents within 15 days of the date of this letter. Also, due to a laboratory oversight, samples were not analyzed for phosphorus. All wells will be re-sampled for phosphorus as well. We currently plan to conduct this sampling on Thursday, August 7, 1997.

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

James D. McGee

James D. McGee
Site Manager

JDM/lfgm0697

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

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

S: ASAP

8/25/97
CR-COR
PROP ADM
ENV
CONTRACTOR 8/26
RETURN FOR FILE

George V. Voinovich
Governor

August 21, 1997

RE: Ground Water Monitoring
Ramsdell Landfill
Ravenna Army Ammunition Plant

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

JOHN A. CICERO, JR.
~~Robert J. Kasper~~
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, OH 44266-9297

Dear Mr. ~~Kasper~~ CICERO:

The Ohio EPA Northeast District Office, Division of Drinking and Ground Waters (NEDO-DDAGW) has reviewed the following ground water sampling reports for the Ramsdell Landfill, located at the Ravenna Army Ammunition Plant, Portage County:

1. December 1995, semi-annual ground water sampling results;
2. February 1996, ground water sampling results;
3. June 1996, semi-annual ground water sampling results;
4. September 1996, ground water sampling results;
5. December 1996, semi-annual ground water sampling results; and
6. February 1997, ground water sampling results.

The attached July 30, 1997 Inter-Office Communication (IOC) from Diane Kurlich of DDAGW-NEDO discusses the findings of the DDAGW review.

Please address all the comments on pages 2 thru 11 of the attached IOC and submit the necessary documentation for review. It is suggested that the facility contact the Ohio EPA to schedule a meeting to discuss the items mentioned in the IOC. If you have any other questions or concerns regarding the findings of the DDAGW review, please do not hesitate to contact either Diane Kurlich at (330) 963-1292 or me at (330) 963-1276. Please call the latter number to schedule the meeting.

Sincerely,

Jarnal Singh.

Jarnal Singh, RS
Environmental Specialist
Division of Solid and Infectious
Waste Management

JS:cl
attachment

cc: Diane Kurlich, DDAGW-NEDO
Virginia Wilson, DSIWM-NEDO
Eileen Mohr, DERR-NEDO
Duwayne Porter, Portage County HD
Robert Whelove, HQ-IOC
File: [LAND/Willowcreek/GRO/67]
CF AMSIO-EAG (formerly Vimont)

RECEIVED
AUG 26 1997
By

NOTES TO JIM MCGEE 8/29/97 REGARDING LANDFILL LETTER FROM JARNAL SINGH:

GENERAL COMMENTS section:

Comments 1, 2 and 3 all deal with gathering more detailed information regarding ground water occurrence, movement, etc. at the landfill. In order to more clearly identify ground water conditions and characteristics at the landfill, an in-depth hydrogeological study, including the installation of additional wells, would be necessary.

Comment 4:

Oops! The wrong top of casing elevation was entered. The right elevation, as taken from the final landfill closure drawings, is 982.50. This has been corrected in GritsStat. Surface elevation is correct at 981.00.

With regard to depths of wells, research of old well installation reports indicates that the drill holes were backfilled with clean sand & gravel to 10′ below bottom screen depth, with betonite from that depth to bottom of screen zone. So, by my calculations, the correct well depths are as follows:
MW1 - 53′, MW2 - 43′, MW3 - 42′, MW4 - 56′, MW5 - 46′.
The well depths have been corrected in GritsStat.

Comment 5:

Well samples are not field filtered. We can revise the landfill ground water monitoring plan to clarify that issue.

Comment 6:

This should be addressed as part of the IRP activity that SAIC and the Corps of Engineers are conducting here.

Comment 7:

A north arrow and scale have been added to the map template and so will be on future submissions. I will re-draft the maps for December, 1996 and February, 1997 (that will take time - I want to review past data). This problem goes back to the issue raised in comments #1, #2 and #3. A more in-depth study would certainly help to provide a more accurate description of ground water flow elevations and direction at this site.

Comment 8:

Good 'ole TMA/Lancaster! These parameters are on the scope of work for lab services and should have been analyzed for and reported in the results. We (I) should have noticed this but didn't. Hopefully, future lab will be reliable.

Comment 9:

This statistical stuff is over my head. However, I will attempt to order and then will review the guidance documents recommended by EPA and attempt to address each item. This will take some time.

Comment 10:

They are right. Larry Johnson needs to take care and make sure each chain of custody form is filled out completely, including date/time of sampling, and date/time samples are relinquished to lab or transport.

Comment 11:

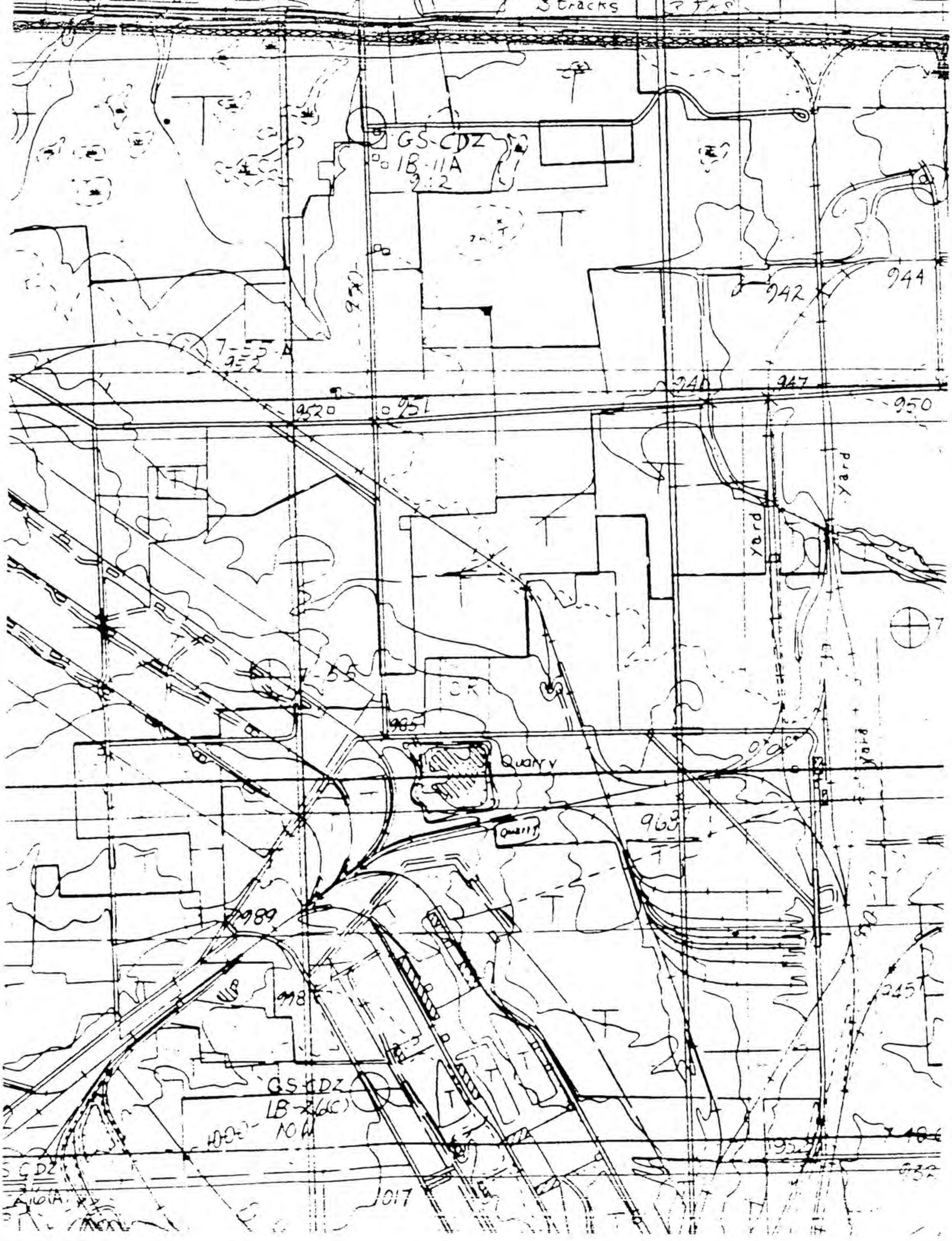
We will need to make sure this information is included on the lab sheets on future submittals by writing the appropriate well number on the lab sheet results for the duplicate analysis.

Comment 12:

Good 'ole TMA/Lancaster. We will need to stress this issue with the new lab.

Specific data comments:

I did not have time to review these in detail. Seems that most of them have to do with statistical issues which we may be able to address once I have spent some time reviewing the guidance and requirements.



3 tracks
GS-CDZ
IB-11A
944
942
950
947
952
Yard
Yard
Yard
Quarry
Quarry
985
989
945
GS-CDZ
1017

ATTACHMENT 1

RAVENNA ORDNANCE PLANT
RAVENNA, OHIO

RAVENNA ARSENAL INC
OPERATING CONTRACTOR

GENERAL MAP

WITH U.T.M. CO-ORDINATES

since 1827
MASON & HANGER CORPORATION
RAVENNA ARMY AMMUNITION PLANT

October 15, 1997

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

Subject: Response to Ohio EPA Review of Ramsdell Landfill Ground Water Monitoring Submittals

Reference: Ohio EPA Letter Dated 8/21/97, Subject as Above

Dear Sir:

We have reviewed the referenced letter and comments regarding ground water monitoring at the RVAAP Ramsdell Landfill and have the following response to the comments as set forth in the above-referenced letter:

GENERAL COMMENTS

1. We agree that the relationship between the pond and the ground water at the landfill has not been defined. A gauge to measure level changes in the pond has been installed and the pond level will be noted each time static water level measurements are taken. A further effort to more clearly define the relationship can also be included as part of an assessment monitoring program which would involve further hydrogeologic investigation at this site.

2. In their "Report on Field Work at the Ravenna Army Ammunition Plant" prepared by the Ohio Drilling Company in August of 1987, the project geologist reported that the differences in color "reflect changes in mineralization of the rock and other factors such as oxygenation of the ground water" and that the different water-bearing zones occur due to "well-developed joint and fracture patterns in the sandstone" and that these zones do not represent separate aquifers. The location of the screened intervals for the wells was determined in consultation with the Ohio EPA Northeast District Office at the time of well installation. However, a study of general water chemistry in the wells could be included as part of an assessment monitoring program which would involve further hydrogeologic investigation at this site.

Fwd to COE, Louisville

3. When in operation, waste material at the landfill extended right up to the pond, and placement of wells in this area would actually be in the landfill rather than downgradient from it. Further hydrogeologic investigation and the installation of additional wells (if determined to be necessary) at the landfill site as part of a ground water assessment monitoring program would help to clarify whether any (or all) of the existing wells meet the definition of "downgradient".

4. The wrong "top of casing" elevation was inadvertently entered into the GRITS/STAT program. The correct elevation, as taken from the final landfill closure drawings, is 982.50. This has been corrected in GRITS/STAT. Well depths have been corrected based upon information provided in The Ohio Drilling Company's "Report on Field Work at the Ravenna Army Ammunition Plant". The corrected depths are as follows: Monitoring Well #1 - 53', Monitoring Well #2 - 43', Monitoring Well #3 - 42', Monitoring Well #4 - 56', and Monitoring Well #5 - 46'. This has been entered into GRITS/STAT.

5. Metals samples are not field filtered; metals analysis is for total metals. This has been clarified in the Landfill Ground Water Monitoring Plan.

6. The Ramsdell Landfill is one of the "areas of concern" that will be further investigated under the Army's on-going remedial investigation activities being conducted as part of the Installation Restoration Program at RVAAP. As part of that investigation, available historical documents and information will be reviewed in an attempt to ascertain past activity at the site. A separation of the affects from RCRA sanitary landfill activities from the affects from pre-sanitary landfill activities at this site certainly presents a challenge.

7. Future submittals of ground water flow maps by Mason & Hanger Corp. will be provided on a revised map base which includes a north arrow and scale, and will incorporate standard geologic procedures for the construction of a contour map. The ground water flow maps for the December 1996 and February 1997 sampling events have been re-drafted and are submitted with this letter. Static water levels were measured on October 7, 1997 and are more consistent with historical levels at the landfill. We believe that the December 1996 and February 1997 measurements may have been inaccurate, and have ordered a new measurement tape to help decrease the possibility of errors in future static level measurements.

8. Mason & Hanger Corporation has contracted with a new laboratory service provider (Quanterra Labs) and will more closely monitor results received to ensure all analytical work has been performed as is required by the Landfill Ground Water Monitoring Plan.

9. (a) Future submittals by Mason & Hanger Corp. will include an analysis of distribution along with the statistical reports.

(b) The GRITS/STAT program was used in conducting statistical analysis for the toluene sample, and the program automatically replaces non-detects with one half the detection limit, which in that case would have been 1.25 ug/L. The detection limits vary in the analytical data, thus the discrepancy between the 2.5 ug/L limit and the 1.0 ug/L limit noted in the comment.

(c) After reviewing US EPA guidance documents regarding statistical analysis of ground water data, we performed an extensive review of the statistical analysis methods performed on past data. In some cases it may have been more appropriate to apply a parametric method versus the non-parametric method that was applied in the submission. In that light, statistical analyses have been re-performed on past data sets starting with the December, 1995 submission. With regard to the specific example in this comment, a change in the method applied did not change the results received. Statistical analyses are performed on data values obtained over time, so that one particular observation may not change the overall outcome of the assessment.

(d) Statistical analyses are performed on data values obtained over time. If we were to use data only obtained from the current sampling period, we would not have enough observations to perform a valid statistical test. Monitoring wells #1 and #2 are considered to be downgradient wells for purposes of statistical analyses. Further hydrogeological investigation at the landfill site may change that determination.

(e) A review of statistical procedures indicates that the explosives data may be more appropriately described by Poisson Prediction Intervals. However, in view of the fact that explosives compounds have been detected in the background well, and because explosives are not a naturally occurring compound, it is intuitive that explosives contamination of the ground water has occurred in the area of the landfill. The application of statistical tests to the explosives data at this point would only serve to confirm that conclusion. A computer disk containing all of the ground water data collected at the Ramsdell Landfill in a GRITS/STAT format is attached for your submittal to OEPA.

10. We have met with the appropriate Mason & Hanger personnel responsible for sampling and have stressed the need for entering complete information on the chain of custody forms for all samples collected at RVAAP. Mason & Hanger will ensure that in the future the chain of custody forms are filled out in their entirety.

11. Mason & Hanger will identify the well number of the duplicate well on the laboratory analytical results prior to submittal of the results to OEPA.

12. We have contracted with a new laboratory, Quanterra, and have stressed to them the importance of meeting method detection limits as specified in the particular method being used to analyze the samples. We have also requested that the laboratory verbally notify Mason & Hanger if method detection limits for a particular analyte are significantly different than specified, and to provide a written explanation with the data as to why the specified limits could not be achieved.

COMMENTS: DECEMBER 1995 DATA

1. Statistical reports for the period in question have been re-generated. The results are unchanged.
2. Statistical analyses of the explosives data was probably not valid. It is not clear whether any statistical analysis of explosives data would be of value.
3. Statistical analyses of metals data is not required as part of the ground water monitoring plan for the landfill. Values for these parameters are slightly above drinking water action levels, statistical analysis shows statistical evidence of contamination only for Ni in Well #1. Monitoring wells #1 and #2 are considered to be downgradient wells at the landfill site, however that may change upon further hydrogeological investigation at the site.
4. This was an error. The statistical analysis for the TOC data for this sampling period have been re-generated with correct data values.
5. The 3.3 ug/L value was obtained in the 2/25/93 sampling event. A copy of the laboratory data sheet for that date is attached.
6. Toluene has not been detected in any subsequent samples in any well

COMMENTS: FEBRUARY 1996 DATA

Statistical analyses of data obtained including this sampling event have been re-generated. Results of the analyses remain unchanged.

COMMENTS: JUNE 1996 DATA

1. Statistical analyses of data obtained including this sampling event have been re-generated. Results of the analyses remain unchanged.
2. Values for these parameters are slightly above drinking water action levels, statistical analysis shows statistical evidence of contamination only for Ni in Well #1. Monitoring wells #1 and #2 are considered to be downgradient wells at the landfill site, however that may change upon further hydrogeological investigation at the site.

3. It is unclear why this was done, perhaps just for information purposes.

COMMENTS: SEPTEMBER 1996 DATA

Statistical analyses of data obtained including this sampling event have been re-generated. Results of the analyses remain unchanged.

COMMENTS: DECEMBER 1996 DATA

1. Statistical analyses of data obtained including this sampling event have been re-generated. Results of the analyses remain unchanged.
2. The reported value for this parameter is slightly above drinking water action levels, and statistical analysis shows statistical evidence of contamination for Ni in Well #1. Monitoring wells #1 and #2 are considered to be downgradient wells at the landfill site, however that may change upon further hydrogeological investigation at the site.
3. Statistical analyses of the explosives data was probably not valid. It is not clear whether any statistical analysis of explosives data would be of value.
4. Statistical analysis of the DCA data including this sampling event has been conducted. Results are attached.
5. The values of 5 ppb for HMX in wells #2, 3, 4, and 5 are values set by GRITS/STAT as one half the detection limit of 10 ppb. The detection limits have varied and are usually lower than that. The values for RDX in well #1 was the value obtained in the 12/19/96 sampling. The value for RDX in well #5 was set by GRITS/STAT at one half the detection limit of 10 ppb.
6. A discussion with Mason & Hanger personnel involved in the sampling indicated that one of the VOC vials arrived broken at the laboratory. Re-sampling was conducted to replace the broken vial. Results were included in the laboratory report for the entire sampling event.
7. If the writer is referring to the January 6, 1997 date written at the top of the chain of custody, that would represent the date Mason & Hanger received the chain of custody copy back with appropriate signature, date and time of receipt from the laboratory.

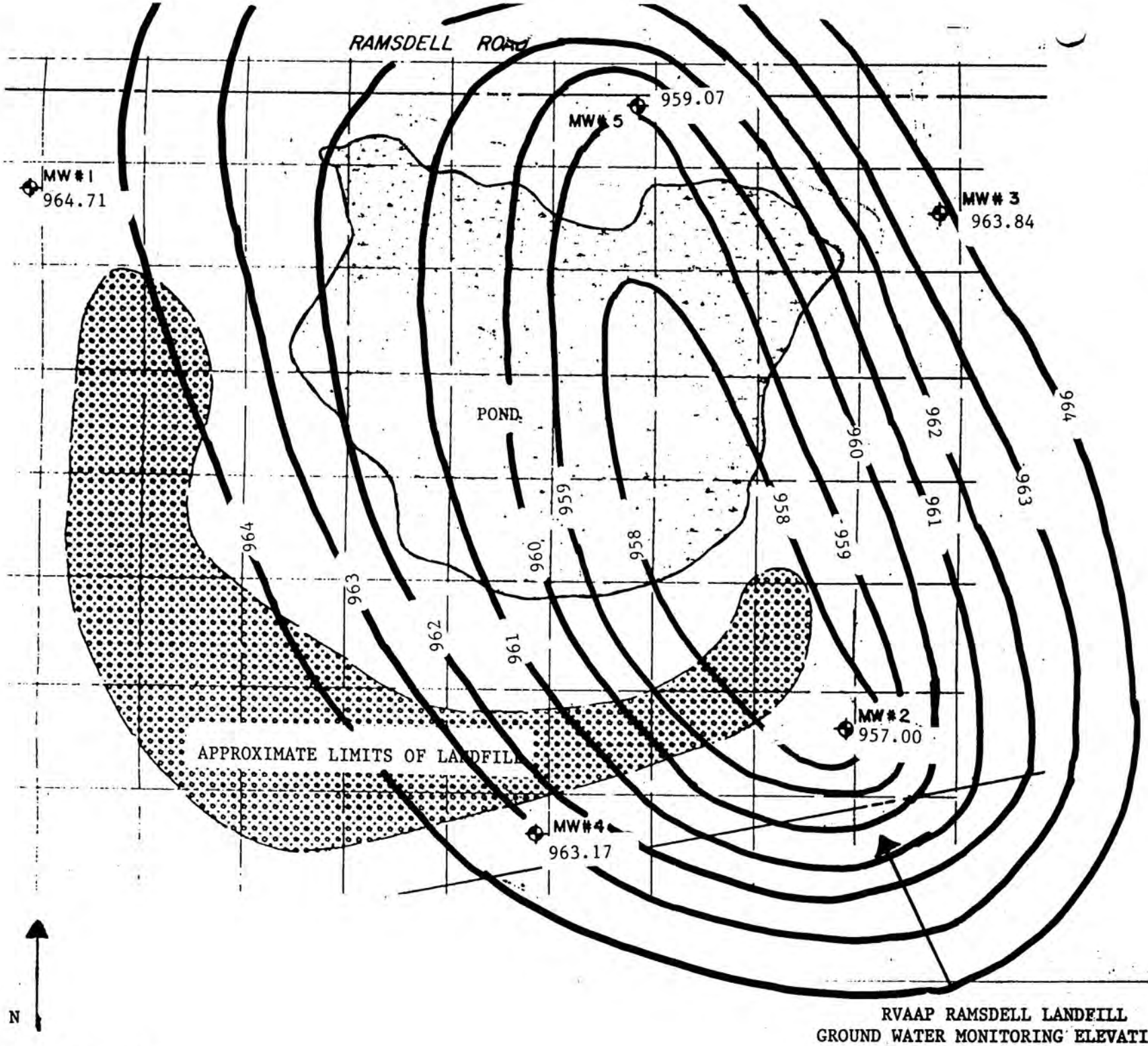
COMMENTS: FEBRUARY 1997 DATA

2. Statistical analyses of the explosives data was probably not valid. It is not clear whether any statistical analysis of explosives data would be of value.
3. It is unclear why this parameter was not included in the resampling event. DCA was not detected in the samples submitted for analysis in June, 1997.
4. The affected monitoring wells which showed statistically significant evidence of contamination for conductivity, TDS and TOC were re-sampled as required by Ohio EPA regulations. Monitoring well #4 was not denoted as having statistically significant evidence of contamination and was not sampled. Prior re-sampling events may have included well #4 in order to obtain additional background data values.

Sincerely,
Mason & Hanger Corporation

James D. McGee
Site Manager

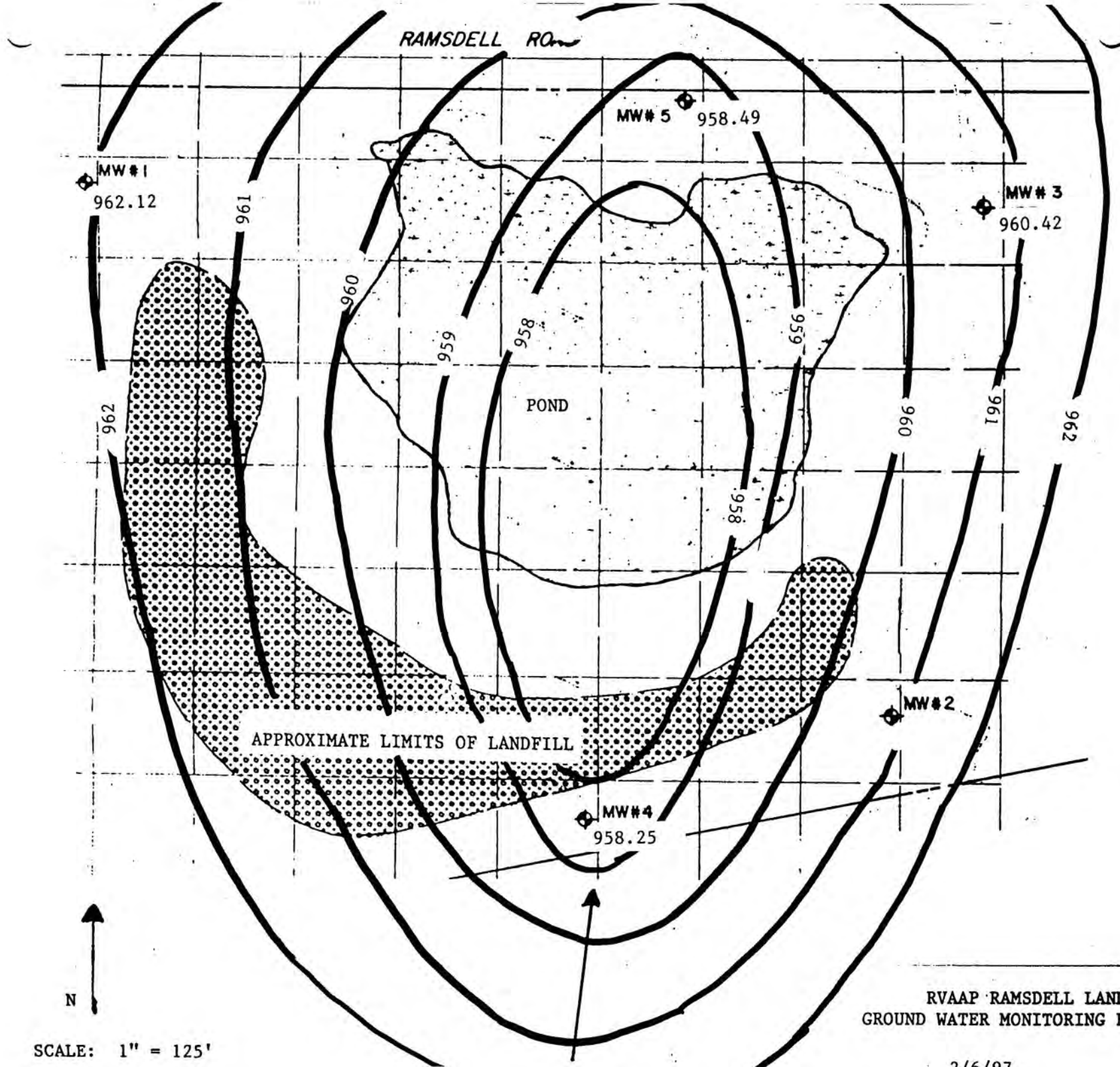
JDM
cc: Robert Whelove, HQ-IOC



SCALE: 1" = 125'

RVAAP RAMSDELL LANDFILL
GROUND WATER MONITORING ELEVATIONS

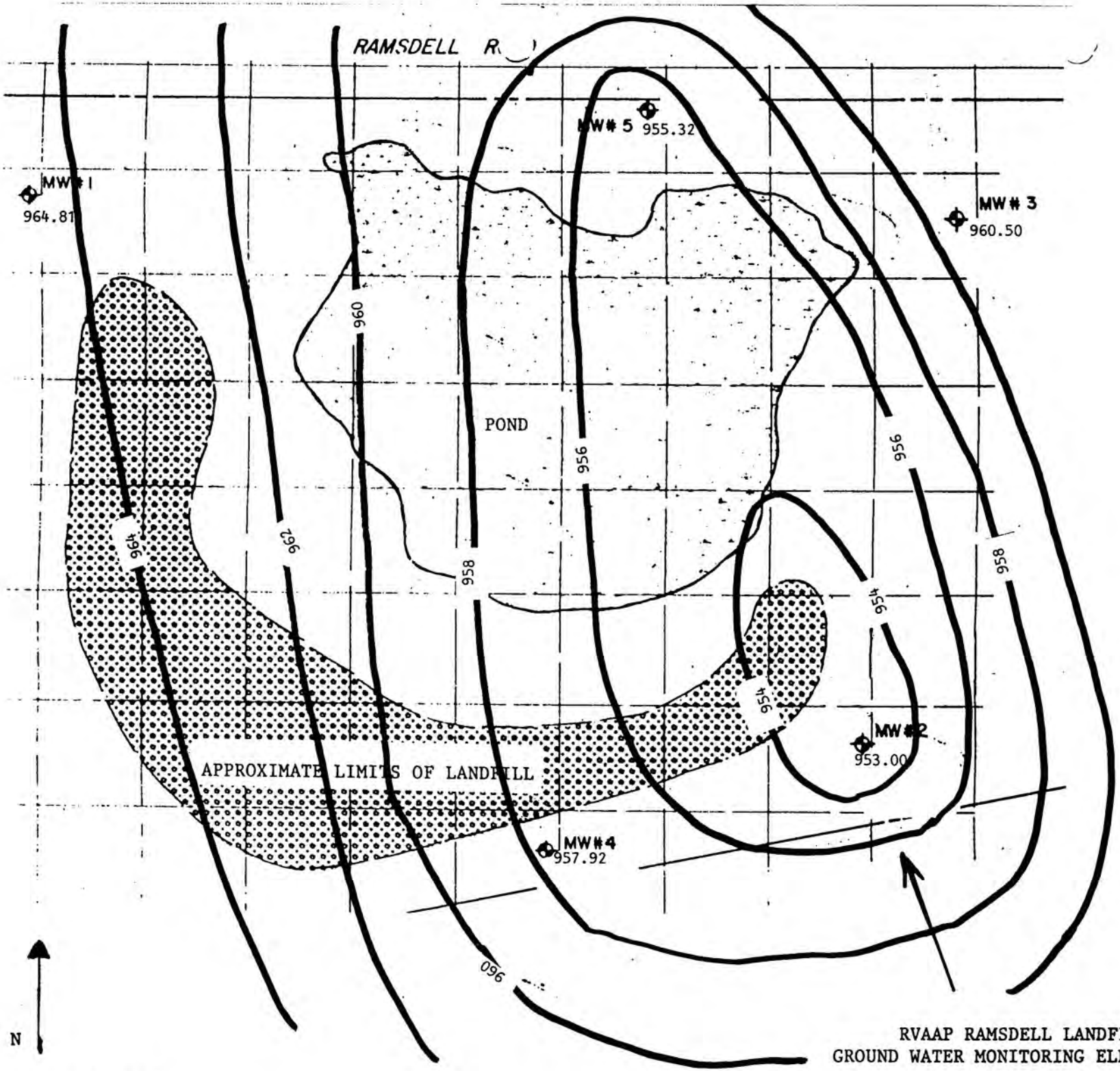
12/19/96



SCALE: 1" = 125'

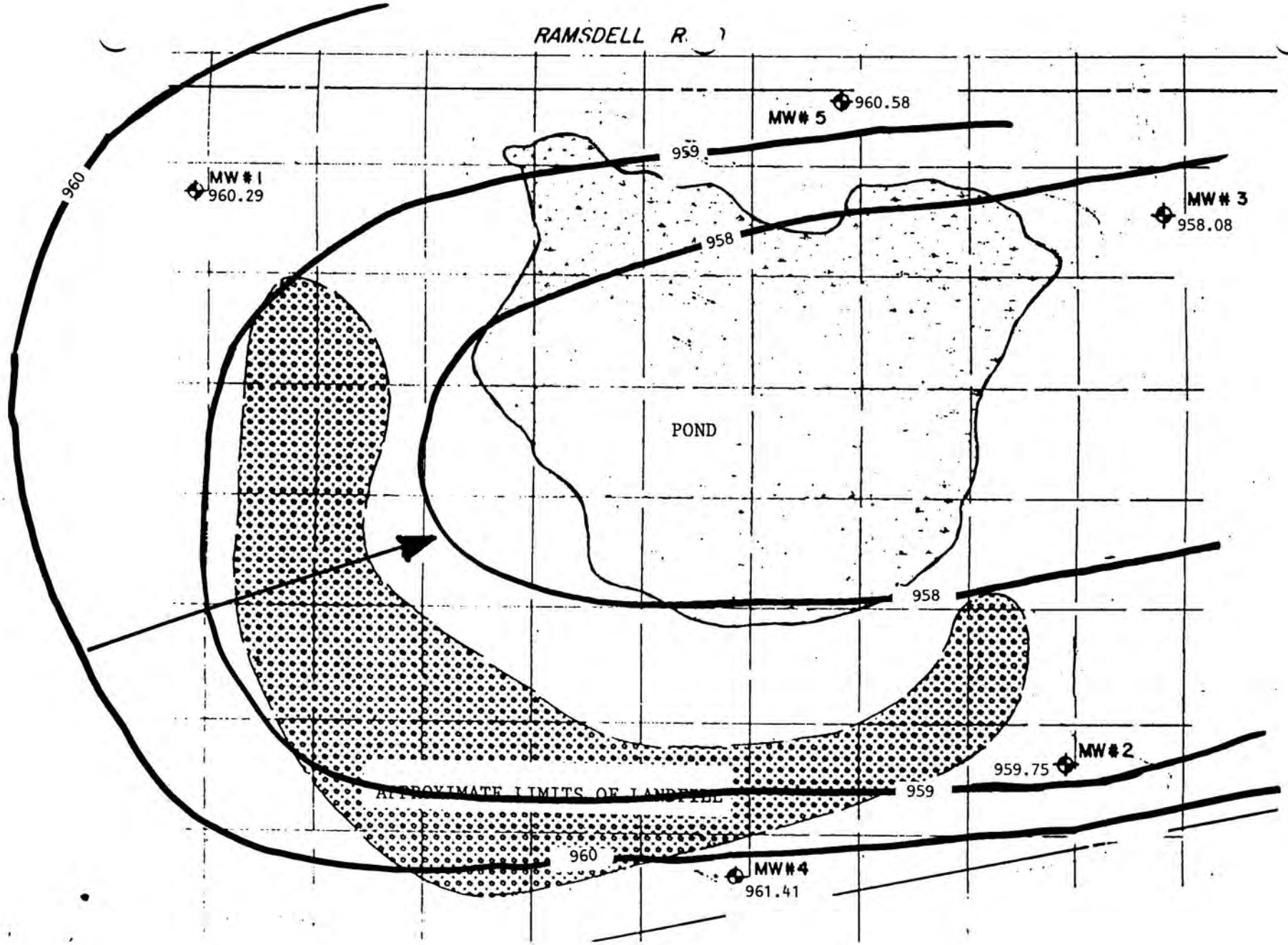
RVAAP RAMSDELL LANDFILL
GROUND WATER MONITORING ELEVATIONS

2/6/97



RVAAP RAMSDELL LANDFILL
GROUND WATER MONITORING ELEVATIONS

SCALE: 1" = 125'



N

SCALE: 1" = 125'

RVAAP RAMSDELL LANDFILL
GROUND WATER MONITORING ELEVATIONS

DATE - October 7, 1997

TMA
Thermo Analytical Inc.

TMA/ERG
7777 Exchange Street
Cleveland, OH 44125-3337

(216) 447-0790

RAVENNA ARSENAL, INC.
LANDFILL GROUNDWATER REPORT

WELL #1 - #5

TMA PROJECT: 0246

FEBRUARY, 1993

Approved by: William L. Ramus

William L. Ramus
Operations Manager

RESULTS

PARAMETER	WELL #4	WELL #5	UNITS
TNT	ND(1.0)	ND(1.0)	ug/l
HMX	ND(1.0)	ND(1.0)	ug/l
RDX	3.3	ND(1.0)	ug/l
2-4 DNT	ND(1.0)	ND(1.0)	ug/l
2-6 DNT	ND(1.0)	ND(1.0)	ug/l

ND - Nondetectable; detection limit next to "ND" notation

Wilcoxon Rank-Sum Test
Report Printed: 10-13-1997 14:07

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:1,2DCE 1,2-Dichloroethane

CAS Number: 107-06-2
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 2.000 ppb

Start Date:Nov 22 1988
End Date:Dec 19 1996

Data Mode:Log Transformed

Background Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-4	15	100	1.61	0.92	0.96	0.18

Compliance Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-2	13	92	2.30	0.92	1.08	0.42

Well	Date	Observation	Rank
MW-4	11/07/91	0.9163	13.0
MW-4	02/27/92	0.9163	13.0
MW-4	06/25/92	0.9163	13.0
MW-4	10/01/92	0.9163	13.0
MW-4	02/25/93	0.9163	13.0
MW-4	07/15/93	0.9163	13.0
MW-4	02/21/94	0.9163	13.0
MW-4	07/28/94	0.9163	13.0
MW-4	12/22/94	0.9163	13.0
MW-4	06/28/95	0.9163	13.0
MW-4	06/28/95	0.9163	13.0

MW-4	12/14/95	0.9163	13.0
MW-4	12/14/95	0.9163	13.0
MW-4	06/20/96	1.6094	26.5
MW-4	12/19/96	0.9163	13.0
	Background Data Rank-Sum:		208.5
MW-2	11/07/91	0.9163	13.0
MW-2	02/27/92	0.9163	13.0
MW-2	06/25/92	0.9163	13.0
MW-2	10/01/92	0.9163	13.0
MW-2	02/25/93	0.9163	13.0
MW-2	07/15/93	0.9163	13.0
MW-2	02/21/94	0.9163	13.0
MW-2	07/28/94	0.9163	13.0
MW-2	12/22/94	0.9163	13.0
MW-2	06/28/95	0.9163	13.0
MW-2	12/14/95	0.9163	13.0
MW-2	06/20/96	1.6094	26.5
MW-2	12/19/96	2.3026	28.0
	Compliance Data Rank-Sum:		197.5

Background Data Pts m:	15
Compliance Data Pts n:	13
Wilcoxon Statistic W:	106.5000
Expected Value E(W):	97.5000
Std Dev SD(W):	21.7083
Std Dev (Ties) SD'(W):	11.6535
Approx Z-Score Z:	0.7294
Significance Level α:	0.05
$Z\alpha$:	1.6449

Since the Approx. Z-Score does not exceed $Z\alpha$ there is no significant evidence of contamination at the compliance well.

CELRL-ED-GE (J. Jent)
P.O. Box 59
Lousiville, KY 40201
(502) 582-5424
Fax-5168

1 December 1997

AMSIO-EQE (Bob Whelove, Jr., Bill Ingold)
RVAAP (Mark Patterson)
Mason-Hanger (Susan McCauslin)

Enclosed is a draft of our response to OEPA regarding the Ramsdell Quarry.

Would like to be able to ship out final to OEPA at end of Thursday, Dec 4.
Our meeting with OEPA has been set for 11-12 Dec.

Please review as soon as possible.

J. Jent

DRAFT

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

December 4, 1997

Ohio Environmental Protection Agency, Northeast District Office
Jarnal Singh, RS
Environmental Specialist
Division of Solid and Infectious Waste Management
2110 E. Aurora Road
Twinsburg, OH 44087-1969

Dear Sir,

1 We are writing in response to your letter dated August 21, 1997 concerning Ground Water Monitoring, Ramsdell Landfill at the Ravenna Army Ammunition Plant in Ravenna, OH. Basically, while we believe that the Army has carried out the requirements of the March 1, 1990 Ground Water Monitoring Program for the Ramsdell Quarry, there are many significant concerns, including:

- Past burning and demolition of explosives at the base of the quarry east of the closed sanitary landfill, see Enclosure 1,
- Inconsistent ground water flow patterns between the five (5) site ground water monitoring wells,
- Lack of data to determine the relationship between the pond directly east of the closed sanitary landfill and the site ground water monitoring wells, and
- Detections from at least three sampling events at all five ground water monitoring wells of explosives in ground water, (thus essentially leaving no "up gradient" monitoring wells), see Enclosures 2(A,B).

Based on these concerns we believe that an entirely new and more comprehensive program needs to be conducted to better define the basic processes on-going at the Ramsdell Quarry. We are thus in agreement with many of the basic concerns raised in your letter. Many of the questions pertaining to individual sampling events relate to statistical comparisons of data to "up gradient" monitoring wells. We believe now that based on the collected data, none of the five ground water monitoring wells is truly "up gradient".

DRAFT

2 To better determine ground water flow and environmental conditions at the Ramsdell Quarry, we have prepared a "Proposed Ramsdell Ground Water Investigation Plan", see Enclosure 3, that we feel addresses many of the outstanding questions relating to the quarry. Upon completion of at least 12 monthly sets of readings of the water levels/elevations in the monitoring wells and pond, and quarterly sampling and analyses, a much better understanding of the ground water situation at the quarry will be achieved, and a prudent course of action to address any remaining environmental problems can be developed. Additionally, related CERCLA ground water monitoring activities will be further along to aid in understanding how the ground water behavior at the quarry relates to the ground water flow at the plant in general.

3 A notebook maintained by RVAAP containing Significant Ramsdell Quarry Ground Water Monitoring information is provided for your reference as Enclosure 5. Of particular importance are the ,

- Ramsdell Quarry Monitoring Wells and Hydrogeologic Investigation, dated June 3, 1998, and
- Report on Field Work at the RVAAP, dated August 10, 1987.

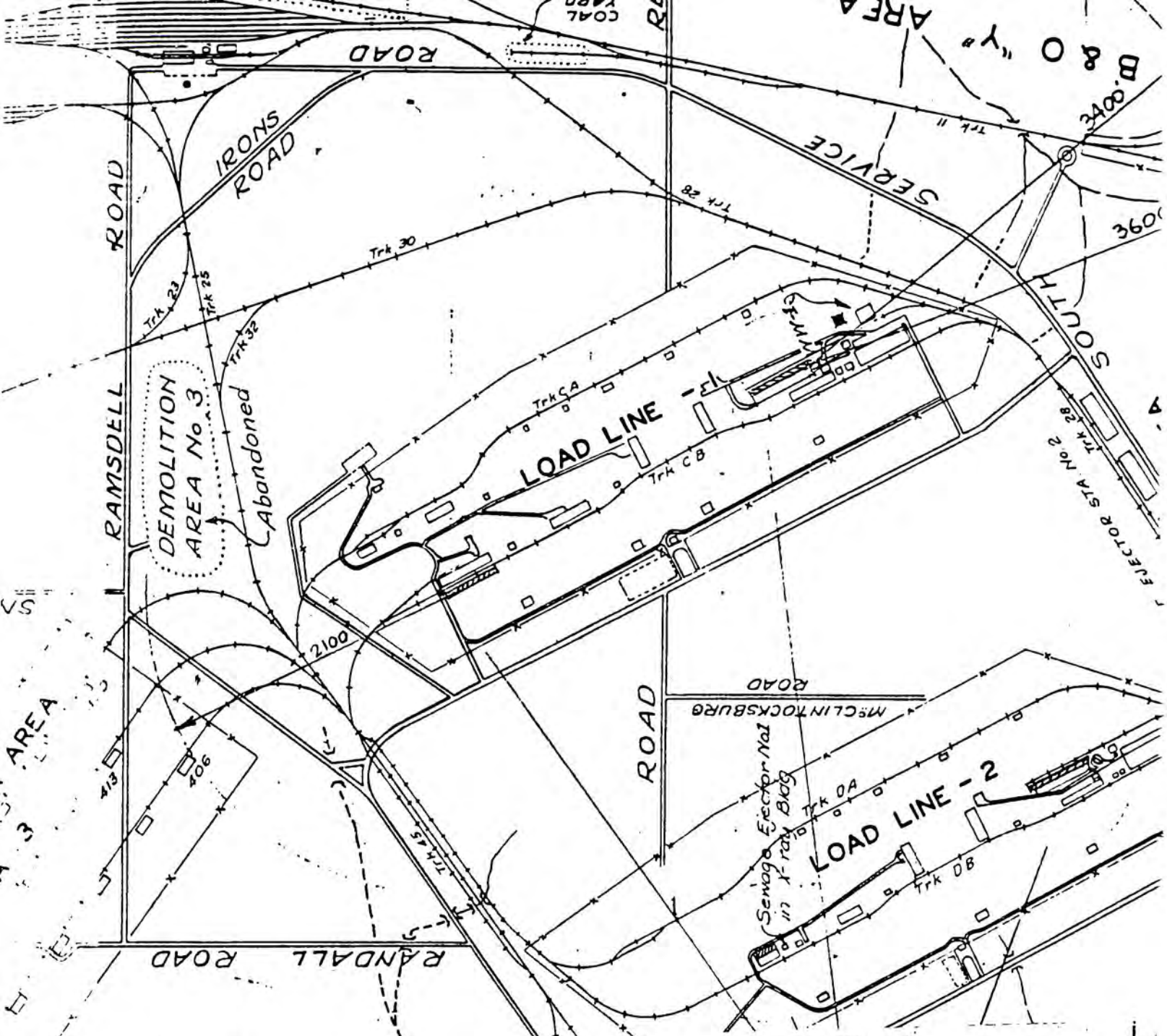
4 Finally, responses to your individual comments of the August 21, 1997 letter are provided as Enclosure 4.

5 We look forward to meeting with you to discuss these issues.

Sincerely,

Enclosures

1 General Site Map, dated March 1947
2A Plan of Ramsdell Quarry Existing Monitoring Well Locations
2B Explosives Concentrations in Ramsdell Landfill Ground Water Monitoring Wells
3 Proposed Ramsdell Ground Water Investigation Plan
4 Responses to OEPA Letter, dated August 10, 1997.
5 Ramsdell Ground Water Monitoring Notebook



Showing

LOCATION OF PROPOSED ~~METAL~~ INERT STORAGE WAREHOUSES

RAVENNA ARSENAL
APCO OHIO
POST ENGINEER

GENERAL MAP

DRAWN: H.C. Weigelt	APPROVED: Arthur Flemming	DATE: MARCH 1947
TRACED: H.C. Weigelt	LT. COL. C.E., POST ENGINEER	SCALE: 1 IN = ~~1000~~ 1540 FT
CHECKED: Peck	DRAWING No. WD-E-101-S	

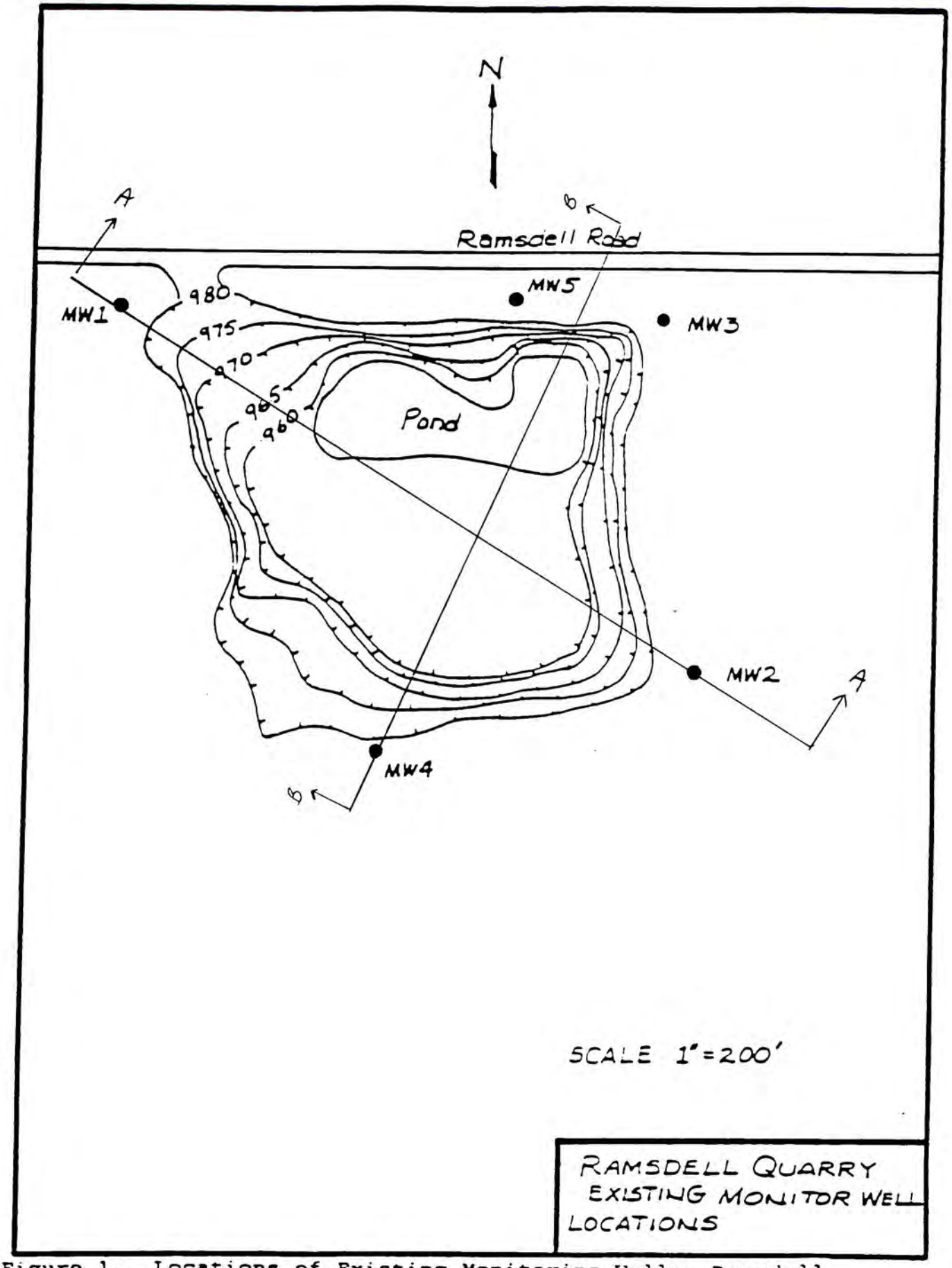


Figure 1. Locations of Existing Monitoring Wells, Ramsdell Quarry Landfill, Ravenna AAP

ENCL 2A

EXPLOSIVES CONCENTRATIONS IN RAMSDELL LANDFILL GROUND WATER MONITORING WELLS

SAMPLING DATE	MONITORING WELL #1 (IN UG/L)	MONITORING WELL #2 (IN UG/L)	MONITORING WELL #3 (IN UG/L)	MONITORING WELL #4 (IN UG/L)	MONITORING WELL #6 (IN UG/L)
02/27/92	2,4 DNT 1.6	RDX 2.5			RDX 1.2 2,4 DNT 1.1 TNT 1.2
06/25/92	RDX 4.7	RDX 2.8 HMX 2.4		RDX 2.4	
10/01/92		RDX 2.4 HMX 2.2	TNT 2.8 RDX 1.7		
02/25/93	HMX 1.1			RDX 3.3	
07/15/93		HMX 1.9			RDX 3.0
07/28/94				HMX 1.8	
12/22/94	RDX 5.7	RDX 8.3 HMX 3.3	HMX 1.6 HMX 1.0 (DUP) RDX 9.5 RDX 4.1 (DUP)	RDX 2.3	RDX 2.5
02/28/95	RDX 3.1	RDX 1.3 HMX 1.8	RDX 4.2		
06/28/95		RDX 1.3 HMX 1.2			
08/30/95		RDX 1.6 HMX 1.2			
12/14/95			RDX 1.3		
06/20/96			TNT 8.8		
12/19/96	HMX 27 RDX 15			RDX 39	
02/06/97	2,6 DNT 24 RDX 20			HMX 16	
06/26/97	RDX 1.3 TNT 2.4	TNT 3.7	TNT 1.14 RDX 1.5		

RAMSDELL QUARRY - PROPOSED ACTION PLAN

0 FILES SEARCH

Thoroughly check all relevant files on-site and interview former/current employees familiar with the site.

1 BETTER DEFINE GROUNDWATER FLOW

A Accept site geohydrology as described in 1988 Hydrogeologic Investigation and Report on Field Work

B Resurvey 5 GW monitoring wells
Top riser/ surface elevation

C Set permanent pond staff gage

C.1 Set staff gage at pond capable of remaining in operation for 5 years w/o maintenance

D Survey pond staff gage

E Set control monuments near Ramsdell Quarry

F Develop 2-foot interval topographic map of site

G Read ground water well depths/elevs & pond elevs monthly,
And daily for 5 days after any rainfalls > 2 inches (Establish rain gage at Bldg 1036)

2 DETERMINE CHARACTER OF POND

A Sample and analyze pond water and monitoring well water quarterly and at same times

B Take pond water and bottom sediment samples, determine thickness of sediment and determine rock elevations beneath pond. Accomplish by personnel wearing hip waders.

B.1 Safety Plan- provide safety plan to facilitate water and sediment sampling

B.2 Pond Water
4 surface water samples
4 samples of pond water within 1-foot of bottom

B.3 Pond Bottom Muck
8 - 32 sediment samples - depends on depth to rock
8 0 - 6 inches deep
8 6" - 2'
8 2 - 4'
8 4 - 6'

B.4 Test all samples for VOC's, SVOC's, TAL, Cyanide, Lithium, Explosives, Propellants, Black Powder

B.5 Test sediment samples for TOC and grain size.

3 IMPROVE FIELD SAMPLING/LAB TEST PROCEDURES

A Use different lab (Quanterra)

B Use improved 8330 method for lower detection limits of explosives

C Provide all field sampling data as described in GW Monitoring Plan

D Coordinate sampling events w/OEPA if they want to observe

ENCL 3

4 REEVALUATE STATISTICAL/ REPORTING PROCEDURES

A Verify performing statistical procedures described in GW Monitoring Plan-
Do for now.

B Relook at triggering parameters- possibly change to site contaminants

C Relook at site "Background", especially in light of explosives detects;
Incorporated results of facility-wide background values

5 COORDINATE ONGOING CERCLA ACTIVITIES w/RAMSDELL

A Facility-wide background

B GW monitoring wells at Load Line 1

C Evaluate test results from nearby groundwater supply wells, especially historic data.

DRAFT

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

December 4, 1997

Ohio Environmental Protection Agency
Jarnal Singh, RS
Environmental Specialist
Division of Solid and Infectious Waste Management
2110 E. Aurora Road
Twinsburg, OH 44087-1969

Subject: Response to Ohio EPA Review Letter, dated August 21, 1997, of Ramsdell Landfill Ground Water Monitoring Submittals

Dear Sir:

We have reviewed the referenced letter and comments regarding ground water monitoring at the RVAAP Ramsdell Landfill and have the following response to the comments as set forth in the above-referenced letter:

GENERAL COMMENTS

1. We agree that the relationship between the pond and the ground water at the landfill has not been defined. A permanent gage to measure pond elevation will be installed, and the pond level/elevation will be noted each time the ground water monitoring wells are read. Water depths/elevations at the five monitoring wells and the pond elevation will be read monthly.

2. In the "Report on Field Work at the Ravenna Army Ammunition Plant", Enclosure 5, prepared by the Ohio Drilling Company in August of 1987, the project geologist, Thomas J. Perkins, reported that,

- the differences in color "reflect changes in mineralization of the rock and other factors such as oxygenation of the ground water",
- the different water-bearing zones occur due to "well-developed joint and fracture patterns in the sandstone, creating zones of relatively high secondary porosity",
- "these zones do not represent separate aquifers",
- "In actuality, the sandstone is saturated up to a zone approximately 15 to 20 feet below the ground surface, and
- "the geology revealed in these four holes is fairly uncomplicated.

See Enclosure 4-A(1,2).

ENCL 4

The locations of the screened intervals for the wells was determined in consultation with the Ohio EPA Northeast District Office at the time of well installation, see OEPA letter dated November 17, 1987, Enclosure 4-B and Enclosure 4-C. Attempts are being made to better determine the rationale for the locations of the screened intervals. However, the OEPA letter states that the well screens would be in the "first saturated horizon in sandstone which is laterally continuous under the facility". This is probably based on the Monitoring Well Analyses, Enclosure 4-C, contained in the Appendix of the August 10, 1987 Field Report, which indicated negligible differences in concentrations of parameters with depth of sampling in the wells. Reference to the drill logs for the 5 monitoring wells, provided as Enclosures 4-E(1-5), and the table of well screens, Enclosure 4-F, indicates that the grayish-white, white, light, white, and gray sandstones at MW- (1-5), respectively were selected as being the first laterally continuous layer. Cross-sections of the monitoring wells in relation to the pond are shown as Enclosures 4-G(1,2).

3. ~~When in operation~~, waste material at the landfill extended right up to the pond, and prior to closure, placement of wells in this area would ~~actually be in the landfill rather than down gradient from it~~. therefore probably not represent down gradient conditions.

4. The wrong "top of casing" elevation was inadvertently entered into the GRITS/STAT program. The correct elevation, as taken from the final landfill closure drawings, is 982.50. This has been corrected in GRITS/STAT. Well depths have been corrected based upon information provided in The Ohio Drilling Company's "Report on Field Work at the Ravenna Army Ammunition Plant". The corrected depths below grade are as follows:

Monitoring Well #1 - 55' BG,
Monitoring Well #2 - 45' BG,
Monitoring Well #3 - 45' BG,
Monitoring Well #4 - 55' BG, and
Monitoring Well #5 - 43' BG.

This has been entered into GRITS/STAT.

5. Metals samples are not field filtered; ~~metals analysis is for total metals~~. This has been clarified in the Landfill Ground Water Monitoring Plan.

6. The Ramsdell Landfill is one of the "areas of concern" that is being further investigated under the Army's on-going remedial investigation activities being conducted as part of the Installation Restoration Program at RVAAP. As part of that investigation, available historical documents and information are being reviewed in an attempt to ascertain past activity at the site. While separation of the affects from RCRA sanitary landfill activities from the affects from pre-sanitary landfill activities at this site needs to be appreciated, the Army seeks to address the Ramsdell Quarry in its entirety.

7. Future submittals of ground water flow maps by Mason & Hanger Corp. will be provided on a revised map base which includes a north arrow and scale, and will incorporate standard geologic procedures for the construction of a contour map. The ground water flow maps for the December

DRAFT

COMMENTS: SEPTEMBER 1996 DATA

Statistical analyses of data obtained including this sampling event have been re-generated. Results of the analyses remain unchanged.

COMMENTS: DECEMBER 1996 DATA

1. Statistical analyses of data obtained including this sampling event have been re-generated. Results of the analyses remain unchanged.
2. The reported value for this parameter is slightly above drinking water action levels, and statistical analysis shows statistical evidence of contamination for Ni in Well #1. Monitoring wells #1 and #2 are considered to be down gradient wells at the landfill site, however that may change upon further hydrogeological investigation at the site. lower case
3. Statistical analyses of the explosives data was probably not valid. It is not clear whether any statistical analysis of explosives data would be of value.
4. Statistical analysis of the DCA data including this sampling event has been conducted. Results are attached as Enclosure 4-J.
5. The values of 5 ppb for HMX in wells #2, 3, 4, and 5 are values set by GRITS/STAT as one half the detection limit of 10 ppb. The detection limits have varied and are usually lower than that. The values for RDX in well #1 was the value obtained in the 12/19/96 sampling. The value for RDX in well #5 was set by GRITS/STAT at one half the detection limit of 10 ppb.
6. A discussion with Mason & Hanger personnel involved in the sampling indicated that one of the VOC vials arrived broken at the laboratory. Re-sampling was conducted to replace the broken vial. Results were included in the laboratory report for the entire sampling event.
7. If the writer is referring to the January 6, 1997 date written at the top of the chain of custody, that would represent the date Mason & Hanger received the chain of custody copy back with appropriate signature, date and time of receipt from the laboratory.

COMMENTS: FEBRUARY 1997 DATA

1. Concur
2. Statistical analyses of the explosives data was probably not valid. It is not clear whether any statistical analysis of explosives data would be of value.
3. It is unclear why this parameter was not included in the resampling event. DCA was not detected in the samples submitted for analysis in June, 1997.
4. The affected monitoring wells which showed statistically significant evidence of contamination for conductivity, TDS and TOC were re-sampled as required by Ohio EPA regulations. Monitoring well #4 was not denoted as having statistically significant evidence of contamination and was not sampled. Prior re-sampling events may have included well #4 in order to obtain additional background data values.

Sincerely,

1996, February 1997, June 1997, and October 1997 sampling events have been re-drafted and are submitted as Enclosures 4-H(1-4). Static water levels were measured on October 7, 1997 and are more consistent with historical levels at the landfill. We believe that the December 1996 and February 1997 measurements may have been inaccurate, and have ordered a new measurement tape to help decrease the possibility of errors in future static level measurements.

8. Mason & Hanger Corporation has contracted with a new laboratory service provider (Quanterra Labs) and will more closely monitor results received to ensure all analytical work has been performed as is required by the Landfill Ground Water Monitoring Plan.
~~Contracting Officer's Representative~~

9. (a) Future submittals by Mason & Hanger Corp. will include an analysis of distribution along with the statistical reports.

(b) The GRITS/STAT program was used in conducting statistical analysis for the toluene sample, and the program automatically replaces non-detects with one half the detection limit, which in that case would have been 1.25 ug/L. The detection limits vary in the analytical data, thus the discrepancy between the 2.5 ug/L limit and the 1.0 ug/L limit noted in the comment.

(c) After reviewing US EPA guidance documents regarding statistical analysis of ground water data, we performed an extensive review of the statistical analysis methods performed on past data. In some cases it may have been more appropriate to apply a parametric method versus the non-parametric method that was applied in the submission. In that light, statistical analyses have been re-performed on past data sets starting with the December, 1995 submission. With regard to the specific example in this comment, a change in the method applied did not change the results received. Statistical analyses are performed on data values obtained over time, so that one particular observation may not change the overall outcome of the assessment.

(d) Statistical analyses are performed on data values obtained over time. If we were to use data only obtained from the current sampling period, we would not have enough observations to perform a valid statistical test. Monitoring wells #1 and #2 are considered to be down gradient wells for purposes of statistical analyses. Further hydrogeological investigation at the landfill site may change that determination.

(e) A review of statistical procedures indicates that the explosives data may be more appropriately described by Poisson Prediction Intervals. However, in view of the fact that explosives compounds have been detected in the background well, and because explosives are not a naturally occurring compound, it is intuitive that explosives contamination of the ground water has occurred in the area of the landfill. The application of statistical tests to the explosives data at this point would only serve to confirm that conclusion. A computer disk containing all of the ground water data collected at the Ramsdell Landfill in a GRITS/STAT format is attached, ~~for your submittal to OEPA.~~

10. We have met with the appropriate Mason & Hanger personnel responsible for sampling and have stressed the need for entering complete information on the chain of custody forms for all samples collected at RVAAP. Mason & Hanger will ensure that in the future the chain of custody forms are filled out in their entirety.

11. Mason & Hanger will identify the well number of the duplicate well on the laboratory analytical results prior to submittal of the results to OEPA.

12. ~~We have~~ contracted with a new laboratory, Quanterra, and ~~have~~ stressed to them the importance of meeting method detection limits as specified in the particular method being used to analyze the samples. ~~We have~~ also requested that the laboratory ~~verbally notify Mason & Hanger~~ if method detection limits for a particular analyte are significantly different than specified, and to provide a written explanation with the data as to why the specified limits could not be achieved.

COMMENTS: DECEMBER 1995 DATA

1. Statistical reports for the period in question have been re-generated. The results are unchanged.
2. Statistical analyses of the explosives data was probably not valid. It is not clear whether any statistical analysis of explosives data would be of value.
3. Statistical analyses of metals data is not required as part of the ground water monitoring plan for the landfill. Values for these parameters are slightly above drinking water action levels, and statistical analysis shows statistical evidence of contamination only for Ni in Well #1. Monitoring wells #1 and #2 are considered to be down gradient wells at the landfill site, however that may change upon further hydrogeological investigation at the site.
4. This was an error. The statistical analysis for the TOC data for this sampling period have been re-generated with correct data values.
5. The 3.3 ug/L value was obtained in the 2/25/93 sampling event. A copy of the laboratory data sheet for that date is attached as Enclosur 4-I.
6. Toluene has not been detected in any subsequent samples in any well .

COMMENTS: FEBRUARY 1996 DATA

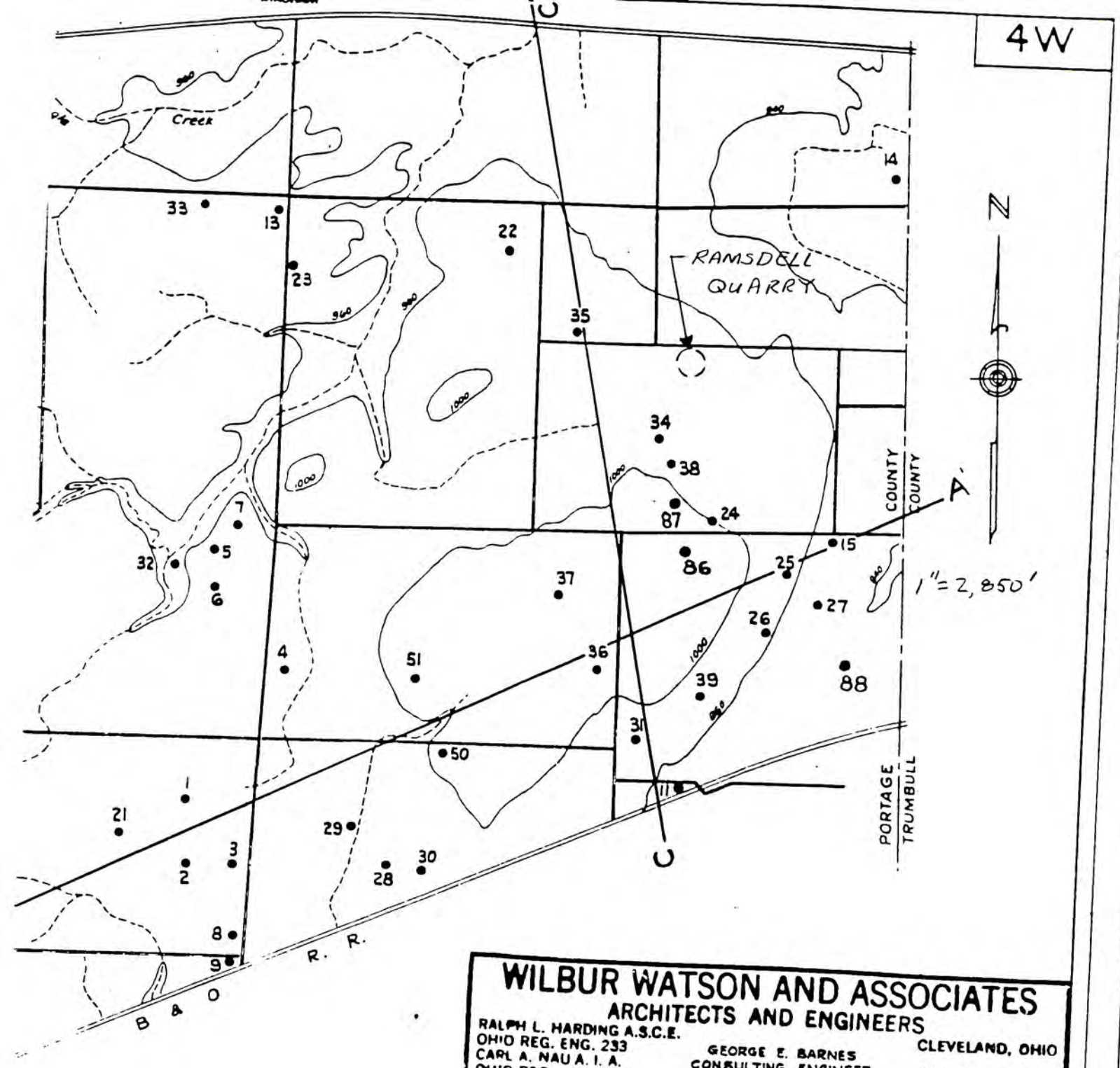
1. Concur
2. Statistical analyses of data obtained including this sampling event have been re-generated. Results of the analyses remain unchanged.

COMMENTS: JUNE 1996 DATA

1. Statistical analyses of data obtained including this sampling event have been re-generated. Results of the analyses remain unchanged.
2. Values for these parameters are slightly above drinking water action levels, statistical analysis shows statistical evidence of contamination only for Ni in Well #1. Monitoring wells #1 and #2 are considered to be down gradient wells at the landfill site, however that may change upon further hydrogeological investigation at the site.
3. It is unclear why this was done, perhaps just for information purposes.
4. Ground water flow directions will be better determined with the upcoming monthly ground water and pond level readings.

Enclosures

4-A(1)	Location of (Supply) Wells, 1953
4-A(2)	N-S Geologic Cross-Section C-C Adjacent to Ramsdell Quarry, 1953
4-B	OEPA Letter dated November 17, 1987
4-C	Addendum to Field Report; Monitoring Well Completion and Development, 1987
4-D	Results of Chemical Analyses of Samples (29 June 87) from Wells Around the Ramsdell Quarry
4-E(1-5)	Monitoring Well Logs, 1987
4-F	Table of Well Screens, 1987
4-G(1,2)	Monitoring Well Cross-Sections
4-H(1,2,3,4)	Ground Water Monitoring Elevations
4-I	Laboratory Data Sheet for 2/25/93 Sampling Event
4-J	Statistical Analyses of DCA Data



WILBUR WATSON AND ASSOCIATES
ARCHITECTS AND ENGINEERS

RALPH L. HARDING A.S.C.E.
OHIO REG. ENG. 233
CARL A. NAU A. I. A.
OHIO REG. ARCH. 813

GEORGE E. BARNES
CONSULTING ENGINEER

CLEVELAND, OHIO
RAVENNA, OHIO

SCALE

REVISIONS
1 ADDED WELLS
2 T. HOFF & ASSOC. 6/9/53

CONSTRUCTION DIVISION
OFFICE OF THE QUARTERMASTER GENERAL

RAVENNA ORDNANCE PLANT
STUDY OF WELLS FOR WATER SUPPLY

LOCATION OF WELLS

FIG. 1 OF 8

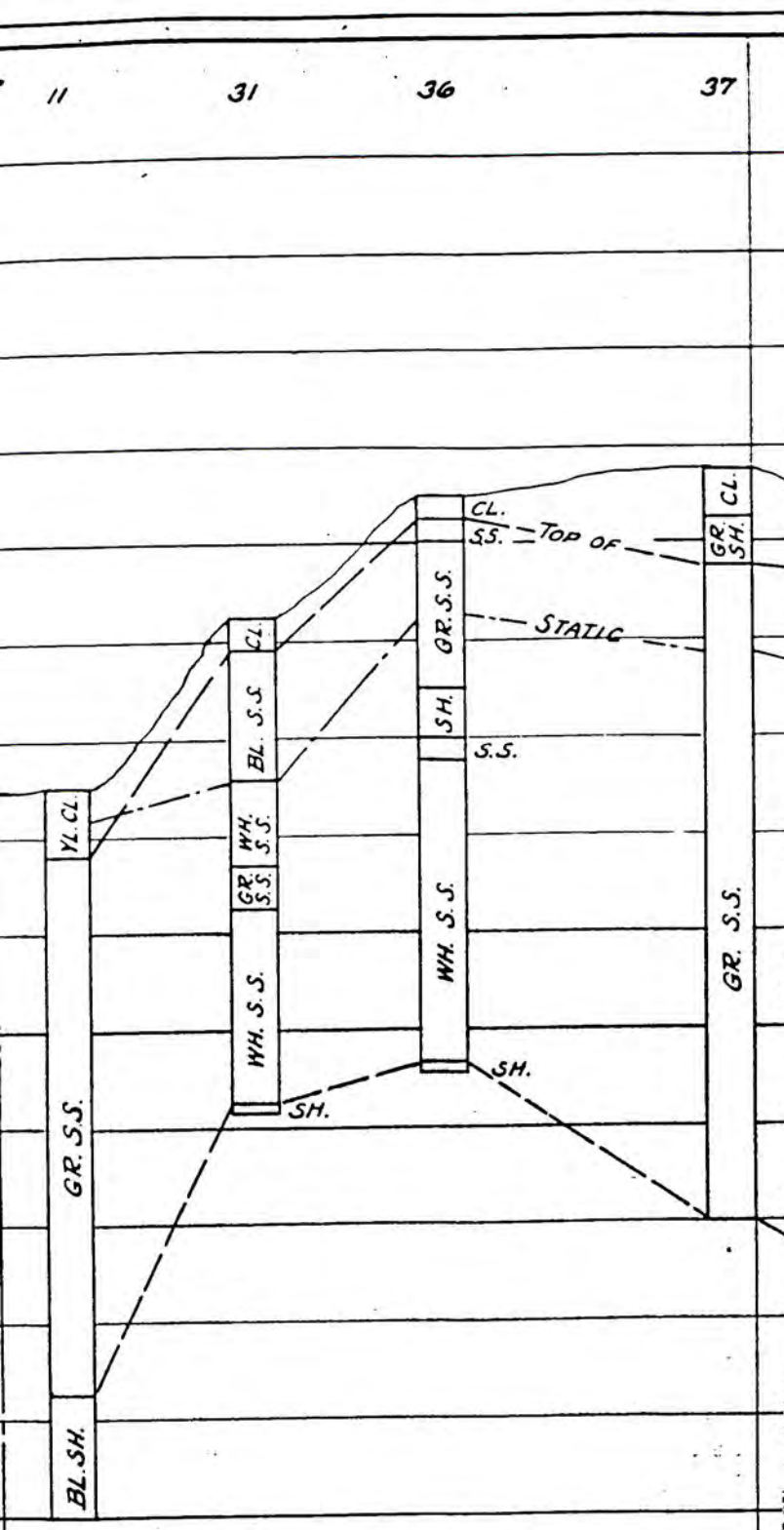
DRAWN BY	CHECKED BY	APPROVED BY DIRECTION	DATE
TRACED BY		LT. COL. ORD. DEPT. CONSTRUCTING QUARTERMASTER	PLAN NUMBER 6934
			1140-131

DRAWING REVISED PER FIELD SURVEY
DATE JUNE 9, 1953
CONTRACT NO. DA-11-173-ORD-65
TRYGVE HOFF & ASSOCIATES
DEV. BY A. F. M. CHK'D BY R. F. M.

REF. { 1140.138
1140.137

COMPILED BY R.L. BARRETT
GEOLOGICAL ASSISTANT

ENCLOSURE 4-A(1)



11W

REVIEWED – NO REVISION
DATE MAR-9-71
REV. BY RLA CHK'D. BY RLA

RAVENNA ARMY AMMUNITION PLANT

LEGEND FOR WELL STRATA

YL.	YELLOW
RD.	RED
BR.	BROWN
GR.	GRAY
BL.	BLUE
WH.	WHITE
FN.	FINE
LT.	LIGHT
S.	SAND
S.S.	SANDSTONE
S.H.	SHALE
CL.	CLAY
S.CL	SANDY CLAY
GRA.	GRAVEL
Q.S.	QUICKSAND

BUR WATSON AND ASSOCIATES
ARCHITECTS AND ENGINEERS
HARDING A.S.C.E.
ENG. 233
AU.A. I. A.
ARCH. 813
GEORGE E. BARNES
CONSULTING ENGINEER
CLEVELAND, OHIO
NEWARK, OHIO

CONSTRUCTION DIVISION
OFFICE OF THE QUARTERMASTER GENERAL

RAVENNA ORDNANCE PLANT
STUDY OF WELLS FOR WATER SUPPLY
NORTH – SOUTH
GEOLOGICAL SECTIONS
FIG. 8 OF 8

DRAWN BY	CHECKED BY	APPROVED BY DIRECTION	DATE
Mentzer			
TRACED BY Thompson		LT. COL. ORD. DEPT. CONSTRUCTING QUARTERMASTER	FILE NO. 6934
			1140-138

ENCLOSURE 4-A(2)

OhioEPA
State Of Ohio Environmental Protection Agency
P.O. Box 1049, 361 East Broad St., Columbus, Ohio 43266-0149
614-8565
Richard F. Celeste, Governor

November 17, 1987

RE: SOLID WASTE
PORTAGE COUNTY
RAVENNA ARSENAL LANDFILL

Mr. H. R. Cooper
Plant Engineer
Ravenna Arsenal, Inc.
8451 State Route 5
Ravenna, Ohio 44266-9297

Dear Mr. Cooper:

This letter is pursuant to the review of the groundwater monitoring proposed for the Ravenna Arsenal Landfill, Portage County, which was received by this office on August 17, 1987. The submittal included much subsurface data including the boring logs for four (4) proposed monitor wells, cross sections, two piezometric surface maps, and multi-level groundwater quality data for all four monitor sites. Groundwater flow has been determined to be to the northeast. As a result, the proposed locations of monitor wells MW-1 and MW-4 would be upgradient while only well MW-3 would be clearly downgradient of the landfill. This office suggests that an additional downgradient well be located in the area between well MW-1 and MW-3 north of the facility.

The proposal for using two inch PVC flush joint casing with five foot screens is acceptable and well development should be in the first saturated horizon in sandstone which is laterally continuous under the facility. This office also requests all elevation data to be in reference to mean sea level. Also, groundwater sampling, as required by OAC 3745-27-09(G) shall be semiannually.

Hopefully, this letter clarifies our position on this matter. If you have any questions, feel free to contact this office.

Sincerely,

Mark F. Schmidt
Environmental Engineer 3
Division of Solid & Hazardous Waste Management

MFS:mjo

cc: Dave Budd, NEDO
Dave Wertz, NEDO
Chris Khourey, DGW, NEDO
Dan Harris, DSHWM, CO
Portage County Health Dept., Attn: Chip Porter

ENCLOSURE 4-B

ADDENDUM

Monitoring Well Completion and Development

The existing test holes were converted to permanent monitoring wells completed in the uppermost saturated zone, as requested by the Northwest District, Ohio EPA. The holes were first backfilled with clean sand and gravel (the material most closely resembling the original geology) to 10 feet below the ultimate screen depth. Bentonite pellets were then emplaced from that depth to the bottom of the screened zone.

Two-inch diameter flush-joint PVC casing and screen were then set in the hole, a sand pack placed around the screen, and the remaining annulus back-filled and sealed with bentonite pellets (immediately on top of the coarse sand pack) and bentonite slurry. The wells were then fully developed in preparation for the second round of sampling on March 14, 1988. The appendix contains a typical well completion diagram as well as the results of the second sampling round.

A fifth monitoring well (MW-5) was drilled and completed in a manner identical to MW-1 through MW-4. Its location is shown on the revised location plat in the appendix. This was drilled to provide the required third down gradient monitoring well.

ENCLOSURE 4-C

samples collected 29 June 87

Ravenna Arsenal Monitoring Well Analyses

Parameter	MW 1			MW 2			MW 3			MW 4			Units
	27'	95'	163'	22'	87'	152'	20'	85'	150'	28'	94'	160'	
Arsenic	.007	.016	.016	.006	.009	.011	ND	ND	ND	.008	.013	.013	mg/l
Barium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/l
Calcium	27	36	35	5.2	20	26	120	127	140	49	44	45	mg/l
Cadmium	.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/l
Chromium	ND	.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/l
Iron	7.1	15	17	1.9	6.7	7.4	.82	.56	.51	8.7	13	14	mg/l
Mercury	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/l
Magnesium	15	19	21	4.4	9.1	11	42	43	48	22	23	24	mg/l
Sodium	10	11	10	1.4	1.4	1.6	11	9.7	9.8	2.2	1.5	1.8	mg/l
Lead	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/l
Selenium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/l
Alkalinity	26	67	4	ND	ND	ND	72	161	148	82	90	76	mg/l
Chloride	7	5	6	ND	ND	ND	5	4	5	2	2	ND	mg/l
Chem. Ox. Dem.	11	11	37	5.3	11	24	13	59	77	5.3	8.0	19	mg/l
Sp. Cond.	300	320	300	120	200	200	500	750	800	320	300	300	umhos/cm
Fluoride	.1	.2	.2	ND	ND	.1	.3	.1	.1	.6	.7	.6	mg/l
Meth. Bl. Active Subst.	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/l
Ammonia Nitrogen	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/l
Nitrate Nitrogen	ND	ND	ND	ND	ND	ND	.4	.2	.2	ND	ND	ND	mg/l
Phenolics	.01	.01	.01	ND	ND	ND	ND	.006	.01	.02	ND	ND	mg/l
pH	6.0	6.1	6.2	4.0	4.2	4.4	6.0	6.4	6.5	6.6	6.6	6.5	S.U.
Sulfate	130	110	120	47	94	130	220	370	380	120	110	110	mg/l
TDS	260	270	270	120	220	270	450	770	770	300	290	290	mg/l
TOC	ND	ND	ND	ND	ND	1	2	8	11	1	ND	ND	ppm

THE OHIO DRILLING CO.

INCORPORATED

MASSILLON, OHIO

DRILLED FOR Ravenna Arsenal, Inc. - Ravenna, Ohio HOLE NO. MW 1

DRILLED BY Paul Ortz DRILLER COMPLETED June 18, 19 87

LOCATION Northwest corner of Ramsdell Quarry

LENGTH OF STRATA	STRATA	TOTAL DEPTH	WEAVED	WATER FROM SURFACE
2 ft. 2	Soil	2 ft.		
7 ft. 7	Red Sandstone	9 ft.		
2 ft. 2	Grey Sandstone	11 ft.		
7 ft. 7	Red Sandstone	18 ft.		
146 ft. 146	Gravish-White Sandstone	164 ft.		
11 ft. 11	Shale	175 ft.		
	First water-bearing zone - 41 ft.			
	Second water-bearing zone - 60 ft.			

ENCLOSURE 4-E(1)

THE OHIO DRILLING CO.

INCORPORATED

MASSILLON, OHIO

DRILLED FOR Ravenna Arsenal, Inc. - Ravenna, Ohio HOLE NO. MW 2

DRILLED BY Paul Orr DRILLER COMPLETED June 17 19 87

LOCATION Southeast corner of Ramsdell Quarry

CHANGE OF STRATA	STRATA	TOTAL DEPTH	HEAVED	WATER FROM SURFACE
11 ft. 11	Reddish Sandstone	11 ft.		
11 ft. 11	White Sandstone	22 ft.		
11 ft. 11	Red Sandstone	33 ft.		
74 ft. 74	White Sandstone	107 ft.		
5 ft. 5	Shale	112 ft.		
40 ft. 40	White Sandstone	152 ft.		
ft. 13	Shale	165 ft.		
	First water-bearing zone - 34 ft.			
	Second water-bearing zone - 53 ft.			
	8" casing with locking cap installed to bedrock.			
			ENCLOSURE	4-E (2)

THE OHIO DRILLING CO.

MASSILLON, OHIO

DRILLED FOR Ravenna Arsenal, Inc. - Ravenna, Ohio HOLE NO. MW 3

DRILLED BY Paul Ortz DRILLER COMPLETED June 17, 19 87

LOCATION Northeast corner of Ramsdell Quarry

THICKNESS OF STRATA	STRATA	TOTAL DEPTH	CASED	WATER FROM SURFACE
2 ft. 2	Soil	2 ft.		
2 ft. 2	Clay	4 ft.		
12 ft. 12	Sandstone	16 ft.		
2 ft. 2	Brown Sandstone	18 ft.		
35 ft. 35	Light Sandstone	53 ft.		
37 ft. 37	Gravish-White Sandstone	90 ft.		
1½ ft. 1½	Shale Streaks	91½ ft.		
1½ ft. 1½	White Sandstone	93 ft.		
5 ft. 5	Shale	98 ft.		
29 ft. 29	Sandstone Conglomerate	127 ft.		
4 ft. 4	Shale	131 ft.		
20 ft. 20	White Sandstone	151 ft.		
14 ft. 17	Shale	165 ft.		
	First water-bearing zone - 18 ft.			
	Second water-bearing zone - 42 ft.			
	Third water-bearing zone - 53 ft.			
	8" casing with locking cap installed to bedrock.			

ENCLOSURE 4-E(3)

THE OHIO DRILLING CO.

MASSILLON, OHIO

DRILLED FOR Ravenna Arsenal, Inc. - Ravenna, Ohio HOLE NO. MW 4

DRILLED BY Paul Ortz DRILLER COMPLETED June 18, 19 87

LOCATION Southwest section of Ramsdell Quarry

THICKNESS OF STRATA	STRATA	TOTAL DEPTH	CASED	WATER FROM SURFACE
3 ft. 3	Fill Material	3 ft.		
3 ft. 3	Brown Sandstone	6 ft.		
6 ft. 6	Red Sandstone	12 ft.		
5 ft. 5	Gray Sandstone (damp)	17 ft.		
12 ft. 12	Brown Sandstone	29 ft.		
85 ft. 85	White Sandstone	114 ft.		
ft. 3	Shale	117 ft.		
ft. 3	Sandstone Conglomerate	155 ft.		
2 ft. 2	Shale	157 ft.		
3 ft. 3	Sandstone	160 ft.		
5 ft. 5	Shale	165 ft.		
	Water-bearing zone - 55 ft.			
	8" casing with locking cap installed to bedrock.			

ENCLOSURE 4-E(4)

THE OHIO DRILLING CO.

MASSILLON, OHIO

DRILLED FOR Ravenna Arsenal, Inc. - Ravenna, Ohio HOLE NO. MW-5
6" Well

DRILLED BY Randy McKay DRILLER COMPLETED January 12, 19 88

LOCATION 50 ft. south of Ramsdell Rd., 231 ft. west of MW-3

THICKNESS OF STRATA	STRATA	TOTAL DEPTH	CASING	WATER FROM SURFACE
11 ft.	Brown Sandstone	11 ft.		
1 ft.	Gray Sandstone	12 ft.		
2 ft.	Brown Sandstone	14 ft.		
2 ft.	Gray Sandstone	16 ft.		
3 ft.	Brown Sandstone	19 ft.		
3 ft.	Gray Sandstone	22 ft.		22 ft.
11 ft.	Brown Sandstone (water-bearing)	33 ft.		
ft.	Gray Sandstone	38 ft.		
12 ft.	Brown Sandstone	50 ft.		
	Converted to 2" diameter monitoring well, screened			
	33 to 43 ft. below grade.			

ENCLOSURE 4-E (5)

Ravenna Arsenal Monitoring Well Elevations

(Using USGS, MSL Datum)

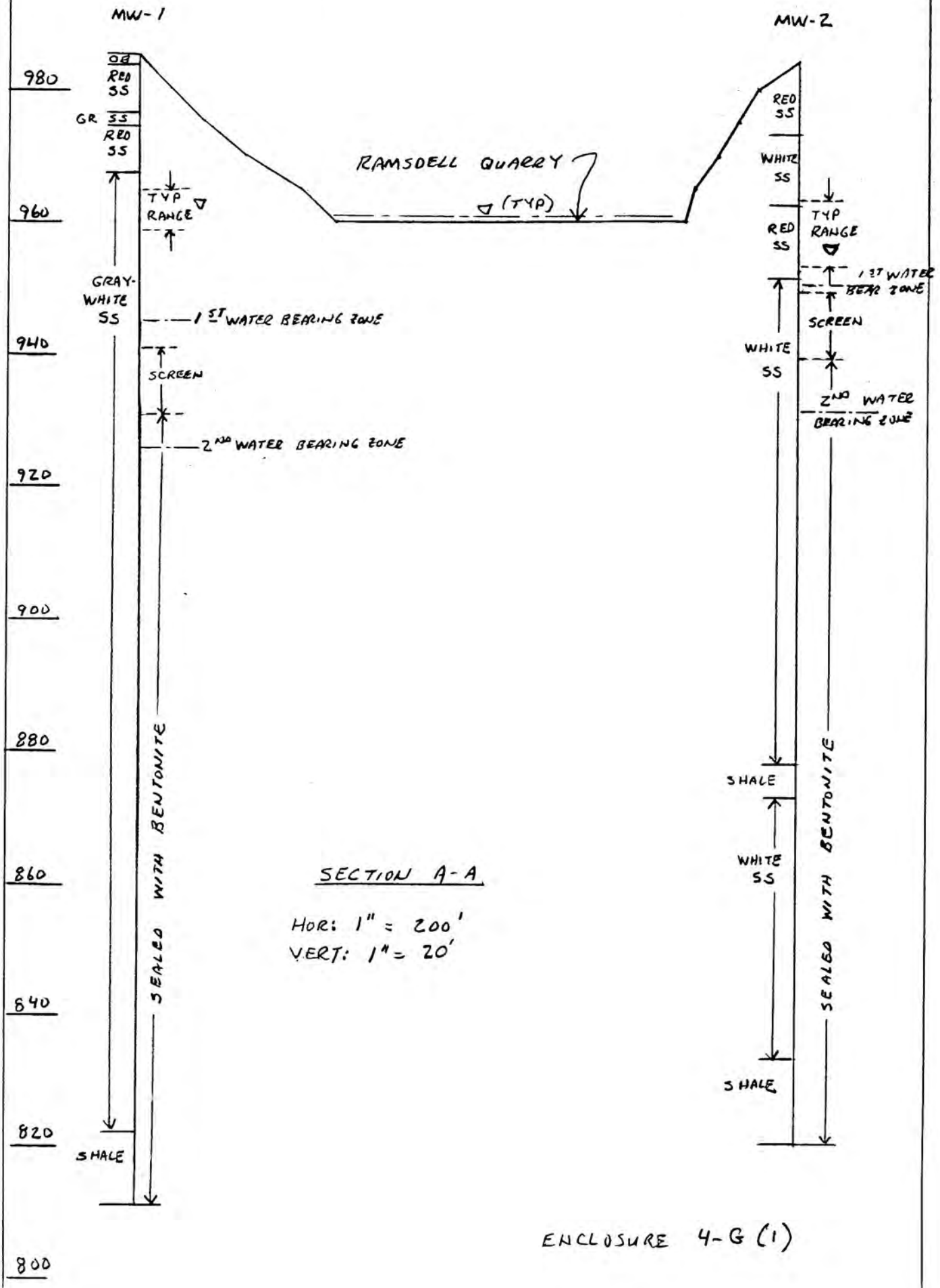
MW-1	MW-2	MW-3	MW-4	MW-5
*986.54 ft.	982.13 ft.	977.00 ft.	989.57 ft.	978.49 ft.
screened 45' - 55' below grade	screened 35' - 45' below grade	screened 35' - 45' below grade	Screened 45' - 55' below grade	screened 33' - 43' below grade

* Elevation of top of outer steel casing.

History of Water Level Elevations (MSL Datum)

Date	MW-1	MW-2	MW-3	MW-4	MW-5
6-26-87	961.05 ft.	960.62 ft.	958.32 ft.	962.88 ft.	not drilled
7-7-87	956.08 ft.	961.15 ft.	959.90 ft.	962.80 ft.	not drilled
7-21-87	962.90 ft.	960.89 ft.	959.90 ft.	964.72 ft.	not drilled
11-20-87	958.04 ft.	957.55 ft.	956.42 ft.	959.74 ft.	not drilled
4-25-88	960.04 ft.	960.80 ft.	959.75 ft.	961.57 ft.	958.32 ft.

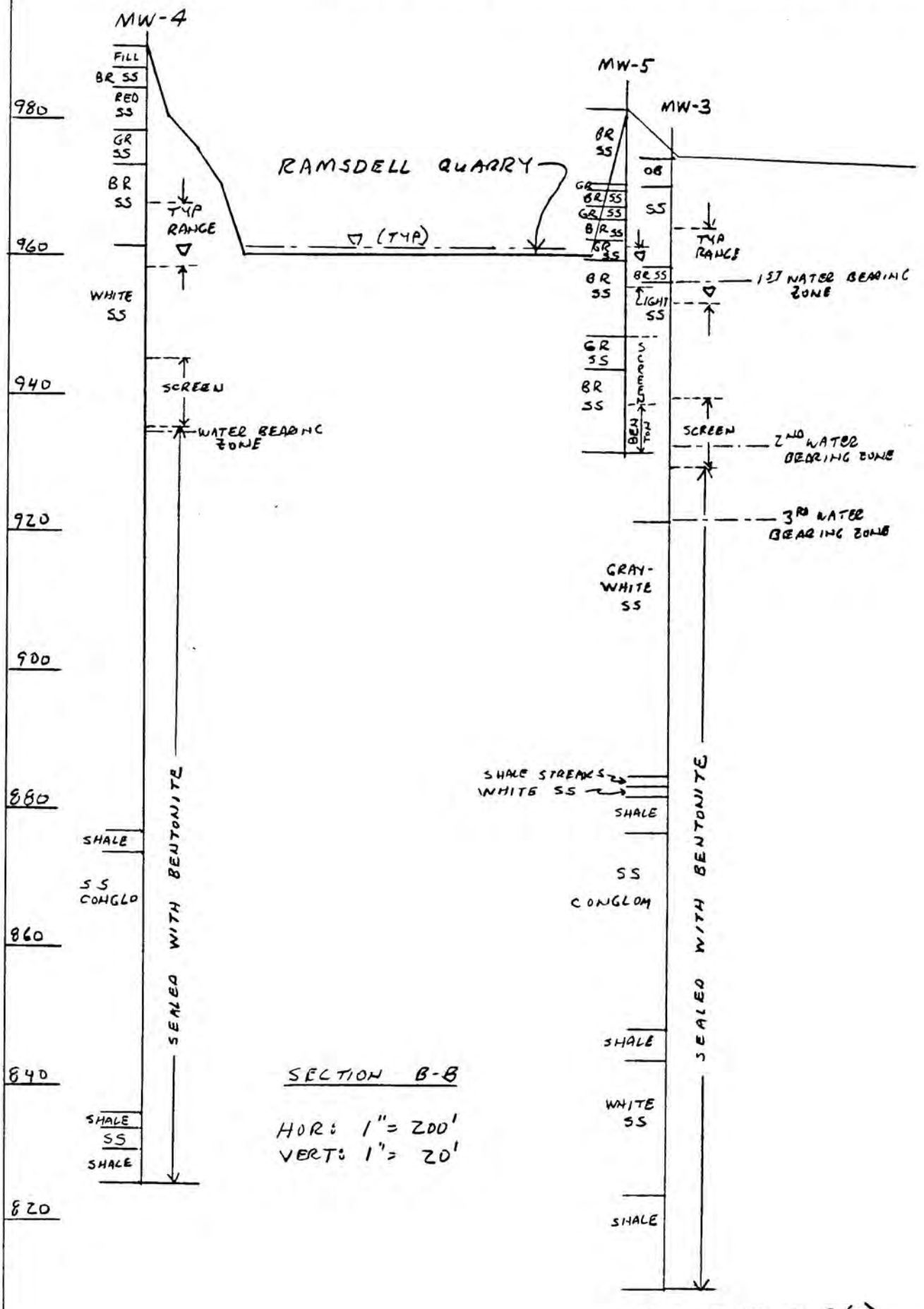
ENCLOSURE 4-F



SECTION A-A

HOR: 1" = 200'
VERT: 1" = 20'

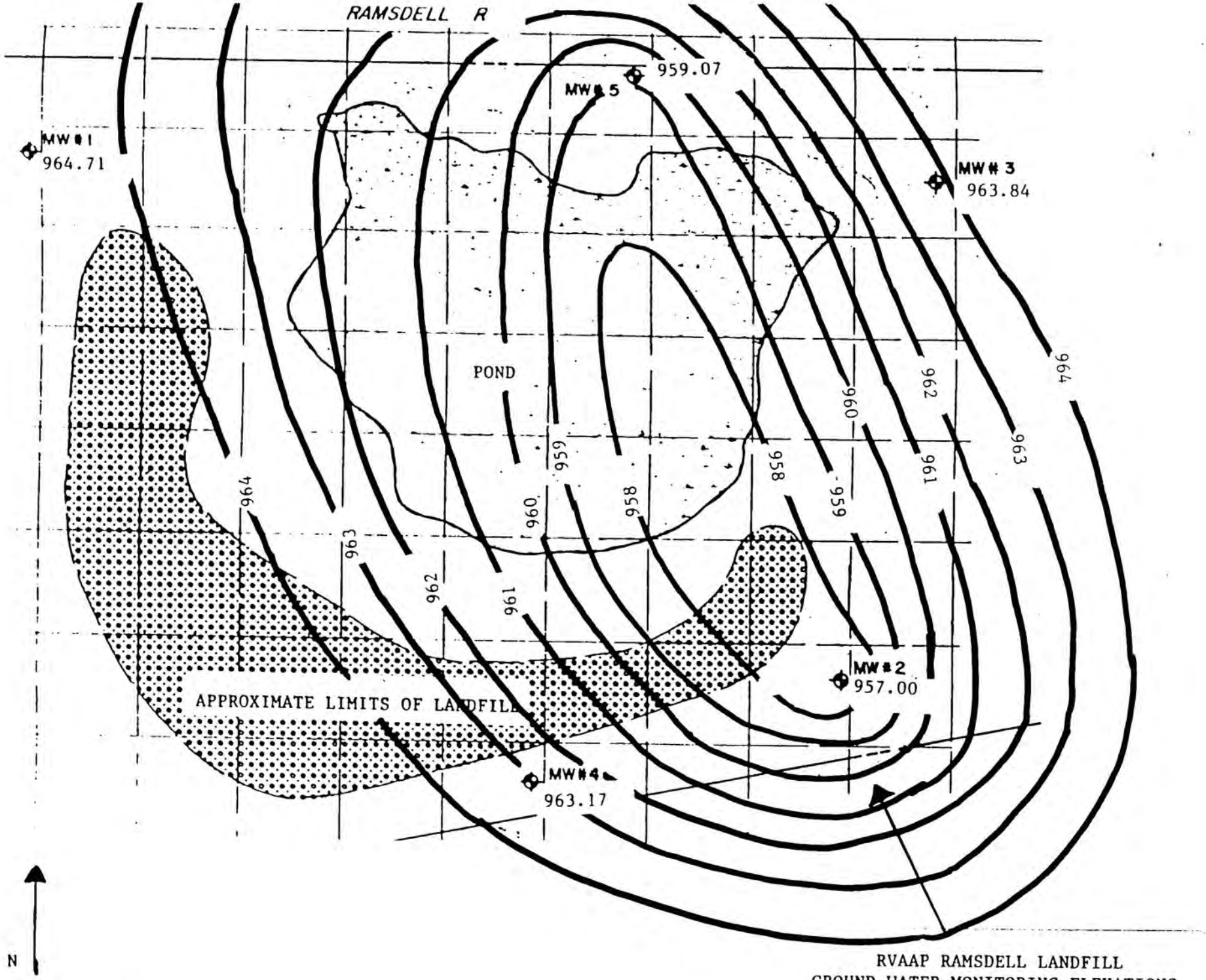
ENCLOSURE 4-G (1)



SECTION B-B

HOR: 1" = 200'
VERT: 1" = 20'

ENCLOSURE 4-G(2)

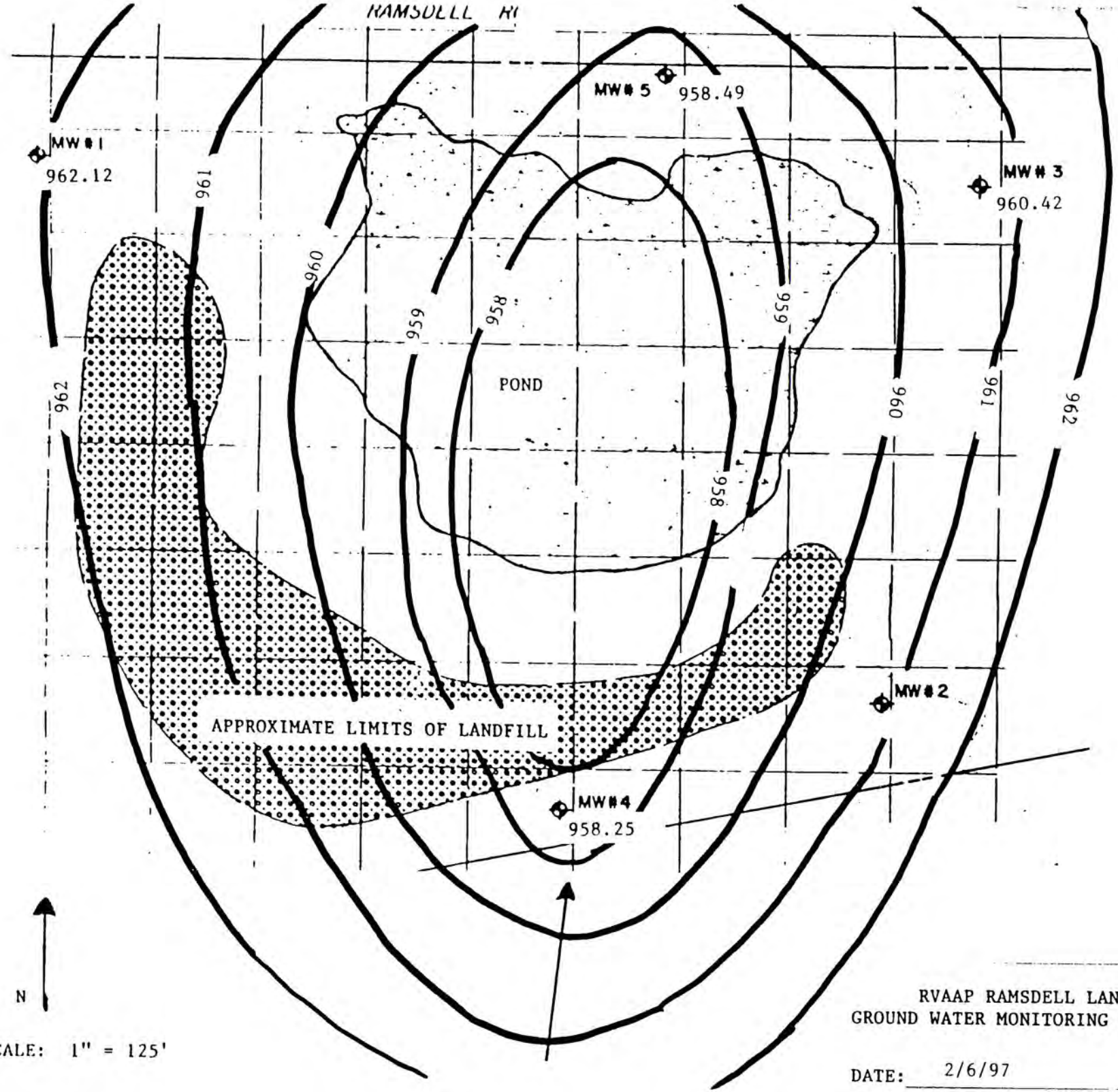


SCALE: 1" = 125'

RVAAP RAMSDELL LANDFILL
GROUND WATER MONITORING ELEVATIONS

DATE: 12/19/96

ENCLOSURE 4-H(1)

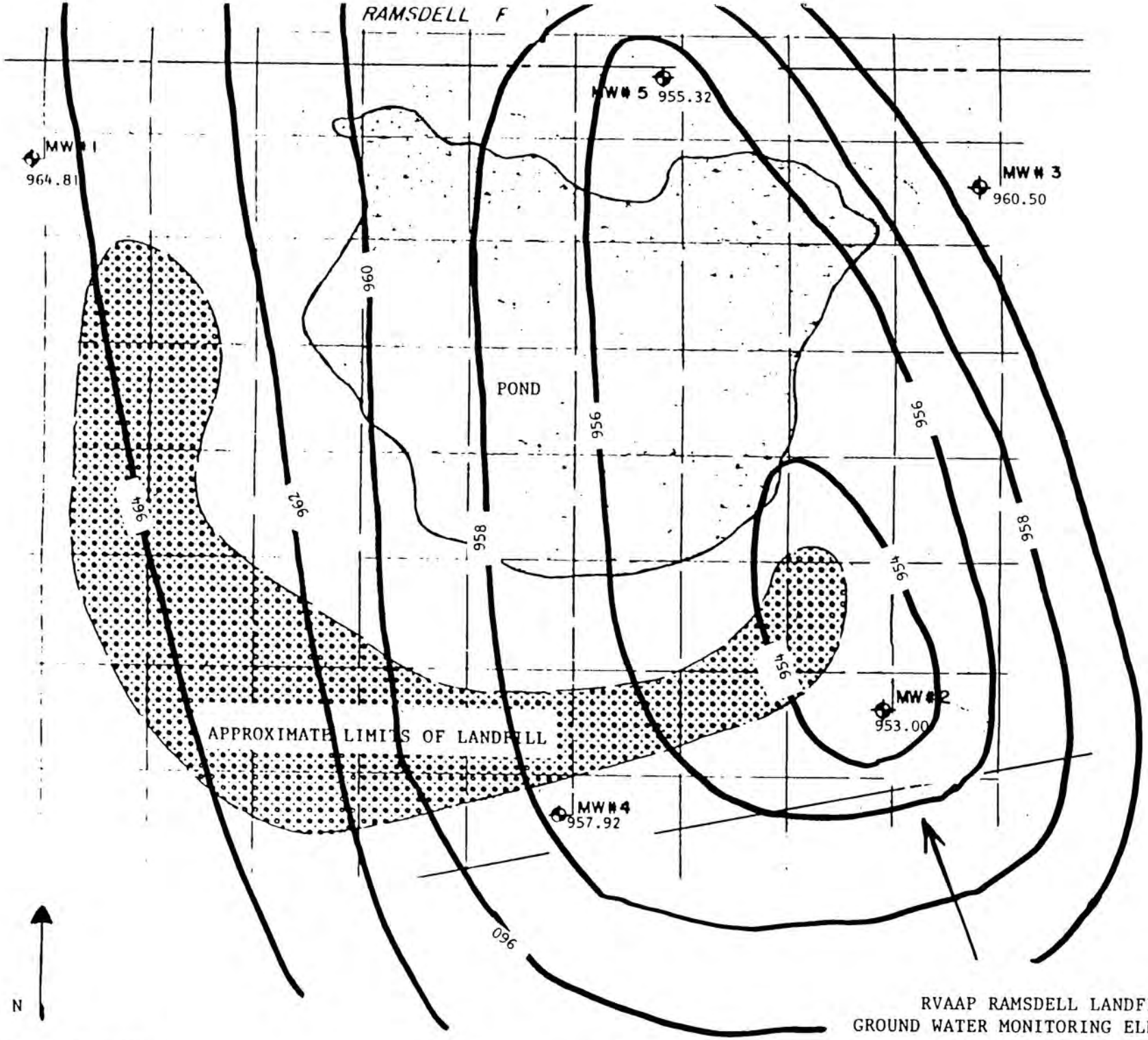


SCALE: 1" = 125'

RVAAP RAMSDELL LANDFILL
GROUND WATER MONITORING ELEVATIONS

DATE: 2/6/97

ENCLOSURE 4-H(2)

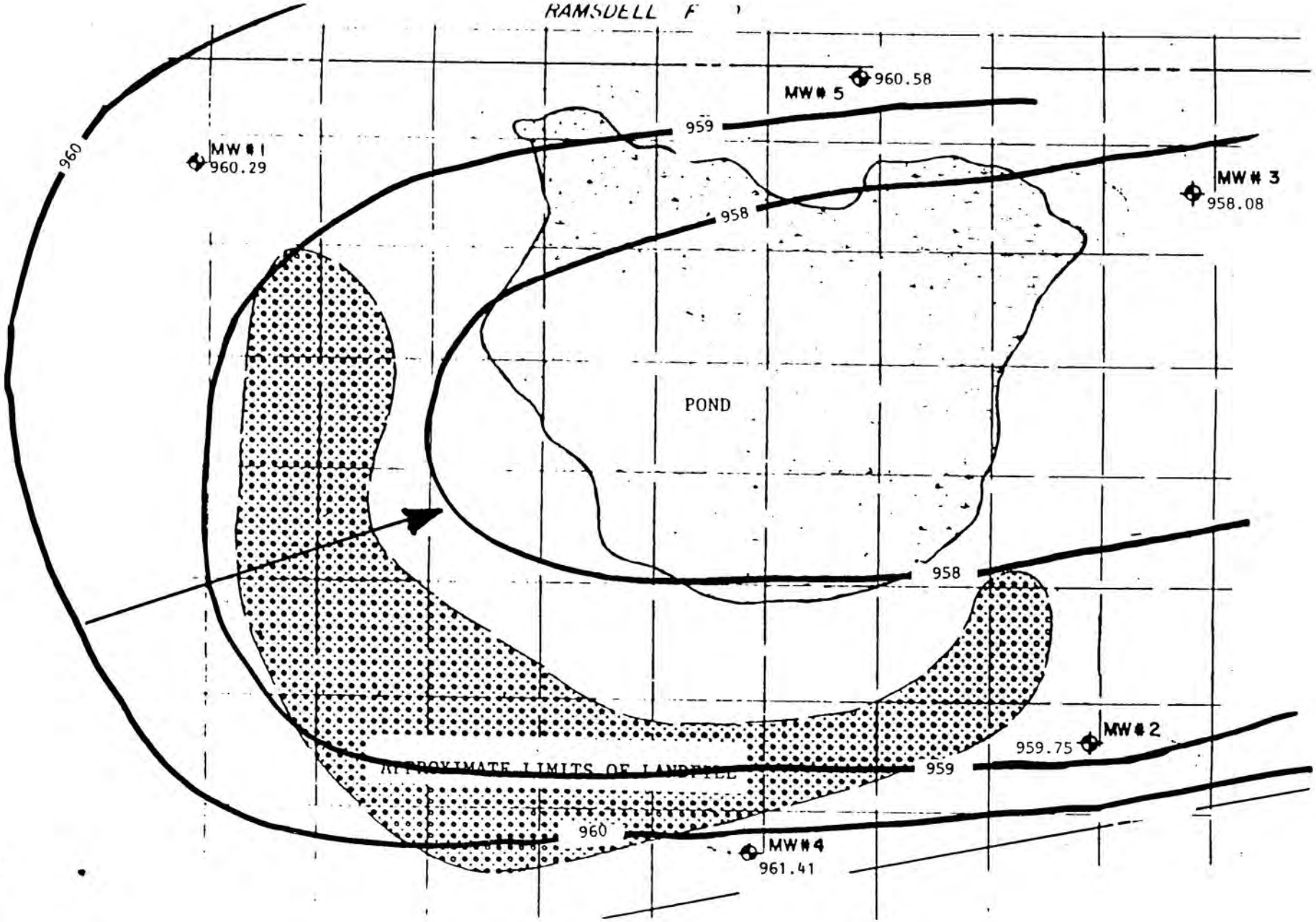


SCALE: 1" = 125'

RVAAP RAMSDELL LANDFILL
GROUND WATER MONITORING ELEVATIONS

DATE: June 26, 1997

ENCLOSURE 4-H(3)



SCALE: 1" = 125'

RVAAP RAMSDELL LANDFILL
GROUND WATER MONITORING ELEVATIONS

DATE: October 7, 1997

ENCLOSURE 4-H (4)

TMA
Thermo Analytical Inc.

TMA/ERG
7777 Exchange Street
Cleveland, OH 44125-3337

(216) 447-0790

RAVENNA ARSENAL, INC.
LANDFILL GROUNDWATER REPORT

WELL #1 - #5

TMA PROJECT: 0246

FEBRUARY, 1993

Approved by: William L. Ramus

William L. Ramus
Operations Manager

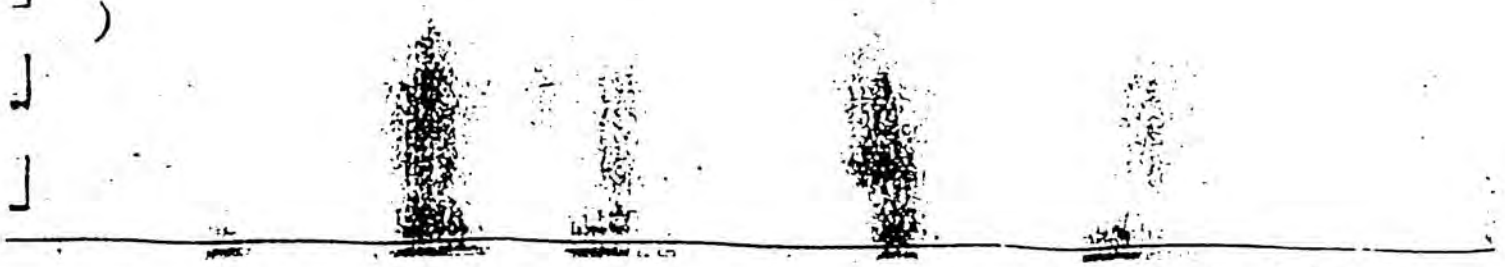
ENCLOSURE 4- I

TMA/

RESULTS

PARAMETER	WELL #4	WELL #5	UNITS
TNT	ND(1.0)	ND(1.0)	ug/l
HMX	ND(1.0)	ND(1.0)	ug/l
RDX	3.3	ND(1.0)	ug/l
2-4 DNT	ND(1.0)	ND(1.0)	ug/l
2-6 DNT	ND(1.0)	ND(1.0)	ug/l

ND - Nondetectable; detection limit next to "ND" notation



ENCLOSURE 4-I

Wilcoxon Rank-Sum Test
Report Printed: 10-13-1997 14:07

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:1,2DCE 1,2-Dichloroethane

CAS Number: 107-06-2
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 2.000 ppb

Start Date:Nov 22 1988
End Date:Dec 19 1996

Data Mode:Log Transformed

Background Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-4	15	100	1.61	0.92	0.96	0.18

Compliance Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-2	13	92	2.30	0.92	1.08	0.42

Well	Date	Observation	Rank
MW-4	11/07/91	0.9163	13.0
MW-4	02/27/92	0.9163	13.0
MW-4	06/25/92	0.9163	13.0
MW-4	10/01/92	0.9163	13.0
MW-4	02/25/93	0.9163	13.0
MW-4	07/15/93	0.9163	13.0
MW-4	02/21/94	0.9163	13.0
MW-4	07/28/94	0.9163	13.0
MW-4	12/22/94	0.9163	13.0
MW-4	06/28/95	0.9163	13.0
MW-4	06/28/95	0.9163	13.0

ENCLOSURE 4-J

MW-4	12/14/95	0.9163	13.0
MW-4	12/14/95	0.9163	13.0
MW-4	06/20/96	1.6094	26.5
MW-4	12/19/96	0.9163	13.0
	Background Data Rank-Sum:		208.5
MW-2	11/07/91	0.9163	13.0
MW-2	02/27/92	0.9163	13.0
MW-2	06/25/92	0.9163	13.0
MW-2	10/01/92	0.9163	13.0
MW-2	02/25/93	0.9163	13.0
MW-2	07/15/93	0.9163	13.0
MW-2	02/21/94	0.9163	13.0
MW-2	07/28/94	0.9163	13.0
MW-2	12/22/94	0.9163	13.0
MW-2	06/28/95	0.9163	13.0
MW-2	12/14/95	0.9163	13.0
MW-2	06/20/96	1.6094	26.5
MW-2	12/19/96	2.3026	28.0
	Compliance Data Rank-Sum:		197.5

Background Data Pts m:	15
Compliance Data Pts n:	13
Wilcoxon Statistic W:	106.5000
Expected Value E(W):	97.5000
Std Dev SD(W):	21.7083
Std Dev (Ties) SD'(W):	11.6535
Approx Z-Score Z:	0.7294
Significance Level α:	0.05
$Z\alpha$:	1.6449

Since the Approx. Z-Score does not exceed $Z\alpha$ there is no significant evidence of contamination at the compliance well.

Author: RWHELOVE at ri3904s1
Date: 12/3/97 10:47 AM
Priority: Normal
TO: JCICERO at ccremote
TO: MPATTERS at ccremote
TO: TMORGAN1 at ccremote
TO: WINGOLD at ri3503s1
TO: eileen.mohr@epa.state.oh.us at SMTP-DDN
TO: kjasper@smtp.orl.usace.army.mil at SMTP-DDN
TO: jjent@smtp.orl.usace.army.mil at SMTP-DDN
Subject: Mtg at twinsburg for the ramsdell landfill, 11&12 DEC
---------- Message Contents ----------

Jarnal Singh of the OEPA and I have been trading phone msgs back and forth and I am ready to inform him our mtg will be at twinsburg on the 11th and 12th starting at 0900 on the 11th.
We have an outstanding letter from the OEPA on the landfill which does not have a suspense but could easily turn into a NOD or NOV if we do not show reasonable response time to. As you recall we met at rvaap in late nov with M&H over the topic. The OEPA letter is now about a month old.
It has been my approach to work out a recommendation which the Army feels comfortable with about the landfill and I think we have done this now. I would like to propose our fix to the OEPA verbally and get them to by into our approach prior to replying in writing to their letter.
I need Mark to intercede with me with Jim McGee. I thought we had an agreement with Jim about using an electronic tape to measure water levels in existing wells and the pond monthly but when John Jent called about the tape to Jim he backed off his statement. We need to clear this up because the water levels are key to our reply with the OEPA. I have asked the COE to buy the tape and I also asked them to provide training to M&H in the scope of work so they feel comfortable measuring the levels for us.
Our fall back position if M&H does not want to measure the levels is to mobilize someone through SAIC to measure the levels at much more expense. I can appreciate Jim's position and if he wants us to expense him through the contract we can take that approach also to measure the water levels. It would require a scope of work through procurement here at Rock Island to do that. Whatever, I just need to know I can measure water levels prior to the 11th.
Let me know soon what M&H wants to do and I will finalize the mtg at twinsburg for all parties. We need to so this soon. Thanks Bob Whelove Jr.

DRAFT

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

December 4, 1997

Ohio Environmental Protection Agency, Northeast District Office
Jarnal Singh, RS
Environmental Specialist
Division of Solid and Infectious Waste Management
2110 E. Aurora Road
Twinsburg, OH 44087-1969

Dear Sir,

1 We are writing in response to your letter dated August 21, 1997 concerning Ground Water Monitoring, Ramsdell Landfill at the Ravenna Army Ammunition Plant in Ravenna, OH. Basically, while we believe that the Army has carried out the requirements of the March 1, 1990 Ground Water Monitoring Program for the Ramsdell Quarry, there are many significant concerns, including:

- Past burning and demolition of explosives at the base of the quarry east of the closed sanitary landfill, see Enclosure 1,
- Inconsistent ground water flow patterns between the five (5) site ground water monitoring wells,
- Lack of data to determine the relationship between the pond directly east of the closed sanitary landfill and the site ground water monitoring wells, and
- Detections from at least three sampling events at all five ground water monitoring wells of explosives in ground water, (thus essentially leaving no "up gradient" monitoring wells), see Enclosures 2(A,B).

Based on these concerns we believe that an entirely new and more comprehensive program needs to be conducted to better define the basic processes on-going at the Ramsdell Quarry. We are thus in agreement with many of the basic concerns raised in your letter. Many of the questions pertaining to individual sampling events relate to statistical comparisons of data to "up gradient" monitoring wells. We believe now that based on the collected data, none of the five ground water monitoring wells is truly "up gradient".

DRAFT

2 To better determine ground water flow and environmental conditions at the Ramsdell Quarry, we have prepared a "Proposed Ramsdell Ground Water Investigation Plan", see Enclosure 3, that we feel addresses many of the outstanding questions relating to the quarry. Upon completion of at least 12 monthly sets of readings of the water levels/elevations in the monitoring wells and pond, and quarterly sampling and analyses, a much better understanding of the ground water situation at the quarry will be achieved, and a prudent course of action to address any remaining environmental problems can be developed. Additionally, related CERCLA ground water monitoring activities will be further along to aid in understanding how the ground water behavior at the quarry relates to the ground water flow at the plant in general.

3 A notebook maintained by RVAAP containing Significant Ramsdell Quarry Ground Water Monitoring information is provided for your reference as Enclosure 5. Of particular importance are the ,

- Ramsdell Quarry Monitoring Wells and Hydrogeologic Investigation, dated June 3, 1998. and
- Report on Field Work at the RVAAP, dated August 10, 1987.

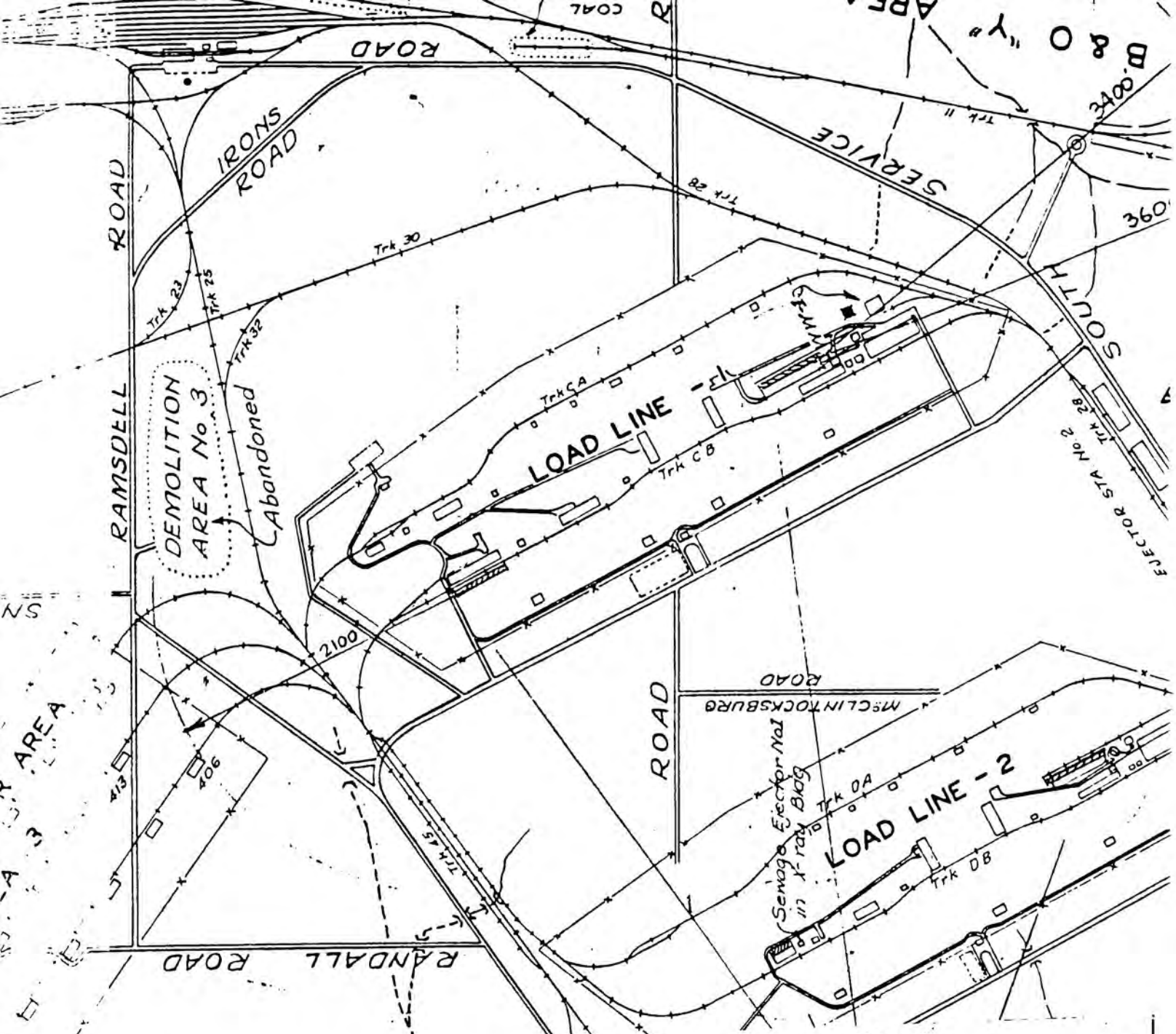
4 Finally, responses to your individual comments of the August 21, 1997 letter are provided as Enclosure 4.

5 We look forward to meeting with you to discuss these issues.

Sincerely,

Enclosures

1 General Site Map, dated March 1947
2A Plan of Ramsdell Quarry Existing Monitoring Well Locations
2B Explosives Concentrations in Ramsdell Landfill Ground Water Monitoring Wells
3 Proposed Ramsdell Ground Water Investigation Plan
4 Responses to OEPA Letter, dated August 10, 1997.
5 Ramsdell Ground Water Monitoring Notebook



Showing

LOCATION OF PROPOSED

~~METAL~~ INERT

STORAGE WAREHOUSES

RAVENNA ARSENAL

APCO OHIO

POST ENGINEER

GENERAL MAP

DRAWN: H.C. Weigelt	APPROVED: Anthony Fleming	DATE: MARCH 1947
TRACED: H.C. Weigelt	LT. COL. C.E., POST ENGINEER	SCALE: 1 IN. = ~~1000 FT~~ 1540 FT
CHECKED: Peck	DRAWING No. WD-E-101-S	

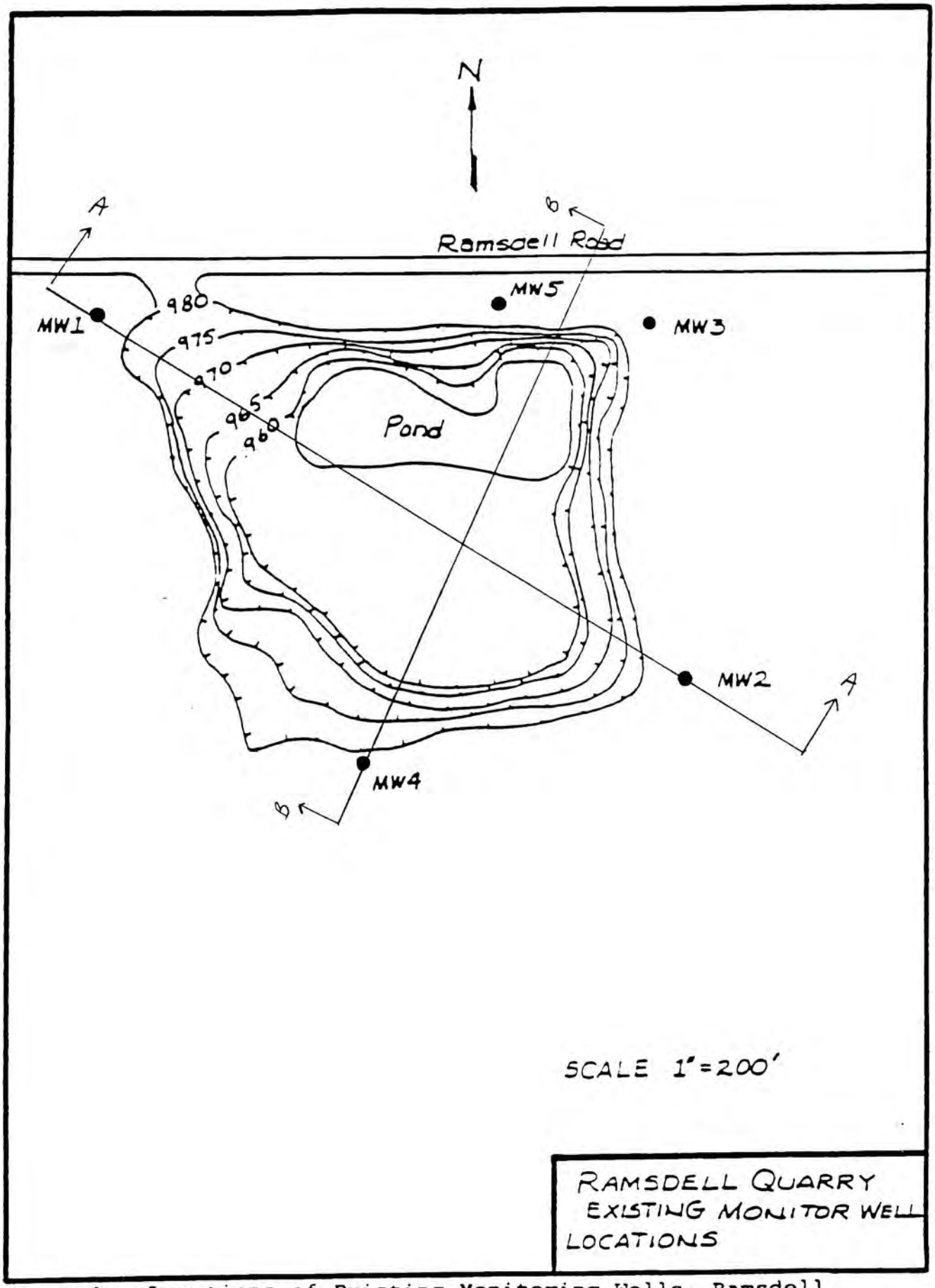


Figure 1. Locations of Existing Monitoring Wells, Ramsdell Quarry Landfill, Ravenna AAP

ENCL 2A

EXPLOSIVES CONCENTRATIONS IN RAMSDELL LANDFILL GROUND WATER MONITORING WELLS

SAMPLING DATE	MONITORING WELL #1 (IN UG/L)	MONITORING WELL #2 (IN UG/L)	MONITORING WELL #3 (IN UG/L)	MONITORING WELL #4 (IN UG/L)	MONITORING WELL #S (IN UG/L)
02/27/92	2,4 DNT 1.6	RDX 2.5			RDX 1.2 2,4 DNT 1.1 TNT 1.2
06/25/92	RDX 4.7	RDX 2.8 HMX 2.4		RDX 2.4	
10/01/92		RDX 2.4 HMX 2.2	TNT 2.8 RDX 1.7		
02/25/93	HMX 1.1			RDX 3.3	
07/15/93		HMX 1.9			RDX 3.0
07/28/94				HMX 1.8	
12/22/94	RDX 5.7	RDX 8.3 HMX 3.3	HMX 1.6 HMX 1.0 (DUP) RDX 9.5 RDX 4.1 (DUP)	RDX 2.3	RDX 2.5
02/28/95	RDX 3.1	RDX 1.3 HMX 1.8	RDX 4.2		
06/28/95		RDX 1.3 HMX 1.2			
08/30/95		RDX 1.6 HMX 1.2			
12/14/95			RDX 1.3		
06/20/96			TNT 8.8		
12/19/96	HMX 27 RDX 15			RDX 39	
02/06/97	2,6 DNT 24 RDX 20			HMX 16	
06/26/97	RDX 1.3 TNT 2.4	TNT 3.7	TNT 1.14 RDX 1.5		

RAMSDELL QUARRY - PROPOSED ACTION PLAN

0 FILES SEARCH

Thoroughly check all relevant files on-site and interview former/current employees familiar with the site.

1 BETTER DEFINE GROUNDWATER FLOW

A Accept site geohydrology as described in 1988 Hydrogeologic Investigation and Report on Field Work

B Resurvey 5 GW monitoring wells
Top riser/ surface elevation

C Set permanent pond staff gage

C.1 Set staff gage at pond capable of remaining in operation for 5 years w/o maintenance

D Survey pond staff gage

E Set control monuments near Ramsdell Quarry

F Develop 2-foot interval topographic map of site

G Read ground water well depths/elevs & pond elevs monthly.
And daily for 5 days after any rainfalls > 2 inches (Establish rain gage at Bldg 1036)

2 DETERMINE CHARACTER OF POND

A Sample and analyze pond water and monitoring well water quarterly and at same times

B Take pond water and bottom sediment samples, determine thickness of sediment and determine rock elevations beneath pond. Accomplish by personnel wearing hip waders.

B.1 Safety Plan- provide safety plan to facilitate water and sediment sampling

B.2 Pond Water
4 surface water samples (PIPER DIAGRAM)
4 samples of pond water within 1-foot of bottom

B.3 Pond Bottom Muck
8 - 32 sediment samples - depends on depth to rock
8 0 - 6 inches deep
8 6" - 2'
8 2 - 4'
8 4 - 6'

B.4 Test all samples for VOC's, SVOC's, TAL, Cyanide, Lithium, Explosives, Propellants, Black Powder

B.5 Test sediment samples for TOC and grain size.

3 IMPROVE FIELD SAMPLING/LAB TEST PROCEDURES

A Use different lab (Quanterra)

B Use improved 8330 method for lower detection limits of explosives

C Provide all field sampling data as described in GW Monitoring Plan

D Coordinate sampling events w/OEPA if they want to observe

ENCL 3

4 REEVALUATE STATISTICAL/ REPORTING PROCEDURES

A Verify performing statistical procedures described in GW Monitoring Plan- Do for now.

B Relook at triggering parameters- possibly change to site contaminants

C Relook at site "Background", especially in light of explosives detects; Incorporated results of facility-wide background values

5 COORDINATE ONGOING CERCLA ACTIVITIES w/RAMSDELL

A Facility-wide background

B GW monitoring wells at Load Line 1

C Evaluate test results from nearby groundwater supply wells, especially historic data.

8 most recent background { 4
only sampling event wells compared to

.01

DRAFT

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

December 4, 1997

Ohio Environmental Protection Agency
Jarnal Singh, RS
Environmental Specialist
Division of Solid and Infectious Waste Management
2110 E. Aurora Road
Twinsburg, OH 44087-1969

Subject: Response to Ohio EPA Review Letter, dated August 21, 1997, of Ramsdell Landfill Ground Water Monitoring Submittals

Dear Sir:

We have reviewed the referenced letter and comments regarding ground water monitoring at the RVAAP Ramsdell Landfill and have the following response to the comments as set forth in the above-referenced letter:

GENERAL COMMENTS

1. We agree that the relationship between the pond and the ground water at the landfill has not been defined. A permanent gage to measure pond elevation will be installed, and the pond level/elevation will be noted each time the ground water monitoring wells are read. Water depths/elevations at the five monitoring wells and the pond elevation will be read monthly.

2. In the "Report on Field Work at the Ravenna Army Ammunition Plant", Enclosure 5, prepared by the Ohio Drilling Company in August of 1987, the project geologist, Thomas J. Perkins, reported that,

- the differences in color "reflect changes in mineralization of the rock and other factors such as oxygenation of the ground water",
- the different water-bearing zones occur due to "well-developed joint and fracture patterns in the sandstone, creating zones of relatively high secondary porosity",
- "these zones do not represent separate aquifers",
- "In actuality, the sandstone is saturated up to a zone approximately 15 to 20 feet below the ground surface, and
- "the geology revealed in these four holes is fairly uncomplicated.

See Enclosure 4-A(1,2).

ENCL 4

The locations of the screened intervals for the wells was determined in consultation with the Ohio EPA Northeast District Office at the time of well installation. see OEPA letter dated November 17, 1987, Enclosure 4-B and Enclosure 4-C. Attempts are being made to better determine the rationale for the locations of the screened intervals. However, the OEPA letter states that the well screens would be in the "first saturated horizon in sandstone which is laterally continuous under the facility". This is probably based on the Monitoring Well Analyses, Enclosure 4-C, contained in the Appendix of the August 10, 1987 Field Report, which indicated negligible differences in concentrations of parameters with depth of sampling in the wells. Reference to the drill logs for the 5 monitoring wells, provided as Enclosures 4-E(1-5), and the table of well screens, Enclosure 4-F, indicates that the grayish-white, white, light, white, and gray sandstones at MW- (1-5), respectively were selected as being the first laterally continuous layer. Cross-sections of the monitoring wells in relation to the pond are shown as Enclosures 4-G(1,2).

3. Prior to closure, waste material at the landfill extended right up to the pond, and therefore, placement of wells in this area would probably not represent down gradient conditions.

4. The wrong "top of casing" elevation was inadvertently entered into the GRITS/STAT program. The correct elevation, as taken from the final landfill closure drawings, is 982.50. This has been corrected in GRITS/STAT. Well depths have been corrected based upon information provided in The Ohio Drilling Company's "Report on Field Work at the Ravenna Army Ammunition Plant". The corrected depths below grade are as follows:

Monitoring Well #1 - 55' BG,
Monitoring Well #2 - 45' BG,
Monitoring Well #3 - 45' BG,
Monitoring Well #4 - 55' BG, and
Monitoring Well #5 - 43' BG.

This has been entered into GRITS/STAT.

5. Metals samples are not field filtered; this has been clarified in the Landfill Ground Water Monitoring Plan.

6. The Ramsdell Landfill is one of the "areas of concern" that is being further investigated under the Army's on-going remedial investigation activities being conducted as part of the Installation Restoration Program at RVAAP. As part of that investigation, available historical documents and information are being reviewed in an attempt to ascertain past activity at the site. While separation of the affects from RCRA sanitary landfill activities from the affects from pre-sanitary landfill activities at this site needs to be appreciated, the Army seeks to address the Ramsdell Quarry in its entirety.

7. Future submittals of ground water flow maps by Mason & Hanger Corp. will be provided on a revised map base which includes a north arrow and scale, and will incorporate standard geologic procedures for the construction of a contour map. The ground water flow maps for the December

1996, February 1997, June 1997, and October 1997 sampling events have been re-drafted and are submitted as Enclosures 4-H(1-4). Static water levels were measured on October 7, 1997 and are more consistent with historical levels at the landfill. We believe that the December 1996 and February 1997 measurements may have been inaccurate, and have ordered a new measurement tape to help decrease the possibility of errors in future static level measurements.

8. Mason & Hanger Corporation has contracted with a new laboratory service provider (Quanterra Labs) and will more closely monitor results received to ensure all analytical work has been performed as is required by the Landfill Ground Water Monitoring Plan.

9. (a) Future submittals by Mason & Hanger Corp. will include an analysis of distribution along with the statistical reports.

(b) The GRITS/STAT program was used in conducting statistical analysis for the toluene sample, and the program automatically replaces non-detects with one half the detection limit, which in that case would have been 1.25 ug/L. The detection limits vary in the analytical data, thus the discrepancy between the 2.5 ug/L limit and the 1.0 ug/L limit noted in the comment.

(c) After reviewing US EPA guidance documents regarding statistical analysis of ground water data, we performed an extensive review of the statistical analysis methods performed on past data. In some cases it may have been more appropriate to apply a parametric method versus the non-parametric method that was applied in the submission. In that light, statistical analyses have been re-performed on past data sets starting with the December, 1995 submission. With regard to the specific example in this comment, a change in the method applied did not change the results received. Statistical analyses are performed on data values obtained over time, so that one particular observation may not change the overall outcome of the assessment.

(d) Statistical analyses are performed on data values obtained over time. If we were to use data only obtained from the current sampling period, we would not have enough observations to perform a valid statistical test. Monitoring wells #1 and #2 are considered to be down gradient wells for purposes of statistical analyses. Further hydrogeological investigation at the landfill site may change that determination.

(e) A review of statistical procedures indicates that the explosives data may be more appropriately described by Poisson Prediction Intervals. However, in view of the fact that explosives compounds have been detected in the background well, and because explosives are not a naturally occurring compound, it is intuitive that explosives contamination of the ground water has occurred in the area of the landfill. The application of statistical tests to the explosives data at this point would only serve to confirm that conclusion. A computer disk containing all of the ground water data collected at the Ramsdell Landfill in a GRITS/STAT format is attached.

10. We have met with the appropriate Mason & Hanger personnel responsible for sampling and have stressed the need for entering complete information on the chain of custody forms for all samples collected at RVAAP. Mason & Hanger will ensure that in the future the chain of custody forms are filled out in their entirety.

11. Mason & Hanger will identify the well number of the duplicate well on the laboratory analytical results prior to submittal of the results to OEPA.

12. Mason & Hanger has contracted with a new laboratory, Quanterra, and have stressed to them the importance of meeting method detection limits as specified in the particular method being used to analyze the samples. Mason & Hanger has also requested that the laboratory provide verbal notification if method detection limits for a particular analyte are significantly different than specified, and to provide a written explanation with the data as to why the specified limits could not be achieved.

COMMENTS: DECEMBER 1995 DATA

1. Statistical reports for the period in question have been re-generated. The results are unchanged.
2. Statistical analyses of the explosives data was probably not valid. It is not clear whether any statistical analysis of explosives data would be of value.
3. Statistical analyses of metals data is not required as part of the ground water monitoring plan for the landfill. Values for these parameters are slightly above drinking water action levels, statistical analysis shows statistical evidence of contamination only for Ni in Well #1. Monitoring wells #1 and #2 are considered to be down gradient wells at the landfill site, however that may change upon further hydrogeological investigation at the site.
4. This was an error. The statistical analysis for the TOC data for this sampling period have been re-generated with correct data values.
5. The 3.3 ug/L value was obtained in the 2/25/93 sampling event. A copy of the laboratory data sheet for that date is attached as Enclosur 4-I.
6. Toluene has not been detected in any subsequent samples in any well

COMMENTS: FEBRUARY 1996 DATA

1. Concur
2. Statistical analyses of data obtained including this sampling event have been re-generated. Results of the analyses remain unchanged.

COMMENTS: JUNE 1996 DATA

1. Statistical analyses of data obtained including this sampling event have been re-generated. Results of the analyses remain unchanged.
2. Values for these parameters are slightly above drinking water action levels, statistical analysis shows statistical evidence of contamination only for Ni in Well #1. Monitoring wells #1 and #2 are considered to be down gradient wells at the landfill site, however that may change upon further hydrogeological investigation at the site.
3. It is unclear why this was done, perhaps just for information purposes.
4. Ground water flow directions will be better determined with the upcoming monthly ground water and pond level readings.

COMMENTS: SEPTEMBER 1996 DATA

Statistical analyses of data obtained including this sampling event have been re-generated. Results of the analyses remain unchanged.

COMMENTS: DECEMBER 1996 DATA

1. Statistical analyses of data obtained including this sampling event have been re-generated. Results of the analyses remain unchanged.
2. The reported value for this parameter is slightly above drinking water action levels, and statistical analysis shows statistical evidence of contamination for Ni in well #1. Monitoring wells #1 and #2 are considered to be down gradient wells at the landfill site, however that may change upon further hydrogeological investigation at the site.
3. Statistical analyses of the explosives data was probably not valid. It is not clear whether any statistical analysis of explosives data would be of value.
4. Statistical analysis of the DCA data including this sampling event has been conducted. Results are attached as Enclosure 4-J.
5. The values of 5 ppb for HMX in wells #2, 3, 4, and 5 are values set by GRITS/STAT as one half the detection limit of 10 ppb. The detection limits have varied and are usually lower than that. The values for RDX in well #1 was the value obtained in the 12/19/96 sampling. The value for RDX in well #5 was set by GRITS/STAT at one half the detection limit of 10 ppb.
6. A discussion with Mason & Hanger personnel involved in the sampling indicated that one of the VOC vials arrived broken at the laboratory. Re-sampling was conducted to replace the broken vial. Results were included in the laboratory report for the entire sampling event.
7. If the writer is referring to the January 6, 1997 date written at the top of the chain of custody, that would represent the date Mason & Hanger received the chain of custody copy back with appropriate signature, date and time of receipt from the laboratory.

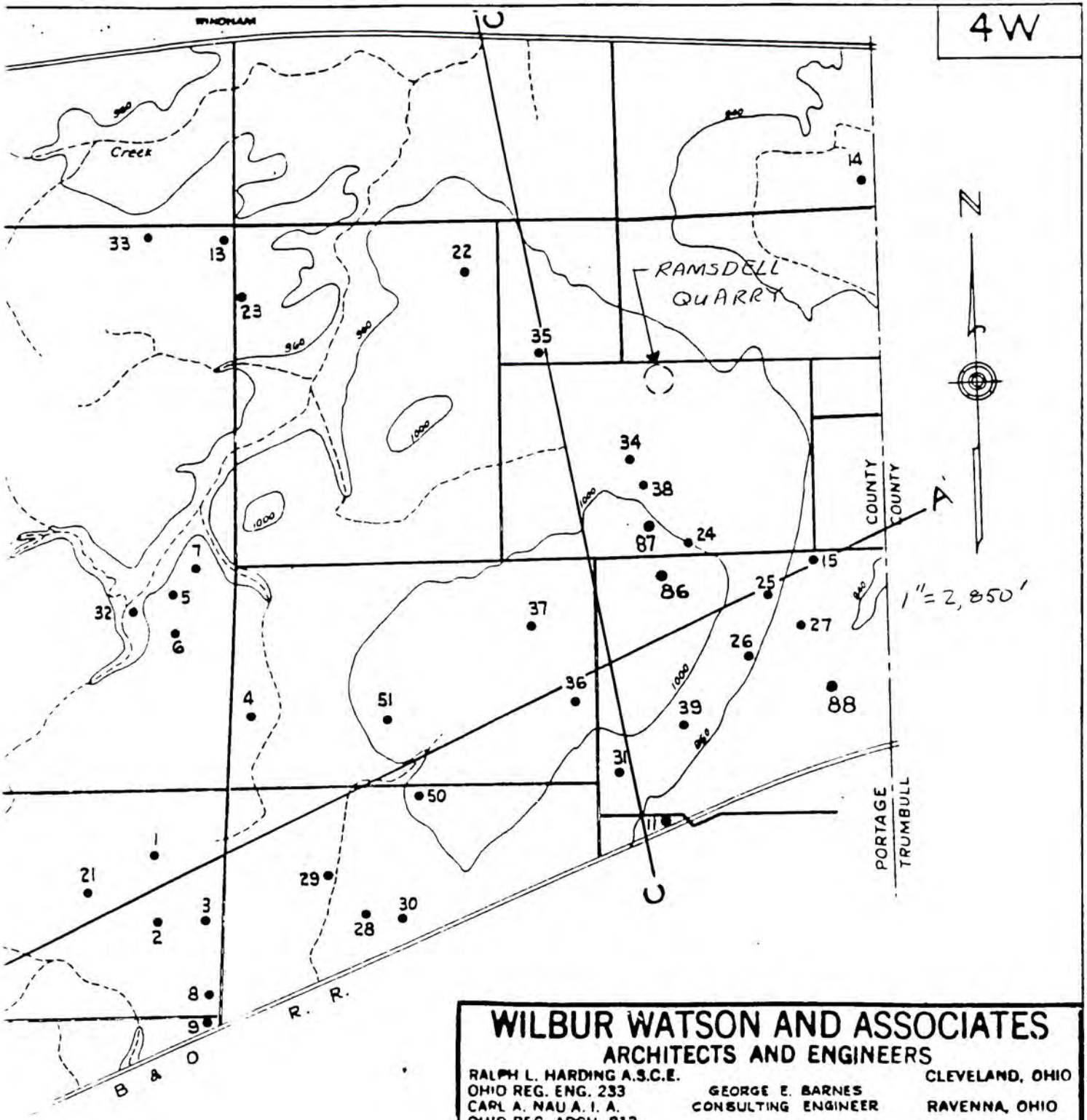
COMMENTS: FEBRUARY 1997 DATA

1. Concur
2. Statistical analyses of the explosives data was probably not valid. It is not clear whether any statistical analysis of explosives data would be of value.
3. It is unclear why this parameter was not included in the resampling event. DCA was not detected in the samples submitted for analysis in June, 1997.
4. The affected monitoring wells which showed statistically significant evidence of contamination for conductivity, TDS and TOC were re-sampled as required by Ohio EPA regulations. Monitoring well #4 was not denoted as having statistically significant evidence of contamination and was not sampled. Prior re-sampling events may have included well #4 in order to obtain additional background data values.

Sincerely,

Enclosures

4-A(1)	Location of (Supply) Wells, 1953
4-A(2)	N-S Geologic Cross-Section C-C Adjacent to Ramsdell Quarry, 1953
4-B	OEPA Letter dated November 17, 1987
4-C	Addendum to Field Report; Monitoring Well Completion and Development, 1987
4-D	Results of Chemical Analyses of Samples (29 June 87) from Wells Around the Ramsdell Quarry
4-E(1-5)	Monitoring Well Logs, 1987
4-F	Table of Well Screens, 1987
4-G(1,2)	Monitoring Well Cross-Sections
4-H(1,2,3,4)	Ground Water Monitoring Elevations
4-I	Laboratory Data Sheet for 2/25/93 Sampling Event
4-J	Statistical Analyses of DCA Data



WILBUR WATSON AND ASSOCIATES

ARCHITECTS AND ENGINEERS

RALPH L. HARDING A.S.C.E.
OHIO REG. ENG. 233
CARL A. NAU A. I. A.
OHIO REG. ARCH. 813

GEORGE E. BARNES
CONSULTING ENGINEER

CLEVELAND, OHIO
RAVENNA, OHIO

SCALE

CONSTRUCTION DIVISION
OFFICE OF THE QUARTERMASTER GENERAL

RAVENNA ORDNANCE PLANT

STUDY OF WELLS FOR WATER SUPPLY

LOCATION OF WELLS

FIG. 1 OF 8

REVISIONS
① ADDED WELLS
2- T. HOFF & ASSOC. 6/9/53

DRAWN BY | CHECKED BY | APPROVED BY DIRECTION | DATE

TRACED BY

LT. COL. ORD. DEPT.
CONSTRUCTING QUARTERMASTER

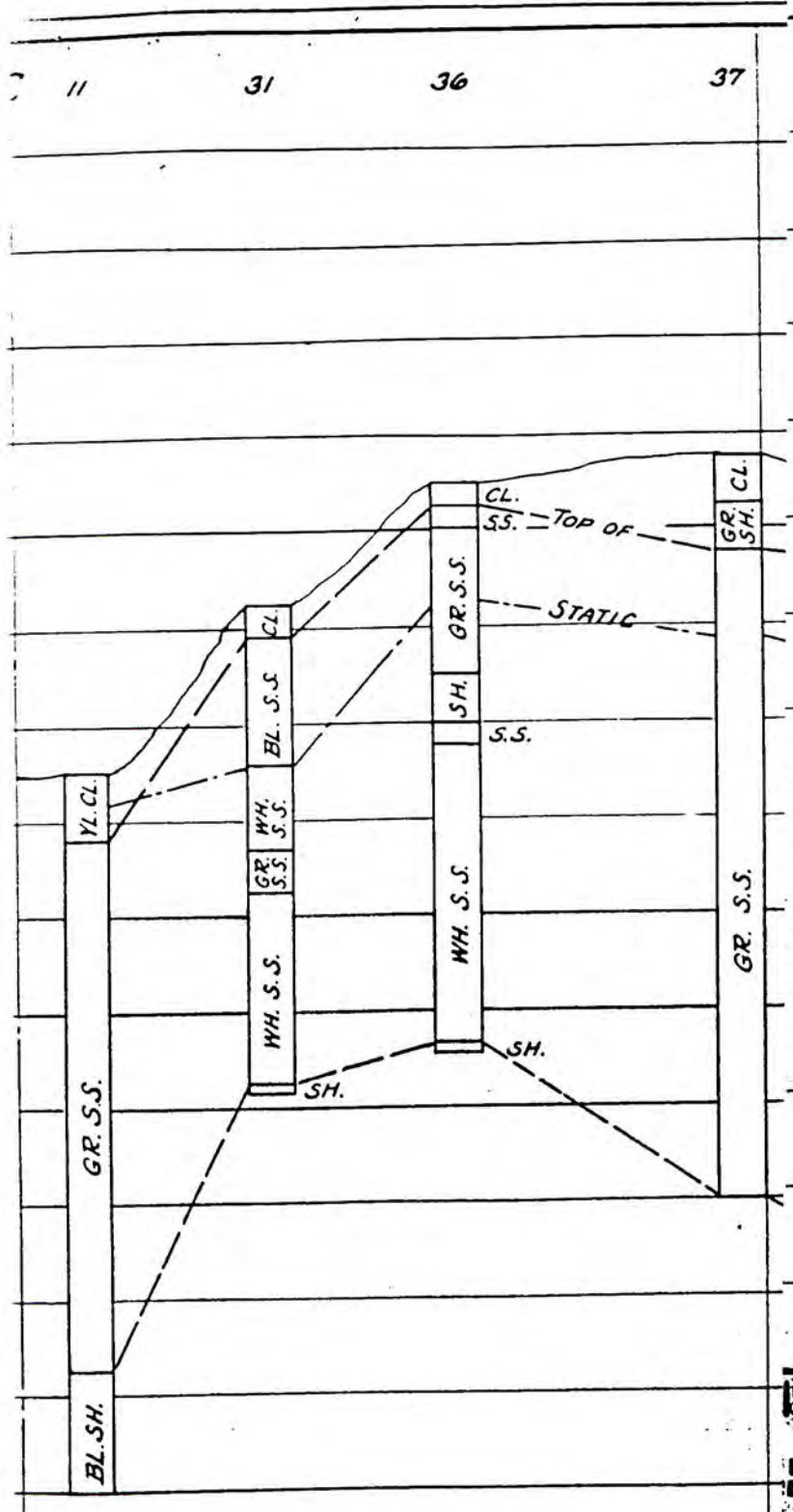
PLAN NUMBER 6934

1140-131

RAWING REVISED PER FIELD SURVEY
ATE JUNE 9, 1953
ONTRACT NO. DA-11-173-ORD-65
TRYGVE HOFF & ASSOCIATES
EV. BY A. F. M. CHK'D BY R. F. M.

F. { 1140.138 / 1140.137 COMPILED BY R.L. BARRETT
GEOLOGICAL ASSISTANT

ENCLOSURE 4-A(1)



11W

REVIEWED – NO REVISION

DATE MAR-9-71

REV. BY RLA

RAVENNA ARMY AMMUNITION PLANT

CHK'D. BY Orl.

LEGEND FOR WELL STRATA

YL.	YELLOW
RD.	RED
BR.	BROWN
GR.	GRAY
BL.	BLUE
WH.	WHITE
FN.	FINE
LT.	LIGHT
S.	SAND
S.S.	SANDSTONE
S.H.	SHALE
CL.	CLAY
S.CL	SANDY CLAY
GRA.	GRAVEL
Q.S.	QUICKSAND

ILBUR WATSON AND ASSOCIATES
ARCHITECTS AND ENGINEERS
L. HARDING A.S.C.E.
EL. ENG. 239
HAU A. I. A.
EL. ARCH. 813
GEORGE E. BARNES
CONSULTING ENGINEER
CLEVELAND, OHIO
RAVENNA, OHIO

CONSTRUCTION DIVISION
OFFICE OF THE QUARTERMASTER GENERAL

RAVENNA ORDNANCE PLANT
STUDY OF WELLS FOR WATER SUPPLY
NORTH – SOUTH
GEOLOGICAL SECTIONS
FIG. 8 OF 8

DRAWN BY	CHECKED BY	APPROVED BY DIRECTION	DATE
Mentzer			
TRACED BY Thompson		LT. COL. ORD. DEPT.	6934
			1140-138

ENCLOSURE 4-A(2)

OhioEPA
State Of Ohio Environmental Protection Agency
P.O. 1049 361 East Broad St. Columbus, Ohio 43266-0149
614-8565
Richard F. Celeste, Governor

November 17, 1987

RE: SOLID WASTE
PORTAGE COUNTY
RAVENNA ARSENAL LANDFILL

Mr. H. R. Cooper
Plant Engineer
Ravenna Arsenal, Inc.
8451 State Route 5
Ravenna, Ohio 44266-9297

Dear Mr. Cooper:

This letter is pursuant to the review of the groundwater monitoring proposed for the Ravenna Arsenal Landfill, Portage County, which was received by this office on August 17, 1987. The submittal included much subsurface data including the boring logs for four (4) proposed monitor wells, cross sections, two piezometric surface maps, and multi-level groundwater quality data for all four monitor sites. Groundwater flow has been determined to be to the northeast. As a result, the proposed locations of monitor wells MW-1 and MW-4 would be upgradient while only well MW-3 would be clearly downgradient of the landfill. This office suggests that an additional downgradient well be located in the area between well MW-1 and MW-3 north of the facility.

The proposal for using two inch PVC flush joint casing with five foot screens is acceptable and well development should be in the first saturated horizon in sandstone which is laterally continuous under the facility. This office also requests all elevation data to be in reference to mean sea level. Also, groundwater sampling, as required by OAC 3745-27-09(G) shall be semiannually.

Hopefully, this letter clarifies our position on this matter. If you have any questions, feel free to contact this office.

Sincerely,

Mark F. Schmidt
Environmental Engineer 3
Division of Solid & Hazardous Waste Management

MFS:mjo

cc: Dave Budd, NEDO
Dave Wertz, NEDO
Chris Khourey, DGW, NEDO
Dan Harris, DSHWM, CO
Portage County Health Dept., Attn: Chip Porter

ENCLOSURE 4-B

ADDENDUM

Monitoring Well Completion and Development

The existing test holes were converted to permanent monitoring wells completed in the uppermost saturated zone, as requested by the Northwest District, Ohio EPA. The holes were first backfilled with clean sand and gravel (the material most closely resembling the original geology) to 10 feet below the ultimate screen depth. Bentonite pellets were then emplaced from that depth to the bottom of the screened zone.

Two-inch diameter flush-joint PVC casing and screen were then set in the hole, a sand pack placed around the screen, and the remaining annulus back-filled and sealed with bentonite pellets (immediately on top of the coarse sand pack) and bentonite slurry. The wells were then fully developed in preparation for the second round of sampling on March 14, 1988. The appendix contains a typical well completion diagram as well as the results of the second sampling round.

A fifth monitoring well (MW-5) was drilled and completed in a manner identical to MW-1 through MW-4. Its location is shown on the revised location plat in the appendix. This was drilled to provide the required third down gradient monitoring well.

ENCLOSURE 4-C

samples collected 29 June 87

Ravenna Arsenal Monitoring Well Analyses

	MW 1			MW 2			MW 3			MW 4			
Parameter	27'	95'	163'	22'	87'	152'	20'	85'	150'	28'	94'	160'	Units
Arsenic	.007	.016	.016	.006	.009	.011	ND	ND	ND	.008	.013	.013	mg/l
Barium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/l
Calcium	27	36	35	5.2	20	26	120	127	140	49	44	45	mg/l
Cadmium	.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/l
Chromium	ND	.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/l
Iron	7.1	15	17	1.9	6.7	7.4	.82	.56	.51	8.7	13	14	mg/l
Mercury	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/l
Magnesium	15	19	21	4.4	9.1	11	42	43	48	22	23	24	mg/l
Sodium	10	11	10	1.4	1.4	1.6	11	9.7	9.8	2.2	1.5	1.8	mg/l
Lead	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/l
Selenium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/l
Alkalinity	26	67	4	ND	ND	ND	72	161	148	82	90	76	mg/l
Chloride	7	5	6	ND	ND	ND	5	4	5	2	2	ND	mg/l
Chem. Ox. Dem.	11	11	37	5.3	11	24	13	59	77	5.3	8.0	19	mg/l
Sp. Cond.	300	320	300	120	200	200	500	750	800	320	300	300	umhos/cm
Fluoride	.1	.2	.2	ND	ND	.1	.3	.1	.1	.6	.7	.6	mg/l
Meth. Bl. Active Subst.	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/l
Ammonia Nitrogen	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/l
Nitrate Nitrogen	ND	ND	ND	ND	ND	ND	.4	.2	.2	ND	ND	ND	mg/l
Phenolics	.01	.01	.01	ND	ND	ND	ND	.006	.01	.02	ND	ND	mg/l
pH	6.0	6.1	6.2	4.0	4.2	4.4	6.0	6.4	6.5	6.6	6.6	6.5	S.U.
Sulfate	130	110	120	47	94	130	220	370	380	120	110	110	mg/l
TDS	260	270	270	120	220	270	450	770	770	300	290	290	mg/l
TOC	ND	ND	ND	ND	ND	1	2	8	11	1	ND	ND	ppm

C-h RAVENNA

THE OHIO DRILLING CO.

INCORPORATED

MASSILLON, OHIO

DRILLED FOR Ravenna Arsenal, Inc. - Ravenna, Ohio HOLE NO. MW 1

DRILLED BY Paul Ortz DRILLER COMPLETED June 18, 19 87

LOCATION Northwest corner of Ramsdell Quarry

THICKNESS OF STRATA	STRATA	TOTAL DEPTH	CASED	WATER FROM SURFACE
2 ft. 2	Soil	2 ft.		
7 ft. 7	Red Sandstone	9 ft.		
2 ft. 2	Grey Sandstone	11 ft.		
7 ft. 7	Red Sandstone	18 ft.		
146 ft. 146	Gravish-White Sandstone	164 ft.		
11 ft. 11	Shale	175 ft.		
	First water-bearing zone - 41 ft.			
	Second water-bearing zone - 60 ft.			

ENCLOSURE 4-E(1)

THE OHIO DRILLING CO.

INCORPORATED

MASSILLON, OHIO

DRILLED FOR Ravenna Arsenal, Inc. - Ravenna, Ohio HOLE NO. MW 2

DRILLED BY Paul Ortz DRILLER COMPLETED June 17 19 87

LOCATION Southeast corner of Ramsdell Quarry

CHANGES OF STRATA	STRATA	TOTAL DEPTH	REAMED	WATER FROM SURFACE
11 ft. 11	Reddish Sandstone	11 ft.		
11 ft. 11	White Sandstone	22 ft.		
11 ft. 11	Red Sandstone	33 ft.		
74 ft. 74	White Sandstone	107 ft.		
5 ft. 5	Shale	112 ft.		
40 ft. 40	White Sandstone	152 ft.		
ft. 13	Shale	165 ft.		
	First water-bearing zone - 34 ft.			
	Second water-bearing zone - 53 ft.			
	8" casing with locking cap installed to bedrock.			

ENCLOSURE 4-E (2)

THE OHIO DRILLING CO.

MASSILLON, OHIO

DRILLED FOR Ravenna Arsenal, Inc. - Ravenna, Ohio HOLE NO. MW 3

DRILLED BY Paul Ortz DRILLER COMPLETED June 17, 19 87

LOCATION Northeast corner of Ramsdell Quarry

THICKNESS OF STRATA	STRATA	TOTAL DEPTH	CASING	WATER FROM SURFACE
2 ft. 2	Soil	2 ft.		
2 ft. 2	Clay	4 ft.		
12 ft. 12	Sandstone	16 ft.		
2 ft. 2	Brown Sandstone	18 ft.		
35 ft. 35	Light Sandstone	53 ft.		
37 ft. 37	Grayish-White Sandstone	90 ft.		
1½ ft. 1½	Shale Streaks	91½ ft.		
½ ft. 1½	White Sandstone	93 ft.		
5 ft. 5	Shale	98 ft.		
29 ft. 29	Sandstone Conglomerate	127 ft.		
4 ft. 4	Shale	131 ft.		
20 ft. 20	White Sandstone	151 ft.		
14 ft. 17	Shale	165 ft.		
	First water-bearing zone - 18 ft.			
	Second water-bearing zone - 42 ft.			
	Third water-bearing zone - 53 ft.			
	8" casing with locking cap installed to bedrock.			

ENCLOSURE 4-E(3)

THE OHIO DRILLING CO.

MASSILLON, OHIO

DRILLED FOR Ravenna Arsenal, Inc. - Ravenna, Ohio HOLE NO. MW 4

DRILLED BY Paul Ortz DRILLER COMPLETED June 18, 19 87

LOCATION Southwest section of Ramsdell Quarry

THICKNESS OF STRATA	STRATA	TOTAL DEPTH	CASING	WATER FROM SURFACE
3 ft. 3	Fill Material	3 ft.		
3 ft. 3	Brown Sandstone	6 ft.		
6 ft. 6	Red Sandstone	12 ft.		
5 ft. 5	Gray Sandstone (damp)	17 ft.		
12 ft. 12	Brown Sandstone	29 ft.		
85 ft. 85	White Sandstone	114 ft.		
ft. 3	Shale	117 ft.		
ft. 3	Sandstone Conglomerate	155 ft.		
2 ft. 2	Shale	157 ft.		
3 ft. 3	Sandstone	160 ft.		
5 ft. 5	Shale	165 ft.		
	Water-bearing zone - 55 ft.			
	8" casing with locking cap installed to bedrock.			

ENCLOSURE 4-E(4)

THE OHIO DRILLING CO.

INCORPORATED

MASSILLON, OHIO

DRILLED FOR Ravenna Arsenal, Inc. - Ravenna, Ohio HOLE NO. MW-5
6" Well

DRILLED BY Randy McKay DRILLER COMPLETED January 12, 19 88

LOCATION 50 ft. south of Ramsdell Rd., 231 ft. west of MW-3

THICKNESS OF STRATA	STRATA	TOTAL DEPTH	CASED	WATER FROM SURFACE
11 ft.	Brown Sandstone	11 ft.		
1 ft.	Gray Sandstone	12 ft.		
2 ft.	Brown Sandstone	14 ft.		
2 ft.	Gray Sandstone	16 ft.		
3 ft.	Brown Sandstone	19 ft.		
3 ft.	Gray Sandstone	22 ft.		22 ft.
11 ft.	Brown Sandstone (water-bearing)	33 ft.		
ft.	Gray Sandstone	38 ft.		
12 ft.	Brown Sandstone	50 ft.		
	Converted to 2" diameter monitoring well, screened			
	33 to 43 ft. below grade.			

ENCLOSURE 4-E (5)

Ravenna Arsenal Monitoring Well Elevations

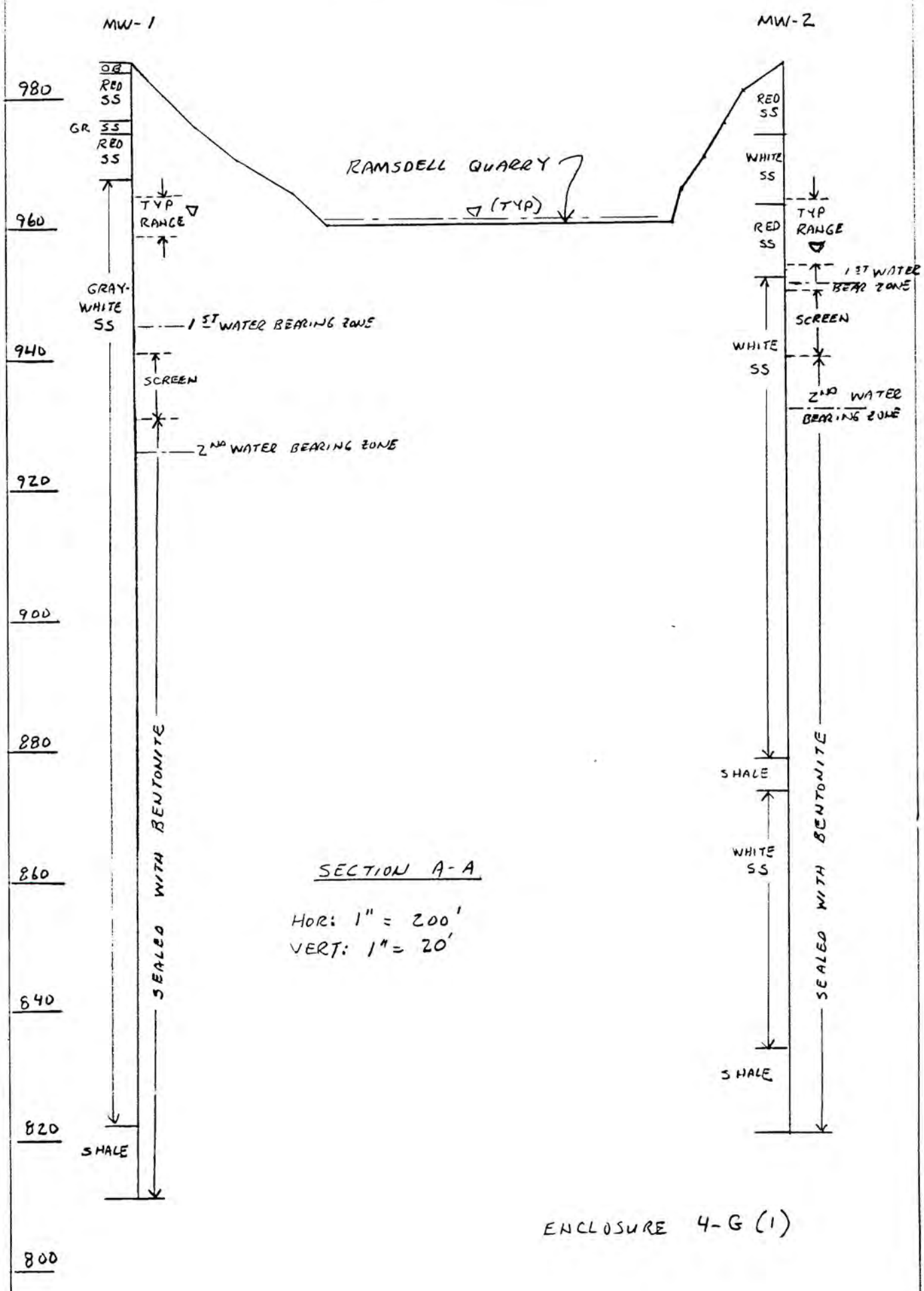
(Using USGS, MSL Datum)

MW-1	MW-2	MW-3	MW-4	MW-5
*986.54 ft.	982.13 ft.	977.00 ft.	989.57 ft.	978.49 ft.
screened 45' - 55' below grade	screened 35' - 45' below grade	screened 35' - 45' below grade	Screened 45' - 55' below grade	screened 33' - 43' below grade

* Elevation of top of outer steel casing.

History of Water Level Elevations (MSL Datum)

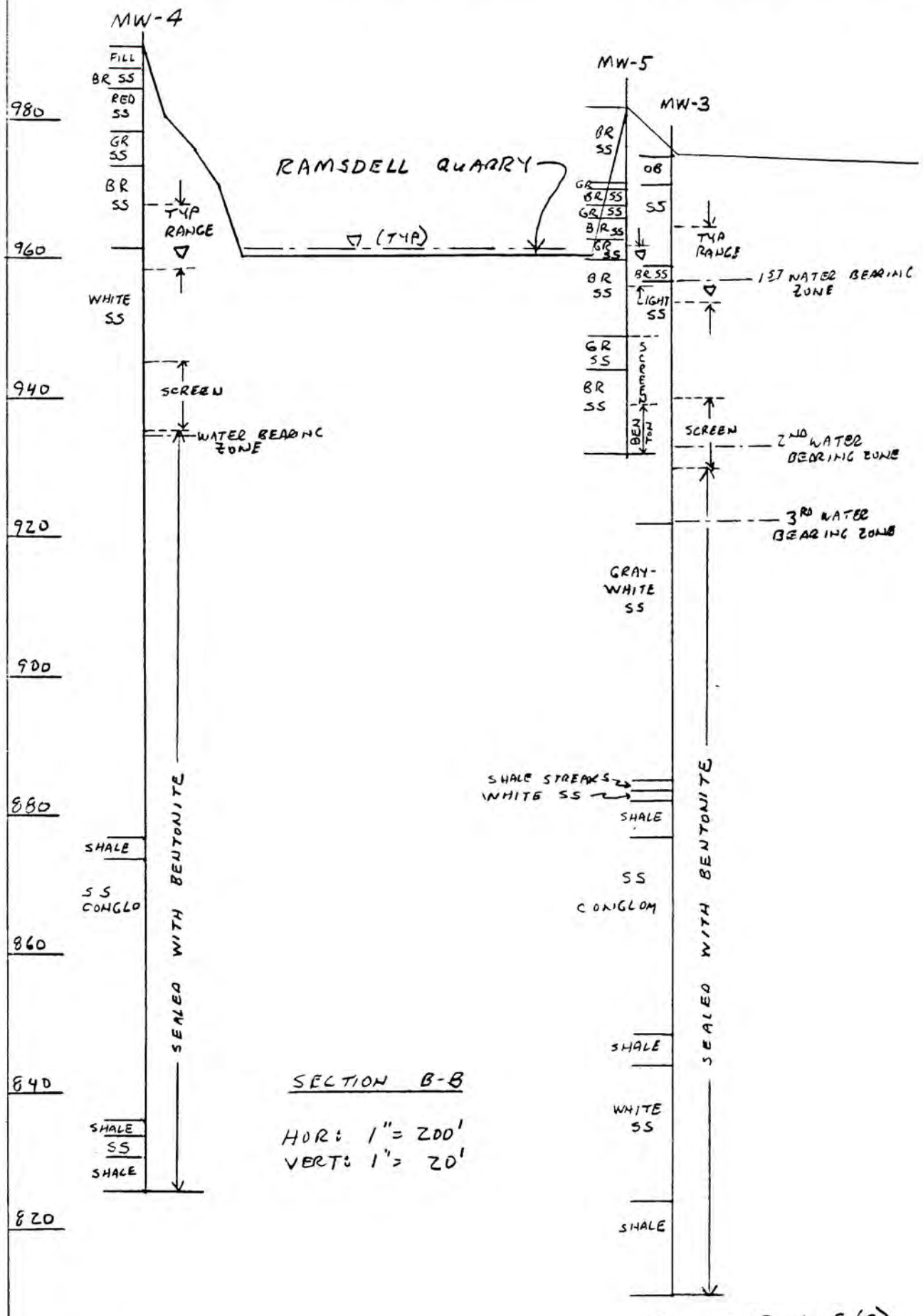
Date	MW-1	MW-2	MW-3	MW-4	MW-5
6-26-87	961.05 ft.	960.62 ft.	958.32 ft.	962.88 ft.	not drilled
7-7-87	956.08 ft.	961.15 ft.	959.90 ft.	962.80 ft.	not drilled
7-21-87	962.90 ft.	960.89 ft.	959.90 ft.	964.72 ft.	not drilled
11-20-87	958.04 ft.	957.55 ft.	956.42 ft.	959.74 ft.	not drilled
4-25-88	960.04 ft.	960.80 ft.	959.75 ft.	961.57 ft.	958.32 ft.



SECTION A-A

HOR: 1" = 200'
VERT: 1" = 20'

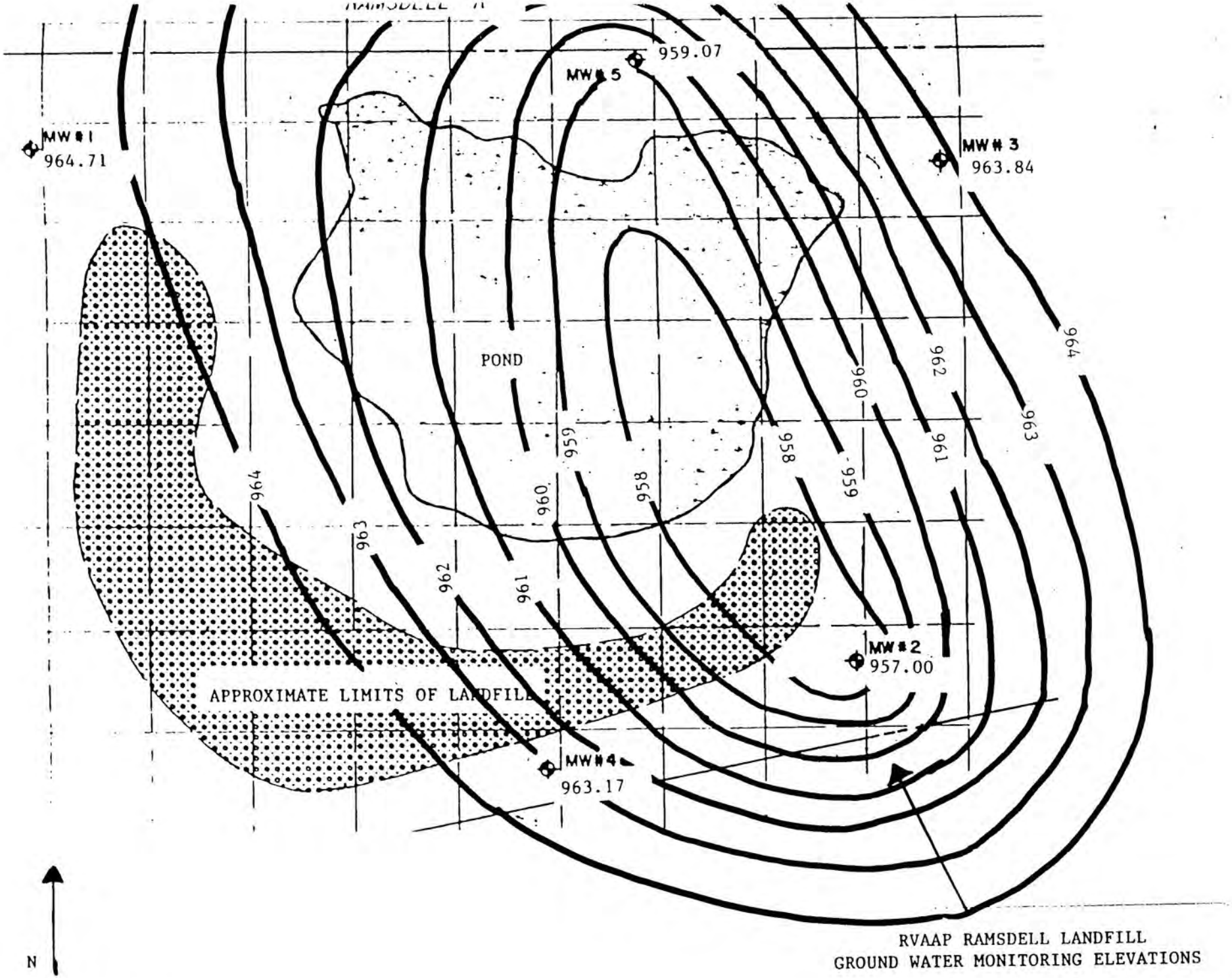
ENCLOSURE 4-G (1)



SECTION B-B

HOR: 1" = 200'
VERT: 1" = 20'

ENCLOSURE 4-G(2)

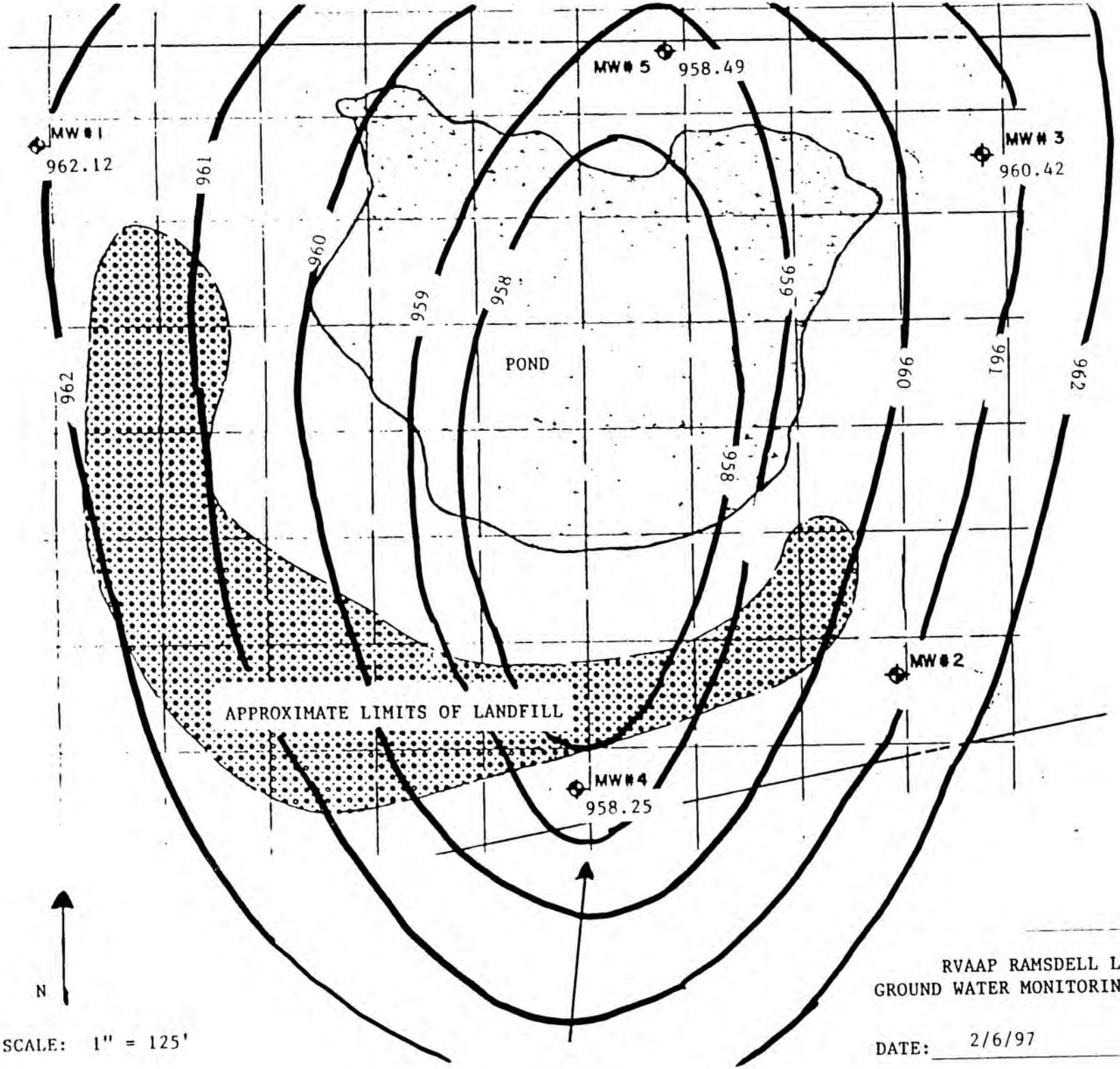


RVAAP RAMSDELL LANDFILL
GROUND WATER MONITORING ELEVATIONS

SCALE: 1" = 125'

DATE: 12/19/96

ENCLOSURE 4-H(1)

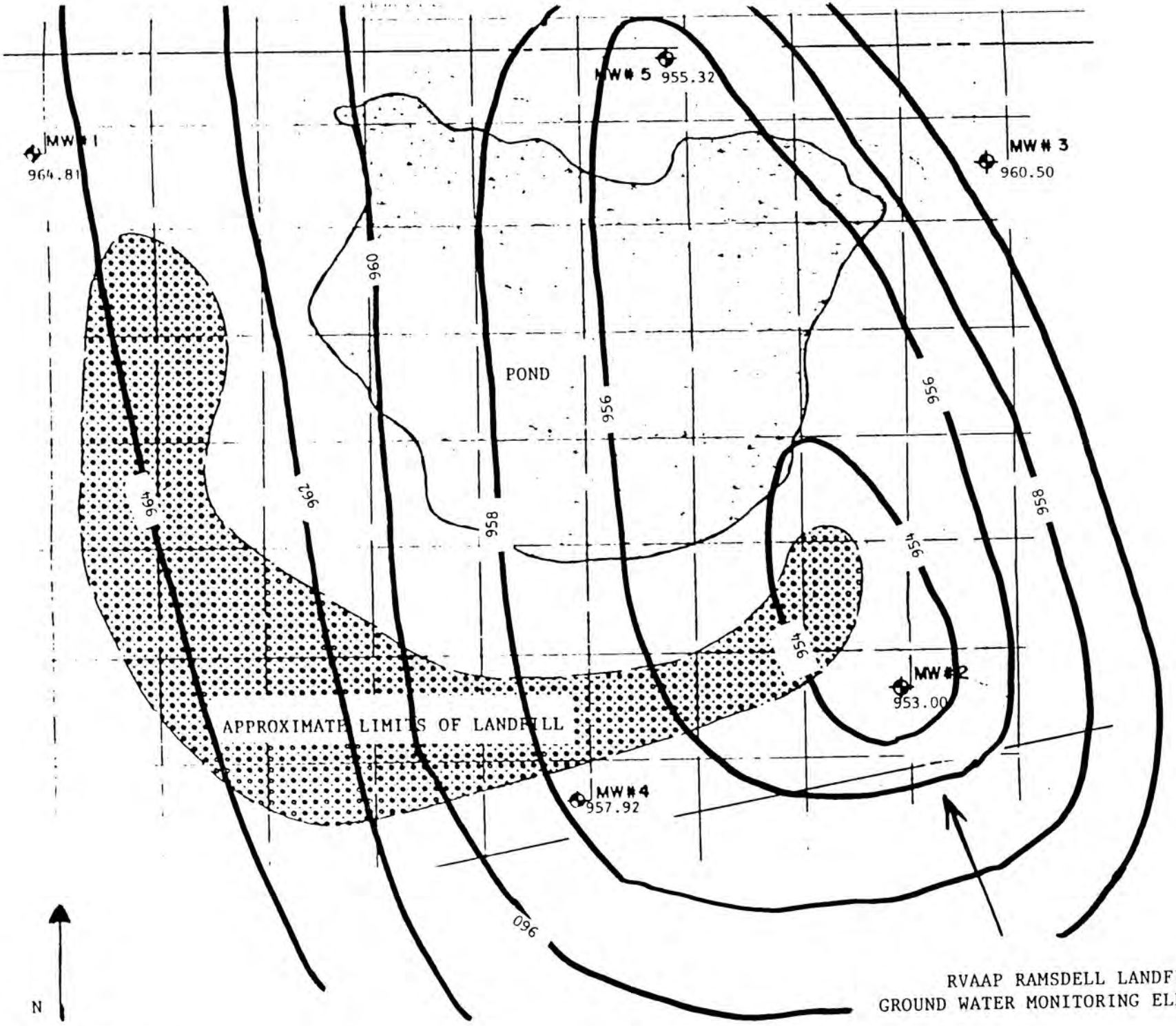


SCALE: 1" = 125'

RVAAP RAMSDELL LANDFILL
GROUND WATER MONITORING ELEVATIONS

DATE: 2/6/97

ENCLOSURE 4-H(2)

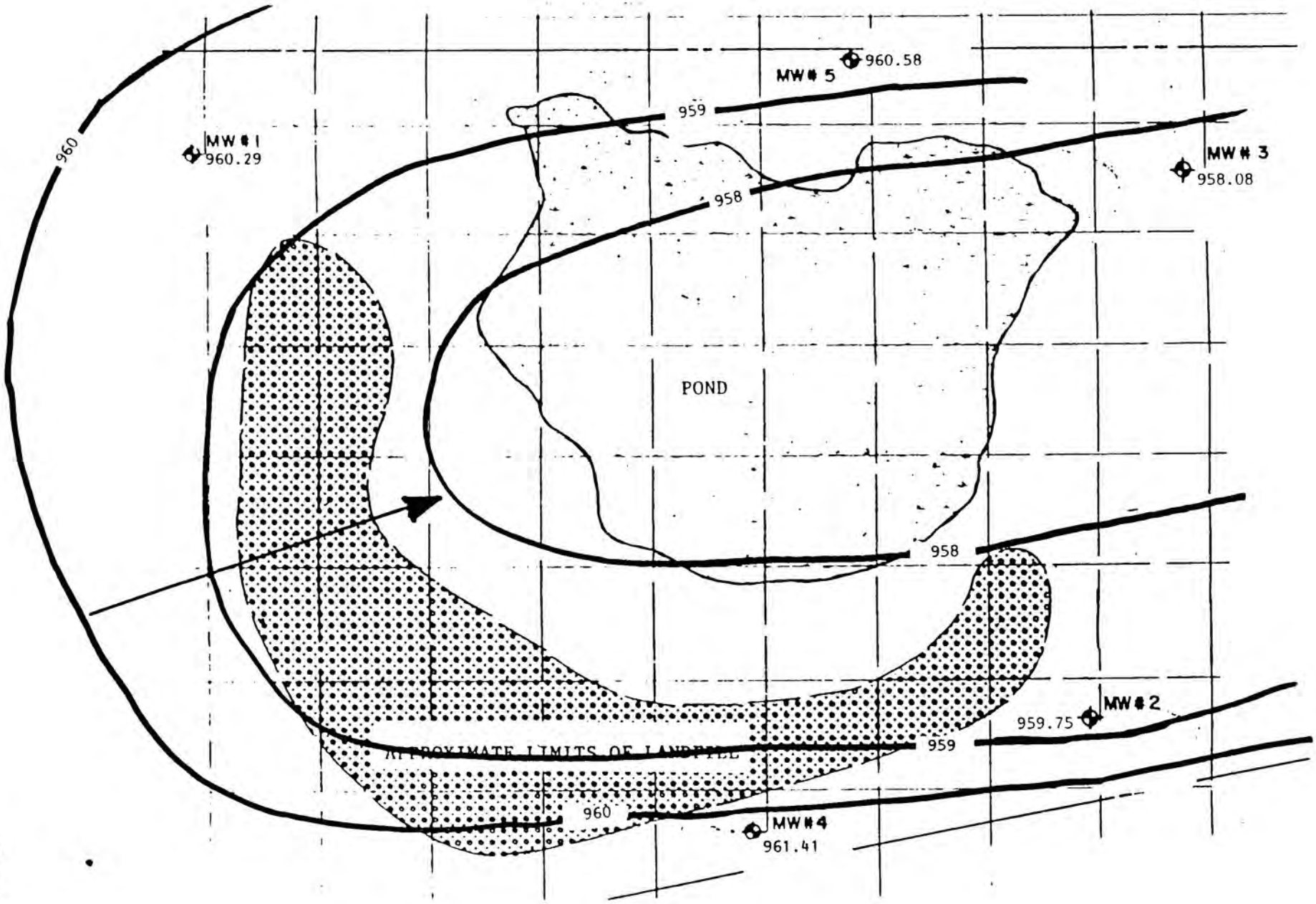


RVAAP RAMSDELL LANDFILL
GROUND WATER MONITORING ELEVATIONS

SCALE: 1" = 125'

DATE: June 26, 1997

ENCLOSURE 4-H(3)



SCALE: 1" = 125'

RVAAP RAMSDELL LANDFILL
GROUND WATER MONITORING ELEVATIONS

DATE: October 7, 1997

ENCLOSURE 4-H (4)

TMA
Thermo Analytical Inc.

TMA/ERG
7777 Exchange Street
Cleveland, OH 44125-3337

(216) 447-0790

RAVENNA ARSENAL, INC.
LANDFILL GROUNDWATER REPORT

WELL #1 - #5

TMA PROJECT: 0246

FEBRUARY, 1993

Approved by: William L. Ramus
William L. Ramus
Operations Manager

ENCLOSURE 4-I

TMA/E

RESULTS

PARAMETER	WELL #4	WELL #5	UNITS
TNT	ND(1.0)	ND(1.0)	ug/l
HMX	ND(1.0)	ND(1.0)	ug/l
RDX	3.3	ND(1.0)	ug/l
2-4 DNT	ND(1.0)	ND(1.0)	ug/l
2-6 DNT	ND(1.0)	ND(1.0)	ug/l

Nd - Nondetectable; detection limit next to "ND" notation

ENCLOSURE 4-I

Wilcoxon Rank-Sum Test
Report Printed: 10-13-1997 14:07

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:1,2DCE 1,2-Dichloroethane

CAS Number: 107-06-2
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 2.000 ppb

Start Date:Nov 22 1988
End Date:Dec 19 1996

Data Mode:Log Transformed

Background Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-4	15	100	1.61	0.92	0.96	0.18

Compliance Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-2	13	92	2.30	0.92	1.08	0.42

Well	Date	Observation	Rank
MW-4	11/07/91	0.9163	13.0
MW-4	02/27/92	0.9163	13.0
MW-4	06/25/92	0.9163	13.0
MW-4	10/01/92	0.9163	13.0
MW-4	02/25/93	0.9163	13.0
MW-4	07/15/93	0.9163	13.0
MW-4	02/21/94	0.9163	13.0
MW-4	07/28/94	0.9163	13.0
MW-4	12/22/94	0.9163	13.0
MW-4	06/28/95	0.9163	13.0
MW-4	06/28/95	0.9163	13.0

ENCLOSURE 4-J

MW-4	12/14/95	0.9163	13.0
MW-4	12/14/95	0.9163	13.0
MW-4	06/20/96	1.6094	26.5
MW-4	12/19/96	0.9163	13.0
	Background Data Rank-Sum:		208.5
MW-2	11/07/91	0.9163	13.0
MW-2	02/27/92	0.9163	13.0
MW-2	06/25/92	0.9163	13.0
MW-2	10/01/92	0.9163	13.0
MW-2	02/25/93	0.9163	13.0
MW-2	07/15/93	0.9163	13.0
MW-2	02/21/94	0.9163	13.0
MW-2	07/28/94	0.9163	13.0
MW-2	12/22/94	0.9163	13.0
MW-2	06/28/95	0.9163	13.0
MW-2	12/14/95	0.9163	13.0
MW-2	06/20/96	1.6094	26.5
MW-2	12/19/96	2.3026	28.0
	Compliance Data Rank-Sum:		197.5

Background Data Pts m:	15
Compliance Data Pts n:	13
Wilcoxon Statistic W:	106.5000
Expected Value E(W):	97.5000
Std Dev SD(W):	21.7083
Std Dev (Ties) SD'(W):	11.6535
Approx Z-Score Z:	0.7294
Significance Level α:	0.05
Zα:	1.6449

Since the Approx. Z-Score does not exceed Zα there is no significant evidence of contamination at the compliance well.

US Army
Corps of Engineers
Louisville District

Serving the Army. Serving the Nation

Kevin Jasper
Project Manager

ATTN: CELRL-DL-B
P.O. Box 59
Louisville, KY 40201-0059

502.625.7015
502.625.7314 (FAX)
kjasper@smtp.orl.usace.army.mil

Ohio Environmental Protection Agency

DIVISION OF SOLID AND INFECTIOUS WASTE MANAGEMENT

Northeast District Office
2110 E. Aurora Road
Twinsburg, OH 44087

(216) 963-1276
(216) 487-0769 Fax

Jarnal Singh
Environmental Specialist

MEETING ATTENDANCE SHEET

Subject: RAMSDELL Landfill - Groundwater Meeting.

Date: 12/11/97 Time: 9am Meeting Place: NEDO.

	Name	Affiliation	Phone Number
1.	JARNAL SINGH	OHIO EPA - NEDO	(330) 963-1276
2.	KURT RINCIC	OHIO EPA	330-963-1204
3.	Susan McLaughlin	Mason & Hanger	330-358-7400
4.	BILL HOGUE	HQ ARMY	309-782-1395
5.	DAVID BRANCATO	USACE - LRL - EDGE	502 582 6765
6.	KEVIN JASPER	USACE-LRL-DL-B CELRL-EDGE	502-625-7015
7.	JOHN HUNT	CORPS OF ENGR	502-582-5424
8.	KENNETH HENN	USACE-LRL-ED-G-ES	(502) 582-5968
9.	Diane Kulich	OEPA	330 963 1150
10.	Eileen Mohr	Ohio EPA	330 963 1221
11.	Jack Madyed	PCHD	330 [illegible]
12.	Bob Wheelove (via phone)	IDC	309-[illegible]-1092
13.			
14.			
15.			

INTER-OFICE COMMUNICATION

TO: JARNAL SINGH, ENVIRONMENTAL SPECIALIST, DSIWM-NEDO

FROM: DIANE KURLICH, HYDROGEOLOGIST, DDAGW-NEDO

SUBJECT: RAMSDELL LANDFILL (67-00-06), RAVENNA ARMY AMMUNITION PLANT, PORTAGE COUNTY:

1. JUNE 1997 GROUND WATER MONITORING DATA.
2. AUGUST 1997 CONFIRMATORY SAMPLING EVENT RESULTS.

DATE: DECEMBER 15, 1997

INTRODUCTION

The Ravenna Army Ammunition Plant (RAAP) operated a sanitary landfill at the Ramsdell Quarry until September 1989. A closure plan dated November 1988 was approved as meeting the requirements of OAC 3745-27-10 effective July 29, 1976, in a March 6, 1990, letter from the Ohio EPA to the facility. An extension for the completion of closure activities by June 30, 1990, was also included in the closure plan approval letter. In August 1990, the Ohio EPA conducted an inspection of the landfill and concluded in a September 17, 1990, letter to the facility that the closure had been successfully completed under the requirements of OAC 3745-27-10 effective July 29, 1976. The company is currently monitoring ground water at the site under OAC 3745-27-10 effective March 1, 1990. Generally, MW-4 is the upgradient monitoring well at the site. Wells MW-1 and MW-2 are also upgradient to the landfill, however, the facility has included them as downgradient wells in the statistical analyses preformed. Well MW-3 is sometimes marginally downgradient of the landfill, although it normally is in more of a side gradient position. The only well at the site that is truly downgradient of the landfill is MW-5.

The Army has submitted the results of the June 1997 ground water sampling event and the results of the August 1997 confirmatory sampling event conducted at the landfill. The Army has not yet addressed the general deficiencies in the monitoring system and the statistical analyses that were documented in a July 30, 1997, IOC from DDAGW to DSIWM. These general deficiencies, although they are still outstanding, will not be addressed again in this IOC. For more information on these deficiencies, the July 30, 1997, IOC should be referenced. At the request of the DSIWM, the DDAGW has reviewed the above cited documents and has the following comments.

COMMENTS: JUNE 1997 DATA

1. The facility reports that MW-3 has triggered for specific conductance (SC), total organic carbon (TOC), and total dissolved solids (TDS); and MW-5 has triggered for SC and TDS. As noted in the July 1997, IOC, there are concerns about the validity of the statistical analyses performed by the facility as well as the adequacy of the monitoring system. In fact, in evaluating the data currently under review, problems with the statistical analyses were again apparent. The values obtained during the June 1997 sampling event for SC, TDS, and TOC are summarized in the table below.

Well ID	Specific Conductance (umohs/cm)	Total Organic Carbon (mg/l)	Total Dissolved Solids (mg/l)
MW-1	358	2.7	269
MW-2	366	2.7	260
MW-3	362	2.7	262
MW-4	547	1.8	405
MW-5	518	2.0	379

Although MW-3 and -5 have "triggered" statistically for SC and TDS, it is apparent from the above table that the SC and TDS values obtained for these wells are actually less than the values obtained for these parameters in upgradient well MW-4. In addition, although the TOC value obtained for MW-3 is equal to the TOC values obtained for MW-1 and -2, only MW-3 triggered.

The statistical procedures used by the facility to evaluate the ground water data should be reviewed and revised as necessary. Statistical analyses should be recalculated and the revised calculations and results should be submitted for review.

2. The compounds RDX and TNT were detected in MW-1, -2, and -3. The concentrations of RDX detected were: MW-1, 1.30 ug/L; MW-2, 1.5 ug/L; and MW-3, 1.3 ug/L. The concentrations of 2,4,6-TNT detected were: MW-1, 2.4 ug/L; MW-2, 3.7 ug/L; and MW-3, 1.14 ug/L. The facility states that statistical analyses indicate that these values are not statistically significant. However, as noted in the July 1997 IOC and in Comment 1 above, there are concerns about the validity of the statistical analyses performed by the facility.

3. The samples were not analyzed for phosphorus. The facility states that this was due to a laboratory oversight. Phosphorus was sampled during the confirmation sampling (August 1997) to correct this error.

4. The ground water flow map is not constructed correctly. The static water level elevation for MW-3 is 960.50, however, on the map, it is located downgradient of the 953 contour. In addition, as drawn, the map indicates that the ground water flows from MW-5 which has a static water level elevation of 955.32, towards MW-3 which has a static water level elevation of 960.50. Ground water does not tend to flow "uphill." A more accurate interpretation of the static water level data should be prepared and submitted for review. In addition, the contour interval varies over the map. Some contours are based on a two foot contour interval and other contours are based on a three foot contour interval. The same contour interval should be used over the entire map. A scale and a north arrow also must be added to the map. The ground water flow map for the June 1997 sampling event should be corrected as per the above comments and resubmitted for review. In the future, ground water elevation maps must be constructed according to generally accepted hydrogeologic protocols.

5. The chain-of-custody form does not document who received the samples from the first person who relinquished them. This information should be supplied to the Ohio EPA. In addition, there is a seven day gap between when the first person relinquished the samples and when the second person in the chain relinquished them. This should be explained. The date that the landfill samples were collected is not indicated on the chain-of-custody. The laboratory data sheets indicate that the landfill samples were collected on June 26. This should be confirmed. If the samples were collected on June 26, the fact that the first date for relinquishing the samples is June 19, seven days before they were collected, should be explained. In the future, for the sample results to be accepted as valid, the chain-of-custody form must be filled out completely and accurately.

   In addition, the chain-of-custody indicates that both trip blanks were received in one cooler. If there are several coolers being used for the shipment of samples collected for volatile organic compound analyses, then there must be a trip blank in each of the coolers. A trip blank should accompany the samples from the time of collection until analyses are complete. In the future, for the sample results to be accepted as valid, trip blanks must be properly used.

6. Two parameters required to be analyzed by the regulations were omitted from this sampling event. Temperature, required by OAC 3745-27-10 (D)(1)(a), was not analyzed, nor was 2-chloroethyl vinyl ether, required by OAC 3745-27-10

(D)(1)(gg). In the future, care should be taken to analyze and report all of the parameters required by the regulations.

Comments: August 7, 1997, Confirmatory Sampling

1. The results of this sampling event confirmed the statistically significant differences between the upgradient and downgradient concentrations of specific conductivity in wells MW-3 and -5, total organic carbon in MW-3, and total dissolved solids in MW-3 and 5. However, as documented in the July 1997, IOC and in Comment 1 above, there are concerns about the validity of the statistical analyses performed by the facility as well as the adequacy of the monitoring system.

2. The explosive compound RDX was confirmed in MW-2 at a concentration of 1.4 ug/L. The compound 2,4-TNT was not confirmed in MW-2. Neither 2,4-TNT nor RDX were detected in MW-1 or -3, the other two wells to be resampled.

3. The chain-of-custody form is incorrectly completed. The first person to relinquish custody did so three days prior to the samples being collected. It is unclear how custody can be relinquished prior to the collection of the samples. In addition, the person to whom the samples were relinquished is not documented. The second person to relinquish the samples did not document the date and time at which the samples were turned over to the next person in the chain. Nor is it clear to whom the samples were relinquished. In the future, for the sample results to be considered to be valid, the chain-of-custody must be filled out completely and accurately.

Reviewed by Scott Williams, Lead Worker, DDAGW-NEDO.

DK:bo

pc: Lindsay Taliaferro, Unit Supervisor, DDAGW-CO
Christopher Khourey, Geology Program Supervisor, DDAGW-NEDO
Kurt Princic, Group Leader, DSIWM-NEDO
Eileen Mohr, Environmental Specialist, DERR-NEDO

Tracking ID #s:

Ground Water	Solid Waste
1. 09-10-97-03-1-35-3	1873
2. 09-18-97-03-1-22-3	1882

1997

OhioEPA
State of Ohio Environmental Protection Agency
Northeast District Office
2110 E. Aurora Road
Twinsburg, Ohio 44087-1969
(330) 425-9171 **FAX** (330) 487-0769

George V. Voinovich
Governor

December 22, 1997

RE: Ground Water Monitoring
Ramsdell Landfill
Ravenna Army Ammunition Plant

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

Attn.: Mr. Robert J. Kasper

Dear Mr. Kasper:

The Ohio EPA Northeast District Office, Division of Drinking and Ground Waters (NEDO-DDAGW) has reviewed the data from the June 1997 ground water sampling event and the results of the August 1997 confirmatory sampling event for the Ramsdell Landfill, located at the Ravenna Army Ammunition Plant, Portage County.

The attached December 15, 1997 Inter-Office Communication (IOC) from Diane Kurlich of DDAGW-NEDO discusses the findings of the DDAGW review.

Please address the comments on pages 2 thru 4 of the attached IOC and submit the necessary documentation for review. Many of the comments made in the attached IOC were also made in the earlier correspondence from this Division to the facility dated August 21,1997, and were discussed in the meeting between Ohio EPA and the Army on December 11, 1997. It is expected that some of these issues will be included in the Army's follow-up written response to that meeting.

If you have any other questions or concerns regarding the findings of the DDAGW review, please do not hesitate to contact either Diane Kurlich at (330) 963-1292 or me at (330) 963-1276.

Sincerely,

Jarnal Singh

Jarnal Singh, RS
Environmental Specialist
Division of Solid and Infectious
Waste Management

JS:cl
Enclosure

cc: Diane Kurlich, DDAGW-NEDO
Virginia Wilson, DSIWM-NEDO
Eileen Mohr, DERR-NEDO
Duwayne Porter, Portage County HD
Robert Whelove, HQ-IOC
File:[LAND/Willowcreek/GRO/67]

Tim - Copy

DRAFT

looks good to me T.W.

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

Subject: Response to Ohio EPA Review of Ramsdell Landfill Ground Water Monitoring Submittals

Reference: Ohio EPA Letter Dated 8/21/97, Subject as Above

Dear Sir:

We have reviewed the referenced letter and comments regarding ground water monitoring at the RVAAP Ramsdell Landfill and have the following response to the comments as set forth in the above-referenced letter:

GENERAL COMMENTS

1. We agree that the relationship between the pond and the ground water at the landfill has not been defined. A gauge to measure level changes in the pond has been installed and the pond level will be noted each time static water level measurements are taken. A further effort to more clearly define the relationship can also be included as part of an assessment monitoring program which would involve further hydrogeologic investigation at this site.

2. In their "Report on Field Work at the Ravenna Army Ammunition Plant" prepared by the Ohio Drilling Company in August of 1987, the project geologist reported that the differences in color "reflect changes in mineralization of the rock and other factors such as oxygenation of the ground water" and that the different water-bearing zones occur due to "well-developed joint and fracture patterns in the sandstone" and that these zones do not represent separate aquifers. The location of the screened intervals for the wells was determined in consultation with the Ohio EPA Northeast District Office at the time of well installation. However, a study of general water chemistry in the wells could be included as part of an assessment monitoring program which would involve further hydrogeologic investigation at this site.

CF - EQE (Wheland)
IRG (Vermont)
FRC (Tangold)

3. When in operation, waste material at the landfill extended right up to the pond, and placement of wells in this area would actually be in the landfill rather than downgradient from it. Further hydrogeologic investigation and the installation of additional wells (if determined to be necessary) at the landfill site as part of a ground water assessment monitoring program would help to clarify whether any (or all) of the existing wells meet the definition of "downgradient".

4. The wrong "top of casing" elevation was inadvertantly entered into the GRITS/STAT program. The correct elevation, as taken from the final landfill closure drawings, is 982.50. This has been corrected in GRITS/STAT. Well depths have been corrected based upon information provided in The Ohio Drilling Company's "Report on Field Work at the Ravenna Army Ammunition Plant". The corrected depths are as follows: Monitoring Well #1 - 53', Monitoring Well #2 - 43', Monitoring Well #3 - 42', Monitoring Well #4 - 56', and Monitoring Well #5 - 46'. This has been entered into GRITS/STAT.

5. Metals samples are not field filtered; metals analysis is for total metals. This has been clarified in the Landfill Ground Water Monitoring Plan.

6. The Ramsdell Landfill is one of the "areas of concern" that will be further investigated under the Army's on-going remedial investigation activities being conducted as part of the Installation Restoration Program at RVAAP. As part of that investigation, available historical documents and information will be reviewed in an attempt to ascertain past activity at the site. A separation of the affects from RCRA sanitary landfill activities from the affects from pre-sanitary landfill activities at this site certainly presents a challenge.

7. Future submittals of ground water flow maps by Mason & Hanger Corp. will be provided on a revised map base which includes a north arrow and scale, and will incorporate standard geologic procedures for the construction of a contour map. The ground water flow maps for the December 1996 and February 1997 sampling events have been re-drafted and are submitted with this letter. Static water levels were measured on October 7, 1997 and are more consistent with historical levels at the landfill. We believe that the December 1996 and February 1997 measurements may have been inaccurate, and have ordered a new measurement tape to help decrease the possibility of errors in future static level measurements.

8. Mason & Hanger Corporation has contracted with a new laboratory service provider (Quanterra Labs) and will more closely monitor results received to ensure all analytical work has been performed as is required by the Landfill Ground Water Monitoring Plan.

9. (a) Future submittals by Mason & Hanger Corp. will include an analysis of distribution along with the statistical reports.

(b) The GRITS/STAT program was used in conducting statistical analysis for the toluene sample, and the program automatically replaces non-detects with one half the detection limit, which in that case would have been 1.25 ug/L. The detection limits vary in the analytical data, thus the discrepancy between the 2.5 ug/L limit and the 1.0 ug/L limit noted in the comment.

(c) After reviewing US EPA guidance documents regarding statistical analysis of ground water data, we performed an extensive review of the statistical analysis methods performed on past data. In some cases it may have been more appropriate to apply a parametric method versus the non-parametric method that was applied in the submission. In that light, statistical analyses have been re-preformed on past data sets starting with the December, 1995 submission. With regard to the specific example in this comment, a change in the method applied did not change the results received. Statistical analyses are performed on data values obtained over time, so that one particular observation may not change the overall outcome of the assessment.

(d) Statistical analyses are performed on data values obtained over time. If we were to use data only obtained from the current sampling period, we would not have enough observations to perform a valid statistical test. Monitoring wells #1 and #2 are considered to be downgradient wells for purposes of statistical analyses. Further hydrogeological investigation at the landfill site may change that determination.

(e) A review of statistical procedures indicates that the explosives data may be more appropriately described by Poisson Prediction Intervals. However, in view of the fact that explosives compounds have been detected in the background well, and because explosives are not a naturally occurring compound, it is intuitive that explosives contamination of the ground water has occurred in the area of the landfill. The application of statistical tests to the explosives data at this point would only serve to confirm that conclusion. A computer disk containing all of the ground water data collected at the Ramsdell Landfill in a GRITS/STAT format is attached for submittal to OEPA.

10. We have met with the appropriate Mason & Hanger personnel responsible for sampling and have stressed the need for entering complete information on the chain of custody forms for all samples collected at RVAAP. Mason & Hanger will ensure that in the future the chain of custody forms are filled out in their entirety.

11. Mason & Hanger will identify the well number of the duplicate well on the laboratory analytical results prior to submittal of the results to OEPA.

12. We have contracted with a new laboratory, Quanterra, and have stressed to them the importance of meeting method detection limits as specified in the particular method being

used to analyze the samples. We have also requested that the laboratory verbally notify Mason & Hanger if method detection limits for a particular analyte are significantly different than specified, and to provide a written explanation with the data as to why the specified limits could not be achieved.

COMMENTS: DECEMBER 1995 DATA

1. Statistical reports for the period in question have been re-generated. The results are unchanged.
2. Statistical analyses of the explosives data was probably not valid. It is not clear whether any statistical analysis of explosives data would be of value.
3. Statistical analyses of metals data is not required as part of the ground water monitoring plan for this facility. Values for the parameters in question fall within limits for drinking water set forth in Ohio EPA regulations and are not considered to pose a concern at this site. Monitoring wells #1 and #2 are considered to be downgradient wells at the landfill site, however that may change upon further hydrogeological investigation at the site.
4. This was an error. The statistical analysis for the TOC data for this sampling period have been re-generated with correct data values.
5. The 3.3 ug/L value was obtained in the 2/25/93 sampling event. A copy of the laboratory data sheet for that date is attached.
6. Toluene has not been detected in any subsequent samples in any well

COMMENTS: FEBRUARY 1996 DATA

Statistical analyses of data obtained including this sampling event have been re-generated. Results of the analyses remain unchanged.

COMMENTS: JUNE 1996 DATA

1. Statistical analyses of data obtained including this sampling event have been re-generated. Results of the analyses remain unchanged.
2. Statistical analyses of metals data is not required as part of the ground water monitoring plan for this facility. Values for the parameters in question, with the exception of one or two early samples, fall within limits for drinking water set forth in Ohio EPA regulations and are not considered to pose a concern at this site. Monitoring wells #1 and #2 are considered to be downgradient wells at the landfill site, however that may change upon further hydrogeological investigation at the site.
3. It is unclear why this was done, perhaps just for information purposes.

COMMENTS: SEPTEMBER 1996 DATA

Statistical analyses of data obtained including this sampling event have been re-generated. Results of the analyses remain unchanged.

COMMENTS: DECEMBER 1996 DATA

1. Statistical analyses of data obtained including this sampling event have been re-generated. Results of the analyses remain unchanged.
2. Statistical analyses of metals data is not required as part of the ground water monitoring plan for this facility. The value for the parameter in question falls within limits for drinking water set forth in Ohio EPA regulations and is not considered to pose a concern at this site. Monitoring well #1 is considered to be a downgradient well at the landfill site, however that may change upon further hydrogeological investigation.
3. Statistical analyses of the explosives data was probably not valid. It is not clear whether any statistical analysis of explosives data would be of value.
4. Statistical analysis of the DCA data including this sampling event has been conducted. Results are attached.
5. The values of 5 ppb for HMX in wells #2, 3, 4, and 5 are values set by GRITS/STAT as one half the detection limit of 10 ppb. The detection limits have varied and are usually lower than that. The values for RDX in well #1 was the value obtained in the 12/19/96 sampling. The value for RDX in well #5 was set by GRITS/STAT at one half the detection limit of 10 ppb.
6. A discussion with Mason & Hanger personnel involved in the sampling indicated that one of the VOC vials arrived broken at the laboratory. Re-sampling was conducted to replace the broken vial. Results were included in the laboratory report for the entire sampling event.
7. If the writer is referring to the January 6, 1997 date written at the top of the chain of custody, that would represent the date Mason & Hanger received the chain of custody copy back with appropriate signature, date and time of receipt from the laboratory.

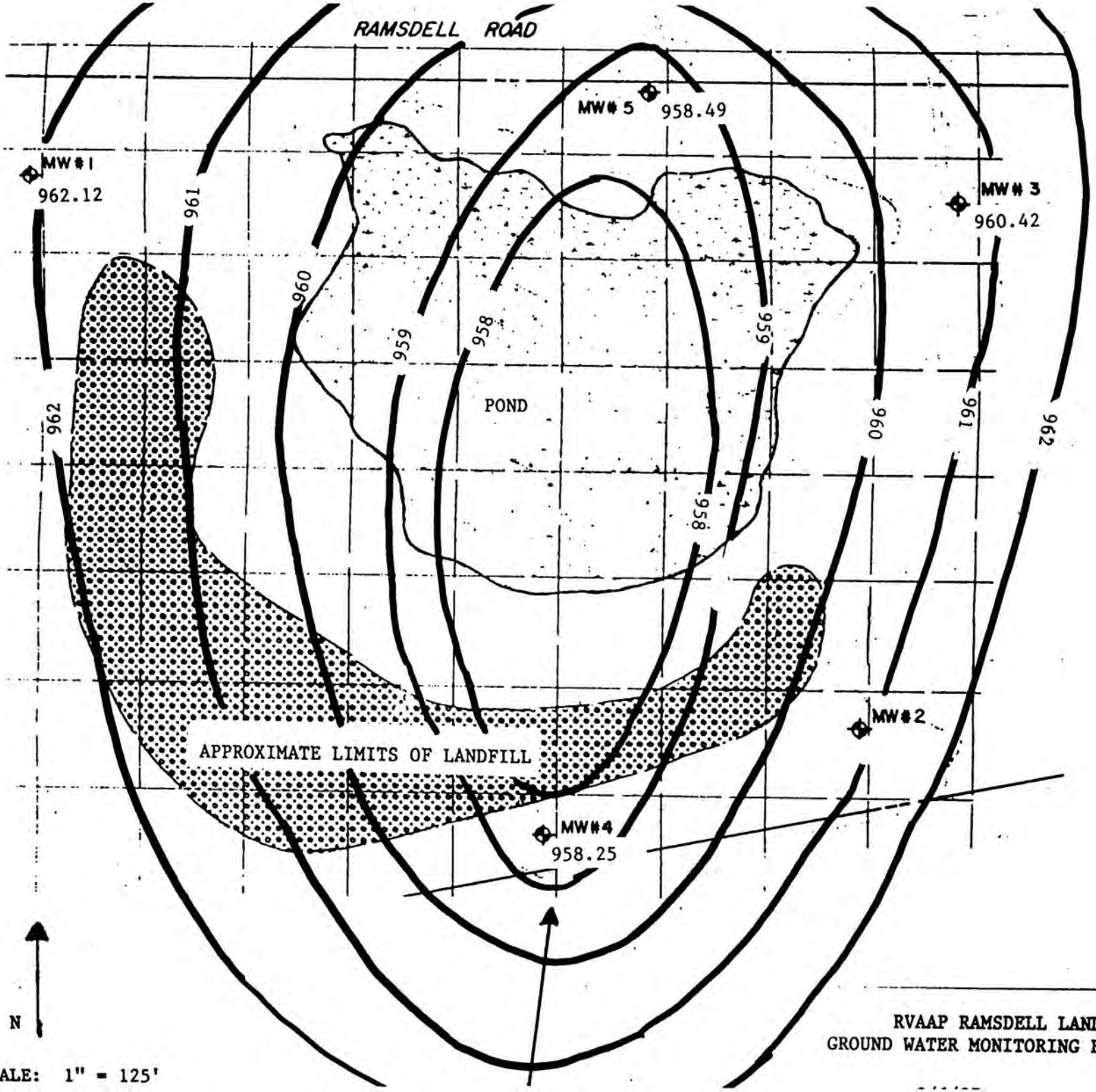
COMMENTS: FEBRUARY 1997 DATA

2. Statistical analyses of the explosives data was probably not valid. It is not clear whether any statistical analysis of explosives data would be of value.
3. It is unclear why this parameter was not included in the resampling event. DCA was not detected in the samples submitted for analysis in June, 1997.
4. The affected monitoring wells which showed statistically significant evidence of contamination for conductivity, TDS and TOC were re-sampled as required by Ohio EPA regulations. Monitoring well #4 was not denoted as having statistically significant

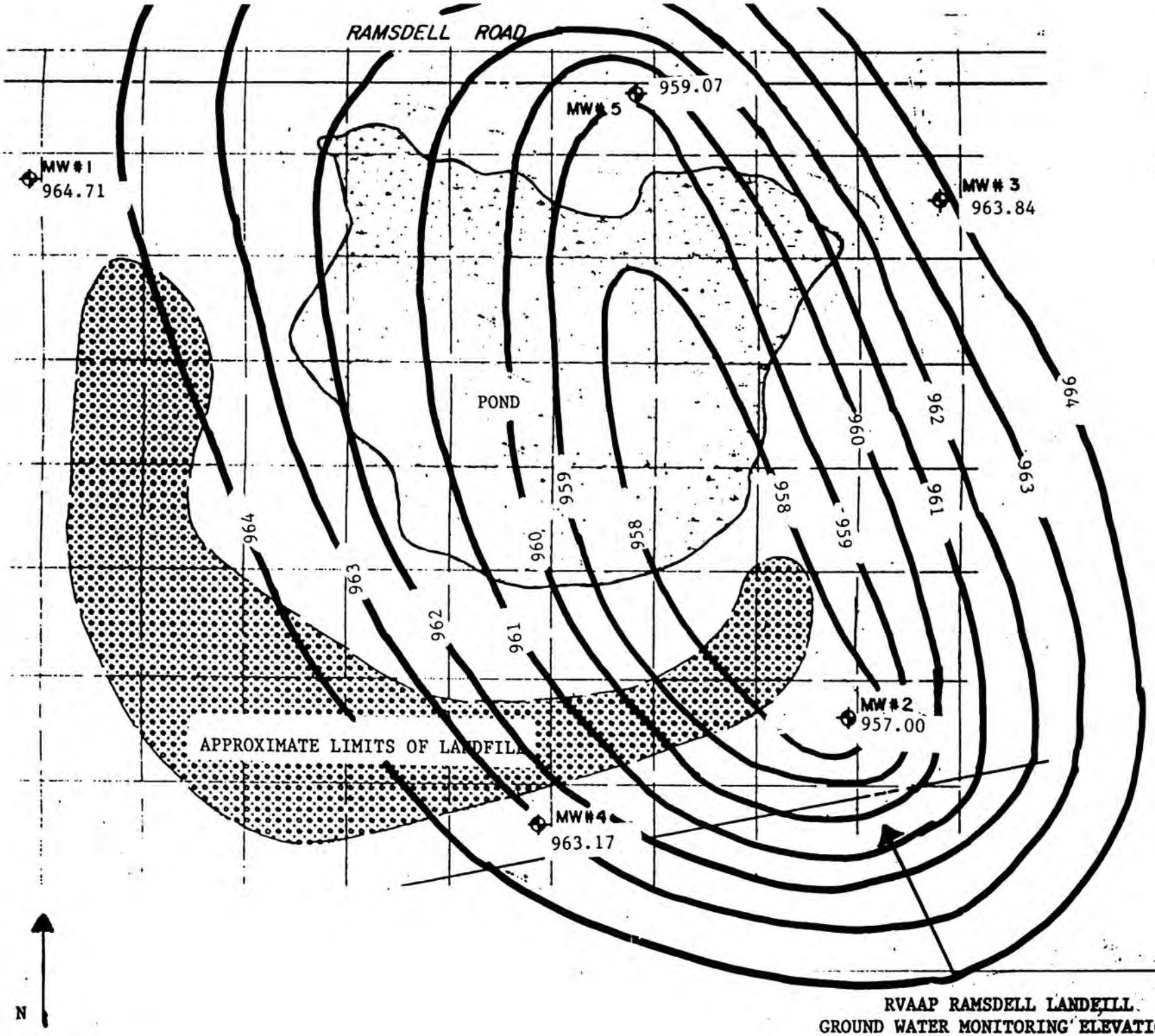
evidence of contamination and was not sampled. Prior re-sampling events may have included well #4 in order to obtain additional background data values.

Sincerely,
Mason & Hanger Corporation

James D. McGee
Site Manager



RVAAP RAMSDELL LANDFILL
GROUND WATER MONITORING ELEVATIONS



RVAAP RAMSDELL LANDFILL
GROUND WATER MONITORING ELEVATIONS

SCALE: 1" = 125'

Wilcoxon Rank-Sum Test
Report Printed: 10-13-1997 14:07

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:1,2DCE (1,2-Dichloroethane)

CAS Number: 107-06-2
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 2.000 ppb

Start Date:Nov 22 1988
End Date:Dec 19 1996

Data Mode:Log Transformed

Background Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-4	15	100	1.61	0.92	0.96	0.18

Compliance Wells

Well ID	N	%ND	Max Value	Min Value	Mean	Std Dev
MW-2	13	92	2.30	0.92	1.08	0.42

Well	Date	Observation	Rank
MW-4	11/07/91	0.9163	13.0
MW-4	02/27/92	0.9163	13.0
MW-4	06/25/92	0.9163	13.0
MW-4	10/01/92	0.9163	13.0
MW-4	02/25/93	0.9163	13.0
MW-4	07/15/93	0.9163	13.0
MW-4	02/21/94	0.9163	13.0
MW-4	07/28/94	0.9163	13.0
MW-4	12/22/94	0.9163	13.0
MW-4	06/28/95	0.9163	13.0
MW-4	06/28/95	0.9163	13.0

MW-4	12/14/95	0.9163	13.0
MW-4	12/14/95	0.9163	13.0
MW-4	06/20/96	1.6094	26.5
MW-4	12/19/96	0.9163	13.0
	Background Data Rank-Sum:		208.5
MW-2	11/07/91	0.9163	13.0
MW-2	02/27/92	0.9163	13.0
MW-2	06/25/92	0.9163	13.0
MW-2	10/01/92	0.9163	13.0
MW-2	02/25/93	0.9163	13.0
MW-2	07/15/93	0.9163	13.0
MW-2	02/21/94	0.9163	13.0
MW-2	07/28/94	0.9163	13.0
MW-2	12/22/94	0.9163	13.0
MW-2	06/28/95	0.9163	13.0
MW-2	12/14/95	0.9163	13.0
MW-2	06/20/96	1.6094	26.5
MW-2	12/19/96	2.3026	28.0
	Compliance Data Rank-Sum:		197.5

Background Data Pts m:	15
Compliance Data Pts n:	13
Wilcoxon Statistic W:	106.5000
Expected Value E(W):	97.5000
Std Dev SD(W):	21.7083
Std Dev (Ties) SD'(W):	11.6535
Approx Z-Score Z:	0.7294
Significance Level α:	0.05
$Z\alpha$:	1.6449

Since the Approx. Z Score does not exceed $Z\alpha$ there is no significant evidence of contamination at the compliance well.

OhioEPA
State of Ohio Environmental Protection Agency

S: 2/26/97

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

NOTICE OF DEFICIENCY

CERTIFIED MAIL

Re: *CLOSURE PLAN*
Ravenna Army Ammunition Plant
OH5 210 020 736

January 23, 1997

CR-COR
PROP ADM
LAND MGR
ENV
CONTRACTOR
RETURN FOR
1/27/97

John A. Cicero, Jr.
Commander's Representative
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, OH 44286-9297

Dear Mr. Cicero:

On October 1, 1996, Ohio EPA received from the Ravenna Army Ammunition Plant (RVAAP) a closure plan for the Open Burning Grounds located within the RVAAP installation at 8451 State Route 5, Ravenna, Ohio.

This closure was submitted pursuant to Rule 3745-66-12 of the Ohio Administrative Code (OAC) in order to demonstrate that the RVAAP's proposal for closure complies with the requirements of OAC Rules 3745-66-11 and 3745-66-12.

The public was given the opportunity to submit written comments regarding the closure plan in accordance with OAC Rule 3745-66-12. The public comment period extended from the week of November 11, 1996 through December 21, 1996. No public comments were received by Ohio EPA.

Pursuant to OAC Rule 3745-66-12(D)(4), I am providing you with a statement of deficiencies in the closure plan, outlined in Attachment A.

Please take notice that OAC Rule(s) 3745-66-12 require that a modified closure plan addressing the deficiencies enumerated in Attachment A be submitted to the Director of the Ohio EPA for approval within thirty (30) days of the receipt of this letter.

cf: AMSIO-EQE (Wheeler)(2)
AMSIO-EQM (Yingling)
CoE, Louisville (Jaeger)
CoE, Nashville (Benton)

The modified closure plan shall be prepared in accordance with the following editorial protocol or convention:

1. Old Language is over-struck, but not obliterated.

2. New Language is capitalized.

3. Page headers should indicate date of submission.

4. If significant changes are necessary, pages should be re-numbered, table of contents revised, and complete sections provided as required.

The modified closure plan should be submitted to: Ohio Environmental Protection Agency, Division of Hazardous Waste Management, Attn: Tom Crepeau, Manager, Data Management Section, P.O. Box 1049, Columbus, Ohio 43216-1049. A copy should also be sent to: Sheila Abraham, Ohio EPA, North East District Office, 2110 East Aurora Road, Twinsburg, Ohio.

Upon review of the resubmitted plan, I will prepare and issue a final action approving or modifying such plan. If you wish to arrange a meeting to discuss your responses to this Notice of Deficiency, please contact Sheila Abraham at (216) 963-1290.

Sincerely,

Donald R. Schregardus
Director

cpobltr.closures.sabraham/ao

cc: Tom Crepeau, DHWM, Central File, Ohio EPA
Harriet Croke, USEPA, Region V
Montee Suleiman, CO, Ohio EPA
Sheila Abraham, Ohio EPA, Northeast DO

ATTACHMENT A

RAVENNA ARMY AMMUNITION PLANT (RVAAP)
OPEN BURNING GROUNDS HAZARDOUS WASTE TREATMENT UNIT CLOSURE
OH5 210 020 736

Section 1.1 General Description:

Comment #1 (page 1-1): The Ravenna Army Ammunition Plant (RVAAP) shall clarify the location of the Open Burning (OB) unit described in the second paragraph on page 1-1 ("The OBG is identified as Pad 38 (WBGss-038)"). In Figure 1-3, the WBGss-038 location is identified as being closest to Pad 44, not Pad 38. Please verify whether Pad 38 relates to the OB unit, and if so, whether the WBGss location correlated with Pad 38 is accurate.

Comment #2 (page 1-1): RVAAP shall reconcile the description of the Open Burning Grounds (OBG), specifically the 2 lines of 4 trays described on page 1-1, with Figures 1-5 and 1-6, which appear to depict 2 lines of 3 trays.

Comment #3 (page 1-1): RVAAP shall clarify that, based on a review of historical documentation, the ash resulting from the open burning treatment was determined to be hazardous; the applicable waste codes shall be listed. Further, although the statement on page 1-1 that the reactivity characteristic (D003) may have been removed by treatment by open burning is accurate, detail on hazardous waste management practices at this unit have not been provided to evaluate whether unexploded or ruptured explosive material that could still possibly retain the reactivity characteristic might be present in the surrounding soil. RVAAP shall clarify if such unexploded or ruptured munitions exist in the surrounding media, and if they do, the manner in which they will be dealt with in the closure activity process.

Comment #4 (page 1-1): RVAAP shall clarify the period, including the last date, during which open burning of munitions occurred at the unit.

Comment #5 (page 1-1): For relevant comments on the proposed interim measures, please refer to subsequent sections.

Section 1.3 Solid Waste Management Units:

Comment #6 (page 1-5): The entire area historically identified, from a RCRA closure perspective, as the Open Detonation (OD) Unit does not appear to be described in this section. For additional comments on the area that may need to be included within the Open Detonation (OD) Unit, please refer to the comments on the OD Closure Plan.

Comment #7 (pages 1-5 and 1-8): RVAAP has appropriately specified all hazardous waste units related to the hazardous waste permit that remain unclosed, as indicated in Section 3.2 of Ohio EPA's 1993 Closure Plan Guidance. However, the "other units of concern (not RCRA regulated)" discussed on page 1-6 do not appear to be directly related to activities and issues discussed in this closure plan. Additionally, based on historical documentation, the "other units of concern" discussed in this document are not the only areas of concern from a complete regulatory perspective. RVAAP shall appropriately modify this section to reflect the historical records and clarify whether hazardous waste management may have occurred in other areas at the facility, including but not limited to the areas detailed on page 1-6. Alternatively, RVAAP has the option of referencing, but not detailing, other areas of concern in this section, if these areas do not substantively impact the OBG closure activities. However, please note that a historical discussion of activities and ensuing waste in the area immediately surrounding the OBG would help place OBG activities in perspective.

Comment #8 (pages 1-5 and 1-8): In the discussion on "other units of concern (not RCRA regulated)", the distinction between "potentially hazardous waste" never having been stored in Building U-202 and "potentially reactive waste" having been stored there is unclear. Please verify the accuracy of the statements and clarify, as appropriate, if this portion of the section is retained. As indicated above, please be aware that appropriate regulatory authority, including generator closure and corrective action, is still maintained by the Division of Hazardous Waste Management (DHWM) with respect to relevant units of concern. The reference to "(not RCRA regulated)" shall be deleted or clarified.

Section 1.4.1.2. Hydrologic setting:

Comment #9 (page 1-8): In the discussion on the hydrologic section, it states that "the Kent and Hiram Tills are too thin and impermeable to produce useful quantities of water," and that "the shales of the Sharon and Mercer Members of the Pottsville Formation" have "insignificant ground water yields." Well logs for water supply wells in the area surrounding the RVAAP, however, indicate that there are a number of wells around the perimeter of the site that are installed into sand and gravel lenses within the tills and also into the shales of the Pottsville Formation. Thus, the ground water available within these units is sufficient to provide water to these water supply wells for residential and business uses. Well logs for water supply wells in the area shall be consulted for additional information and the section modified to indicate that these units are more important in supplying the water needs of the surrounding properties than is presently indicated.

Comment #10 (page 1-8): In addition, the specific information concerning the geologic units discussed in this section (e.g., hydraulic conductivity) shall be properly referenced and citations added to the bibliography.

Section 1.4.2 Ground Water Monitoring System:

Comment #11 (page 1-10): In this section, the facility states that "OBG-3 and OBG-4 are not directly down gradient but are potentially close enough to the burning activity to detect contamination impact." The fact that OBG-4 is not down gradient of the unit was a comment of the Ohio EPA in June 1995. The Ohio EPA indicated that the close proximity of OBG-4 to the unit appears to make it an acceptable sampling point. There is no question on the part of the Ohio EPA about the appropriateness of the location of OBG-3 as a down gradient well. The Ohio EPA concern regarding OBG-3 was that it sometimes did not supply sufficient water for sampling. However, this has not been a problem recently. This section shall therefore be modified to indicate that although OBG-3 is down gradient, OBG-4 is not down gradient of the unit; however, its close proximity appears to make it an acceptable sampling point.

Section 1.4.2.2. Ground Water Monitoring Results:

Comment #12 (page 1-12): In this section, the facility states that one ground water sampling event was conducted in 1992 at the OB grounds. Data submitted to the Ohio EPA indicates that the wells in the OB area were sampled twice in 1992, in April and December. Section 1.4.2.2 shall be modified accordingly.

Comment #13 (page 1-13): With reference to Table 1-1 on the maximum concentrations of selected analytes detected in ground water, RVAAP shall distinguish between the data collected prior to December 1995 and those collected after that date. Please note on this table and in the discussion that the values obtained for metals analyses prior to December 1995 are for total metals. In December 1995, the facility began to field filter the metals samples. Thus, data subsequent to December 1995 are for dissolved metals analyses. The discussion of the metals data included in this section shall be evaluated with respect to the fact that some of the data are for dissolved metals and some of the data are for total metals, and modified as necessary. In addition, this section shall include a discussion of the occurrence of site specific contaminants in the upgradient well.

Comment #14 (page 1-12): Appendix D is referenced in this section as containing the available ground water analytical data. The presentation of the data in Appendix D is unacceptable. The data shall be presented such that intra-well and inter-well comparisons of parameters over time can be easily accomplished. The data presented in Appendix D shall be tabulated. One recommended format would involve a table for each well with sampling dates along one axis and parameters along the other axis. Alternatively, each sampling date could have a table with the wells listed along one axis and the parameters along the other axis. All non-detects shall be indicated by < the actual detection limit (i.e., < 0.01 ug/L).

Section 1.5.1 Waste Managed:
Comment #15 (page 1-13): The description of the period of operation of this unit shall be amplified, as discussed in a previous comment.

Comment #16 (page 1-13): As discussed in an earlier comment, this section shall be modified to reflect the fact that the open burning of munitions resulted in hazardous waste; the specific waste codes in question shall be listed or referenced.

Comment #17 (page 1-13): In this section the only explosive wastes discussed as constituents of concern for the OB area are 2,4,5-trinitrotoluene (TNT), 1,3,5-hexahydro-1,3,5-trinitrohydazine (RDX) and 1,3,5,7-hexahydro-1,3,5,7-tetranitrohydrazine (HMX). RVAAP shall clarify if a potential existed for the explosive material to have ruptured during the open burning process and to have impacted the surrounding media. RVAAP shall also discuss the potential for the presence of other hazardous wastes, including but not limited to the degradation products of concern, in the OB unit and the surrounding media. Previous hazardous waste management and geohydrologic studies conducted at the unit shall also be discussed to provide an overall perspective on hazardous waste/ material that could be present at the beginning of the closure activities.

Section 1.5.2 Capacity and Section 1.6 References to other Environmental Permits:
Comment #18 (page 1-15): RVAAP has listed environmental permits currently in force at the facility. However, reference shall be made to historical records on the emergency hazardous waste treatment permits that have been issued specifically for the OB unit. Sufficient detail on permit dates, periods and amounts of hazardous waste treated shall also be provided to provide a perspective on the total quantity and type of hazardous waste that was treated at this unit.

Section 2.1.1 Estimates of the Quantity of Inventory to be Removed and Section 2.1.2. Procedures for Inventory Removal, Disposal and Decontamination:
Comment #19 (page 2-1): The burn trays and ancillary equipment were used for the open burning of reactive waste, and, at the end of the process, contained hazardous waste. RVAAP shall clarify that situation in this section, and discuss the procedures that are currently detailed in the Interim Measures (IM) plan relative to the dismantling, characterization and removal to Building 1601 of the burn trays and ancillary equipment.

Comment #20 (page 2-1): Details shall also be provided on the material and thickness of the berm, as well as on the thickness of the liner proposed to be utilized for decontamination activities to facilitate review and substantiate conclusions that the environment will not be adversely impacted during closure activities. This comment is also applicable to Section 2.1.2.2.

Section 2.1.2.2. Equipment Decontamination:

Comment #21 (page 2-2): RVAAP shall clarify if the lined and bermed decontamination area proposed (in the first paragraph of this section) to be used for equipment decontamination is to be set up in the OB area or in Building 1601. A detailed sequence and time frame for equipment decontamination activities proposed in the OB area shall be provided, such that the OB closure plan can be reviewed by all stakeholders as a stand alone document.

Section 2.2. Risk-Based Closure:

Comment #22 (page 2-5): Although RVAAP has the option, as stated in Ohio EPA's 1993 Closure Plan Review Guidance for RCRA Facilities to address the OD unit through a risk-based closure, please be aware that a critical component of the risk-based closure demonstration is defining the extent of soil and ground water contamination utilizing adequate sampling data. The closure plan, as submitted, does not contain enough information on this issue to facilitate decisions on the possibility of a risk-based closure. For example, all constituents of concern, including the potential degradation products have not been identified, nor has a sampling plan to delineate the full lateral and vertical extent of contamination been proposed in the current version of the closure plan. DHWM recommends that the nature and extent of contamination be fully delineated prior to conducting the risk assessment, and is willing to work with the facility through this process.

Comment #23 (page 2-5): Please be aware that the DHWM Central Office has, to date, not approved any methodology for assessing risks associated with exposures to lead in the soil. If, based on soil sampling data, lead contamination is evaluated as a concern at the OB unit, alternative methods of contaminant management might need to be explored.

Comment #24 (page 2-5): Further, evaluating the risk to possible receptors through a recreational land use scenario is currently unacceptable in RCRA closure activities. As explicitly stated in the closure guidance, DHWM requires that standard exposure assumptions for a residential scenario be used to establish health-based standards to assure a consistent, minimum level of decontamination at RCRA regulated facilities and to facilitate post-closure transfer and development. RVAAP shall therefore evaluate the risks based on an unrestricted residential, rather than a recreational, future land-use scenario. This comment is applicable to Section 2.2.2. also.

Comment #25 (page 2-5): Finally, please also be aware that Ohio EPA's Closure Plan Guidance requires that preliminary remediation goals for all impacted media be provided in the closure plan containing the site-specific risk-assessment demonstrations. Section 2.1 and subsequent sections related to the risk assessment shall therefore be appropriately modified.

Section 2.2.1.1. Data Evaluation/ Collection:
Comment #26 (page 2-6): In this section, the availability of 15 rounds of ground water data is discussed. The facility should note that only the last year (four or five quarters) of metals data are for dissolved metals. It is the dissolved metals data that probably will be the most useful in risk assessment calculations.

Comment #27 (page 2-7): With reference to the 1992 Geohydrologic Study explosive detections discussed in this section, only those contaminant levels above the 10 ppm level are addressed. The rationale for this is unclear as certain explosives such as RDX could pose a threat to human health at levels below the 10 ppm level (based on conservative exposure assumptions). RVAAP shall discuss all historical contaminant levels found with detailed supporting documentation. Alternatively, if such a detailed discussion will not substantially impact conclusions on current closure issues, all relevant data shall be provided in the form of an appendix.

Comment #28 (page 2-7): As indicated in the previous comment, if data from the 1992 USAEHA Report (or any other report) are proposed to be used to substantiate any conclusions, or as the foundation for any proposed closure activities at the OB unit, such data shall be provided (in as complete a manner as possible) in the OB closure plan to facilitate review and conclusions by all stakeholders in the process.

Comment #29 (page 2-8): RVAAP shall submit, as part of the closure plan, a soil sampling plan in order to delineate the full nature and extent of contamination related to the OB unit, with the understanding that the proposed sampling plan could be subject to modification if unexpected situations are encountered during closure activities. As stated in previous comments, this soil sampling plan is a critical prerequisite to any closure decisions, and is required as part of the closure plan, as stated in Ohio EPA's 1993 Closure Plan Review Guidance for RCRA Facilities. Additional detail and technical guidance on the soil sampling plan is provided in the closure guidance document. This comment is applicable to section 2.4.1 ("Activities to be Conducted"), too.

Comment #30 (page 2-8): Once the soil sampling plan has been submitted as part of the modified closure plan, DHWM is willing to work with RVAAP on the process of completely defining the nature and extent of contamination through a review of the soil sampling data, and also on evaluating the acceptability of historical data for the risk assessment process.

Section 2.2.1.2. Background Concentrations of Naturally Occurring Constituents:
Comment #31 (page 2-8): With respect to the background values for 8 naturally occurring constituents in soil presented in Table 2-3, please clarify if the "average UCL background concentration" refers to "average concentrations", as stated in the description, or the upper confidence limit of the mean concentration. Please also be aware that the "average UCL

background concentration" of 40.3 mg/kg for arsenic presented in the table is above the levels at which arsenic could pose a risk to human health (calculated using conservative exposure assumptions). The background data on selected inorganic constituents provided in Table 2-3 are thus unacceptable to the Division of Hazardous Waste Management (DHWM) for risk assessment purposes. For additional information on acceptable background data for risk assessment purposes, please refer to Ohio EPA's 1993 Closure Plan Review Guidance for RCRA Facilities. Further, given the historical information on the impact of installation activities on media at the facility, any background data that RVAAP wishes to use in the risk assessment process shall be adequately substantiated, both with respect to location and reliability of the sampling procedures.

Comment #32 (page 2-8): RVAAP shall also clarify the background values that shall be used in the case of the non-detects (i.e., cadmium, mercury and silver).

Comment #33 (page 2-8): Further, this section discusses the determination of background concentrations for naturally occurring constituents in ground water using the upgradient well (OBG-1). Once again, the facility is reminded that there are two types of metals data, total and dissolved. When determining background, it is recommended that the dissolved metals data are used or that two different background values are calculated, one for dissolved metals and one for total metals. Using the available data, the ground water background values should be calculated and should be tabulated in a similar manner to Table 2-3, which is a summary of the background concentrations for soils. Because of the known historical use of the land surrounding the RCRA unit, it may also be prudent to investigate the background concentrations of explosive compounds in ground water.

Section 2.2.1.3. Selection of Contaminants of Potential Concern:
Comment #34 (pages 2-8 and 2-9): With respect to other potential contaminants of concern, RVAAP shall address all organic contaminants of concern, including but not limited to the degradation products related to the explosive material that was thermally treated in the OB unit.

Section 2.2.2 Exposure Assessment:
Comment #35 (page 2-9): Although RVAAP has the option, as stated in Ohio EPA's 1993 Closure Plan Review Guidance for RCRA Facilities, to address the OB unit through a risk-based closure, please be aware that evaluating the risk to possible receptors through a recreational land use scenario is currently unacceptable, as stated in a previous comment. As stated in the closure guidance, DHWM requires that standard exposure assumptions for a residential scenario be used to establish health-based standards to assure a consistent, minimum level of decontamination at RCRA regulated facilities. This requirement also facilitates post-closure transfer and development without notification and/ or prior approval of the Agency. RVAAP shall therefore evaluate the risks based on unrestricted residential, rather than recreational, future land-use scenario. Sections 2.2.2.2, 2.2.2.3 and Table 2-4 shall be appropriately modified.

Section 2.2.2.4 Intake Equations:
Comment #36 (page 2-10): Please be aware that the U.S. EPA Guidance (1991) referred to for deriving the relationship between the concentration of contaminants in the soil and the volatilized contaminants in the air has recently been superseded by the 1996 U.S. EPA Soil Screening User's Guidance.

Comment #37 (page 2-10): Please clarify that the 0.06 absorption factor for the PCBs shall be used only in the event that PCB contamination related to the OB unit is identified.

Section 2.2.7 Conclusions and Recommendations:
Comment #38 (page 2-13): The facility has not included provisions for the continued monitoring of ground water during the period closure activities are being performed at the site and until final closure is certified. The facility is presently sampling ground water on a quarterly schedule according to the ground water sampling and analysis plan included in its Part B Permit (according to OAC 3745-54-90 through 99). The facility shall include a statement in the closure plan that ground water monitoring will continue on a quarterly basis as per the procedures in the present sampling and analysis plan (i.e., in accordance with OAC 3745-54-90 through 99) with the following three modifications incorporated:

1. The sampling and analysis plan shall be modified to include sampling only for site specific parameters plus temperature, specific conductance, and pH; these parameters shall be specified in the closure plan.

2. The analytical detection limits shall be modified to ensure that they are less than or equal to the MCLs for any applicable parameter (e.g., the detection limit for arsenic will be less than or equal to 0.05 mg/L). Table E-4-1 in the sampling and analysis plan shall be modified accordingly.

3. Statistical analyses shall be performed on site specific parameters rather than on the indicator parameters. The statistical analysis of indicator parameters has indicated that the site is impacting the quality of ground water. However, the results of the analysis of site specific parameters has been inconclusive. Site specific contaminants periodically are detected at low concentrations in site wells. However, these detections do not seem to follow a pattern, are also present in the upgradient well, and are not confirmed during the subsequent sampling event. Thus it is recommended that the statistical analysis of the indicator parameters be halted and that the focus of the sampling program be on the site specific parameters which will also be the focus of any risk assessment performed at the site. Because site specific contaminants have periodically been detected in the ground water at the site, it is important that quarterly ground water monitoring continue until final closure is certified. Section 2.2.7 shall also be modified accordingly.

Comment #39 (page 2-13): Please be aware that Ohio EPA's Closure Plan Guidance requires that preliminary remediation goals for all impacted media be provided in the closure plan containing the site-specific risk-assessment demonstrations.

Section 2.4.2 Testing and Analysis to Be Performed:
Comment #40 (page 2-14): With reference to soil sampling, as indicated in Ohio EPA's Closure Plan Review Guidance, the submission of a complete quality assurance and quality control (QA/QC) plan is not required but evidence of such a program shall be presented in the closure plan. RVAAP's attention is also directed to the model Quality Assurance Project Plan prepared by U.S. EPA Region V. The facility shall follow standard procedures, and document adherence to QA/QC protocol. Any proposed deviations from accepted protocol shall, however, be addressed in the closure plan. DHWM reserves the right to request specific portions of the QA/QC documentation in the event of a data quality issue. This comment is also applicable to section 3.8 (Milestones). For ground water QA/QC requirements, please see the following comment.

Section 2.4.5 Types of Documentation:
Comment #41 (page 2-15): In this section, the facility discusses types of documentation that will be submitted with the closure certification. The submission of QA/QC information on ground water, including field and laboratory procedures and data, should be added to this section.

Section 3.8 Milestones:
Comment #42 (page 2-10): This section shall be modified as necessary, based on previous comments.

cpob.closures/SA.ao

OhioEPA
State of Ohio Environmental Protection Agency

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

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

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

NOTICE OF DEFICIENCY

CERTIFIED MAIL

Re: ***CLOSURE PLAN***
Ravenna Army Ammunition Plant
OH5 210 020 736

January 23, 1997

John A. Cicero, Jr.
Commander's Representative
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, OH 44286-9297

Dear Mr. Cicero:

On October 1, 1996, Ohio EPA received from the Ravenna Army Ammunition Plant (RVAAP) a closure plan for the Open Detonation Area located within the RVAAP installation at 8451 State Route 5, Ravenna, Ohio.

This closure was submitted pursuant to Rule 3745-66-12 of the Ohio Administrative Code (OAC) in order to demonstrate that the RVAAP's proposal for closure complies with the requirements of OAC Rules 3745-66-11 and 3745-66-12.

The public was given the opportunity to submit written comments regarding the closure plan in accordance with OAC Rule 3745-66-12. The public comment period extended from the week of November 11, 1996 through December 21, 1996. No public comments were received by Ohio EPA.

Pursuant to OAC Rule 3745-66-12(D)(4), I am providing you with a statement of deficiencies in the closure plan, outlined in Attachment A.

Please take notice that OAC Rule(s) 3745-66-12 require that a modified closure plan addressing the deficiencies enumerated in Attachment A be submitted to the Director of the Ohio EPA for approval within thirty (30) days of the receipt of this letter.

The modified closure plan shall be prepared in accordance with the following editorial protocol or convention:

1. Old Language is over-struck, but not obliterated.

2. New Language is capitalized.

3. Page headers should indicate date of submission.

4. If significant changes are necessary, pages should be re-numbered, table of contents revised, and complete sections provided as required.

The modified closure plan should be submitted to: Ohio Environmental Protection Agency, Division of Hazardous Waste Management, Attn: Tom Crepeau, Manager, Data Management Section, P.O. Box 1049, Columbus, Ohio 43216-1049. A copy, with an additional copy to facilitate ground water review, should also be sent to: Sheila Abraham, Ohio EPA, North East District Office, 2110 East Aurora Road, Ohio.

Upon review of the resubmitted plan, I will prepare and issue a final action approving or modifying such plan. If you wish to arrange a meeting to discuss your responses to this Notice of Deficiency, please contact Sheila Abraham at (216) 963-1290.

Sincerely,

Donald R. Schregardus
Director

cpodltr.closures.sabraham/ao

cc: Tom Crepeau, DHWM, Central File, Ohio EPA
Harriet Croke, USEPA, Region V
Montee Suleiman, CO, Ohio EPA
Sheila Abraham, Ohio EPA, Northeast DO

ATTACHMENT A

RAVENNA ARMY AMMUNITION PLANT (RVAAP)
OPEN DETONATION GROUNDS HAZARDOUS WASTE
TREATMENT UNIT CLOSURE
OH5 210 020 736

Section 1.1 General Description:
Comment #1 (page 1-1): The Horseshoe Area (depicted in Figure 1-4) and the area of possible scrap bombs are not identified in the description of the Open Detonation Grounds (ODG). The Ravenna Army Ammunition Plant (RVAAP) shall clarify if these areas are considered part of the RCRA regulated unit. If so, the general description of the site shall be modified to include these areas. If not, RVAAP shall clarify the regulatory authority under which these areas shall be addressed. This comment is applicable to section 1.5 (Open Demolition Area #2 Unit Description)

Comment #2 (page 1-1): Although the statement on page 1-1 that the reactivity characteristic (D003) may have been removed by treatment by open burning is accurate, unexploded ordinances could still possibly retain the reactivity characteristic. RVAAP shall clarify if such unexploded or ruptured munitions exist in the surrounding media. If the potential remains for such reactive waste in the Open Detonation (OD) unit, RVAAP shall clarify the manner in which such ordinances will be dealt with through the closure activity process to facilitate the review of the OD area closure plan by all stakeholders in the process. As indicated above, this comment is also applicable to Section 1.5.

Comment #3 (page 1-1): RVAAP shall clarify the period, including the last date, during which open detonation of munitions occurred at the unit.

Section 1.3 Solid Waste Management Units:
Comment #4 (page 1-7): RVAAP has appropriately specified all hazardous waste units related to the hazardous waste permit that remain unclosed, as indicated in Section 3.2 of Ohio EPA's 1993 Closure Plan Guidance. However, the "other units of concern (not RCRA regulated)" discussed on page 1-7 do not appear to be directly related to activities and issues discussed in this closure plan. Additionally, based on historical documentation, the "other units of concern" discussed in this document are not the only areas of concern from a complete regulatory perspective. RVAAP shall appropriately modify this section to reflect the historical records and clarify whether hazardous waste management may have occurred in other areas at the facility, including but not limited to the areas detailed on page 1-7. Alternatively, RVAAP has the option of referencing, but not detailing, other areas of concern in this section, if these areas do not

substantively impact the OD Grounds (ODG) closure issues. However, please note that a historical discussion of activities and ensuing waste in the area immediately surrounding the ODG would help place OD unit activities in perspective.

Comment #5 (page 1-7): With reference to the discussion on "other units of concern (not RCRA regulated)", please be aware that appropriate regulatory authority, including generator closure and corrective action, is still maintained by the Division of Hazardous Waste Management (DHWM) with respect to relevant units of concern. The reference to "(not RCRA regulated)" shall be deleted or clarified if the section is retained.

Section 1.4.1.2 Hydrologic Setting:

Comment #6 (page 1-9): In the discussion in this section on the hydrologic setting in the vicinity of the RVAAP, it states that "the Kent and Hiram Tills are too thin and impermeable to produce useful quantities of water," and that "the shales of the Sharon and Mercer Members of the Pottsville Formation" have "insignificant ground water yields." Well logs for water supply wells in the area surrounding the RVAAP, however, indicate that there are a number of wells around the perimeter of the site that are installed into sand and gravel lenses within the tills and also into the shales of the Pottsville Formation. Thus, the ground water available within these units is sufficient to provide water to these water supply wells for residential and business uses. Well logs for water supply wells in the area shall be consulted for additional information concerning the use of these units for water supply purposes. Section 1.4.1.2 shall be modified to indicate that these units are more important in supplying the water needs of the surrounding properties than is presently indicated.

Section 1.4.2.2. Ground Water Monitoring Results:

Comment #7 (page 1-11): With reference to Table 1-1 where the maximum concentrations of selected analytes detected in ground water are provided, it shall be noted on this table and in the discussion that these values relate to total metals, not dissolved metals. Because dissolved metals analyses are more pertinent for risk assessment calculations and for comparisons with MCLs, in December 1995 the facility began to field filter the metals samples. Thus, the analysis of metal samples for dissolved metals began in 1995. The maximum concentration of the dissolved metals detected shall be added to this table.

Comment #8 (page 1-12): Additionally, the discussion on page 1-12 shall note that the reduction in the concentrations of the metals detected recently may be due to changing from analyzing for total metals to analyzing for dissolved metals. The discussion of the metals data included in this section shall be evaluated with respect to the available dissolved metals data and modified accordingly. In addition, this section shall include a discussion of the occurrence of site specific contaminants in the upgradient well.

Comment #9 (page 1-11): Appendix D is referenced in this section as containing the available ground water analytical data. The presentation of the data in Appendix D is unacceptable. The data shall be presented such that intra-well and inter-well comparisons of parameters over time can be easily accomplished. The data presented in Appendix D shall be tabulated. One recommended format would involve a table for each well with sampling dates along one axis and parameters along the other axis. Alternatively, each sampling date could have a table with the wells listed along one axis and the parameters along the other axis. All non-detects shall be indicated by < the actual detection limit (i.e., < 0.01 ug/L).

Comment #10 (page 1-11): Table 1-1 lists concentrations for 1,2-DCE. The volatile organic compound actually detected in samples from the site wells was 1,2-DCA. This shall be corrected.

Section 1.5 Open Demolition Area #2 Unit Description:
Comment #11 (page 1-7): Please refer to the comments under Section 1.1, and describe all regulated areas of this unit related to RCRA closure.

Section 1.5.1 Waste Managed:
Comment #12 (page 1-12): The description of the period of operation of this unit shall be amplified.

Comment #13 (page 1-12): In this section the only explosive wastes discussed as constituents of concern for the OD area are 2,4,5-trinitrotoluene (TNT), 1,3,5-hexahydro-1,3,5-trinitrohydazine (RDX) and 1,3,5,7-hexahydro-1,3,5,7-tetranitrohydrazine (HMX). RVAAP shall also discuss the potential for the presence of other hazardous wastes, including but not limited to ordinance fragments, unexploded ordinances, and the degradation products of the contaminants of concern, in the OD unit and the surrounding media. Previous hazardous waste management practices and geohydrologic studies conducted at the unit shall also be discussed to provide an overall perspective on hazardous waste/ material that could be present at the beginning of the closure activities.

Comment #14 (page 1-13): The constituents of concern listed in Table 1-2 shall be expanded to include ground water constituents; alternatively another table listing the constituents of concern for ground water shall be provided.

Section 1.5.2 Capacity and Section 1.6 References to other Environmental Permits:
Comment #15 (page 1-14): RVAAP has listed environmental permits currently in force at the facility. However, reference shall be made to historical records on the emergency hazardous waste treatment permits that have been issued specifically for the OD unit. Sufficient detail on permit dates, periods and amounts of hazardous waste treated shall also be provided to provide a perspective on the total quantity and type of hazardous waste that was treated at this unit.

Section 2.1 Risk-Based Closure:

Comment #16 (page 2-1): Although RVAAP has the option, as stated in Ohio EPA's 1993 Closure Plan Review Guidance for RCRA Facilities to address the OD unit through a risk-based closure, please be aware that a critical component of the risk-based closure demonstration is defining the extent of soil and ground water contamination utilizing adequate sampling data. The closure plan, as submitted, does not contain enough information on this issue to facilitate decisions on the possibility of a risk-based closure. For example, all constituents of concern, including the potential degradation products have not been identified, nor has a sampling plan to delineate the full lateral and vertical extent of contamination been proposed in the current version of the closure plan. DHWM recommends that the nature and extent of contamination be fully delineated prior to conducting the risk assessment, and is willing to work with the facility through this process.

Comment #17 (page 2-1): Please be aware that the DHWM Central Office has, to date, not approved any methodology for assessing risks associated with exposures to lead in the soil. If, based on soil sampling data, lead contamination is evaluated as a concern at the OD unit, alternative methods of contaminant management might need to be explored.

Comment #18 (page 2-1): Further, evaluating the risk to possible receptors through a recreational land use scenario is currently unacceptable in RCRA closure activities. As stated in the closure guidance, DHWM requires that standard exposure assumptions for a residential scenario be used to establish health-based standards to assure a consistent, minimum level of decontamination at RCRA regulated facilities and to facilitate post-closure transfer and development. RVAAP shall therefore evaluate the risks based on an unrestricted residential, rather than a recreational, future land-use scenario.

Comment #19 (page 2-1): Please be aware that Ohio EPA's Closure Plan Guidance requires that preliminary remediation goals for all impacted media be provided in the closure plan containing the site-specific risk-assessment demonstrations. Section 2.1 and subsequent sections related to the risk assessment shall therefore be appropriately modified.

Section 2.1.2. Data Collection:

Comment #20 (page 2-2): Please clarify the reference to Figure 2-1-2 related to the sampling locations in the USAEHA 1992 Report; such a figure does not appear to have been included in the closure plan submitted to DHWM. If the figure provides information on closure plan issues, it shall be included in the closure plan to facilitate review and support conclusions.

Comment #21 (pages 2-2 and 2-3): RVAAP shall discuss the reliability and relevance of previous data collected at the OD unit to the proposed risk-based closure. Specifically, the issue of the data quality level and usability in the risk assessments shall be clarified. If the data do not

meet the appropriate standards, DHWM would recommend referencing the data, as appropriate, and providing them in an appendix. DHWM is willing to work with RVAAP on the process of deciding the acceptability of historical data for the risk assessment process.

Comment #22 (page 2-2): Further, in this section, the availability of 15 rounds of ground water data is discussed. As stated in a previous comment, the facility shall note that only the last year (four or five quarters) of metals data are for dissolved metals. It is the dissolved metals data that probably will be the most useful in risk assessment calculations.

Comment #23 (page 2-2): RVAAP shall also discuss the reliability of ground water data, the analytical detection limits of which did not meet the MCLs.

Comment #24 (page 2-3): RVAAP shall submit, as part of the closure plan, a soil sampling plan in order to delineate the full nature and extent of contamination related to the OD unit, with the understanding that the proposed sampling plan could be subject to modification if unexpected situations are encountered during closure activities. As stated in previous comments, this soil sampling plan is a critical prerequisite to any closure decisions, and is required as part of the closure plan, as stated in Ohio EPA's 1993 Closure Plan Review Guidance for RCRA Facilities. Additional detail and technical guidance on the soil sampling plan is provided in the closure guidance document. This comment is applicable to section 2.10.1 ("Activities to be Conducted"), too.

Comment #25 (page 2-3): Once the soil sampling plan has been submitted as part of the modified closure plan, DHWM is willing to work with RVAAP on the process of completely defining the nature and extent of contamination through a review of the soil sampling data, and also on evaluating the acceptability of historical data for the risk assessment process.

Section 2.1.3. Background Concentrations of Naturally Occurring Constituents:
Comment #26 (pages 2-3 and 2-4): With respect to the background values for 8 naturally occurring constituents in soil presented in Table 2-1, please clarify if the "average UCL background concentration" refers to "average concentrations", as stated in the description, or the upper confidence limit of the mean concentration, as seemingly indicated in the table. Please also be aware that the "average UCL background concentration" of 40.3 mg/kg for arsenic presented in the table is above the levels at which arsenic could pose a risk to human health (calculated using conservative exposure assumptions). The background data on selected inorganic constituents provided in Table 2-3 are thus unacceptable to the Division of Hazardous Waste Management (DHWM) for risk assessment purposes. For additional information on acceptable background data for risk assessment purposes, please refer to Ohio EPA's 1993 Closure Plan Review Guidance for RCRA Facilities. Further, given the historical information on the impact of installation activities on media at the facility, any background data that RVAAP

wishes to use in the risk assessment process shall be adequately substantiated, both with respect to location and reliability of the sampling procedures.

Comment #27 (page 2-4): With respect to Table 2-1, RVAAP shall also clarify the background values that shall be used in the case of the non-detects (i.e., cadmium, mercury and silver).

Comment #28 (page 2-3): In the discussion in Section 2.1.3 on the determination of background concentrations for naturally occurring constituents in ground water using the upgradient well (DET-1), once again, the facility is reminded that there are two types of metals data, total and dissolved. When determining background, it is recommended that the dissolved metals data are used or that two different background values are calculated, one for dissolved metals and one for total metals. Using the available data, the ground water background values should be calculated and should be tabulated in a similar manner to Table 2-1, which is a summary of the background concentrations for soils. Because of the known historical use of the land surrounding the RCRA unit, it may also be prudent to investigate the background concentrations of explosive compounds in ground water.

Section 2.1.4. Selection of Contaminants of Potential Concern:
Comment #29 (page 2-4): RVAAP shall discuss all organic constituents of concern, including but not limited to the degradation products of the explosive material that was treated in the OD unit.

Section 2.2. Exposure Assessment:
Comment #30 (page 2-4): Please refer to comments on Section 2.1 on DHWM's inability to accept a future recreational scenario in the risk assessment for the OD unit. RVAAP shall, as stated previously, evaluate the risk to future residential receptors. This comment is applicable to Table 2-2 (page 2-5). All pathways, including dermal contact with potentially contaminated ground water through inhalation and showering, shall be evaluated.

Section 2.2.4. Intake Equations:
Comment #31 (page 2-6): Please be aware that the U.S. EPA Guidance (1991) referred to for deriving the relationship between the concentration of contaminants in the soil and the volatilized contaminants in the air has recently been superseded by the 1996 U.S. EPA Soil Screening User's Guidance.

Comment #32 (page 2-6): Please clarify that the 0.06 absorption factor for the PCBs will be used only in the event that PCB contamination related to the OB unit is identified.

Section 2.7. Conclusions and Recommendations:

Comment #33 (page 2-9): The facility has not included provisions for the continued monitoring of ground water during the period closure activities are being preformed at the site and until final closure is certified. The facility is presently sampling ground water on a quarterly schedule according to the ground water sampling and analysis plan included in its Part B Permit (according to OAC 3745-54-90 through 99). RVAAP shall include a statement in the closure plan that ground water monitoring will continue on a quarterly basis as per the procedures in the present sampling and analysis plan (i.e., in accordance with OAC 3745-54-90 through 99) with the following three modifications incorporated:

1) The sampling and analysis plan shall be modified to include sampling only for site specific parameters plus temperature, specific conductance, and pH. These parameters shall be specified in the closure plan.

2) The analytical detection limits shall be modified to ensure that they are less than or equal to the MCLs for any applicable parameter (e.g., the detection limit for arsenic will be less than or equal to 0.05 mg/L). Table E-4-1 in the sampling and analysis plan will be modified accordingly.

3) Statistical analyses shall be performed on site specific parameters rather than on the indicator parameters. The statistical analysis of indicator parameters has indicated that the site is impacting the quality of ground water but the results of the analysis of site specific parameters has been inconclusive. Site specific contaminants periodically are detected at low concentrations in site wells. However, these detections do not seem to follow a pattern, are also present in the upgradient well, and are not confirmed during the subsequent sampling event. Thus it is recommended that the statistical analysis of the indicator parameters be halted and that the focus of the sampling program be on the site specific parameters that will also be the focus of any risk assessment performed at the site. Because site specific contaminants have periodically been detected in the ground water at the site, it is important that quarterly ground water monitoring continue until final closure is certified. Section 2.7 shall be modified accordingly.

Comment #34 (page 2-9): Please be aware that Ohio EPA's Closure Plan Guidance requires that preliminary remediation goals for all impacted media be provided in the closure plan containing the site-specific risk-assessment demonstrations.

Section 2.10.2. Testing and Analysis to be Performed:

Comment #35 (page 2-10): With reference to soil sampling, as indicated in Ohio EPA's Closure Plan Review Guidance, the submission of a complete quality assurance and quality control (QA/QC) plan is not required but evidence of such a program shall be presented in the closure

plan. RVAAP's attention is also directed to the model Quality Assurance Project Plan prepared by U.S. EPA Region V. The facility shall follow standard procedures, and document adherence to QA/QC protocol. Any proposed deviations from accepted protocol shall, however, be addressed in the closure plan. DHWM reserves the right to request specific portions of the QA/QC documentation in the event of a data quality issue. This comment is also applicable to Section 3.8 (Milestones). For ground water QA/QC requirements, please see the comment on Section 2.10.5.

Comment #36 (page 2-10): Please refer to comments on ground water analytical detection limits in Section 2.7.

Section 2.10.5 Types of Documentation:
Comment #37 (page 2-11): In this section, the facility discusses types of documentation that will be submitted with the closure certification. The submission of QA/QC information on ground water, including field and laboratory procedures and data, shall be added to this section.

Section 3.8. Milestones:
Comment #38 (page 2-11): This section shall be modified based on previous comments.

cpod.closures/SA.ao

RCRA Closure File

Brown & Root Environmental

910 Clopper Road
Gaithersburg, MD 20878-1399

May 21, 1997

Mr. John Cicero
Ravenna AAP
8451 State Route 5
Ravenna, OH 44266-9297

Dear: Mr. John Cicero

Brown & Root Environmental expends significant resources to stay current on new policies and regulatory trends affecting Open Burning/Open Detonation units. As a service to our DOD RCRA clients, we like to pass copies of this information along whenever appropriate.

I though you might wish to read the enclosed *DRAFT EPA Clean Closure Guidance*. It makes a couple points of particular note:

- Risk-based closures based on industrial or commercial standards cannot be considered clean closed and remain subject to requirements for post-closure care

- Fate and transport models can be used to support clean closure standards based on exposure of a receptor at the unit boundary (as a minimum, clean closure standards must be achieved at the unit boundary)

Please give me a call at (301) 258-8649 if you have questions about how the enclosed draft EPA guidance affects your facility or how to access Brown & Root Environmental through existing nationwide DoD contracts.

Sincerely,

Ronald R. Stoner
Program Manager

Enclosure

RECEIVED
MAY 23 1997
By

Draft EPA Clean Closure Guidance

Memorandum
Subject: Risk-Based Clean Closure
From: Michael Shapiro, Director (Draft)
Office of Solid Waste
To: RCRA/CERCLA Senior Policy Managers
Regions I-X

The purpose of this memorandum is to confirm that, under current regulations, RCRA regulated units may be clean closed to protective, risk-based cleanup levels and to provide guidance on risk-based clean closure.

To achieve clean closure, owner/operators must comply with the closure performance standards at 40 CFR 264.111 or 40 CFR 265.111 and applicable unit-specific closure standards in 40 CFR Part 264 or 265. They also must remove or decontaminate all wastes, waste residues, contaminated containment system components, contaminated soils (including groundwater), and structures and equipment contaminated with hazardous waste and hazardous waste leachate. Clean closure demonstrations should document that any hazardous waste constituents[1] left in place will not have an impact on any environmental media including ground water, surface water, or the atmosphere in excess of Agency recommended limits or factors, and that direct contact through dermal exposure, inhalation, or ingestion will not result in a threat to human health or the environment. The Agency's assumption is that most well designed and well operated RCRA units (i.e., units that comply with the unit-specific minimum technical requirements) will be clean closed.[2] Units that do not meet the requirements for clean closure remain subject to the requirements for post-closure care, including post-closure permitting.

EPA first interpreted the clean closure regulations to allow risk-based demonstrations on March 19, 1987 (52 FR 8704). The Agency stated that clean closure would not necessarily involve removal or decontamination of all hazardous constituents (i.e., to background concentrations), but that some limited quantity of hazardous constituent might remain at closure provided the constituents were at levels that would not pose a substantial threat to human health or the environment. The Agency recommended that site-specific clean closure requirements be established using available constituent-specific limited or factors that had under-gone Agency review (e.g., MCLs or health-based limits calculated using a verified reference dose developed by EPA's Risk Assessment Forum). When Agency-reviewed limits or factors were not available, EPA required that clean closure requirements be established either by using toxicity information submitted by the owner/operator and approved by EPA, or by using background concentrations. Background concentrations are generally interpreted as constituent concentrations that are present in environmental media not influenced by facility activities or releases.

EPA continues to believe that site-specific clean closure requirements should be developed through appropriate application of risk information. Since 1987, EPA and the states have gained considerable experience in developing protective, site-specific, risk-based cleanup levels in the RCRA corrective action and CERCLA programs. Based on this experience, EPA believes that, in most situations, removal of all wastes, waste residuals, liners, etc. and cleanup (i.e., removal or treatment of contaminated media) to protective, risk-based, cleanup levels will be adequate for clean closure. The procedures and guidance used for developing protective, risk-based cleanup levels for closures should be consistent with the procedures and guidance used to establish protective, risk-based cleanup levels in the context of a RCRA corrective action or CERCLA cleanup. For example, clean closure levels should be developed in consideration of Agency guidance in development of protective, risk-based cleanup standards As discussed in the National Contingency Plan (55 FC 8666, March 8, 1990) the 1990 Subpart S Proposal (55 FR 30798, July 27, 1990), and the 1996 Subpart S ANPR (61 FR 19432, May 1, 1996). EPA generally interprets protective cleanup standards to mean constituent concentrations that result in the total excess risk from any medium to an individual exposed over a lifetime falling within a range from 10^{-4} to 10^{-6}, with the cumulative carcinogenic risk not to exceed 10^{-4} and a preference for cleanup standards at the more protective end of the risk range. For non-carcinogenic effects, EPA generally interprets protective cleanup standards to mean constituent concentrations that an individual could be exposed to on a daily basis without appreciable risk of deleterious effect during a lifetime. [Region 4.] Cleanup to standards that are consistent with these

risk-reduction goals (e.g., most MCLs and many state cleanup standards) will be adequate for clean closure. Note that, as discussed in the Subpart S ANPR, a site-specific risk assessment is not always necessary to support site-specific, risk-based cleanup standards. (See 61 FR 19450, column S, May 1, 1996).

In some cases, cleanup standards developed in the context of a RCRA corrective action or CERCLA cleanup will be within the 10^{-4} to 10^{-6} risk range, but will have been calculated using industrial or commercial exposure assumptions. Industrial and commercial cleanup standards by definition rely on further control of the property (i.e., through maintenance of the industrial or commercial land use). Units can be closed to industrial or commercial standards, however, these units cannot be considered clean closed and remain subject to requirements for post-closure care, including permitting. Of course, the schedule for imposition of post-closure care requirements and issuance of post-closure permits is largely dependent on regional (or authorized states) priorities.

In the 1987 Notice, EPA required that clean closure demonstrations assume that receptors would be in contact with any hazardous waste constituents left in place at the boundary of the waste management unit (i.e., fate and transport modeling were not allowed). EPA recently revised this policy in a memo from Elliott Laws and Steven Herman to RCRA/CERCLA National Policy Managers (September 214, 1996), commonly referred to as the RCRA/CERCLA Integration Memo. Under the new Agency policy, fate and transport models may not be used to support clean closure determinations; however, at a minimum, clean closure standards must be achieved at the boundary of the closing unit. For example, appropriate fate and support modeling can be used to determine the potential for groundwater contamination from residual contaminants in soil or for calculating movement of residual soil contamination from within the unit to the unit boundary; fate and transport modeling cannot be used to support clean closure standards based on exposure of a receptor beyond the unit boundary.

Reliance on risk-based approaches during the clean closure should complement EPA's other ongoing efforts to encourage coordination of cleanup requirements and eliminate duplication of effort. Guidance on coordination of RCRA closure requirements with other cleanup activities was provided in the RCRA/CERCLA integration memo, referenced above. In addition, in the November 8, 1994 proposed Post-Closure Rule (59 FR 55778), EPA requested comment on an approach that would reduce or eliminate the regulatory distinction between cleanup of releases from closed or closing regulated units and cleanup of releases from non-regulated units under the RCRA corrective action program. The Office of Solid Waste plans to address this issue further in the final post-closure and Subpart S rules.

I encourage you to use risk-based approaches to develop site-specific clean closure requirement and to continue in your efforts to integrate cleanup requirements and eliminated duplication of effort.

[1]For purposes of closure, the Agency only addresses hazardous constituents from hazardous wastes. Hazardous constituents from other sources may be addressed, as necessary to protect human health and the environment, using other authorities (e.g., RCRA corrective action authorities).

[2]Except, of course, hazardous waste landfills, which we anticipate will generally require post-closure care.

OhioEPA
State of Ohio Environmental Protection Agency

STREET ADDRESS:
'00 WaterMark Drive
Columbus, OH 43215-1099

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

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

S: 2/26/97

NOTICE OF DEFICIENCY

CERTIFIED MAIL

Re: *CLOSURE PLAN*
Ravenna Army Ammunition Plant
OH5 210 020 736

TO 1/27/97
CR-COR
ENV ADM
LAND MGR
ENV
CONTRACTOR 1/27/97
RETURN FOR F

January 23, 1997

John A. Cicero, Jr.
Commander's Representative
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, OH 44286-9297

Dear Mr. Cicero:

On October 1, 1996, Ohio EPA received from the Ravenna Army Ammunition Plant (RVAAP) a closure plan for Building 1601 located within the RVAAP installation at 8451 State Route 5, Ravenna, Ohio.

This closure was submitted pursuant to Rule 3745-66-12 of the Ohio Administrative Code (OAC) in order to demonstrate that the RVAAP's proposal for closure complies with the requirements of OAC Rules 3745-66-11 and 3745-66-12.

The public was given the opportunity to submit written comments regarding the closure plan in accordance with OAC Rule 3745-66-12. The public comment period extended from the week of November 11, 1996 through December 21, 1996. No public comments were received by Ohio EPA.

Pursuant to OAC Rule 3745-66-12(D)(4), I am providing you with a statement of deficiencies in the closure plan, outlined in Attachment A.

Please take notice that OAC Rule(s) 3745-66-12 require that a modified closure plan addressing the deficiencies enumerated in Attachment A be submitted to the Director of the Ohio EPA for approval within thirty (30) days of the receipt of this letter.

CF:
AMSIO-EQE (Whelan) (2)
AMSIO-EQM (Vodraska)
COE Louisville (Grasso)
COE Nashville (Sattmer)

The modified closure plan shall be prepared in accordance with the following editorial protocol or convention:

1. Old Language is over-struck, but not obliterated.

2. New Language is capitalized.

3. Page headers should indicate date of submission.

4. If significant changes are necessary, pages should be re-numbered, table of contents revised, and complete sections provided as required.

The modified closure plan should be submitted to: Ohio Environmental Protection Agency, Division of Hazardous Waste Management, Attn: Tom Crepeau, Manager, Data Management Section, P.O. Box 1049, Columbus, Ohio 43216-1049. A copy, with an additional copy to facilitate ground water review, should also be sent to: Sheila Abraham, Ohio EPA, North East District Office, 2110 East Aurora Road, Twinsburg, Ohio 44087.

Upon review of the resubmitted plan, I will prepare and issue a final action approving or modifying such plan. If you wish to arrange a meeting to discuss your responses to this Notice of Deficiency, please contact Sheila Abraham at (216) 963-1290.

Sincerely,

Donald R. Schregardus
Director

cp1601lr.closures.sabraham/ao

cc: Tom Crepeau, DHWM, Central File, Ohio EPA
Harriet Croke, USEPA, Region V
Montee Suleiman, CO, Ohio EPA
Sheila Abraham, Ohio EPA, Northeast DO

ATTACHMENT A

RAVENNA ARMY AMMUNITION PLANT (RVAAP)
CONTAINER STORAGE UNIT (BUILDING 1601) CLOSURE
OH5 210 020 736

Section 1.1 General Description:
Comment #1 (page 1-1): The Ravenna Army Ammunition Plant (RVAAP) shall clarify the period, including the last date, during which hazardous waste was generated and stored in Building 1601.

Comment #2 (page 1-1): For comments on the proposal to decontaminate the Open Burning (OB) Grounds equipment, please refer to comments on Section 2.3.1. and on the OB Closure Plan.

Section 1.3 Solid Waste Management Units:
Comment #3 (page 1-5): The entire area historically identified, from a RCRA closure perspective, as the Open Detonation (OD) Unit does not appear to be described in this section. For additional comments on the area that may need to be included within the Open Detonation (OD) Unit, please refer to the comments on the OD Closure Plan.

Comment #4 (page 1-6): RVAAP has appropriately specified all hazardous waste units related to the hazardous waste permit that remain unclosed, as indicated in Section 3.2 of Ohio EPA's 1993 Closure Plan Guidance. However, the "other units of concern (not RCRA regulated)" discussed on page 1-6 do not appear to be directly related to activities and issues discussed in this closure plan. Additionally, based on historical documentation, the "other units of concern" discussed in this document are not the only areas of concern from a complete regulatory perspective. RVAAP shall appropriately modify this section to reflect the historical records and clarify whether hazardous waste management may have occurred in other areas at the facility, including but not limited to the areas detailed on page 1-6. Alternatively, RVAAP has the option of referencing, but not detailing, other areas of concern in this section, if these areas do not substantively impact the Container Storage Area (Building 1601) closure issues.

Comment #5 (page 1-6): With reference to the discussion on "other units of concern (not RCRA regulated)", the distinction between "potentially hazardous waste" never having been stored in Building U-202 and "potentially reactive waste" having been stored there is unclear. Please verify the accuracy of the statements and clarify, as appropriate, if this portion of the section is retained. As indicated above, please be aware that appropriate regulatory authority, including generator closure and corrective action, is still maintained by the Division of

Hazardous Waste Management with respect to relevant units of concern. The reference to "(not RCRA regulated)" shall either be deleted or clarified.

Section 1.4.1.2. Hydrologic setting:
Comment #6 (page 1-8): In the discussion on the hydrologic section, it states that "the Kent and Hiram Tills are too thin and impermeable to produce useful quantities of water," and that "the shales of the Sharon and Mercer Members of the Pottsville Formation" have "insignificant ground water yields." Well logs for water supply wells in the area surrounding the RVAAP, however, indicate that there are a number of wells around the perimeter of the site that are installed into sand and gravel lenses within the tills and also into the shales of the Pottsville Formation. Thus, the ground water available within these units is sufficient to provide water to these water supply wells for residential and business uses. Well logs for water supply wells in the area shall be consulted for additional information and the section modified to indicate that these units are more important in supplying the water needs of the surrounding properties than is presently indicated.

Section 1.4.2 Ground Water Monitoring System:
Comment #7 (page 1-9): A storage unit such as Building 1601 normally does not require a ground water monitoring system. However, if during closure activities it is discovered that the containment system (e.g., floors) has been compromised (e.g., cracked or broken), a ground water monitoring program in accordance with OAC 3745-65-90 through 95 may be necessary to meet the closure performance standard (OAC 3745-55-11). The need for a ground water monitoring program would be based on a determination that hazardous wastes or hazardous waste constituents had migrated from the storage area into the site soils and, thus, possibly into the site ground water. The closure plan shall therefore be modified to include a statement that if the structural integrity of Building 1601 has been compromised, the need for a ground water monitoring program in accordance with OAC 3745-65-90 through 95 shall be evaluated. If it is determined that hazardous wastes or hazardous waste constituents have migrated from the storage area into the site soils and, thus, possibly into the site ground water, a ground water monitoring program in accordance with OAC 3745-65-90 through 94 shall be instituted at the site.

Section 1.4.3 Corrective Actions:
Comment #8 (page 1-9): RVAAP shall clarify the source for stating that "There are suspected releases of hazardous wastes or constituents from this unit". This statement shall reconciled with the statements in the same paragraph that "The RCRA Facility Assessment (U.S. EPA,1989) identified no potential for releases to soil, surface water, ground water or the air" and "no corrective action has been identified".

Section 1.5.1. Waste Managed and Section 1.5.3. Storage Area Design and Equipment:
Comment #9 (pages 1-9 and 1-10): RVAAP shall provide additional detail on the container storage unit to facilitate conclusions on the structural integrity of the building as related to hazardous waste container storage. This shall include, but not be limited to a discussion of relevant construction specifications, including the thickness of the floor. RVAAP shall also clarify whether, based on a visual inspection, cracks and other evidence of deterioration exist in the building. For additional information on this issue, please refer to section 3.4 of Ohio EPA's 1993 Closure Plan Guidance.

Comment #10 (pages 1-9 and 1-10): RVAAP shall also discuss the potential for hazardous waste to have impacted the interior and exterior of the container storage unit. Specifically, RVAAP has the option to reference unit operation records to document historical management of hazardous waste, and clarify whether spills occurred. If spills occurred and the interior of the building was periodically cleaned, rinseate handling (including migration routes, as appropriate) shall be discussed. RVAAP shall also clarify whether mechanisms, including sumps, exist in the building that could impact potential migration of hazardous waste.

Comment # 11 (pages 1-9 and 1-10): Finally, RVAAP shall clarify whether the earth removal activities (from the sides and top of the building) occurred during the period when hazardous wastes were still stored within the building.

Section 1.5.4 Secondary Containment:
Comment #12 (page 1-11): With respect to the container storage area, if it was used for containers that did not have free liquids, a containment system is not required, provided the storage area meets the requirements of OAC 3745-55-75 (C) (1) and (2). This shall be clarified, and the section appropriately modified.

Section 1.6. References to Other Environmental Permits:
Comment #13 (page 1-11): Although RVAAP has referenced the permits currently in force at the facility, other historical permits that impact closure issues at this unit shall be identified, including, but not limited to the Part A permit to provide a perspective on hazardous waste management in this unit.

Section 2.2. Estimates of the Quantity of Inventory to be Removed:
Comment #14 (page 2-1): RVAAP shall clarify the absence of the D011 waste code (historically identified in the July 1990 inventory of hazardous waste activity) in this section.

Section 2.3.1 Waste Inventory Removal and Disposal:
Comment #15 (page 2-2): RVAAP shall modify this section to reflect the proposal to decontaminate the trays from the Open Burning (OB) Area within the Container Storage Area

(Building 1601). This comment also applies to Section 2.3.2. For additional comments on this proposal, please refer to the Notice of Deficiency for the OB Closure Plan.

Comment #16 (page 2-2): RVAAP shall clarify the status of the scales used to weigh the drums of hazardous waste (i.e., whether they will be evaluated as to hazardous waste status and decontaminated, as appropriate).

Section 2.3.2 Building 1601 Hazardous Waste Storage Unit Wall, Ceiling, and Floor Decontamination:

Comment #17 (page 2-2): If, during closure activities, cracks or other evidence of deterioration in the containment structure are discovered, the potential for hazardous waste migration through such breaches in structural integrity, and impact on soil under and around the building (and potentially ground water, as stated in a previous comment) shall be assessed. Such an assessment shall be conducted prior to decontamination activity in the unit. The closure plan shall be modified to include a statement that in such an event, a revised closure plan comprising of a soil sampling plan (and a ground water monitoring plan, as necessary) shall be submitted to the Agency. For additional guidance on the soil sampling plan, please refer to Ohio EPA's 1993 Closure Plan Review Guidance for RCRA Facilities.

Comment #18 (page 2-2): Further, this section, including the paragraph discussing the constituents for which each sample is analyzed (on page 2-3), shall also be modified to reflect the proposal to decontaminate the trays from the OB area in Building 1601.

Sections 3.3 and 3.8 Waste Removal and Milestones:

Comment #19 (pages 3-1 and 3-2): These sections shall be modified, based on previous comments, including the decontamination of the trays from the OB grounds so as to clarify the time frame and sequence of activities in Building 1601.

cp1601.closures/SA.ao

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

January 9, 1997

Reed Memorial Library
Attn: Head Librarian
167 East Main Street
Ravenna, Ohio 44266

Dear Sir or Madam:

Enclosed with this letter is a copy of the hazardous waste closure plan submitted to the Ohio EPA by the Ravenna Army Ammunition Plant, in Ravenna, Ohio. May I ask that you make this closure plan available for public review in your library until the close of the public comment period on February 15, 1997.

A public notice concerning the availability of the closure plan will appear in the legal notice section of the Record Courier newspaper the week of January 13, 1997.

I may be contacted at (614) 644-2942 if you have any questions on this matter.

Thank you.

Sincerely yours,

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

PUBLIC NOTICE

PORTAGE COUNTY

RECEIPT OF HAZARDOUS WASTE FULL CLOSURE PLAN

Notice is hereby given of the receipt on December 23, 1996 of a hazardous waste full 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 Deactivation Furnace area at the site indicated above. Notice is given pursuant to Rule 3745-66-10 through 117. The Ohio EPA is also giving notice that this facility is subject to a determination concerning corrective action, a requirement under the Hazardous & Solid Waste Amendments of 1984, which concern any possible uncorrected releases of hazardous waste or waste management units at the above facility. A corrective action determination is required from hazardous waste facilities intending to close.

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 this closure plan or factual information concerning any releases of hazardous waste or hazardous waste constituents by the above facility requiring corrective action 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.

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 1/21/97
CR-COR
PROP ADM
LAND MGR
CONTRACTOR
ENGR

January 9, 1997

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 full closure plan for the Deactivation Furnace located at your facility. A public notice concerning receipt of the closure plan will appear the week of January 13, 1997 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 February 15, 1997.

A copy of the 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

RECEIVED
JAN 21 1997
By

cc. Montee Suleiman, DHWM
Sheila Abraham, NEDO
file

INTER-OFFICE COMMUNICATION

TO: SHEILA ABRAHAM, ENVIRONMENTAL SPECIALIST, DHWM, NEDO

FROM: DIANE KURLICH, HYDROGEOLOGIST, DDAGW, NEDO DK

SUBJECT: RAVENNA ARMY AMMUNITION PLANT (OH5 210-020-736), PORTAGE COUNTY, CLOSURE PLAN FOR THE DEACTIVATION FURNACE AREA (DFA) HAZARDOUS WASTE TREATMENT UNIT, DATED DECEMBER 1996

DATE: MARCH 7, 1997

INTRODUCTION

The Army has submitted a closure plan for the Deactivation Furnace Area Hazardous Waste Treatment Unit at the Ravenna Army Ammunition Plant (RAAP) in Portage County. The Army plans to risk-based clean close this unit. At the request of DHWM, the DDAGW has reviewed the document and has the following comments.

COMMENTS

1. Adding a reference to Figure 1.5 in the second paragraph of Section 1.1 would be helpful in understanding the text describing the unit.

2. In Section 1.4.1.2, the hydrologic setting in the vicinity of the RAAP is discussed. In this discussion it states that "the Kent and Hiram Tills are too thin and impermeable to produce useful quantities of water," and that "the shales of the Sharon and Mercer Members of the Pottsville Formation" have "insignificant ground water yields." Well logs for water supply wells in the area surrounding the RAAP, however, indicate that there are a number of wells around the perimeter of the site that are installed into sand and gravel lenses within the tills and also into the shales of the Pottsville Formation. Thus, the ground water available within these units is sufficient to provide water to these water supply wells for residential and business uses. Well logs for water supply wells in the area should be consulted for additional information. Section 1.4.1.2 should be modified to indicate that these units are more important in supplying the water needs of the surrounding properties than is presently indicated.

3. On page 2-1, the facility states that "risks from exposures to both soil and ground water contaminants will be estimated in an additive assessment which considers multiple constituents and multiple pathways." On page 2-4, the facility states that "the potential migration of soil contaminants to ground water will be evaluated using TCLP analysis. . ." The TCLP analyses are valid only for RCRA metals. Thus, TCLP analyses are not valid for over half of the constituents of concern at the site (i.e., copper, zinc, antimony, beryllium, and nickel). In addition, relatively high concentrations of site specific constituents have been detected in the

RCRA Closure File

Ohio EPA

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 4/4/97
CR-CCR
DPCP ADM
LAND MGR
CONTRACTOR 4/4/97
RETURN FOR FILE

NOD

S: 5/2/97

NOTICE OF DEFICIENCY

CERTIFIED MAIL

Re: *CLOSURE PLAN*
Ravenna Army Ammunition Plant
OH5 210 020 736

March 31, 1997

CONTRACTOR
FWD FOR
☒ Information
☐ Compliance as applicable
☐ Reply NLT______

Mr. John A. Cicero, Jr.
Commander's Representative
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, OH 44286-9297

Dear Mr. Cicero:

On December 23, 1996, Ohio EPA received from the Ravenna Army Ammunition Plant (RVAAP) a closure plan for the Deactivation Furnace Area located within the RVAAP installation at 8451 State Route 5, Ravenna, Ohio.

This closure was submitted pursuant to Rule 3745-66-12 of the Ohio Administrative Code (OAC) in order to demonstrate that the RVAAP's proposal for closure complies with the requirements of OAC Rules 3745-66-11 and 3745-66-12.

The public was given the opportunity to submit written comments regarding the closure plan in accordance with OAC Rule 3745-66-12. The public comment period extended from the week of January 13, 1997 through February 15, 1997. No public comments were received by Ohio EPA.

Pursuant to OAC Rule 3745-66-12(D)(4), I am providing you with a statement of deficiencies in the closure plan, outlined in Attachment A.

Please take notice that OAC Rule(s) 3745-66-12 require that a modified closure plan addressing the deficiencies enumerated in Attachment A be submitted to the Director of the Ohio EPA for approval within thirty (30) days of the receipt of this letter.

The modified closure plan shall be prepared in accordance with the following editorial protocol or convention:

CF: AMSIO-EQM (Visalusp) - 4/4/97
AMSIO-EQE (Wilkins)
AMSIO-IRG (Vermont)
COE, Louisville (Jasper)
COE, Nashville (Boatman)

RECEIVED
APR 4 1997
By______

1. Old Language is over-struck, but not obliterated.

2. New Language is capitalized.

3. Page headers should indicate date of submission.

4. If significant changes are necessary, pages should be re-numbered, table of contents revised, and complete sections provided as required.

The modified closure plan should be submitted to: Ohio Environmental Protection Agency, Division of Hazardous Waste Management, Attn: Tom Crepeau, Manager, Data Management Section, P.O. Box 1049, Columbus, Ohio 43216-1049. A copy, with an additional copy to facilitate ground water review, should also be sent to: Sheila Abraham, Ohio EPA, North East District Office, 2110 East Aurora Road, Ohio.

Upon review of the resubmitted plan, I will prepare and issue a final action approving or modifying such plan. If you wish to arrange a meeting to discuss your responses to this Notice of Deficiency, please contact Sheila Abraham at (216) 963-1290.

Sincerely,

Donald R. Schregardus
Director

cpdafltr/CLOSURE.ao

cc: Tom Crepeau, DHWM, Central File, Ohio EPA
Harriet Croke, USEPA, Region V
Montee Suleiman, CO, Ohio EPA
Sheila Abraham, Ohio EPA, NEDO

ATTACHMENT A

Ravenna Army Ammunition Plant (RVAAP)
Deactivation Furnace Area Hazardous Waste Treatment Unit Closure
OH5 210 020 736

Section 1.1 General Description:

Comment #1 (page 1-1): The Ravenna Army Ammunition Plant (RVAAP) shall clarify the regulatory status of the deactivation furnace area (DFA). The DFA was operated as a treatment facility (as per the RCRA Part A Permit Application dated December 29, 1981). RVAAP did not upgrade the DFA to meet the hazardous waste incinerator standards for Class A and Class B explosives, and the RCRA Part B permit application submitted by RVAAP to Ohio EPA in November 1988, and the revised Part B Application submitted in 1992 were withdrawn. The DFA cannot be termed a "RCRA permitted" unit, as the Part B permit was not approved by Ohio EPA, nor was it granted by the permitting authority. Finally, the 0H5 210 020 736 number cited as the "interim permit"number is the generator identification number of the facility.

Comment #2 (page 1-1): Adding a reference to Figure 1.5 in the second paragraph of Section 1.1 would be helpful in understanding the text describing the unit.

Comment #3 (page 1-1): Although the statement on page 1-1 that the reactivity characteristic (D003) may have been removed by treatment in the deactivation furnace is accurate, no information is provided on whether the ash residue present in the furnace and associated appurtenances could be characterized as hazardous waste. Further, RVAAP shall clarify the hazardous waste status of the material that has been staged on site.

Comment #4 (pages 1-2 and 1-3): Please relate the descriptions of the historical sampling to Figure 1-6 (map of the DFA) and to the appropriate portions of Appendix B to facilitate review by all stakeholders. For example, the information tabulated on page 2 of the 1992 Interim Report or Table 1 from the 1993 Amended Closure Plan would be an useful addition to this section. This level of comprehension is critical if any of the data collected in the sampling events referred to will be used to delineate the nature and extent of contamination.

Section 1.3 Solid Waste Management Units:

Comment #5 (page 1-8): The entire area historically identified, from a RCRA closure perspective, as the Open Detonation (OD) Unit does not appear to be described in this section. For additional comments on the area that may need to be included within the Open Detonation (OD) Unit, please refer to the comments on the OD Closure Plan.

Section 1.4.1.2 Hydrologic Setting:

Comment #6 (pages 1-13 and 1-14): In the discussion in this section on the hydrologic setting in the vicinity of the RVAAP, it states that "the Kent and Hiram Tills are too thin and impermeable to produce useful quantities of water," and that "the shales of the Sharon and Mercer Members of the Pottsville Formation" have "insignificant ground water yields." Well logs for water supply wells in the area surrounding the RVAAP, however, indicate that there are a number of wells around the perimeter of the site that are installed into sand and gravel lenses within the tills and also into the shales of the Pottsville Formation. Thus, the ground water available within these units is sufficient to provide water to these water supply wells for residential and business uses. Well logs for water supply wells in the area shall be consulted for additional information concerning the use of these units for water supply purposes. Section 1.4.1.2 shall be modified to indicate that these units are more important in supplying the water needs of the surrounding properties than is presently indicated. .

Section 1.5.1 Waste Managed:

Comment #7 (page 1-14): RVAAP shall clarify what is meant by "negative sampling results". If the implication is that explosive constituents were not found in the soil, this conclusion needs to be explicitly substantiated by data. RVAAP shall also clarify if, historically, the media surrounding the unit were analyzed for **all** the possible degradation products of the munitions treated.

Section 1.5.2 Capacity and Section 1.6 References to other Environmental Permits:

Comment #8 (page 1-14): RVAAP has listed environmental permits currently in force at the facility. Any emergency hazardous waste treatment permits issued for the DFA unit shall be referenced, so as to provide a perspective on the total quantity and type of hazardous waste that was historically treated at this unit.

Section 2.1 Risk-Based Closure:

Comment # 9 (page 2-1): Although RVAAP has the option, as stated in Ohio EPA's 1993 Closure Plan Review Guidance for RCRA Facilities, to address the DFA unit through a risk-based closure, please be aware that a critical component of the risk-based closure demonstration is defining the lateral and vertical extent of soil (and ground water) contamination utilizing adequate sampling data. DHWM recommends that the nature and extent of contamination be fully delineated prior to decisions on the applicability of risk based closure, and is willing to work with the facility through this process.

Comment #10 (pages 2-1 and 2-4): On page 2-1, the facility states that "risks from exposures to both soil and ground water contaminants will be estimated in an additive assessment which considers multiple constituents and multiple pathways." On page 2-4, the facility states that "the potential migration of soil contaminants to ground water will be evaluated using TCLP analysis. . ." The TCLP analyses are valid only for RCRA metals. Thus, TCLP analyses are not valid for over half of the constituents of concern at the site (i.e., copper, zinc, antimony, beryllium, and nickel). In addition, relatively high concentrations of site specific

constituents have been detected in the soils at the site (e.g., 380,000 mg/kg of copper; 13,000 mg/kg of lead; 210,000 mg/kg of zinc; and 1,615 mg/kg of cadmium). Thus, in order to determine how ground water should be addressed in the risk assessment, the facility shall first determine the full vertical and horizontal extent of soil contamination. If elevated concentrations of the site specific constituents are detected at or below the seasonal high ground water table, a ground water monitoring system that meets the requirements of OAC 3745-65-90 through 94 shall be installed and sampled. Because site specific parameters have been determined, an alternate ground water monitoring system as described in 3745-65-90(D) would be appropriate for the site. The facility is referred to Section III of the Ohio EPA guidance document, "Ground Water Monitoring and Information Requirements for Hazardous Waste Management Unit Closure Plans and Risk Assessments," April 1992 for additional information concerning the ground water data requirements for risk-based clean closure. The closure plan shall be modified to include provisions for instituting a ground water monitoring program that meets the requirements of OAC 3745-65-90 through 94 if elevated concentrations of site specific contaminants are detected in the site soils at or below the seasonally high water table. Any risk assessment calculations would then use actual ground water data from the site.

Comment #11 (page 2-1): RVAAP shall detail closure activities related to the furnace, earthen barricade and portions of the wooden safety wall that, as stated on page 1-1, have been staged on site. Confirmatory sampling data subsequent to the removal of the waste material (residual ash referred to in paragraph 3) shall be provided (as an appendix), as appropriate, to facilitate review of the closure plan as a stand alone document by all stake holders.

Comment #12 (page 2-1): Please be aware that the DHWM Central Office has, to date, not approved any methodology for assessing risks associated with exposures to lead in the soil. If, based on soil sampling data, lead contamination is evaluated as a concern at the OD unit, alternative methods of contaminant management might need to be explored.

Comment #13 (page 2-1): Further, evaluating the risk to possible receptors through a recreational land use scenario is currently unacceptable in RCRA closure activities. As stated in the closure guidance, DHWM requires that standard exposure assumptions for a residential scenario be used to establish health-based standards to assure a consistent, minimum level of decontamination at RCRA regulated facilities and to facilitate post-closure transfer and development. RVAAP shall therefore evaluate the risks based on an unrestricted residential, rather than a recreational, future land-use scenario.

Comment #14 (page 2-1): Please be aware that Ohio EPA's Closure Plan Guidance requires that preliminary remediation goals for all impacted media be provided in the closure plan containing the site-specific risk-assessment demonstrations. Section 2.1 and subsequent sections related to the risk assessment shall therefore be appropriately modified.

Section 2.1.1.1 Data Evaluation/ Collection

Comment #15 (pages 2-2 and 2-3): RVAAP shall discuss the reliability of previous data collected from December 15, 1989 through May 5, 1993 at the DFA unit. Specifically, the issue of the data quality level and

usability in the closure process shall be clarified prior to the inclusion of the historical data in the closure process. For example, the dependability and usability of antimony levels analyzed from 135A, 140A, 146A, 154A, 161A, 166A, 135C, 140C, 146C, 154C, 161C, 166C, 214A, 218A, 228A, 236A, 247A, 252A, 308A, 312A, 326A, 334A, 349A, and 354A needs to be discussed, in terms of the detection limits achieved. The absence of antimony and beryllium levels for samples collected at 184A, 186A, 189A, 198A, 206A, 274A, 276A, 279A, 290A, 359A, 361A, 364A, 366A, 370A, 374A, 378A, 381A, 385A, 394A, 398A, 416A and 418A needs to be explained. The transposition of data from the original laboratory analytical results also need to be verified. For example, the 53.70 mg/kg of beryllium reported at 3E is not supported by the laboratory result, which shows <5.7 mg/kg.

Comment #16 (pages 2-2 and 2-3): RVAAP shall also verify the accuracy of the grid locations/ numbering presented in Figure 1-6, versus the soil sampling data corresponding to the grid locations (presented in Appendix B). For instance, soil sampling locations identified by grid numbers 108, 350 and 376 (in Figure 1-6) did not appear to correlate to data presented in Appendix B. Further, the grid locations corresponding to the soil samples labeled 198A, 359A and 374A in Appendix B are not evident in Figure 1-6. RVAAP shall clarify this.

Comment #17 (pages 2-2 and 2-3): Finally, laboratory analytical results do not appear to have been provided for the May 5, 1993 sampling event. This omission shall be rectified or discussed.

Comment #18 (page 2-2): Additionally, the presentation of the data in Appendix B is unclear. For example, if the data presented in Appendix B are integral to the proposed closure activities, please clarify what the symbols (A, C, and E) attached to the soil sampling grid numbers refer to. Additionally, please clarify whether the samples collected during the July 8-9, 1991 sampling event at depth "E" below ground level were collected at 4' - 5' (as stated in the tabulation on page 2 in the 1992 Interim Report), or at 5'- 6', as stated in the written narrative (on page 1).

Comment #19 (page 2-2): RVAAP shall clarify that the mean and standard deviation values presented throughout Appendix B refer to background values, and are not calculated by grouping specific data sets. The different data points would also benefit, in the tabulation, from being related to the different sampling events in time, as stated in a previous comment.

Comment #20 (page 2-3): RVAAP shall submit, as part of the closure plan, a soil sampling plan in order to delineate the full nature and extent of contamination in the DFA, with the understanding that the proposed sampling plan could be subject to modification if unexpected situations are encountered during closure activities. As stated in previous comments, this soil sampling plan is a critical prerequisite to any closure decisions, and is required as part of the closure plan, as stated in Ohio EPA's 1993 Closure Plan Review Guidance for RCRA Facilities. Additional detail and technical guidance on the soil sampling plan is provided in the closure guidance document. This comment is applicable to section 2.3.1 ("Activities to be Conducted"), too.

Comment #21 (page 2-3): Once the soil sampling plan has been submitted as part of the modified closure plan, DHWM is willing to work with RVAAP on the process of completely defining the nature and extent of contamination through a review of the soil sampling data, and also on evaluating the acceptability of historical data for the risk assessment process.

Section 2.1.1.2. Background Concentrations of Naturally Occurring Constituents:

Comment #22 (page 2-3): Given the historical information on the impact of installation activities on media at the facility, any background data that RVAAP wishes to use in the closure process shall be adequately substantiated, both with respect to location and reliability of the sampling procedures. Adequate information has not been provided in the closure plan to facilitate decisions on the acceptability of the background data. For example, it is stated that the background samples were collected "near" the RCRA unit; neither the exact locations nor a figure depicting the locations, including the distance from the DFA unit of the background samples, are provided in this closure plan. RVAAP shall also clarify whether S1, S2, S3 and S4 (Appendix B - presumably background sampling locations), are separate and distinct from the sampling locations S-1, S-2, and S-4 identified in Figure 1-6.

Further, the issue of whether the background samples are unaffected by contamination from other units or by process activities at RVAAP needs to be clarified. Decisions on the background samples would be facilitated if the location of the background samples were superimposed on the sampling grid provided in Figure 1-6.

Overall, given that the closure plan is typically a stand alone document that could be reviewed by all stakeholders, the background information on selected inorganic constituents as provided in Table 2-2 has not been sufficiently substantiated.

Comment #23 (page 2-3): RVAAP shall clarify and reference data on the rationale for analyzing those particular inorganic constituents, and not analyzing other inorganics.

Section 2.1.1.3. Selection of Contaminants of Potential Concern:

Comment #24 (page 2-4): RVAAP shall discuss all organic constituents of concern, including but not limited to the degradation products of the explosive material that was treated in the DFA unit. Further, as stated in the previous comment, the rationale for not considering other inorganic constituents shall be addressed, and supported by data. The issue of whether other inorganic constituents were present in the residue ash shall also be discussed, and substantiated by data.

Section 2.1.2. Exposure Assessment:

Comment #25 (page 2-4): Please refer to comments on Section 2.1 on DHWM's inability to accept a future recreational scenario in the risk assessment for the DFA unit. RVAAP shall, as stated previously, evaluate the risk to future residential receptors. This comment is applicable to Table 2-3 (page 2-5). All pathways,

including dermal contact with potentially contaminated ground water through inhalation and showering, shall be evaluated as appropriate.

Section 2.1.2.1. Point of Exposure:

Comment #26 (page 2-4): Please be aware that the nature and extent of contamination attributable to the RCRA unit needs to be defined, and the point of exposure should reflect this.

Section 2.1.2.4. Intake Equations:

Comment #27 (page 2-5): Please be aware that the U.S. EPA Guidance (1991) referred to for deriving the relationship between the concentration of contaminants in the soil and the volatilized contaminants in the air has recently been superseded by the 1996 U.S. EPA Soil Screening User's Guidance.

Section 2.1.7. Conclusions and Recommendations:

Comment #28 (page 2-8): Please be aware that Ohio EPA's Closure Plan Guidance requires that preliminary remediation goals for all impacted media be provided in the closure plan containing the site-specific risk-assessment demonstrations. As stated in previous comments, Ohio EPA would recommend that the nature and extent of contamination is delineated before the clean up mechanism is finalized.

Section 2.3.1. Activities to be Conducted:

Comment #29 (page 2-9): Please refer to comments on Section 2.1.1.1. on the timing of submittal of the Sampling and Analysis Plan. RVAAP shall submit, as part of the closure plan, a soil sampling plan in order to delineate the full nature and extent of contamination in the DFA.

Section 2.3.2. Testing and Analysis to be Performed:

Comment #30 (page 2-9): With reference to soil sampling, as indicated in Ohio EPA's Closure Plan Review Guidance, the submission of a complete quality assurance and quality control (QA/QC) plan is not required but evidence of such a program shall be presented in the closure plan. RVAAP's attention is also directed to the model Quality Assurance Project Plan prepared by U.S. EPA Region V. The facility shall follow standard procedures, and document adherence to QA/QC protocol. Any proposed deviations from accepted protocol shall, however, be addressed in the closure plan. DHWM reserves the right to request specific portions of the QA/QC documentation in the event of a data quality issue. This comment is also applicable to Section 3.8 (Milestones).

Section 3.8. Milestones:

Comment #31 (page3-2): This section shall be modified based on previous comments.

End of Comments

since 1827
MASON & HANGER CORPORATION
RAVENNA ARMY AMMUNITION PLANT

April 4, 1997

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

Subject: CLOSURE PLAN
RAVENNA ARMY AMMUNITION PLANT
OH5 210 020 736

Reference: 1. A certified letter from the Ohio EPA dated March 31, 1997, subject as above

Dear Sir:

The referenced certified letter directs RVAAP to revise the Closure Plan that was submitted last fall for the installation's Deactivation Furnace. The installation has been given 30 days following the receipt of the letter in which to complete the necessary revisions.

Following the receipt of such correspondence, it is necessary to establish a record within the enforcement tracking module of the ACTS database. Transmitted herewith is a copy 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 CORPORATION

W. B. Talmon, Jr.
Site Manager

WBT:wbt:actsltr2

cc: Robert Whelove/AMSIO-EQE
ACTS File
Closure Plan File
Reading File

ENFORCEMENT ACTION TRACKING

POC NAME JOHN A. CICERO, JR. PH.(330)358-7311

MSC: IOC RECORD NUMBER : 36

INSTALLATION: RAVENNA AAP RECORD'S FY : 97

1. REGULATORY REQUIREMENT RCRA_C
2. ENFORCEMENT ACTION TYPE WL IF CMPA, AGREEMENT TYPE
3. DATE OF ACTION 04/04/1997 4. ACTION # 20736-36-RCRA_C-WL

5. FINDINGS:

FINDING # / TYPE OF FINDING	DESCRIPTION	STATUS	DATE	1383 NUMBER
0001 - A	NOD RE CLOSURE PLAN FOR DEACTIVATION FURNACE	U	04/04/1997	RVAP050394

FINDING SUMMARY

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

6. STATUS OF ACTION STATUS DATE
UNRESOLVED 04/04/1997

7. ISSUING AGENCY(S) STATE

8. PREVIOUS OR REPEAT INOV's

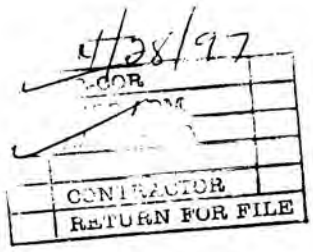
9. CORRECTIVE ACTIONS MILESTONES

TARGET	ACTUAL	MILESTONE
05/02/1997	01/01/1900	SUBMISSION OF REVISED CLOSURE PLAN

10. REASON FOR NON-COMPLIANCE

THE INSTALLATION HAS SUBMITTED A CLOSURE PLAN COVERING ITS DEACTIVATION FURNACE. THE OHIO EPA HAS IDENTIFIED DEFICIENCIES IN THE CLOSURE PLAN, AND HAS REQUIRED THAT THE INSTALLATION SUBMIT A REVISED PLAN THAT SATISFACTORILY ADDRESSES THE DEFICIENCIES. THE REVISED DOCUMENT MUST BE SUBMITTED WITHIN THIRTY DAYS FOLLOWING THE RECEIPT OF THE NOD.

April 25, 1997



MEMO TO: John Cicero and Tim Morgan
FROM: John Jent

SUBJECT: RVAAP, OH; Deactivation Furnace Area, Coordination of RCRA/CERCLA Activity

John and Tim,

Attached is a Draft Proposal to OEPA to define boundaries between RCRA and CERCLA activites at the subject site. Specifically the following are enclosed:

I	Discussion of OEPA RCRA guidelines
II	Draft Proposal to be submitted to OEPA
III	Cost Estimate with RCRA/CERCLA boundaries set
IV	Cost Estimate if proceed with additional sampling, etc.

Please review these documents ASAP. If we can reach agreement on the proposal, we would like to forward the proposal to OEPA by Wed, April 30.

John Jent

I

April 25, 1997

BOB,

Attached is material from the current (1993) OEPA Guidance for RCRA Facilities that I think is pertinent to the RCRA/CERCLA discussion at RVAAP.

Attachment A, in discussing determination of Background, allows flexibility in "--situations where the surrounding area or matrix has historically been affected by sources outside of the site under investigation". Further on it says that evaluations may be made on a site-by-site basis. Although this is specifically addressed to Background, the same sort of reasoning could be applied to the proposed separation of RCRA/CERCLA sites that we are proposing at the Deactivation Furnace.

Attachment B, in discussing Risk Assessment says that the RCRA guidance is for future unrestricted (residential) use of the site. At the Deactivation Furnace site, the CERCLA remediation (Winklepeck Burning Grounds) will almost certainly be taken only to recreational or industrial use.

? Didn't the EPA say residential in our last meeting? ?

Although it is not reasonable to clean up the RCRA Deactivation Furnace to residential and the surrounding Winklepeck Burning Grounds to recreational or industrial, the proposed delineation of the RCRA/CERLCA boundaries appears to be a reasonable compromise that would satisfy both RCRA and CERCLA.

John Jent

↓

What are you saying here John?
How will the determination of a boundary help in our determination of clean-up levels?
Are you saying that each area will be cleaned up to a different standard and therefore we must determine the boundaries?

INTERIM FINAL

CLOSURE PLAN REVIEW GUIDANCE FOR RCRA FACILITIES

OHIO ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF HAZARDOUS WASTE MANAGEMENT (DHWM)
1800 Watermark Drive, P.O. Box 1049
Columbus, Ohio 43266-0149

September 1, 1993

Closure unit staff may be reached at (614) 644-2956

Randy D. Meyer, Environmental Supervisor
Sandra Leibfritz, Environmental Specialist (Risk Assessment)
Kimberly Smith, Environmental Specialist (Risk Assessment)
Montee Suleiman, Environmental Specialist (Engineering)
Dan Lukovic, Environmental Specialist (Engineering)

ATTACHMENT A

3.11 Remediation Standards for Soils (Including Ground Water)

[40 CFR 264.111 and 265.111; OAC 3745-55-11 and 66-11]

One of the most problematic, yet essential, issues for closures is the determination of remediation standards. **All closure plans must include a remediation standard for soil (and for ground water if ground water monitoring is required)** impacted by the hazardous waste management unit, unless, as an activity normally associated with a certain permitted management method, waste is legally placed in or on the land and leaving that waste in place is determined to meet the general closure performance standard in OAC 3745-66-11 or -55-11. Examples include land disposal facilities, although even in these cases closure and post-closure must ensure that migration of hazardous waste or hazardous constituents from the unit does not occur.

For clean closure, a remediation standard for each contaminant in soil and ground water is required in the closure plan (not the final certification statement) and may be determined by either comparison to background conditions or through risk assessment. Although an owner/operator is not required to attempt a clean-up to background conditions first, it is usually infeasible to attempt a risk-based closure demonstration without substantial sampling data defining the extent of soil and ground water contamination. For further information on making this demonstration, see:

(1) "Guidance Document on the Statistical Analysis of Ground Water Monitoring Data at RCRA Facilities" announced in the September 11, 1989 FR.

(2) "Guidance for Reviewing Risk-Based Closure Plans for RCRA Units."

(3) "Ground Water Monitoring & Information Requirements for Hazardous Waste Management Unit Closure Plans & Risk Assessments."

In order to establish consistent soil and ground water remediation standards for hazardous waste closures in Ohio, the following criteria should be met:

3.11.1 Naturally Occurring Elements or Compounds:

INTERIM FINAL

Alternative A - Soils in the closure area containing hazardous constituents shown to occur in nearby background soils unaffected by the RCRA unit or any other concentrated waste activities (e.g., air emissions or wastewater sludge management operations), unless these operations similarly affected the closure unit, shall be considered to be contaminated if the concentration of any hazardous constituent of concern in the soils circumscribing the RCRA unit exceed the upper confidence limit (i.e., mean concentration plus two standard deviations) for the background concentration of that constituent. Background samples shall be analyzed using total constituent analysis. Background samples need not be analyzed using the Toxicity Characteristic Leaching Procedure (TCLP: see 40 CFR 261.24 and OAC 3745-51-24), unless Ohio EPA determines that such analysis is appropriate.

Closures Involving Characteristic Wastes Only

Soils contaminated with hazardous constituents originating solely from characteristic wastes shall be removed and managed as hazardous waste until sampling results and statistical analyses conducted in accordance with the waste characterization procedures described in USEPA Publication SW-846 (Chapter 9) indicate that the excavated material does not exhibit a characteristic of a hazardous waste. Soils which are contaminated, but do not exhibit a characteristic of a hazardous waste, shall be removed and managed as a solid waste, unless shown to be clean via the risk assessment procedures outlined in "Guidance for Preparing Risk-Based Closure Plans for RCRA Units."

Contamination Originating from Wastes Listed for Heavy Metal Content

Soils contaminated with listed hazardous wastes for which the basis for listing is heavy metal content (i.e., lead, cadmium, chromium, nickel, mercury, or arsenic) shall be considered hazardous waste when the analysis for total metals exceeds either the concentrations determined as background for total metals or risk-based clean-up standards developed in accordance with "Guidance for Preparing Risk-Based Closure Plans for RCRA Units."

INTERIM FINAL

Background Soil Sampling Requirements

It is important that background soil be of the same type of soil horizon material as the comparison sample. To confirm this, the DHWM may require the owner/operator to determine and compare soil texture (percent silt, sand, clay), soil pH and cation exchange capacity. Background sampling locations must be in areas representative of the matrix of interest. For example, background samples must, if possible, be taken within the same aquifer unit, soil type and stratigraphic unit as comparison samples.

Twelve soil sampling points shall be selected to represent an area not directly affected by the RCRA unit or any other concentrated waste management or product handling activities, unless it can be shown that the area undergoing closure was equally affected by these activities. (Please note: in order to obtain appropriate background samples, the owner/operator may be required to collect samples from a near-by, off-site location.) All points and sampling data from these points shall be reviewed and approved by the DHWM.

As an aid to evaluating the background data, the reviewer shall use the following equations (Hoaglin et al, 1983) to determine whether there is statistical evidence that an observation that appears extreme does not fit the distribution of the rest of the data:

Upper cutoff = upper quartile + 1.5(interquartile range)

Lower cutoff = lower quartile - 1.5(interquartile range)

where:

Upper quartile or $Q_{.75}$ is the observation in the background soil data set which divides the data so that 0.25 of the data are greater than $Q_{.75}$ and 0.75 of the data are less than or equal to $Q_{.75}$;

Lower quartile or $Q_{.25}$ is the observation in the background soil data set which divides the data so that 0.75 of the data are greater than $Q_{.25}$ and 0.25 of the data are less than or equal to $Q_{.25}$; and

Interquartile range (IQR) is the difference between the upper

INTERIM FINAL

quartile and the lower quartile (i.e., IQR = $Q_{.75} - Q_{.25}$).

Data shall be normalized by use of an appropriate transformation, if necessary (See discussion below for Goodness-of-Fit or Normality tests), prior to calculation of the upper cutoff.

Data not falling between the upper and lower cutoffs shall be reviewed to determine whether evidence exists to suggest that the data are not representative of the background population.

The reviewer should direct the owner/operator to check such data for sampling and laboratory errors, field evidence of waste materials at the sampling locations, and other plausible causes. Where sufficient evidence indicates that a background sample is not representative of background contamination, the owner/operator shall discard the datum and obtain a substitute sample. If no specific error can be documented, the sample must be retained in the data.

In addition, background samples must be eliminated and replaced with a like number of samples from uncontaminated areas if: (1) the background samples are taken in areas known or suspected to be contaminated and whose areal extent of contamination does not include the closure area, or (2) the background samples have possibly been affected by RCRA activities conducted in the area undergoing closure. Areas to avoid for background sampling include but are not limited to:

(1) past waste management areas where solid and/or hazardous wastes or wastewaters may have been placed on the ground, areas of concentrated air pollutant deposition (from a definable localized source), or areas affected by the runoff;

(2) roads, roadsides, parking lots, areas surrounding parking lots or other paved areas, railroad tracks or railway areas or other areas affected by their runoff;

(3) storm drains or ditches presently or historically receiving industrial or urban runoff;

(4) spill areas;

(5) material handling areas, such as truck or rail car loading areas, or near pipelines;

INTERIM FINAL

provide considerable background discussion of the proposed method and its applications, literature references, sample calculations, and any other information deemed appropriate by the reviewer(s).

For further information on statistical procedures, consult:

(1) USEPA, (1986): "*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Third Edition.*"

(2) Bickel, P.J., Doksum, K.A., (1977): *Mathematical Statistics: Basic Ideas and Selected Topics*, John Wiley & Sons Inc., New York.

(3) Conover, W.J., (1980): *Practical Nonparametric Statistics*, John Wiley & Sons Inc., New York.

(4) Devore, J., Peck, R., (1986): *Statistics: The Exploration and Analysis of Data*, West Publishing Company, St. Paul, Minnesota.

(5) Gilbert, K.O., (1987): *Statistical Methods for Environmental Pollution Monitoring*, Van Nostrand Reinhold, New York.

(6) Hoaglin, D.C., Mosteller, F., Tukey, J.W. (1983): Understanding Robust and Exploratory Data Analysis, Wiley, New York.

(7) ASTM E-178, Standard Practice for Dealing with Outlying Observations

Situations will exist where the surrounding area or matrix (i.e. ground water, air, soil) has historically been affected by sources outside of the site under investigation. Examples of such situations include: acid mine drainage areas, surface waterways with point/non-point discharge sources, non-potable aquifers (high mineral content, saline) or where the aquifer is affected by off-site sources (upgradient or upslope contamination). Specific guidelines cannot be outlined for every site; therefore, evaluations must be made on a site-by-site basis.

Alternative B - When site-specific background samples will not be taken, soils containing zinc, cadmium, chromium, lead, and nickel shall be considered to be contaminated if concentrations in the soil using total metals analysis exceed the action level (upper confidence limit) for Ohio farm

INTERIM FINAL

soils, as given in Table 1 below. Because site-specific background data is always preferable, Alternative B is only available to those facilities whose contaminants are limited to zinc, cadmium, chromium, lead, and nickel.

Table 1

Action Levels (Upper Confidence Limits) for Heavy Metals Calculated from "Ohio Farm Soils" Data

METAL	ACTION LEVEL (TOTAL METAL CONCENTRATION IN UG/G)
Zinc	105
Cadmium	0.8
Chromium	20
Lead	29
Copper	29
Nickel	28

*Action levels calculated from data presented in Table 2 of Logan, T.J. and R.H. Miller, 1983: Background Levels of Heavy Metals in Ohio Farm Soils, Research Circular 275, Ohio State University, Ohio Agricultural Research and Development Center, Wooster.

Ohio EPA may reject any of the above alternatives based on site-specific information. For example, it is inappropriate to use the clean standards in Alternative B when there is site specific background data available, or when the soil parent materials underlying the RCRA unit are radically different (e.g., sand and gravel deposits, mine spoil, foundry sand, etc.) from those included in Logan and Miller's study.

3.11.2 Compounds not Naturally Occurring:

Hazardous waste releases may result in soil and ground water contamination from RCRA-regulated compounds or elements (D,F,K,P or U wastes or 40 CFR 261, Appendix VIII) not naturally occurring in the area of the hazardous waste management unit. Soil and ground water in these areas shall be considered to be contaminated if the presence of synthetic compounds or non-naturally occurring elements are detected (although not necessarily quantifiable) using the most sensitive methods available in USEPA Publication SW-846 "Test Methods for Evaluating Solid Waste: Physical/Chemical

INTERIM FINAL

Methods." Analytical data shall be reported according to procedures described in SW-846. **Reviewers should be careful to instruct owner/operators to report all concentration data, even if it is estimated, for compounds or elements that have been positively identified in the sample.**

Since the ability to detect the presence of a constituent in environmental media is dependent upon the characteristics of the matrix, it is inappropriate for the owner/operator to state detection limits for the constituents of concern *apriori*. Therefore, the owner/operator shall use detection limits developed by the analytical laboratory at the time the sample is analyzed using SW-846 methods. Also, please note that the detection limit (DL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the value is above zero. The PQL or SQL is the lowest concentration of a substance that can be consistently quantified. **DHWM expects the DL to be used as the clean target level rather than the PQL or SQL.**

Again, situations will exist where the surrounding area or matrix (i.e., ground water, air, soil) has historically been affected by sources outside of the site under investigation. Examples include: acid mine drainage areas, surface waterways with point/non-point discharge sources, non-potable aquifers (high mineral content, saline) or where the aquifer is affected by off-site sources (upgradient or upslope contamination). Specific guidelines cannot be outlined for every site. Evaluations must be made on a site-by-site basis.

3.12 Risk-Based Remediation Standards

Federal regulations of May 2, 1986 (51 FR 16422) and March 19, 1987 (52 FR 8704) modified the closure performance standard such that risk assessment, or what constitutes "decontamination" of a site, may be considered by USEPA as a closure option. Ohio EPA adopted the equivalent of USEPA's March 19, 1987, regulations on December 8, 1988 (see OAC 3745-67-28), clarifying that risk assessment may be an option. **It is Ohio EPA, DHWM, practice to consider risk assessment as a possible third option for closure for all types of units.** Ohio EPA will expect complete, site-specific demonstrations of protection of human health and the environment in such closure plans. See DHWM's "Guidance for Reviewing Risk-Based Closure Plans for RCRA Units" for further details on the requirements for risk-based closures.

the closure plan containing site-specific risk assessment demonstrations. Also, due to its lack of completeness, Ohio EPA does not consider the *RCRA Facility Investigation Guidance* (USEPA, 1989c) to be a complete guidance document for RCRA closures, but it may provide some relevant basic guidance. This document includes health and environmental criteria numbers that should not be used as final clean-up target levels. On page 8-1, Volume I, USEPA emphasizes that "... *the health and environmental criteria provided in this section do not necessarily represent clean-up target levels that must be achieved through the implementation of protective measures. Rather, they establish presumptive levels that indicate a closer examination is necessary.*" DHWM requires that all hazardous waste constituents and hazardous constituents treated, stored, or disposed in the RCRA unit and detected in the environmental media, regardless of the concentration (whether above or below any published "health and environmental criteria"), must be included in a multi-constituent and multi-route, additive risk assessment that assumes all exposure routes exist.

Because a closure by risk assessment is considered decontaminated, no subsequent post-closure monitoring will be required, other than perhaps confirmatory ground water monitoring, and the property owner will not be subject to RCRA-imposed restrictions based on the use of the property. Therefore, risk assessment demonstrations on site controls (e.g., fencing, paving, etc.), self-imposed deed restrictions, zoning laws, master development plans, and fate and transport models are unacceptable.

In many cases, CERCLA guidance may appear to conflict with RCRA guidance or Ohio EPA, DHWM, guidance. For RCRA closures, this guidance and the March 19, 1987 *Federal Register* (Vol. 52, pp. 8704-8709) always override guidance applicable to other programs. All risk assessment reviewers are encouraged to scrutinize the March 19, 1987 *Federal Register* (Vol. 52, pp. 8704-8709) and carefully follow the detailed assumptions for risk assessment in this reference. In addition, Ohio EPA has found it necessary to establish guidance in other areas not covered in this reference. These risk assessment assumptions are discussed in Section 3.0.

2.3 Summary of Risk Assessment Assumptions

In order to clarify many of the assumptions that should be used in RCRA closure plans utilizing risk assessment, Ohio EPA, DHWM, is providing the following summary of directives:

RCRA vs. CERCLA risk assessment - Not all CERCLA guidance is appropriate for RCRA closures. For example, it is assumed that there are no legal controls for units that are risk-based closed. Therefore, the exposure assumptions discussed below are

ATTACHMENT B

appropriate for sites where future use is not restricted. Ohio EPA, DHWM must assume that the future use of any site without post-closure requirements pursuant to OAC rules 3745-66-16 through 3745-66-20 is unrestricted. For all RCRA units, all routes of exposure must be applied and included in a risk assessment. For example, a drinking water well could be located on the property or the site could be used for residential use where both adults and children, ages 1-6 years, are assumed to live.

Also, unless contaminated soil is contained in a landfill cell with post-closure requirements, Ohio EPA, DHWM must assume that contaminated soil use is unrestricted and could result in exposure to humans or released to the environment. RCRA risk assessment identifies which soils are considered "contaminated" and which soils are considered "decontaminated." Each area, usually a grid cell, of contaminated soil must be removed or managed in an in-situ solid or hazardous waste landfill; whereas, decontaminated soil may remain in-place without post-closure requirements. Ohio EPA believes this is consistent with USEPA's statement in March 19, 1987 *Federal Register* (Vol. 52, pp. 8704-8709) that all soil must be removed or decontaminated.

3.0 GENERAL CONCEPTS IN RISK ASSESSMENT

Risk assessment is the process utilized to determine if the hazardous waste constituent(s) and the hazardous constituent remaining in the effected or potentially effected environmental media pose a threat to human health. The National Research Council (NRC, 1983) has defined risk assessment as "the characterization of potential adverse effects of exposures to hazards." The *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual, Part A* (RAGS, Part A) (USEPA, 1989a) presents a four step chemical risk assessment process as follows:

(1) Data Evaluation/Collection;
(2) Exposure Assessment;
(3) Toxicity Assessment; and
(4) Risk Characterization.

3.1 Data Evaluation/Collection

The first step in reviewing a risk assessment is to review the analytical data. The reviewer should compare the analytical data with Sections 3.11 Remediation Standards for Soil, 3.11.1 Background, and 3.11.2 Sampling Requirements and Sampling and Analytical Procedures in the *Closure Plan Review Guidance*. Sections 3.11, 3.11.1, and 3.11.2 provide a detailed discussion on sampling protocol, defining the extent of soil contamination, defining the rate and extent of ground water contamination,

II

RCRA/CERCLA COORDINATION
at the
RVAAP DEACTIVATION FURNACE AREA

I OVERVIEW OF THE DEACTIVATION FURNACE AREA (DFA)

The Ravenna Army Ammunition Plant (RVAAP) is located in the northeastern portion of Ohio, within Portage and Trumbull Counties. The location of the facility is shown in Figure 1. The plant covers approximately 8668.3 hectares (21,419 acres) and is approximately 17.7 kilometers (11 miles) long and 5.6 kilometers (3.5 miles) wide as shown on Figure 2. During operation, the primary purpose of the plant was to load explosives into medium and major caliber artillery ammunition, bombs, mines, fuzes and boosters, primers, and percussion elements. Currently, the munitions facilities are in an inactive status. The Department of the Army is pursuing investigations to determine the presence and extent of hazardous contamination at the plant, with the ultimate goal of performing the necessary remediation. To date, thirty-nine (39) different potential Areas of Concern(AOC) have been established. These are shown on Figure 2.

The Deactivation Furnace Area (DFA), denoted as AOC RVAAP-17 on Figure 2, is located within the Winklepeck Burning Grounds, denoted as AOC RVAAP-5, see Figure 3. Specifically, it is located on the north side of Pallet Road D, West. The Deactivation Furnace structure consisted of a control room and earth-filled timber wall, see Figure 4, with a discharge point for the ash collection conveyor exiting the safety barricade along the west face of the timber wall. Photographs of the deactivation furnace are provided as Enclosure 1.

The deactivation furnace itself consisted of a no. 2 oil-fired, horizontal, rotary retort furnace and was used to deactivate fuzes, boosters, and munitions containing up to 400 grains of explosive. The facility was constructed in the 1960's and last used in 1983. At present, the earthen barricade and portions of the safety wall have been removed from the structure.

Explosive wastes (D003) that were treated in the furnace resulted in ash residues potentially containing toxic metals, aluminum, tin, iron, magnesium, calcium silicates, chlorides, potassium, copper, strontium, antimony, and various thermally degraded organic compounds containing oxygen, nitrogen, sulphur, carbon, and hydrogen.

II GEOLOGY

Two glacial advances during the Wisconsin Age of the Pleistocene Epoch resulted in the deposition of glacial till over the entire RVAAP. The map, " Glacial Geology of Northeastern Ohio, shows the DFA to be underlain by the Hiram Till which typically is composed predominantly of silts and clays. Figure 5 shows the dominant material type within the upper 25 feet of the land surface at the DFA to be glacial till. Figure 6 shows the drift thickness to be about 150 feet. However, borings performed in the vicinity of the Open Burning Area (RVAAP-39), see Figure 3, showed only about 20' of clayey silt to silty clay with sand lenses, underlain by bedrock, possibly shale. A plan and logs of these borings are provided as Enclosures 2 (A-E) for reference.

Specifically at the DFA, the Modified Amended RCRA Closure Plan, dated Oct. 31, 1994 states that a 12-deep trench was dug at the site and no groundwater was encountered.

III PREVIOUS INVESTIGATIONS/CLOSURE PLANS

III.A RCRA Investigations

Extensive sampling (230 individual samples) has been conducted in the Deactivation Furnace Area to develop site specific background concentrations and to establish the horizontal and vertical extent of contamination. Figures 7 and 8 detail the locations and depths of all sampling and Tables 2(A - C) show the levels of contaminants measured and compared against the 1994 proposed remediation goals. Table 7 compares the levels of antimony, arsenic, and beryllium with depth at the sample locations where deeper than surface sampling was conducted. This table shows the results to be somewhat inconsistent in that there appears to be a general reduction of contaminant level with depth in some areas, and sharply increased levels with depth at other areas. These inconsistencies may be due to one or more of the following; sampling error, laboratory error, stratigraphy changes (as reworking of the surface by filling during construction of the Deactivation Furnace, stratigraphy changes due to maintenance operations, etc.

III.B RCRA Closure Plans

Several closure plans have been prepared for the DFA, including:

March	1990	Closure Plan for Deactivation Furnace, RVAAP, Ohio
Dec	1990	Revision 1 to the Closure Plan
July	1993	Amended RCRA Closure Plan for Deactivation Furnace
Sep	1994	Modified Amended RCRA Closure Plan for Deactivation Furnace
Dec	1996	Closure Plan for the Deactivation Furnace Area (DFA)

The Modified Amended RCRA Closure Plan for Deactivation Furnace (Sep 1994) sought to incorporate all previous OEPA comments and included detailed procedures for cleaning up the site soil contamination, background results, and site specific risk based calculations. No contamination of soil with TNT, 2,4-DNT, 2,6-DNT, or RDX has been encountered. Risk-based clean up levels for a residential child scenario were determined for antimony, arsenic, beryllium, cadmium, chromium, copper, nickel and zinc were determined, see Table 3, and a value of ½ of the EPA Region V default value (300 ppm) for lead equal to 150 ppm was utilized. These values were compared with background levels and the following table was established for clean-up levels:

Metal	Background Concentration (PPM	Risk-Based Clean-Up Level (PPM)	1994 Remediation Clean-Up Limit (PPM)
Antimony	2.21	22.	22.
Arsenic	14.72	0.3	14.72
Beryllium	5.	0.1	5.
Cadmium	5.	24.9	24.9
Chromium	39.11	3.7	39.11
Copper	27.35	2,189.	2,189.
Lead	28.1	N/A	150.
Nickel	41.3	180.4	180.4
Zinc	84.35	10,947.	10,947.

Figure 9 shows the depths at which measured contaminant levels exceeded the 1994 Remediation Levels. A plan of the proposed excavation in the 1994 Modified Amended RCRA Closure Plan is provided as Figure 10. In the Modified Amended RCRA Closure Plan it is stated that the data suggests that contamination has taken place in a conical form (i.e., deepest at the center and shallower at the periphery). Table 4 also tends to show that the suggested vertical extents of excavation would appear to provide generally soils that contain less than the 1994 Remediation Levels.

III.C 1996 CERCLA Investigation

As part of the investigation of the Winklepeck Burning Grounds (RVAAP-05), surface soils were sampled and tested for explosives and inorganic elements. Figures 10 and 11 show limited presence of explosives in the area around the Deactivation Furnace, but consistent elevated levels of inorganic elements.

IV CONCLUSIONS

A. Based on the 1996 CERCLA investigation in the Winklepeck Burning Grounds, there is widespread presence of inorganic elements that would practically prohibit delineating between the RCRA and CERCLA contamination.

B. Based on the geology of the area (thickness of till), there appears to be very limited potential for groundwater migration out of the immediate Deactivation Furnace Area.

C. Although the extensive amount of sampling and testing performed to date is not entirely consistent, it does support the basic conclusion that the deepest contamination is directly beneath the Deactivation Furnace area.

V ACTION PLAN

Based on,

- the impossibility of delineating between the RCRA and CERCLA contamination,
- the area outside the RCRA unit will be remediated under CERCLA activity and not simply abandoned, and
- the highly likely land usage that will be either recreational or industrial for CERCLA, as opposed to residential for RCRA,

It is proposed to,

A. Define the boundary between the RCRA and CERCLA activity at this site as 21' outside of the east, north and west sides of the Deactivation Furnace and at Pallet Road D, West on the south side, see Figure 10,

B. Treat the RCRA units as follows,

B.1 - search for and evaluate any as-built drawings of the Deactivation Furnace and Winklepeck Burning Grounds,

- drill 2 20'deep borings within the RCRA area to verify that groundwater level is below any soil contamination, to assess the soil stratigraphy, and to determine total concentrations of the nine 1994 Remediation metals at depth intervals of 2' feet.

B.2 - develop a RCRA closure plan to implement the recommended depths of excavation, 8' deep within, and 6' deep outside of the Deactivation Furnace, (unless the 2 borings dictate otherwise),

- implement the closure, and
- perform closure sampling at the specified depths to insure that adequate excavation has occurred and to possibly deepen the excavation until the 1994 Remediation Clean-up Levels are achieved,

C. Treat the CERCLA area outside the RCRA unit as the remainder of the plant is being pursued.

FIGURES

TABLES

ENCLOSURES

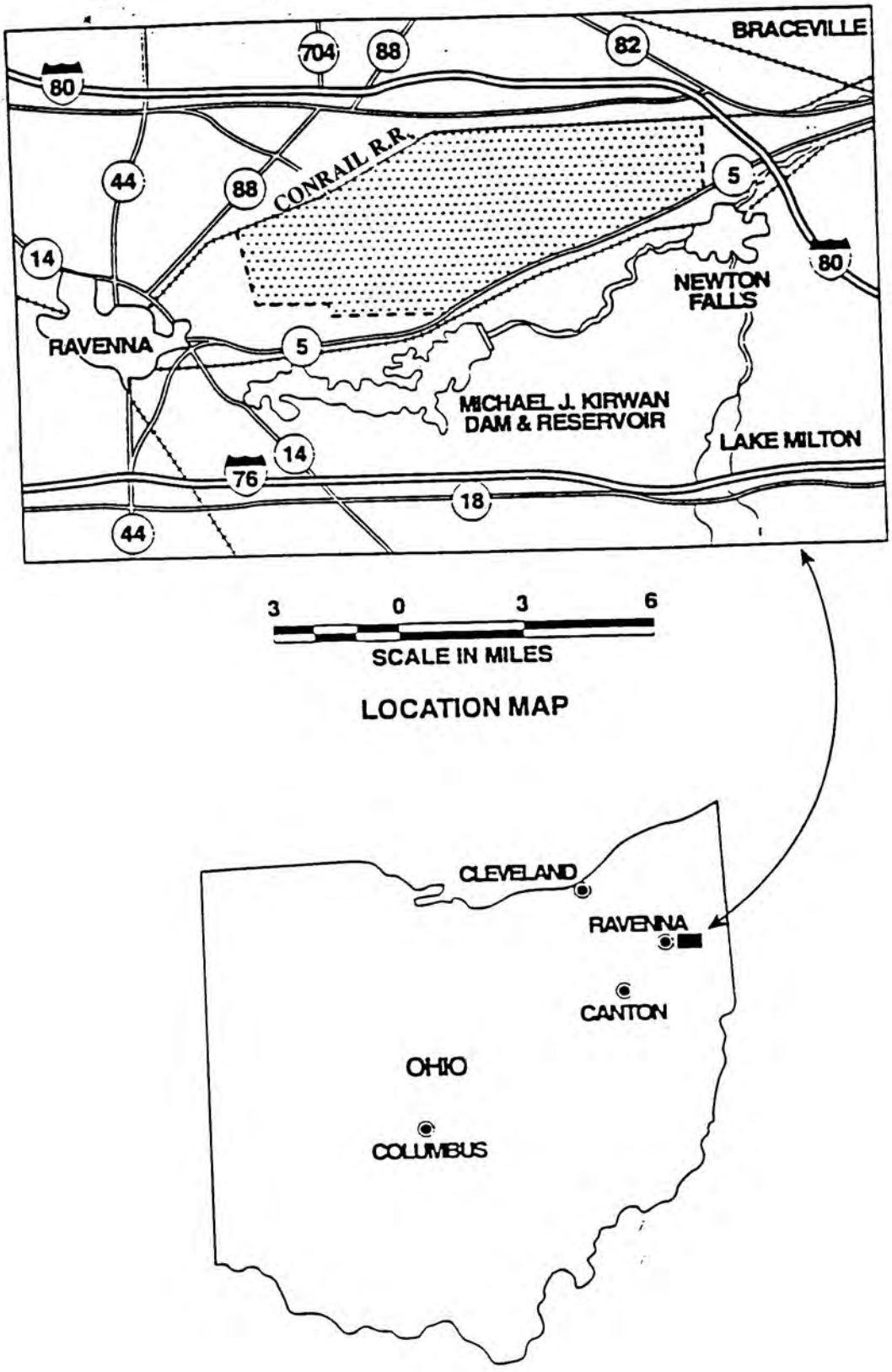


FIGURE 1 General Location and Orientation of RVAAP

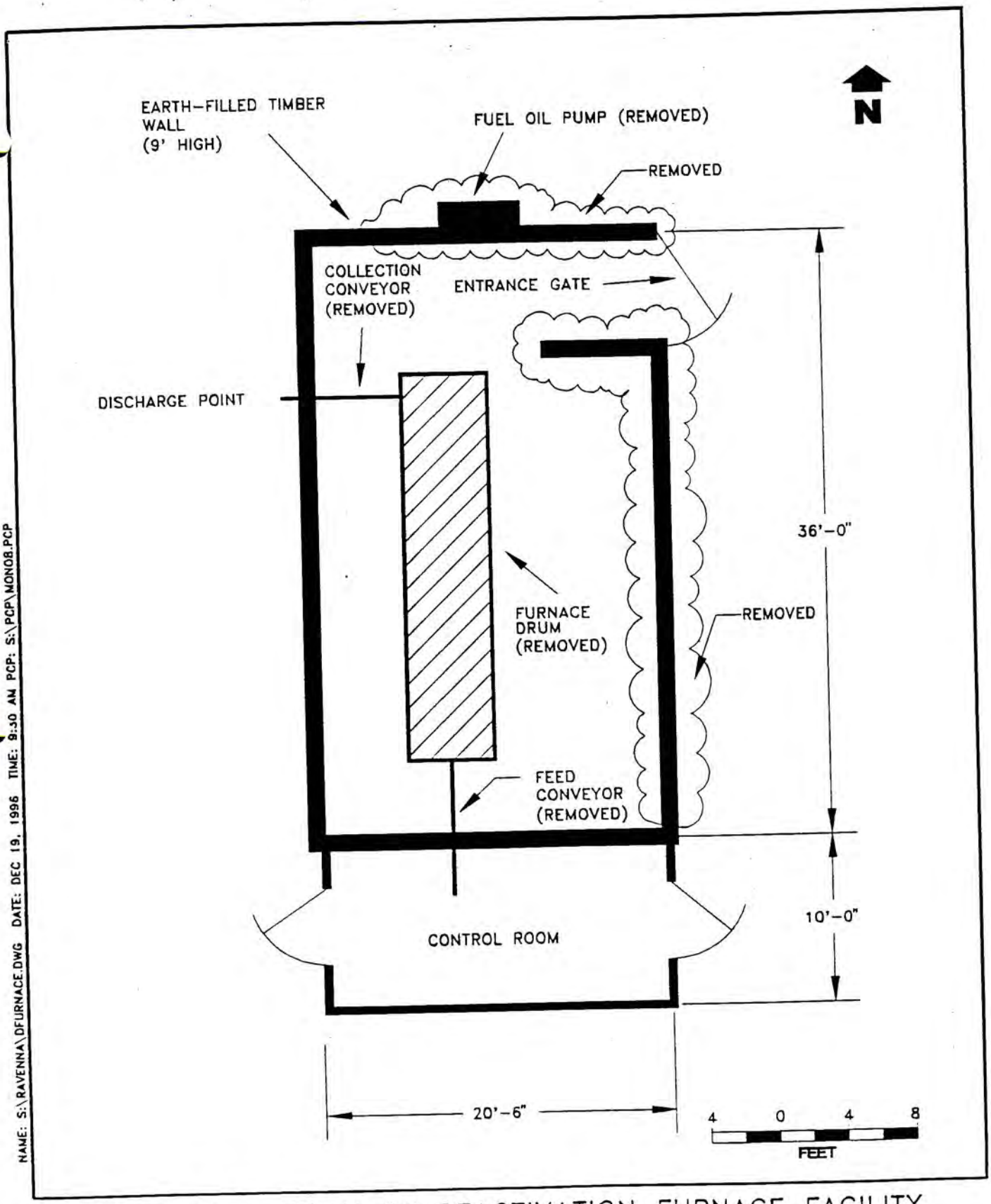


FIGURE 4 PLAN OF DEACTIVATION FURNACE FACILITY

RAVENNA ARSENAL, INC. DEACTIVATION FURNACE CLOSURE

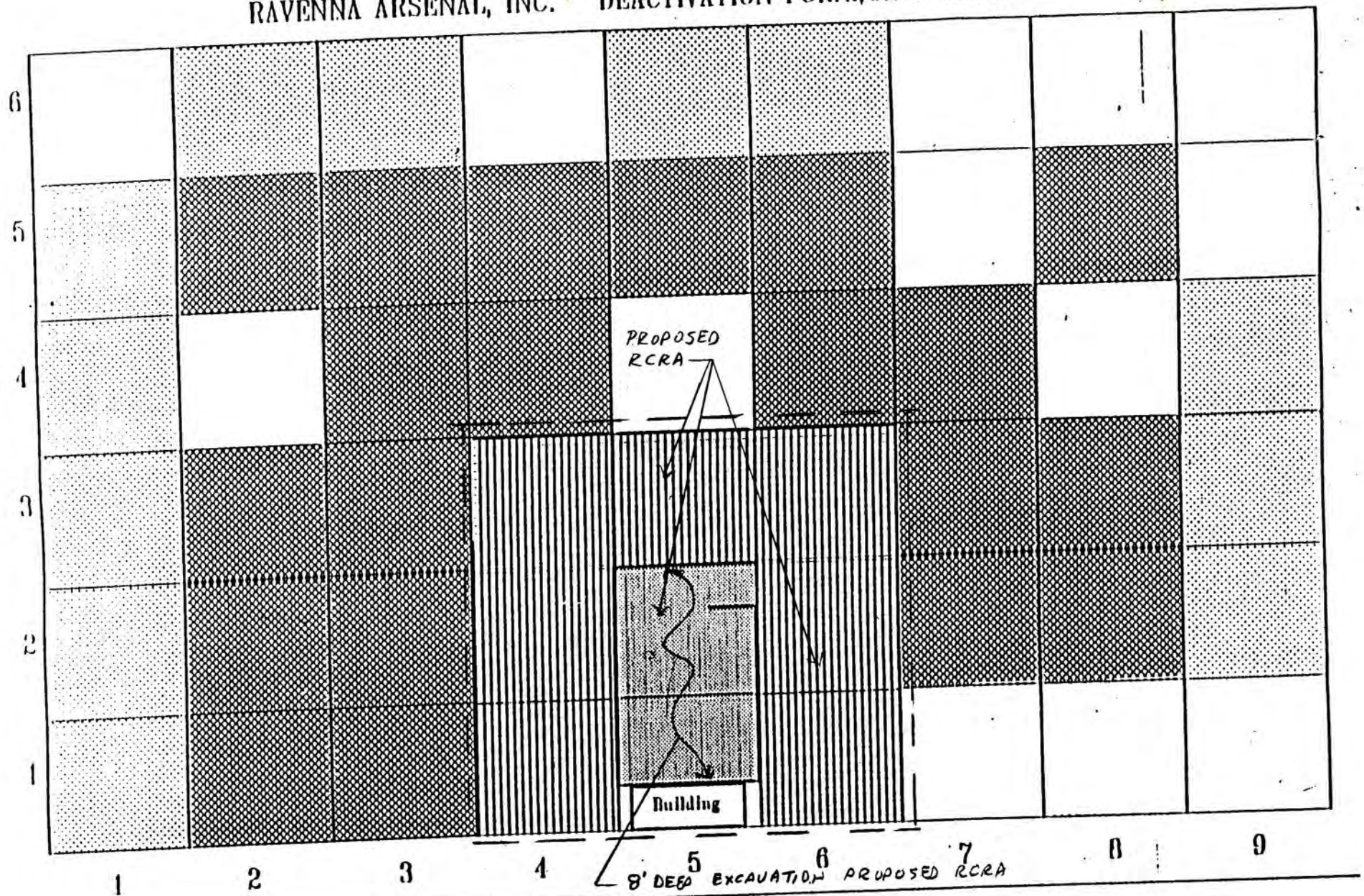


FIGURE 10 - EXCAVATION LOCATIONS AND CONFIRMATION SAMPLING
GRID SIZE 21' X 21'
NOT TO SCALE

31 OCT 1994

TABLE 3
RISK ASSESSMENT DATA

Toxicity Values (some toxicity values in table have changed since 09 Dec 1992 report)

	RfD(o)	RfD(i)	SF(o)	SF(i)
Antimony	4.00E-04			50.00
Arsenic+	3.00E-04		1.75	8.40
Beryllium	5.00E-03		4.30	6.10
Cadmium+	1.00E-03			41.00
Chromium#+	5.00E-03	6E-07		
Copper#	4E-02			
Lead				0.84
Nickel	2.00E-02			
Zinc#	2.00E-01			

"+" = Slope Factor has changed since 09 Dec 1992 report.
"#" = RfD has changed since 09 Dec 1992 report.

Multiplication Factors (MF)

	Noncarcinogenic			Carcinogenic		
	Ingestion	Dermal	Inhalation	Ingestion	Dermal	Inhalation
Res. Child	1.33E-05	4.97E-06	7.70E-06	1.14E-06	4.26E-07	6.60E-09

Residential Child

	Noncarcinogenic (mg/kg)			NCPRG	Carcinogenic (mg/kg)			CPRG	Site-Specific Risk-Based Cleanup Level
	Ingestion	Dermal	Inhalation		Ingestion	Dermal	Inhalation		
Antimony	30.1	80.5		22					22
Arsenic	22.6	60.4		16	0.5	1.3	3.0	0.3	0.3
Beryllium	375.9	1006.0		274	0.2	0.5	18.0	0.1	0.1
Cadmium	75.2	201.2		55			24.8	24.8	24.8
Chromium	375.9	1006.0	7.8	8			3.7	3.7	3.7
Copper	3007.5	8048.3		2350					2189
Lead									
Nickel	1503.8	4024.1		1093			180.4	180	180.4
Zinc	15037.6	40241.4		10947					10947

Exposure Assumptions

	Res. Child
Ingestion Rate (IR(s)) mg/day	200
Skin Surface Area (SA) cm^2/event	3536
Inhalation Rate (IR(a)) m^3/hr	0.83
Conversion Factor (CF) 1E-06 kg/mg	1E-06
Fraction Ingested (FI) unitless	1
Soil Adherence Factor (AF) mg/cm^2	2.11
Absorption Factor (ABS) %	1
Exposure Frequency (EF) days/yr	365
Exposure Duration (ED) yrs	6
Particulate Emission Factor (PEF) m^3/kg	1.73E+07
Body Weight (BW) kg	15
Averaging Time (AT) days	
Carcinogenic	25550
Noncarcinogenic	2190

Equations

Multiplication Factors (MF)

Ingestion: $\frac{IR(s) \times CF \times FI \times EF \times ED}{BW \times AT}$

Dermal Contact: $\frac{CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$

Inhalation: $\frac{IR(a) \times ET \times EF \times ED}{PEF \times BW \times AT}$

Risk-Based Noncarcinogenic Soil Concentration (CS)

HQ = 1 HQ = CDI/RfD CDI = MF x CS $CS = \frac{HQ \times RfD}{MF}$

Risk-Based Carcinogenic Soil Concentration (CS)

Risk = 1E-06 Risk = CDI x SF CDI = MF x CS $CS = \frac{Risk}{MF \times SF}$

TABLE 4

VARIATION OF ANTIMONY, ARSENIC + BERYLLIUM W/DEPTH

(ALL NUMBERS PPM)

	3			4			5			6			7			8			9		
DEPTH(FT)	AN	AR	BE	AN	AR	BE	AN	AR	BE	AN	AR	BE	AN	AR	BE	AN	AR	BE	AN	AR	BE
0-1	<5	11.3	<5	<5	25.0	<5	<5	16.9	<5	<5	17.5	<5	<5	14.8	<5	<5	9.6	<5	<5	15.5	<5
1-2	5.9	8.4	<5	10.	11.	<5	<5	14.4	<5	<5	8.2	<5	<5	7.3	<5	<5	11.4	<5	<5	5.4	<5
2-3	<5	15.6	<5	<5	10.2	<5	<5	8.2	<5	<5	6.9	<5	<5	9.2	<5	<5	7.2	<5	<5	5.5	<5
4-5	161.	193	54	196	19.6	<5.8	157	17.6	<5.7	182	14.2	<5.7				133	17.1	5.6			

	8			9			10			11			12			13			14		
DEPTH(FT)	AN	AR	BE	AN	AR	BE	AN	AR	BE	AN	AR	BE	AN	AR	BE	AN	AR	BE	AN	AR	BE
0-1	<5	9.6	<5	<5	15.5	<5	22.5	35.7	<5	3.1	27.5	<5	5	48.7	<5	<5	30.3	<5	1.7	9.6	<5
1-2	<5	11.4	<5	<5	5.4	<5	<5	6.0	<5	7	11.	<5	<5	8.4	<5	<5	6.6	<5	<5	4.9	<5
2-3	<5	7.2	<5	<5	5.5	<5	<5	6.	<5	<5	4.6	<5	<5	8.2	<5	<5	7.2	<5	<5	7.1	<5
4-5	133	17.1	5.6				187	15.3	<5.7	105	8.9	<5.6				178	10.7	<5.7	160	17.7	<5.7
10										<52.9	8.2	<5.3									
12										<54.3	10.1	<5.4									

	15			16			17			1			2			18			19		
DEPTH(FT)	AN	AR	BE	AN	AR	BE	AN	AR	BE	AN	AR	BE	AN	AR	BE	AN	AR	BE	AN	AR	BE
0-1	<.5	6.3	<5	<.5	<5	<5	<.5	6.	<.5	<.5	7.2	<5	<5	7.1	<5	<5	4.5	<5	<5	16	<5
1-2	<5	5.7	<5	<5	4.5	<5	<5	4.6	<5	<5	7.9	<5	<5	5.2	<5						
2-3	<5	5.9	<5	<5	5.6	<5	<5	5.3	<5	<5	7.2	<5	<5	5.5	<5	70.4	14.6	<5.7	127	16.7	<5.7
4-5							190	21.6	<5.7												

	20			21			22			23			25			26			27		
DEPTH(FT)	AN	AR	BE	AN	AR	BE	AN	AR	BE	AN	AR	BE	AN	AR	BE	AN	AR	BE	AN	AR	BE
0-1	<5	6.4	<5	<5	6.4	<5	<5	5.5	<5	<5	4.6	<5	<5	10.7	<5	<5	5.6	<5	<5	5.8	<5
2-3	103	11.5	<5.8	91.1	14.5	<5.8	67.1	11.5	<5.7	77.4	10.8	<5.7	73.7	9.5	<5.8	85.3	20.7	<5.7	63	17.1	<6.1

	28			29			30			135			140			146			154		
DEPTH (FT)	AN	AR	BE	AN	AR	BE	AN	AR	BE	AN	AR	BE	AN	AR	BE	AN	AR	BE	AN	AR	BE
0-1	<5	5.8	<5	<5	5.9	<5	<5	5.8	<5	<54	10.	<5.4	<53.5	23.1	<5.3	<57.7	13.4	<5.8	<55.1	15.0	<5.5
2-3	101	24.2	<5.8	73.2	21.3	<5.8	98.4	14.1	<57	<56	6.6	<5.6	<57.8	16.4	<5.8	<59.5	16.9	<6	<59.1	17.7	<5.7
4-5													<6	21.0	<6	2.6	19.0	<6	<7	23.0	<6.3

	161			166		
DEPTH (FT)	AN	AR	BE	AN	AR	BE
0-1	<50.9	12.3	<5.1	<57.6	22.5	<5.8
2-3	<62.3	14.3	<6.2	<57.9	25.1	<5.8
4-5				<6	24.	<6.1

PRELIMINARY SAMPLING

	1 INSIDE D.F.			2 IMMED OUTSIDE D.F.			3 NEAR (290 WAY) OUTSIDE			4 SOUTH OF ROAD			5 IMMED OUTSIDE (59)			6 IMMED OUTSIDE (62)		
DEPTH (FT)	AR	BE	PB	AR	BE	PB	AR	BE	PB	AR	BE	PB	AR	BE	PB	AR	BE	PB
0-1	69	1.9	750	<10.	2.9	47	25 (4.9)	<.5	100 <12)	16.	<.5	31	14, (13.6)	<.5 (<5.9)	53 (21.3)	14, (10.4)	<.5 (<5.9)	35 (14.1)
1-2	18	2.4	70	17	1.2	43	12	0.8	38	22.	<.5	35						
2-3	15	0.6	42	16	0.6	35	36	0.6	27	13,	0.8	31						
3-4	12	<.5	28	21	0.6	31	17	0.7	36	36	0.7	30						

RVAAP- 17 JAN 1997

DEACTIVATION FURNACE- VIEW LOOKING FROM SOUTHEAST

DEACTIVATION FURNACE- VIEW LOOKING FROM NORTHEAST

ENCLOSURE 1

PHOTOGRAPHS OF DEACTIVATION FURNACE

Geohydrologic Study No. 38-26-KF95-92, 23-27 Mar and 20 Apr -
5 May 92

FIGURE 9.
Contour Map of Top of Bedrock at Open Burning Ground,
Ravenna Army Ammunition Plant, Ravenna, Ohio.

ENCLOSURE 2A
PLAN OF OBG BORINGS

US ARMY ENVIRONMENTAL HYGIENE AGENCY

DRILLING LOG

(The proponent of this form is HSHB-ES)

INSTALLATION Ravenna AAP
PROJECT NUMBER 38-26-KF95-92
LOCATION Approximately 100 ft Northwest of Open Burning Ground
DRILL RIG Mobile B-53
DATE 30 April 92
GEOLOGIST Barrett Borry
DRILLERS W.Smithson, R. Kestner, M. Farro
BORE HOLE OBG-1
WATER LEVEL 3.43 3 May 92
Sheet 1 of 1

DEPTH	SAMPLE TYPE	DESCRIPTION	REMARKS
0.2	3" s.s.s. 3.8 ft rec	Crushed rock and slag fragment fill, gr to bl Silty clay, r y, moist	
3.0		Clayey fine sand, y br, wet	
5.5	3" s.s.s. 5.0 ft rec	Clayey silt, y br, moist Color change to gr at 8.5 ft	
12.2	3" s.s.s. 3.2 ft rec	Sand, y br, wet	
15.0	3" s.s.s.	Clayey silt, gr moist	
17.0	3.2 ft rec	Sand, gr, wet	
17.9		Clayey, silt, gr, moist	Drill chatter at 18 ft
19.0		B.O.H. at 19 ft	

AEHA Form 130, 1 Nov 82
Replaces HSHB Form 78, 1 Jun 80, which will be used.

F-8

ENCL 28.1

US ARMY ENVIRONMENTAL HYGIENE AGENCY

DRILLING LOG

(The proponent of this form is HSHB-ES)

INSTALLATION Ravenna AAP
PROJECT NUMBER 38-26-KF95-92
LOCATION Eight ft North of OBG-1

DRILL RIG Mobile B-53
Sheet 1 of 1

DATE 21 April 92
GEOLOGIST Barrett Borry
DRILLERS W.Smithson, R. Kestner, M. Farro
BORE HOLE OBG-1A
WATER LEVEL

DEPTH	SAMPLE TYPE	DESCRIPTION	REMARKS
0.7	3" s.s.s. 4.4 ft rec	v f sand, lt y br, moist	
		silty clay y br, moist	
3.6		Clayey silt, dk gr br moist	
4.4		Clayey, v f sand, mottled br y to v pale br wet	
6.8	3" s.s.s. 5 ft rec	Silty clay, y br w occ rounded pebbles, moist Color change to olive y at 8 ft	
13.0	2" s.s. 0.2 ft rec	Sand y br poorly sorted, fine to coarse, wet	
15.0		Clayey silt gr Flowing sand and pebbles jammed between center stem and auger unable to attempt spoon at 18 ft	
23.0		B.O.H. at 23 ft	Auger refusal at 23 ft

AEHA Form 130, 1 Nov 82
Replaces HSHB Form 78, 1 Jun 80, which will be used.

ENCL 28.2

US ARMY ENVIRONMENTAL HYGIENE AGENCY

DRILLING LOG

(The proponent of this form is HSHB-ES)

INSTALLATION Ravenna AAP
PROJECT NUMBER 38-26-KF95-92
LOCATION Northeast Corner of Open Burning Ground

DRILL RIG Mobile B-53

DATE 22 April 92
GEOLOGIST Barrett Borry
DRILLERS W.Smithson, R. Kestner, M. Farro
BORE HOLE OBG-2
WATER LEVEL 5.69 3 May 92

Sheet 1 of 1

DEPTH	SAMPLE TYPE	DESCRIPTION	REMARKS
	3" s.s.s.	Crushed rock and slag fill, gr to bl	
2.0	3.0 ft rec	Clayey silt mottled br to y, moist	
	3" s.s.s. 4.2 ft rec	Color change to y br at 5 ft	
8.4		Silty clay y br occ rounded pebble, moist	
10.0	3" s.s.s. 5.0 ft rec	Clayey silt, gr occ pebble, moist y br between 14-15 ft	
	3" s.s.s. 2.5 ft rec	gr at 15 ft, wet	Note: Auger turned up siltstone and shale fragments at 19 ft Very slow auger penetration at 19 ft
		Sand gr, wet	
19.0		B.O.H. at 19 ft in weathered rock	

AEHA Form 130, 1 Nov 82
Replaces HSHB Form 78, 1 Jun 80, which will be used.

F-11

ENCL 2-C

US ARMY ENVIRONMENTAL HYGIENE AGENCY

DRILLING LOG

(The proponent of this form is HSHB-ES)

INSTALLATION Ravenna AAP
PROJECT NUMBER 38-26-KF95-92
LOCATION Southeast Corner of Open Burning Grounds

DRILL RIG Mobile B-53
Sheet 1 of 1

DATE 22 April 92
GEOLOGIST Barrett Borry
DRILLERS W.Smithson, R. Kestner, M. Farro
BORE HOLE OBG-3
WATER LEVEL 4.41 3 May 92

DEPTH	SAMPLE TYPE	DESCRIPTION	REMARKS
		Crushed rock and slag fill, gr to bl	
2.7	3" s.s.s. 2.5 ft rec	Clayey silt w occ pebble y br to br y w/faint mottles, moist	
4.0		Silty clay, br y w/very pale br mottles, damp	
	3" s.s.s. 5 ft rec		
		Color change to gr at 9.0 ft	
	3" s.s.s. 5.0 ft rec		
14.1		Sand, r b, wet	
14.2		Clayey silt,occ ss pebble,moist	
15.0			
16.9	3" s.s.s. 4.4 ft rec	vf sand w/clay, occ pebble,br moist	
16.9		Clayey silt, gr moist	Augers turned water at 19 ft
18.4		Sand, pale yellow, wet	B.O.H. at 20 ft in weathered rock
19.0		Clayey, silt, lt br gr	
20.0			

AEHA Form 130, 1 Nov 82
Replaces HSHB Form 78, 1 Jun 80, which will be used.

ENCL 2-D

US ARMY ENVIRONMENTAL HYGIENE AGENCY

DRILLING LOG

(The proponent of this form is HSHB-ES)

INSTALLATION Ravenna AAP
PROJECT NUMBER 38-26-KF95-92
LOCATION Along the Southern Boundary of the Open Burning Ground
DRILL RIG Mobile B-53
DATE 25 April 92
GEOLOGIST Barrett Borry
DRILLERS W.Smithson, R. Kestner, M. Farro
BORE HOLE OBG-4
WATER LEVEL 2.99 3 May 92
Sheet 1 of 1

DEPTH	SAMPLE TYPE	DESCRIPTION	REMARKS
1.0	3" s.s.s. 3.0 ft rec	Silty clay w/rock fragments,gr, moist	
1.5		Clayey silt, lt olive br, moist	
2.6		Silty clayey fine sand, br y w/r y mottles, wet	
		Clayey silt br y w/r y mottles damp,color change to y br at 4 ft	
	3" s.s.s. 5.0 ft rec		
	3" s.s.s. 2.0 ft rec	Color change to gr with r y mottles at 10.8 ft	
14.0	3" s.s.s. 3.0 ft rec	Fine sand and clay, gr, wet	
18.0		B.O.H. at 18 ft in weathered rock	Auger refusal at 18 ft

AEHA Form 130, 1 Nov 82
Replaces HSHB Form 78, 1 Jun 80, which will be used.

III

ACTION PLAN COSTS (LIMIT RCRA AREA & CLEAN UP TO 1994 MOD. RESIDENTIAL LEVELS WITH 2 BORINGS)

V B.1 - Search for as-built drawings	Proj Engr. 16 hours@ $75 = $1,200.
Drill/samle 2 20'-deep borings	$10,000 = $20,000.
Lab 20 samples for 11 priority metals	20 samples @ $150 = $3,000.
A/QC, Lab Report	Chemist, 16 hours @ $75 = $1,200.
	TOTAL = $25,500.

V.B.2

DEACTIVATION FURNACE - DISPOSAL COSTS
1994 MODIFIED AMENDED CLOSURE PLAN - ONLY TO 21' OUTSIDE FURNACE

A. INSIDE FURNACE (20' x 36')- PLAN CALLS FOR EXCAVATION TO 8'

Based on totals/TCLP 20/1 guideline (except for lead use 400 ppm), conservatively only upper 2 feet of inside area will be "hazardous"

A.1 (0 - 2')
(20' x 36' x 2') x (120 pcf/2000 T/p) = 86 T (Hazardous)
Disposal including transportation ranges $150 - $300 / T; Use $300
86 T x $300/T = $25,800.

A.2 (2' - 8')
(20' x 36' x 6') x (120 pcf/2000 T/p) = 259 T (Special Waste)
Disposal including transportaton ranges $30 - $50 / T; Use $50
259 T x $50/T = $12,950.

A.3 (8' - 12')
Assume confirmatory testing requires area be excavated to 12' on average
(20' x 36' x 4') x (120 pcf/2000 T/p) = 173 T (Special Waste)
173 T x $50/T = 8,650.

B. OUTSIDE FURNACE 7 (21' X 21') GRIDS EXCAVATED TO 6'

B.1 (0 - 6')
7 x (21' x 21' x 6') x (120 pcf/2000 T/p) = 1,111 T (Special Waste)
1,111 T x $50/T = $55,550.

B.2 (6' - 8')
Assume confirmatory testing requires area to be excavated to 8' on average
7 x (21' x 21' x 2') x (120 pcf/2000 T/p) = 370 T (Special Waste)
370 T x $50/T = $18,500.

C. CONFIRMATORY SAMPLING (Test for 11 Priority Metals)

Field sample 30 samples @$100 = $3,000.
Lab Test for 30 Samples @$150 = $4,500.
Data validation & report = $1,000.
TOTAL = $8,500.

D. BACKFILL COSTS

Assume can get clean backfill from within ½ mile, on site.
Use $10/T in-place

D.1 Total backfill if no extra (confirmatory)
((20' x 36' x 8') + 7x(21' x 21' x 6')) x (120 pcf/2000 T/p) = 1,457 T
1,457 T x $10/T = $14,570.

D.2 Extra backfill if need extra (confirmatory)
((20' x 36' x 4') + 7x(21' x 21' x 2')) x (120 pcf/2000 T/p) = 543 T
543 T x $10/T = $5,430.

E. PLANNING & OVERSIGHT

Proj Engr 24 hrs @ $75 = $1,800.
Superintendent 60 hrs @ $65 = $3,900.
TOTAL = $5,700.

F. CERTIFICATION REPORTS

Confirmation Sampling review
Closure Plan

Proj Engr 12 hrs @ $75 = $900.
Proj Engr. 60 hrs @ $75 = $4,500.
TOTAL = $5,400.

G. TOTAL DISPOSAL COSTS

G.1 If no extra (confirmatory), Total Cost = A.1 + A.2 + B.1 + C + D.1 + E + F = $128,470.

G.2 If extra (confirmatory), Total Cost = A.1+A.2+A.3 + B.1+B.2 + C + D.1 + D.2 + E + F = $161,050.

TOTAL COST IF NO EXTRA EXCAVATION = $153,870

TOTAL COST IF HAVE EXTRA EXCAVATION = $186,450

FOR PLANNING PURPOSES, (INCCLUDING CONTRACT AWARD AND OVERSIGHT)
USE $200,000 TO $225,000

IX

RCRA DEACTIVATION FURNACE COSTS - IF PROCEED WITH ADDITONAL SAMPLING, ETC

A. SEARCH/EVAL as-built drawings and drill/sample/test 2 20'-deep borings, $25,500.

B. EXTRA SAMPLING/ RISK ASSESSMENT

B.1 SAMPLING AND ANALYSIS PLAN

Existing Data Review(inc drawings) Proj Engr 32 hrs @ $75 = $2,400.

Plan Preparation	Proj Engr 32 hrs @ $75 = $2,400.
Agency Negotiation	Proj Man 16 hrs @ $85 = $1,360.
	TOTAL = $6,160.

B.2 FIELD SAMPLING AND ANALYTICAL

Will have to test for 11 priority metals,
For any significant lateral and vertical extent, will need at least 200 samples

Hand Auger	200 samples @ $100 = $20,000.
Analytical	200 samples @ $150 = $30,000.
Data Validation	Chemist 2 x 20 hrs@ $75 = $3,000.
Data Compilation	Chemist 2 x 40 hrs@ $74 = $6,000.
Agency Negotiation	Proj Man 16 hrs @ $85 = $1,360.
	TOTAL = $60,360.

B.3 RISK ASSESSMENT

Data Review	RA	24 hrs @ $75 = $1,800.
Risk Calculaton	RA	80 hrs @ $75 = $6,000.
Plan Preparation	RA	40 hrs @ $75 = $3,000.
Agency Negotiation	RA	16 hrs @ $85 = $1,360.
		TOTAL = $12,160.

TOTAL = $78,680.

C. DISPOSAL COST - USE EPA-REGION 9 INDUSTRIAL CRITERIA & DON'T LIMIT LATERAL EXTENT

C.A. INSIDE FURNACE (20' x 36')- PLAN CALLS FOR EXCAVATION TO 8'

Based on totals/TCLP 20/1 guideline (except for lead use 400 ppm), conservatively only upper 2 feet of inside area will be "hazardous"

A.1 (0 - 2')
(20' x 36' x 2') x (120 pcf/2000 T/p) = 86 T (Hazardous)
Disposal including transportation ranges $150 - $300 / T; Use $300
86 T x $300/T = $25,800.

A.2 (2' - 6')
(20' x 36' x 4') x (120 pcf/2000 T/p) = 173 T (Special Waste)
Disposal including transportaton ranges $30 - $50 / T; Use $50
173 T x $50/T = $8,650.

A.3 (6' - 8')
Assume confirmatory testing requires area be excavated to 8' on average
(20' x 36' x 2') x (120 pcf/2000 T/p) = 86 T (Special Waste)
86 T x $50/T = $4,300.

C.B. OUTSIDE FURNACE

B.1 7 (21' X 21') GRIDS ADJACENT TO FURNACE
Based on plot, assume 4' excavation

B.1.1 (0 - 4')
7 x (21' x 21' x 4') x (120 pcf/2000 T/p) = 741 T (Special Waste)
741 T x $50/T = $37,050.

B.1.2 (4' - 6')
Assume confirmatory testing requires area to be excavated to 6' on average
7 x (21' x 21' x 2') x (120 pcf/2000 T/p) = 370 T (Special Waste)

370 T x $50/T = $18,500.

B.2 AREA OUTSIDE FURNACE (63' BEYOND FURNACE ON EAST, NORTH, SOUTH SIDES)

B.2.1 (0 - 2') Of 59 sample grids outside the 7 (21' Grids), 16 have levels over the EPA 9 Criteria (16/59 = 27 %); based on contaminant levels, excavate 2' deep

0.27 x ((9x7)x (18x7) + (9x7)x(9x7) + (9x7)x(18x7)) = 5,358 sf
(2' deep x 5,358 sf)x (120 pcf/2000 T/p) = 643 T
643 T x $50/T = $32,150.

C.C CONFIRMATORY SAMPLING (Test for 11 Prioroty Metalss)
Field sample 75 samples @ $100. = $7,500.
Lab test 75 Samples @ $150 = $11,250.
Data validation & report = $2,000.
TOTAL = $20,750.

C.D BACKFILL COSTS
Assume can get clean backfill from within ½ mile, on site.
Use $10/T in-place

D.1 Total backfill if no extra (confirmatory)
((20' x 36' x 6') + 7x(21' x 21' x 4') + 10,716 cf) x (120 pcf/2000 T/p) = 1,643 T
1,643 T x $10/T = $16,430.

D.2 Extra backfill if need extra (confirmatory)
((20' x 36' x 2') + 7x(21' x 21' x 2')) x (120 pcf/2000 T/p) = 457 T
457 T x $10/T = $4,570.

C.E PLANNING & OVERSITE

Proj Engr 24 hrs @ $75 = $1,800.
Superintendent 80 hrs @ $65 = $5,200.
TOTAL = $7,000.

C.F CERTIFICATION REPORTS

Confirmation Sampling Review	Proj. Engr 20 hrs @ $75. = $1,500.
Closure Plan	Proj. Engr 80 hrs @ $75. = $6,000.
	TOTAL = $7,500.

C.G TOTAL COSTS

G.1 If no extra (confirmatory), Total Cost =A.1 + A.2 + B.1.1 + B2.1 + C
+ D.1 + E + F = $155,330.

G.2 If extra (confirmatory),Total Cost = A.1+A.2+A.3 + B.1.1 +B1.1.2 + B.2.1
+ C + D.1 + D.2 + E + F = $182,700.

D. TOTAL COSTS IF NO EXTRA EXCAVATION = $259,510

TOTAL COSTS IF HAVE EXTRA EXCAVATION = $286,880

FOR PLANNING PURPOSES, (INCLUDING CONTRACT AWARDS AND OVERSIGHT

USE $300,000 TO $350,000

IF RESIDENTIAL RISK-BASED LEVELS ARE REQUIRED, THE COSTS WOULD BE SIGNIFICANTLY HIGHER !!!

31 OCT 1994

TABLE 2 - REMEDIATION LIMITS - REGION 9 INDUSTRIAL LEVELS

METAL	BACKGROUND CONCENTRATION +/- 2 STD (PPM)		SITE-SPECIFIC RISK-BASED CLEAN-UP LEVEL (PPM)		REMEDIATION CLEAN-UP LIMIT (PPM)	REGION 9 INDUSTRIAL CLEAN-UP LIMIT
ANTIMONY	2.21	PHASE I	EPA 9-IN LIMITED PRGs 680.	22	22	680.
ARSENIC	14.72	19.6	2.4	0.3	14.72	14.72
BERYLLIUM	5		1.1	0.1	5	5
CADMIUM	5	0.29	850.	24.9	24.9	850
CHROMIUM	39.11	18.7	450.	3.7	39.11	450.
COPPER	27.35		63,000.	2,189	2,189	63,000.
LEAD	28.1	17.9	1,000.	N/A	150	1,000.
NICKEL	41.3		34,000.	~~18.7~~ 1804	~~41.3~~ 180.4	34,000
ZINC	84.35		100,000.	10,947	10,947	100,000

C. Confirmation Sampling

In the original closure plan, a sampling grid of 7' x 7' was established as sufficient to delineate the extent of contamination on the area. This number was based upon an area of contamination more than 23 times smaller than the current subject area. The number of confirmation samples required per the original closure plan, if it is maintained, is over 475 samples. To take into consideration the expanded subject area, the grid length has been recalculated.

Applying the grid length formula given in the OEPA Closure Plan Review Guidance Manual to the current conditions on-site yields the following:

$$GI = (A*Pi/GL)^{0.5} = (34,476*3.14/221)^{0.5} = 22.1'$$

RVAAP proposes establishment of a 21' x 21' grid for utilization during excavation and in collecting confirmation samples. When superimposed over the current 7' x 7' grid, a 54 grid system would result. The new grid system is provided in Figure 4.

Confirmation sampling protocol will confor
established in the original closure plan i
(page 14, paragraph 5).

Bird Environmental Technologies, Inc.

6490 Promier Avenue, NW. North Canton, OH 44720 Phone 216-499-8181 1-800-759-5956 Fax 216-499-4044

RCRA Closures

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

REPLY TO
ATTENTION OF

May 1, 1997

SIORV-CR (200-1a)

Mr. Donald R. Schregardus, Director
Ohio Environmental Protection Agency
1800 Watermark Drive
P.O. Box 1049
Columbus, Ohio 43215-1049

Dear Mr. Schregardus,

The Ravenna Army Ammunition Plant requests an extension for the submittal of a response to the Notice of Deficiency issued regarding the closure plan for the Deactivation Furnace Area. This request is necessary to allow for the procurement of Architect-Engineering (A-E) Services through the Corps of Engineers (COE). A new contract evaluation is required to have a consultant prepare the revised closure plan.

We request you allow us to respond to your deficiency notice not later than September 30, 1997. This schedule allows sufficient time for the movement of funds to the Corps of Engineers, the contractual award, and preparation of responses to the comments with revised closure plan. Every effort will be made to expedite the process. With our next submittal we will provide an anticipated schedule for the environmental restoration activities required by the revised closure plan.

Close coordination of schedules is necessary to allow the plant adequate time to respond to your agency's requirements. With continued staffing reductions, it has become necessary that a majority of the effort for environmental restoration be contracted out. Adequate time is required to accommodate the contracting process.

Your points of contact for this action are Mr. Bill Ingold, AMSIO-IRI, (309) 782-1395, and Mr. Robert Whelove, Jr., AMSIO-EQE, (309) 782-1092.

John A. Cicero, Jr.
Commander's Representative

RECEIVED
MAY 2 1997
By

Copies Furnished:

Ms. Sheila Abraham, Division of Hazardous Waste Management, Northeast District Office, Ohio Environmental Protection Agency, 2110 East Aurora Road, Twinsburg, OH 44087-1969

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-EQM, (Mr. Versluys), Rock Island, IL 61299-6000

Commander, U.S. Army Industrial Operations Command, ATTN: AMSIO-IRI, (Mr. Ingold), Rock Island, IL 61299-6000

Commander, U.S. Army Industrial Operations Command, ATTN: AMSIO-IRG, (Ms. Vermost), Rock Island, IL 61299-6000

U.S. Army Corps of Engineers, Nashville District, ATTN: CEORN-ER-H (Mr. Todd Boatman), P.O. Box 1070, Nashville, TN 37202

U.S. Army Corps of Engineers, Louisville District, ATTN: CEORL-DL-B (Mr. Kevin Jasper), P.O. Box 59, Louisville, KY 40201-0059

since 1827
MASON & HANGER CORPORATION
RAVENNA ARMY AMMUNITION PLANT

June 6, 1997

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

Subject: CLOSURE PLAN FOR DEACTIVATION FURNACE
RAVENNA ARMY AMMUNITION PLANT
OH5 210 020 736

Reference:
1. Certified letter from the Ohio EPA to the Commander's Representative dated March 31, 1997, subject as above

2. An AMSIO-RV letter to the Ohio EPA dated May 6, 1997, subject as above

3. A letter from the Ohio EPA to the Commander's Representative dated June 4, 1997, subject as above

Dear Sir:

Reference 1 directed RVAAP to revise the Closure Plan that was submitted last fall for the installation's Deactivation Furnace. The installation was given 30 days following the receipt of the letter in which to complete the necessary revisions. The installation was unable to submit the revised closure plan in a timely fashion, and consequently received a notice of violation from the Ohio EPA (reference 3).

Following the receipt of such correspondence, it is necessary to establish a record within the enforcement tracking module of the ACTS database. Transmitted herewith is a copy of the record that were developed in response to the receipt of the latest letter from the Ohio EPA. Please furnish a copy of the record to Mr. Dennis Versluys, AMSIO-EQM, and retain the record in 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 CORPORATION

W. B. Talmon, Jr.
Site Manager

WBT:wbt

cc: Robert Whelove/AMSIO-EQE
ACTS File
Closure Plan File
Reading File

ENFORCEMENT ACTION TRACKING

POC NAME JOHN A. CICERO, JR. PH.(330) 358-7311

MSC: IOC RECORD NUMBER : 37

INSTALLATION: RAVENNA AAP RECORD'S FY : 97

1. REGULATORY REQUIREMENT RCRA_C
2. ENFORCEMENT ACTION TYPE INOV IF CMPA, AGREEMENT TYPE
3. DATE OF ACTION 06/04/1997 4. ACTION # 20736-37-RCRA_C-INOV

5. FINDINGS:

FINDING # / TYPE OF FINDING	DESCRIPTION	STATUS	DATE	1383 NUMBER
0001 - A	NOV RE FAILURE TO SUBMIT A REVISED CLOSURE PLAN IN A TIMELY FASHION	U	06/04/1997	RVAP050394

FINDING SUMMARY

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

6. STATUS OF ACTION STATUS DATE
UNRESOLVED 06/04/1997

7. ISSUING AGENCY(S) STATE

8. PREVIOUS OR REPEAT INOV's

9. CORRECTIVE ACTIONS MILESTONES

TARGET	ACTUAL	MILESTONE
09/30/1997	01/01/1900	SUBMISSION OF REVISED CLOSURE PLAN

10. REASON FOR NON-COMPLIANCE

THE INSTALLATION FAILED TO SUBMIT A REVISED CLOSURE PLAN COVERING ITS DEACTIVATION FURNACE IN A TIMELY FASHION. AS A CONSEQUENCE, THE OHIO EPA HAS ISSUED A NOTICE OF VIOLATION TO THE INSTALLATION. THE INSTALLATION MUST SUBMIT A REVISED DOCUMENT THAT ADEQUATELY ADDRESSES THE DEFICIENCIES IDENTIFIED BY THE REGULATORS, BY SEPTEMBER 30, 1997.

RCRA Closures File

TO 6/5-197
CR-COR
PROP ADM
LAND MGR
CONTRACTOR 6/5/97
RETURN FOR 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

George V. Voinovich
Governor

June 4, 1997

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

Mr. John Cicero, Jr.
Commander's Representative
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, OH 44266-9297

RE: Ravenna Army Ammunition Plant: Request for extension of time to respond to the Deactivation Furnace Notice Of Deficiency

Dear Mr. Cicero:

On May 6, 1997 the Director's Office received your request for extension, up to September 30, 1997, for the submittal of responses to the Notice of Deficiency (NOD) issued by the Director, Ohio EPA on March 31, 1997. The NOD was sent to the Ravenna Army Ammunition Plant (RVAAP) in regards to the closure plan submitted for the Deactivation Furnace Area (DFA). Ohio EPA has no legal mechanism to grant an extension to the period of time in which a facility is required to respond to an NOD for a closure plan.

Please be advised that since a formal response was not received by Ohio EPA within the 30 day period allowed, RVAAP is in violation of the Ohio Administrative Code (OAC) 3745-66-12(D)(4), and that RVAAP will remain in violation until the response is submitted. However, the Division of Hazardous Waste Management (DHWM) is willing to work with you to clarify any issues of concern, and to expedite a timely submittal.

Please feel free to contact me at (216) 963-1290 if you have any questions.

Sincerely,

Sheila Abraham

Sheila Abraham
Environmental Specialist
Division of Hazardous Waste Management

RECEIVED
JUN 5 1997
By_____

SA:ddb

cc: Thomas Crepeau, DHWM, CO
Marlene Emanuelson, DHWM, NEDO
Mark Navarre, Legal, CO
Montee Suleiman, DHWM, CO

CF:
AMSIO-EQE, EQM, IRG
COE, LOUISVILLE (Jasper/Grant)
COE, NASHVILLE (BOATMAN)
} 6/5/97

Closure 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

George V. Voinovich
Governor

July 9, 1997

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

RE: Draft Approach to the Ravenna Army Ammunition Plant Deactivation Furnace Closure

Dear Mr. Cicero:

Thank you for your letter of May 2, 1997, outlining the draft approach to the closure of the Deactivation Furnace Area (DFA) at the Ravenna Army Ammunition Plant (RVAAP). I have reviewed the proposed approach, and am providing brief comments below. Please be aware that the comments are preliminary in nature, and address only the data presented as attachments to the May 2, 1997 letter. Any additional comments from the Division of Ground Water will be provided under separate cover.

Briefly, the unit subject to the RCRA closure regulations is situated in Winklepeck Burning Grounds, in the midst of a larger area of contamination, which is being addressed by the CERCLA process. The strategy as currently proposed by the facility, is a deviation from that proposed in the December 1996 Closure Plan. That (December 1996) plan indicated that the facility would define the nature and extent of contamination, and then avail of the option for risk based closure for the area. The rationale for deviation now proposed from the December 1996 Closure Plan is the complexity of delineating between the RCRA Unit and historical contamination proposed to be addressed through the CERCLA process. The difficulty of validating historical data that would be used to define the nature and extent of contamination is another concern for the facility. Therefore, as stated in the draft proposal, RVAAP would like to define the extent of the boundary of the RCRA area at a distance of 21 feet outside the east, north, and west sides of the DFA. The area beyond this "line in the sand" would be addressed by the CERCLA process.

The Division of Hazardous Waste Management (DHWM) comprehends RVAAP's desire to focus resources on remediation (rather than on further delineation of the nature and extent of contamination attributable to the RCRA Unit in an area of widespread contamination), particularly given the sampling effort that has already taken place in relation to the RCRA Unit. However, DHWM's primary concern is that decisions taken to delineate the boundary of the RCRA unit need to be defensible, and supported by the data. One method of addressing this concern is an evaluation of relevant currently available or future data to demonstrate that there is no (statistically significant) variation between the contaminants of concern in the RCRA unit (DFA) area and the surrounding area (Winklepeck Burning Grounds) that is proposed to be addressed by the CERCLA process. Please also note that the south side of the DFA needs to be explicitly addressed.

With reference to the remediation goals, please be aware that DHWM and the facility need to reach an agreement on appropriate background levels, and thus remediation goals, for the inorganic constituents of concern. Issues related to using the proposed 1994 Remediation Clean up Levels remain unresolved. Specifically, the background levels for the beryllium and arsenic need to be substantiated in the closure plan, such that remediation and/or clean closure levels are protective of human health and the environment.

Further, the comments provided by the Agency on previous closure plans, including the December 1996 Closure Plan need to be factored into the process, as appropriate. More detailed comments on the May 1997 draft proposal are provided in the attachment. These comments are meant to provide preliminary input on the draft proposal and assist in the formulation of the formal submittal to the Agency. A (blank) copy of the closure checklist used by Ohio EPA DHWM personnel to evaluate closure plans is also enclosed, to facilitate the formal submittals.

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:ddb

cc: Diane Kurlich, DDAGW-NEDO (w/ attachments)
Eileen Mohr, DERR-NEDO (w/ attachments)
Mark Navarre, Legal(w/o attachments)
Carolyn Princic, DHWM-NEDO (w/ attachments)
Jarnal Singh, DSWM-NEDO (w/o attachments)
Virginia Wilson, DSWM-NEDO (w/o attachments)

Attachments

Facility Name_____ Reviewer/DO _____

ID Number _____ Date _____

General Closure Plan Check List

	Provided (Y/N or NA)	Adequate (Y/N)	Location in CP (page/section) and Comments
1. Description of the Facility	____	____	_____
A) including type of industry, size, products, history, security etc...			
B) description of processes which generate and manage hazardous waste			
C) lists/references environmental permits and specifics for permits relevant to closure			
2. Map of the Facility	____	____	_____
A) location of Facility on topographic or county map			
B) map of Facility detailing location of hazardous waste units with North arrow, scale and legend			
3. Description of Units to be Closed	____	____	_____
A) each unit individually with associated wastes types			
B) including period of use, dimensions, construction details (materials, as-built drawings, etc...)			
C) detailed drawing or blueprints including appurtenant structures			
D) geologic, hydrogeologic info as appropriate			
E) proximity to groundwater			
4. List of Hazardous Wastes	____	____	_____
A) complete and detailed			
B) chemical name and EPA hazardous waste number			
C) identify all hazardous constituents listed in Appendix to OAC 3745-51-11. (40 CFR, Part 261. Appendix VIII)			
D) includes potential degradation products of concern			
E) max inventory of waste ever on-site (OAC 3745-66-12)			
F) inventory of waste present at beginning of closure			
5. Removal of Hazardous Waste	____	____	_____
A) removal protocol and equipment			
B) staging, loading and transportation procedures			

C) storage, treatment and disposal specifications
D) LDR status
E) detailed description of treatment processes

6.Decontamination Efforts

A) including structures, equipment and PPE
B) meets analytical/performance standards as described in section 3.10 of the CPRG
C) rinseate/debris generated must be managed as hazardous waste unless proven otherwise
D) estimate of volume of rinseate/debris to be generated and disposal requirements
E) adequate controls against release (decon pad designed as outlined in CPRG)

7.Remediation Standards for Soil (including Groundwater)

A) specified remediation standard for each contaminant
B) meets closure performance standard requirements
- MDLs, background, risk-based
C) background samples (i.e, selection, statistical analysis) as described in section 3.11.1 of the CPRG

8.Sampling and Analysis Procedures

A) parameters to be analyzed
B) number of samples and location
C) intent to define full extent of contamination using MDLs
D) list/utilizes SW 846 3rd Edition S&A methods with acceptable detection limits.
E) reference QA/QC procedures (field and lab)
F) sample type (grab unless justified for composite)
G) all previous sampling/analysis data related to closure included in closure plan (lab sheets and methods)
H) groundwater monitoring as applicable (see OAC 3745-65-90)

9.Health and Safety Plan

- not approved, but required
- consistent with 29 CFR
- may include: monitoring equipment, hazard evaluation, site safety plans, SOPs, engineering controls, PPE, decon and emergency procedures

10.Air Emissions and Wastewater ____ ____ _____

A) minimize/eliminate air emissions related to closure (may require a permit)
B) wastewater managed in accordance with Ohio water pollution control rules

11.Schedule for Closure ____ ____ _____

A) details all critical milestones for closure
B) start date is Director's approval letter
C) includes possible/needed extension beyond 180 day limit. (OAC 3745-66-13)
D) notification of DO inspector of critical activities
E) Professional Engineer (licensed and registered in the state of Ohio) or authorized representative on site for all critical closure activities (waste removal, sampling, decontamination, etc...)

12.Certification ____ ____ _____

A) acknowledgment of certification requirements listed in the CPRG
B) status of facility and unit after closure

13.Closure Cost Estimates and Financial Assurance Requirements ____ ____ _____

- need to be submitted to DHWM but, not necessarily included in closure plan

14.Other Requirements: (as applicable) ____ ____ _____

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

November 24, 1997

RE: RAVENNA ARMY AMMUNITION PLANT
DEACTIVATION FURNACE AREA
DRAFT REVISED CLOSURE PLAN

John Cicero, Jr.
Commander's Representative
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, OH 44266-9297

Dear Mr. Cicero:

On September 30, 1997 the Ohio EPA received your documents dated September 1997, regarding the Draft Revised Closure Plans for the Ravenna Army Ammunition Plant's (RVAAP) Deactivation Furnace Area (DFA) Hazardous Waste Treatment Unit, located within the RVAAP installation at 8451 State Route 5, Ravenna, Ohio.

Pursuant to the Ohio Administrative Code (OAC) rule 3745-66-12(D)(4), I am providing you with a statement of deficiencies in the draft revised closure plans regarding the DFA in Attachment A.

As in these drafts the final modified closure plans should be prepared in accordance with the following editorial protocol or convention:

1. Old language is overstruck, but not obliterated.

2. New Language is capitalized.

3. Page headers should indicate date of submission.

4. If significant changes are necessary, pages should be re-numbered, table of contents revised, and complete sections provided as required.

The final modified closure plan should be submitted to: Ohio Environmental Protection Agency, Division of Hazardous Waste Management, Attn: Tom Crepeau, Manager, Data Management Section, P.O. Box 1049, Columbus, Ohio 43216-1049. a copy, with an additional copy to facilitate ground water review, should be sent to : Gregory Orr, Ohio EPA, Northeast District Office, 2110 East Aurora Road, Twinsburg, Ohio 44087.

Upon review of the resubmittal, the Ohio EPA will prepare and issue a final action approving or modifying such plan. If you wish to arrange a meeting to discuss your responses to this letter, please feel free to contact me at (216) 963-1189.

Sincerely,

Gregory Orr
Environmental Specialist
Division of Hazardous Waste Management

GO:ddb
Printed on recycled paper

cc: Carolyn Princic, DHWM, NEDO
Bob Princic, DERR, NEDO
Sheila Abraham, DERR, NEDO
Diane Kurlich, DGW, NEDO
Eileen Mohr, DERR, NEDO
Mark Navarre, Legal, CO
Montee Suleiman, DHWM, CO
Kathryn Dominic, SAIC
Tim Leet, SAIC

ATTACHMENT A

COMMENTS ON THE SEPTEMBER 1997 "DRAFT REVISED CLOSURE PLAN FOR THE RAVENNA ARMY AMMUNITION PLANT (RVAAP) DEACTIVATION FURNACE AREA HAZARDOUS WASTE TREATMENT UNIT"

1. **SECTION 1.1 (FIGURE 1-3; PAGE 1-4)**

   Ohio EPA would recommend that, given the current importance of the burn pads (stippled rectangular areas numbered from 1 to 70 in Figure 1-3) in the decision making process at the site, these are referenced in the legend to the figure.

2. **SECTION 1.2 CLOSURE ACTIVITIES (PAGES 1-8 AND 1-10)**

   With reference to the July 8-9, 1991 sampling event, in the interest of consistency, please clarify if the 11 samples collected were at 5-6 feet (as stated in the narrative) or at 4-5 feet as shown in Table 1-1.

3. **SECTION 1.4 SOLID WASTE MANAGEMENT UNITS (PAGE 1-13)**

   Please note that the Part B Permit Application is in the precess of being withdrawn, and the reference that it "was subsequently withdrawn" under bullet item 1, 2 and 3 is not entirely accurate. The language on page 1-25 (Section 1-7) that RVAAP has requested withdrawal might be a more appropriate phraseology.

4. **SECTION 1.6.1.1 EVALUATION OF THE SOIL SAMPLING DATA (FIGURES 1-8 AND 1-9; PAGES 1-16, 1-18 AND 1-19)**

   With reference to the relative concentrations of cadmium and lead shown in the figures, please clarify the actual levels (in ppm or ppb) to which each color coded grid conforms, in order to provide a perspective on the absolute (versus relative) levels that were encountered at the unit. Further, please clarify if the data shown incorporate the 1989 sampling or refer to the March 1991 to May 1993 events alone. Do the figures refer to a particular depth stratification or do they include a vertical averaging of all depths sampled? Do the white grids refer to non-detects or detects below a certain level? These clarifications could help elucidate why cadmium in grid 13 (at 0-1 feet) at 86 ppm (Appendix B data) was not color coded in the figure, whereas grids with lower levels (example grid 4 with 35 ppm at 0-1 feet) were color coded (indicating higher contaminant levels).

5. **SECTION 1.6.1.2 CERCLA ACTIVITIES AT WINKLEPECK BURNING GROUNDS (PAGE 1-22)**

It might be helpful if, in addition to the information provided on beryllium, lead and cadmium, recent CERCLA Remedial Investigation (RI) data on the other site related contaminants of concern were discussed in this section. Further, since data from the CERCLA RI Report is discussed in the narrative, it would also be helpful if stakeholders could be directed on how to access the relevant portions of the CERCLA RI Report.

6. **SECTION 1.6.1.2 CERCLA ACTIVITIES AT WINKLEPECK BURNING GROUNDS (PAGES 1-22 AND 1-23)**

Please clarify if the concentration of beryllium at WBGss-029 were 2.6 mg/kg (as stated on page 1-22) or 0.58 mg/kg (as on page 1-23).

7. **SECTION 1.6.2 WASTE MANAGED (PAGE 1-23)**

With reference to the statement that "preliminary soil sampling described in Section 1.1.2 showed that there are no explosive constituents remaining in the soil at the DFA", please note that Section 1.1.2 does not appear in this closure plan. Further, the detection limits for the explosive constituents evaluated during the 1989 and 1991 sampling are substantially higher than those achieved during recent sampling events. Ohio EPA would therefore recommend mentioning applicable recent data in this section, even if collected through another program process.

8. The discussion of the glacial materials present at the site should be revised to indicate that Lavery Till is present on the western portion of the site (as per the mapping of George W. White, 1982, Glacial Geology of Northeastern Ohio, Bulletin 68, Division of Geological Survey, Ohio Department of Natural Resources, and the Ravenna Army Ammunition Plant, Phase 1 Remedial Investigation (RI) Report, Section 3.1.1). RVAAP is referred to Section 3.1.1 of the Phase 1 RI Report for replacement language concerning the Lavery Till. All references to the Kent Till that may appear in other sections of the closure plan should also be changed to refer to the Lavery Till, instead.

END OF COMMENTS

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

CONTRACTOR
FWD FOR
☒ Information
☐ Compliance as applicable
☐ Reply NLT

11/5/97
ENV
RETURN FOR

George V. Voinovich
Governor

November 03, 1997

RE: Ravenna Army Ammunition Plant
Portage/Trumbull Counties
Investigation-Derived Wastes

Mr. Robert Whelove
Environmental Engineer
Restoration and Engineering Division
HQ Army Industrial Operations Command
AMSIO-EQE
Rock Island, IL 61299-6000

Dear Mr. Whelove:

The purpose of this correspondence is to state the Ohio Environmental Protection Agency's (Ohio EPA's) position regarding the disposition of investigative-derived wastes (IDW) that have been generated, and will continue to be generated, during investigative activities conducted at the various Areas of Concern (AOCs) at the Ravenna Army Ammunition Plant (RVAAP).

The IDW was generated, and will be generated, as part of the Remedial Investigation (RI) activities being conducted at the installation. On-site investigative activities are being conducted in accordance with workplans that have been reviewed and agreed-upon by the following stakeholders: Industrial Operations Command (IOC); United States Army Corps of Engineers (USACE); RVAAP personnel; and Ohio EPA. Copies of all pertinent workplans and reports have also been sent to the United States Environmental Protection Agency (USEPA). On-site investigative activities are also being conducted with oversight from the USACE and Ohio EPA.

The Ohio EPA's position is as follows:

1. all generated IDW shall be containerized and characterized in accordance with previously reviewed and agreed-upon workplans and reports. This step forms the basis for the following procedures:

2. all contaminated liquid IDW (including decontamination fluids, development and purge waters from groundwater wells, etc.) subsequent to the receipt and approval of the analytical results by personnel from Ohio EPA's Division of Surface Water (DSW), can be sent through the Load Line 12 pinkwater Waste Water Treatment Plant (WWTP).

3. all generated solid IDW that are determined to be hazardous in nature shall be disposed of off-site at a licensed facility, in accordance with all applicable State and Federal rules, laws, and regulations.

4. all generated solid IDW that is determined to be non-hazardous but contaminated, (i.e.: including metal concentrations above determined background concentrations; and/or any detectable concentrations of explosives compounds, pesticides/PCBs, Volatile Organic Compounds, Semi-Volatile Organic Compounds) may be temporarily stored at the point of generation (i.e. within the AOC) in a manner that does not constitute a risk to human health or the environment, until final remediation of the AOC is initiated. This option is available solely if the AOC is to be remediated. The Ohio EPA will not consider this option at an AOC for which a No Further Action (NFA) is proposed or anticipated.

5. all generated solid and liquid IDW that is determined to be uncontaminated by analytical methods (i.e. cuttings from background monitor well locations, cuttings from background soil borings, purge and development water from background groundwater wells, etc.) can be permanently stored on the installation property. This does not include any decontamination fluids.

We trust that this correspondence clarifies the Ohio EPA's position regarding the issue of IDW. If you have any questions, please do not hesitate to contact Eileen Mohr at 330-963-1221 or Catherine Stroup (Ohio EPA, Central Office, Legal) at 614-644-3037.

Sincerely,

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

Catherine Stroup
Senior Staff Attorney
CO Legal

ETM.w mk

cc: Bob Princic, NEDO DERR
Rod Beals, NEDO DERR
Kurt Princic, NEDO DSIWM
Diane Kurlich, NEDO DDAGW
Graham Mitchell, OFFO SWDO
Bonnie Buthker, OFFO SWDO
Steve Selecman, SAIC
Lisa Balderson, CO Legal DSIWM
David Seely, USEPA Region V
John Cicero, RVAAP
Mark Patterson, RVAAP
Kevin Jasper, USACE Louisville
Todd Boatman, USACE Nashville

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

George V. Voinovich
Governor

October 3, 1997

RE: Ravenna Army Ammunition Plant
Portage/Trumbull Counties
AOC # 38 - NACA Test Area

Mr. Mark Patterson
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, OH 44266-9297

Dear Mr. Patterson:

This correspondence serves as a follow-up to our meeting regarding usage of the NACA Test Area by the Ohio National Guard (ONG). This meeting was held on September 29, 1997, at the Ravenna Army Ammunition Plant (RVAAP).

The Ohio Environmental Protection Agency (OEPA), entered into a Defense-State Memorandum of Understanding (DSMOA) with the Department of Defense (DoD) in order to expedite the clean-up of hazardous waste sites on DoD installations within the State of Ohio and to ensure compliance with the applicable State laws and regulations of Ohio. From my reading of the DSMOA document, I do not believe that the OEPA has the legal authority to dictate to the ONG, the National Guard Bureau (NGB), or the Army, as to whether or not a specific Area of Concern (AOC) can or cannot be utilized for training purposes. That decision, and the resulting liability, would rest with the Army and the National Guard.

However, the OEPA would strongly recommend the following prior to the continued usage of the NACA Test Area:

1. Soil sampling should be conducted in the areas where the gray water tank, and platform tents are proposed to be emplaced. In addition, soil sampling should be conducted in the open area that would be used for any above-ground maneuvers. The purpose of the soil sampling would be to ensure the health and safety of any personnel training at AOC # 38.

2. The soil samples that would be obtained should be analyzed for the same constituents that were looked for in Phase 1 Remedial Investigations (RIs) conducted at other AOCs on the installation. Specific attention should be given to potential contaminants that would be expected, based upon previous usage of this AOC; i.e. Target Analyte List (TAL) metals, Volatile Organic Compounds (VOCs), and Semi-Volatile Organic Compounds (SVOCs). To be consistent with the Phase I RI, the OEPA would also recommend that 10% of the samples also be analyzed for explosives and pesticides/PCBs.

3. All sampling should be conducted in accordance with the installation-wide Phase 1 RI sampling plan. This would include soil sampling procedures, decontamination of field equipment procedures, the handling of any generated investigative derived wastes (IDW) in accordance with applicable State and Federal laws and regulations, laboratory selection, etc.

4. The number of samples that would be required, the locations and corresponding depth(s), etc. can be discussed during a future scoping meeting. Please refer to guidance documents submitted to LtCol Tom Tadsen's attention (under separate cover) for further guidance on this issue. The decisions that would be reached would need to be formalized in writing, subsequent to the meeting.

5. Although potential groundwater contamination may be an issue at this AOC in the future, the more immediate concern would be the potential for soil contamination, and as a result, a complete direct contact pathway for the soldiers training in the AOC. As such, the OEPA would recommend that emphasis currently be placed on soil and sediment sampling at the AOC.

6. The authorization that was granted by the Director of the OEPA on November 4, 1996, under Ohio Administrative Code (OAC) 3745-27-13 for the previously-conducted work for the Relative Risk Site Evaluation (RRSE) would suffice for any additional work conducted as part of this investigative effort.

7. The OEPA would be glad to provide sampling assistance, and/or oversight of field work in order to ensure consistency with the Phase 1 workplans that are already in place.

8. I would recommend that a representative of OEPA's Division of Surface Waster (DSW) be included in future conversations, to ensure that the installation/usage of a gray-water tank would not pose any environmental concerns.

9. The other two known AOCs in the vicinity of AOC # 38 - AOC # 3 (Demolition Area # 1) and AOC # 28 (suspected Mustard Agent Burial Site) - should be placed off-limits to all personnel.

I trust that this correspondence accurately formalizes our discussion. If you have any questions, please do not hesitate to contact me at 330-963-1221.

Sincerely,

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

ETM.wmk

cc: Bob Princic, NEDO DERR
Rod Beals, NEDO DERR
Catherine Stroup, CO Legal
LtCol Tom Tadsen, ONG/RVAAP
John Cicero, RVAAP
Bob Whelove, IOC
Kevin Jasper, USACE/Louisville
Todd Boatman, USACE/Nashville
Maj Joe Knott, NGB
Bonnie Buthker, SWDO OFFO

OhioEPA
State of Ohio Environmental Protection Agency
Northeast District Office
2110 E. Aurora Road
Twinsburg, Ohio 44087-1969
(330) 425-9171 **FAX** (330) 487-0769

VC HARNG

George V. Voinovich
Governor

November 21, 1997

RE: PORTAGE COUNTY
RAVENNA ARMY AMMO PLANT
COMPLIANCE EVALUATION INSP.
NPDES PERMIT NO. OH0010936
OEPA PERMIT NO. 3I00000

Mr. John Cicero
Ravenna Army Ammunition Plant (RVAAP)
8451 State Route 5
Ravenna, OH 44266

Dear Mr. Cicero:

On November 6, 1997, a compliance evaluation/site evaluation/ NPDES pre-permit evaluation inspection was conducted by this writer, Mr. Bill Zawiski of the Ohio EPA and Mr. DuWayne Porter of the Portage County Health Department at the above referenced facility. Lt.Col. Tom Tadsen, Mr. Jim McGee and Mrs. Susan McCauslin accompanied us on the inspection. The inspection was used to document existing plant conditions prior to reissuance of the NPDES permit which expired on October 28, 1997. In addition, a site evaluation was conducted concerning expected grey water issues at the NACA crash test site.

The first part of the evaluation was to review the proposed plan to handle grey water issues at the NACA crash test area. Lt.Col. Tadsen accompanied us to the site. RVAAP proposes to install a [illegible] contained) that will be utilized for the temporary storage of [illegible] operations which will be pumped out on an as-needed basis by a contract vacuum truck. This tank shall have no outlet to the environment, save a pump-out port.

This office would not object to the installation of the proposed "holding tank" with an appropriate Permit to Install (PTI) issued by the Director of Ohio EPA. The application information to obtain a PTI is attached to this correspondence. Application fees should be made payable to: "Treasurer, State of Ohio".

The soil sample analyses obtained from the excavation shall be forwarded to the attention of Ms. Eileen Mohr at this office, Division of Emergency and Remedial Response (DERR), as previously requested by Ms. Mohr.

The inspection of previously permitted outfalls and sampling stations indicated that all have been eliminated with the exception of station #006. This station shall require continued monitoring/ reporting on an "as discharging" basis. In addition, sufficient historical data exists to indicate that the Ferrochrome piles monitoring stations (No. 800 and 900) are not contributing chromium pollution levels of concern. These stations shall also be removed from the renewal permit.

Review of the Monthly Operating Reports for the period **JAN 1996- AUG 1997** indicated one (1) COD violation for the month of Jan '97. Please be advised, non-compliance with the provisions of the effective NPDES permit may be cause for enforcement action as provided by Ohio environmental regulations. Overall, RVAAP is considered in substantial compliance with the NPDES permit.

The NPDES permit will be renewed with the modifications indicated, in the near future. Public notice of the draft permit shall occur prior to final issuance. Please continue to observe the conditions and provisions of the expired permit until reissuance.

Please submit the appropriate applications and detail plans concerning the installation of the grey water tank to this office as soon as practicable.

If there are any questions regarding this matter, please contact this office at (330) 963-1135.

Respectfully,

Peter D. Killmer
District Engineer
Division of Surface Water

PDK:crh

Enclosure

cc: Portage County Health Department-Mr. DuWayne Porter, MPH, R.S.
Ohio EPA/NEDO/DERR- Ms. Eileen Mohr
Ohio EPA/NEDO/DSW- Mr. Dennis Lee

Closure Plans File

since 1827
MASON & HANGER CORPORATION
RAVENNA ARMY AMMUNITION PLANT

FAX TRANSMITTAL

TO:

Name: Tim Leet

Office: SAIC

Telephone: (614) 793-7600

FAX: (614) 793-7620

FROM:

Name: Bill Talmon

Office: **Mason & Hanger Corporation,
Ravenna, OH.**

Telephone: (330) 358-7400

Fax: (330) 358-7414

Date: 22 July 1997

Number of Pages: 4 **(Including Header Page)**

Please phone if all pages are not received.

Comments:

1996 SUPPLEMENTARY ANNUAL REPORT

GROUND WATER MONITORING INFORMATION

RAVENNA ARMY AMMUNITION PLANT
1996 GROUND WATER ANNUAL REPORT
NARRATIVE

Description of the Ground Water Flow System

Physiography

Ravenna Army Ammunition Plant lies within the glaciated Allegheny Plateau section of the Appalachian Plateau Province. Topography within the installation consists of gently rolling hills to moderately level terrain.

All of Ravenna Army Ammunition Plant is situated within the Ohio River Basin. The West Branch of the Mahoning River is the major surface stream in the area. This river flows in a southerly direction past the west end of the installation where it turns to the east and flows into the M.J. Kirwan Reservoir. From the reservoir, the west branch continues to flow in an easterly direction along the installation's southern boundary until joining the Mahoning River east of the installation. Three primary water courses drain the installation: South Fork of Eagle Creek, Sand Creek, and Hinckley Creek. Sand Creek flows in an easterly to northeasterly direction through the central portion of the installation to its confluence with the South Fork of Eagle Creek. The South Fork of Eagle Creek flows along the inside of the northern boundary of RVAAP. Hinckley Creek originates about 2 miles north of RVAAP and flows through the western portion of the installation in a southerly direction.

Geology

The glacially deposited surface material of RVAAP consists of glacial till and sand and gravel. Till thickness ranges from less than 3 feet in some locations to about 45 feet. Bedrock formations underlying the glacial deposits consist of consolidated sediments of the Carboniferous Age. These sediments dip gently to the southeast. Mississippian Age shales and sandstones of the Cuyahoga Group are the oldest formation to outcrop within the installation boundary. Most of the installation is underlain by Pennsylvanian Age conglomerates, shales, and sandstones of the Pottsville Formation.

Hydrogeology and Monitoring Well System

Bedrock aquifers are the only source of water supply at RVAAP. The primary bedrock aquifer underlying the installation is the Sharon Conglomerate member of the Pottsville Formation. Depending on the existence and depth

of overburden, this aquifer ranges from an unconfined to a leaky artesian aquifer. The thickness of the primary aquifer ranges from 44 to 177 feet. The regional contours indicate an easterly to northeasterly groundwater flow direction across the installation.

RVAAP has a set of four each ground water monitoring wells installed at the Open Burning Grounds and Open Detonation Area. Each site maintains one upgradient and three downgradient wells. The wells were constructed in boreholes using 2-inch ID, Schedule 40 PVC pipe.

The Open Detonation Area site consists of a cleared area approximately 200 x 250 feet. The site is located about 150 feet north of Sand Creek on ground that gently slopes towards the creek. Sand Creek flows past the site in an easterly direction. Ground water surface elevation contours suggest that the ground water at this site flows generally north to south, towards the creek.

The Open Burning Grounds site consists of a level area approximately 100 x 135 feet. The southern portion of the Open Burning Grounds is bordered by a shallow drainage way that flows to the east. Ground water surface elevation contours suggest the ground water at this site flows generally towards the east.

Statistical Analysis of the Ground Water Data

Statistical analysis of the ground water data was conducted using USEPA's Ground Water Information Tracking System/Statistical Analysis System (GRITS/STAT). RVAAP has chosen the non-parametric Analysis of Variance (ANOVA) to statistically analyze the quarterly ground water data from the Open Burning Grounds and Open Detonation Area. The ANOVA method was chosen to determine whether differences between background well means and compliance well means for the indicator parameters are statistically significant, indicating possible contamination. The non-parametric ANOVA was chosen because the ground water data values for the indicator parameters do not pass the GRITS/STAT methods for normality.

Statistical analysis of the data revealed statistically significant evidence of contamination at the Open Burning Grounds and the Open Detonation Area. The analyses for the OB Grounds and Open Detonation Area both triggered for Specific Conductivity, and Total Organic Carbon. Statistical analysis result tables are attached to this report.

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

12/5/97 - gt
ENV 12/8/97

December 3, 1997

Re: Ohio EPA Permit No. 3IO00000*GD
Facility Name: U. S. Department of the Army

U. S. Department of the Army
Ravenna Army Ammunition Plant (RVAAP)
8451 State Route 5
Ravenna, OH 44266

Ladies and Gentlemen:

Transmitted herewith is one copy of the Public Notice and Draft Permit in the above-referenced matter.

The public has been invited to submit comments regarding this draft permit. If sufficient public interest is indicated, a public meeting will be held.

The permit as drafted will be issued as a final action unless the director revises the permit after consideration of all written comments received during the 30-day period following Public Notice and consideration of the record of a public meeting, if one is held, or unless the draft is disapproved by the Regional Administrator, U.S. Environmental Protection Agency.

You should note that a general condition of your permit states that issuance of an NPDES permit does not relieve you of the duty of complying with all applicable Federal, State, and local laws, ordinances, and regulations.

Sincerely,

Martha D. Spurbeck, Supervisor
Permit Processing Unit
Division of Surface Water

MDS/KEP

Enclosure

CERTIFIED MAIL

67/NE

Application No. OH0010936

Issue Date: _____

Effective Date: _____

Expiration Date: 5 Years

Ohio Environmental Protection Agency
Authorization to Discharge Under the
National Pollutant Discharge Elimination System

In compliance with the provisions of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et. seq., hereinafter referred to as the "Act"), and the Ohio Water Pollution Control Act (Ohio Revised Code Section 6111),

U. S. Department of the Army
Ravenna Army Ammunition Plant (RVAAP)

is authorized by the Ohio Environmental Protection Agency, hereinafter referred to as "Ohio EPA," to discharge from the wastewater treatment works located at 8451 State Route 5, Ravenna, Ohio, Portage County

and discharging to an unnamed tributary entering Sand Creek at River Mile 2.22

in accordance with the conditions specified in Parts I, II, and III of this permit.

This permit is conditioned upon payment of applicable fees as required by Section 3745.11 of the Ohio Revised Code.

This permit and the authorization to discharge shall expire at midnight on the expiration date shown above. In order to receive authorization to discharge beyond the above date of expiration, the permittee shall submit such information and forms as are required by the Ohio EPA no later than 180 days prior to the above date of expiration.

_____
Donald R. Schregardus
Director

Part I, A. - **FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

1. During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 3IO00000001. See Part II, **OTHER REQUIREMENTS**, for locations of effluent sampling.

EFFLUENT CHARACTERISTIC			DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
			Concentration Specified Units		Loading*** kg/day			
Reporting Code	Units	Parameter	30 day	Daily	30 day	Daily	Meas. Freq.*	Sample Type
00056	GPD	Flow Rate	-	-	-	-	Daily	24-Hr. Total**
00083	UNITS	Color, Severity (1)	-	-	-	-	Daily	Observation
01330	UNITS	Odor, Severity (1)	-	-	-	-	Daily	Observation
01350	UNITS	Turbidity, Severity (1)	-	-	-	-	Daily	Observation
00335	mg/l	COD	20	30	0.45	0.68	1/Week	Composite
00530	mg/l	Total Suspended Solids	30	45	0.68	1.02	1/Week	Composite
00610	mg/l	Nitrogen, Ammonia (NH_3)	-	-	-	-	1/Week	Grab
00620	mg/l	Nitrogen, Nitrate (NO_3)	-	-	-	-	1/Week	Grab
75120	mg/l	Toluene	-	-	-	-	Semi-Annually	Composite
81360	µg/l	Trinitrotoluene, Total	-	140	-	0.0032	1/Week	Composite
81533	µg/l	Dinitrotoluene, Total	-	-	-	-	Semi-Annually	Composite

* Except those days when the facility is not normally staffed. Report "AN" on the monthly operating reports for those days.

** Estimated flow is acceptable if there is no flowmeter.

*** Effluent loading limitations are based on a flow of 5,000 GPD.

(1) See Part II, Item B.

2. The pH (Reporting Code 00400) shall not be less than 6.5 S.U. nor greater than 9.0 S.U. and shall be monitored 1/week by grab sample.

3. The method used to monitor TNT (Trinitrotoluene) and DNT (Dinitrotoluene) should have a detection limit no greater than 10 ug/l.

4. Samples taken in compliance with monitoring requirements specified above shall be taken at sampling stations described in Part II, Other Requirements.

Part II, **OTHER REQUIREMENTS**

A. Description of the location of the required sampling stations are as follows:

Sampling Station	Description of Location
3IO00000001	At a point representative of discharge from projectile melt-out treatment system prior to entry to unnamed tributary to Sand Creek. (Lat: 41° 11' 30"; Long: 81° 02' 55")

B. If severity units are required for turbidity, odor, or color, use the following table to determine the value between 0 and 4 that is reported.

Reported Value*	Severity Description	Turbidity	Odor	Color
0	None	Clear	None	Colorless
1	Mild			
2	Moderate	Light Solids	Musty	Grey
3	Serious			
4	Extreme	Heavy Solids	Septic	Black

* Interpolate between the descriptive phrases.

C. This permit shall be modified, or alternatively, revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the Clean Water Act, if the effluent standard or limitation so issued or approved.

1. Contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
2. Controls any pollutant not limited in the permit.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Act then applicable.

D. In the event that the permittee's operation requires the use of cooling or boiler water treatment additives that are discharged to surface waters of the state, written permission must be obtained from the director of the Ohio EPA prior to use. Reporting and testing requirements to apply for permission to use additives can be obtained from the Ohio EPA Central Office, Division of Surface Water, Water Resource Management Section. Reported information will be used to evaluate whether the use of the additive(s) at concentrations expected in the final discharge will be harmful or inimical to aquatic life.

E. Permit limitations may be revised in order to meet water quality standards after a stream use determination and waste load allocation are completed and approved. This permit may be modified, or alternatively, revoked and reissued, to comply with any applicable water quality effluent limitations.

F. There shall be no detectable amount of any priority pollutant attributable to cooling tower maintenance chemicals in the cooling tower blowdown wastewater.

PART III - GENERAL CONDITIONS

1. DEFINITIONS

"daily load limitations" is the total discharge by weight during any calendar day. If only one sample is taken during a day, the weight of pollutant discharge calculated from it is the daily load.

"daily concentration limitation" means the arithmetic average (weighted by flow) of all the determinations of concentration made during the day. If only one sample is taken during the day, its concentration is the daily concentration. Coliform bacteria limitations compliance shall be determined using the geometric mean.

"7-day load limitation" is the total discharge by weight during any 7-day period divided by the number of days in that 7-day period that the facility was in operation. If only one sample is taken in a 7-day period, the weight of pollutant discharge calculated from it is the 7-day load. If more than one sample is taken during the 7-day period, the 7-day load is calculated by determining the daily load for each day sampled, totaling the daily loads for the 7-day period, and dividing by the number of days sampled.

"7-day concentration limitation" means the arithmetic average (weighted by flow) of all the determinations of daily concentration limitation made during the 7-day period. If only one sample is taken during the 7-day period, its concentration is the 7-day concentration limitation for that 7-day period. Coliform bacteria limitations compliance shall be determined using the geometric mean.

"30-day load limitation" is the total discharge by weight during any 30-day period divided by the number of days in the 30-day period that the facility was in operation. If only one sample is taken in a 30-day period, the weight of pollutant discharge calculated from it is the 30-day load. If more than one sample is taken during one 30-day period, the 30-day load is calculated by determining the daily load for each day sampled, totaling the daily loads for the 30-day period and dividing by the number of days sampled.

"30-day concentration limitation" means the arithmetic average (weighted by flow) of all the determinations of daily concentration made during the 30-day period. If only one sample is taken during the 30-day period, its concentration is the 30-day concentration for that 30-day period. Coliform bacteria limitations compliance shall be determined using the geometric mean.

"85 percent removal limitations" means the arithmetic mean of the values for effluent samples collected in a period of 30 consecutive days shall not exceed 15 percent of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period.

"Absolute Limitations" Compliance with limitations having descriptions of "shall not be less than," "nor greater than," "shall not exceed," "minimum," or "maximum" shall be determined from any single value for effluent samples and/or measurements collected.

"Net concentration" shall mean the difference between the concentration of a given substance in a sample taken of the discharge and the concentration of the same substances in a sample taken at the intake which supplies water to the given process. For the purpose of this definition, samples that are taken to determine the net concentration shall always be 24-hour composite samples made up of at least six increments taken at regular intervals throughout the plant day.

"Net load" shall mean the difference between the load of a given substance as calculated from a sample taken of the discharge and the load of the same substance in a sample taken at the intake which supplies water to given process. For purposes of this definition, samples that are taken to determine the net loading shall always be 24-hour composite samples made up of at least six increments taken at regular intervals throughout the plant day.

"MGD" means million gallons per day.

"mg/l" means milligrams per liter.

"µg/l" means micrograms per liter.

"Reporting Code" is a five digit number used by the Ohio EPA in processing reported data. The reporting code does not imply the type of analysis used nor the sampling techniques employed.

"Quarterly sampling frequency" means the sampling shall be done in the months of March, June, August, and December.

"Yearly sampling frequency" means the sampling shall be done in the month of September.

"Semi-annual sampling frequency" means the sampling shall be done during the months of June and December.

"Winter" shall be considered to be the period from November 1 through April 30.

"Bypass" means the intentional diversion of waste streams from any portion of the treatment facility.

"Summer" shall be considered to be the period from May 1 through October 31.

"Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

PART III - GENERAL CONDITIONS (continued)

"Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

2. GENERAL EFFLUENT LIMITATIONS

The effluent shall, at all times, be free of substances:

A. In amounts that will settle to form putrescent, or otherwise objectionable, sludge deposits; or that will adversely affect aquatic life or water fowl;

B. Of an oily, greasy, or surface-active nature, and of other floating debris, in amounts that will form noticeable accumulations of scum, foam or sheen;

C. In amounts that will alter the natural color or odor of the receiving water to such degree as to create a nuisance;

D. In amounts that either singly or in combination with other substances are toxic to human, animal, or aquatic life;

E. In amounts that are conducive to the growth of aquatic weeds or algae to the extent that such growths become inimical to more desirable forms of aquatic life, or create conditions that are unsightly, or constitute a nuisance in any other fashion;

F. In amounts that will impair designated instream or downstream water uses.

3. FACILITY OPERATION AND QUALITY CONTROL

All wastewater treatment works shall be operated in a manner consistent with the following:

A. At all times, the permittee shall maintain in good working order and operate as efficiently as possible all treatment or control facilities or systems installed or used by the permittee necessary to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with conditions of the permit.

B. The permittee shall effectively monitor the operation and efficiency of treatment and control facilities and the quantity and quality of the treated discharge.

C. Maintenance of wastewater treatment works that results in degradation of effluent quality shall be scheduled during non-critical water quality periods and shall be carried out in a manner approved by the Ohio EPA as specified in the Paragraph in this PART III entitled, "UNAUTHORIZED DISCHARGES".

4. REPORTING

A. Monitoring data required by this permit shall be reported on the Ohio EPA report form (4500) on a monthly basis. Individual reports for each sampling station for each month are to be received no later than the 15th day of the next month. The original of the report form must be signed and mailed to:

Ohio Environmental Protection Agency
Division of Surface Water
Enforcement Section, ES/MOR
P.O. Box 1049
Columbus, Ohio 43266-0149

B. If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified below, the results of such monitoring shall be included in the calculation and reporting of the values required in the reports specified above.

C. Analyses of pollutants not required by this permit, except as noted in the preceding paragraph, shall not be reported on Ohio EPA report form (4500) but records shall be retained as specified in the paragraph entitled "RECORDS RETENTION".

5. SAMPLING AND ANALYTICAL METHODS

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored flow. Test procedures for the analysis of pollutants shall conform to regulation 40 CFR 136, "Test Procedures For The Analysis of Pollutants" unless other test procedures have been specified in this permit. The permittee shall periodically calibrate and perform maintenance procedures on all monitoring and analytical instrumentation at intervals to insure accuracy of measurements.

PART III - GENERAL CONDITIONS (continued)

6. RECORDING OF RESULTS

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

A. The exact place and date of sampling; (time of sampling not required on EPA 4500)

B. The person(s) who performed the sampling or measurements;

C. The date the analyses were performed on those samples;

D. The person(s) who performed the analyses;

E. The analytical techniques or methods used; and

F. The results of all analyses and measurements.

7. RECORDS RETENTION

The permittee shall retain all of the following records for the wastewater treatment works for a minimum of three years, including:

A. All sampling and analytical records (including internal sampling data not reported);

B. All original recordings for any continuous monitoring instrumentation;

C. All instrumentation, calibration and maintenance records;

D. All plant operation and maintenance records;

E. All reports required by this permit; and

F. Records of all data used to complete the application for this permit for a period of at least three years from the date of the sample, measurement, report, or application.

These periods will be extended during the course of any unresolved litigation, or when requested by the Regional Administrator or the Ohio EPA. The three year period for retention of records shall start from the date of sample, measurement, report, or application.

8. AVAILABILITY OF REPORTS

Except for data determined by the Ohio EPA to be entitled to confidential status, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the appropriate district offices of the Ohio EPA. Both the Clean Water Act and Section 6111.05 Ohio Revised Code state that effluent data and receiving water quality data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Ohio Revised Code Section 6111.99.

9. DUTY TO PROVIDE INFORMATION

The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking, and reissuing, or terminating the permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

10. RIGHT OF ENTRY

The permittee shall allow the Director, or an authorized representative upon presentation of credentials and other documents as may be required by law to;

A. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit.

B. Have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit.

C. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit.

D. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

11. UNAUTHORIZED DISCHARGES

A. Bypassing or diverting of wastewater from the treatment works is prohibited unless:

1. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

PART III - GENERAL CONDITIONS (continued)

2. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of downtime. This condition is not satisfied if adequate back up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

3. The permittee submitted notices as required under paragraph D. of this section.

B. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.

C. The Director may approve an unanticipated bypass, after considering its adverse effects, if the Director determines that it has met the three conditions listed in paragraph 11.A. of this section.

D. The permittee shall submit notice of an unanticipated bypass as required in section 12.

E. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded if that bypass is for essential maintenance to assure efficient operation.

12. NONCOMPLIANCE NOTIFICATION

A. The permittee shall by telephone report any of the following within twenty-four (24) hours of discovery at (toll free) 1-800-282-9378:

1. Any noncompliance which may endanger health or the environment;

2. Any unanticipated bypass which exceeds any effluent limitation in the permit; or

3. Any upset which exceeds any effluent limitation in the permit.

4. Any violation of a maximum daily discharge limitation for any of the pollutants listed by the Director in the permit.

B. For the telephone reports required by Part 12.A., the following information must be included:

1. The times at which the discharge occurred, and was discovered;

2. The approximate amount and the characteristics of the discharge;

3. The stream(s) affected by the discharge;

4. The circumstances which created the discharge;

5. The names and telephone numbers of the persons who have knowledge of these circumstances;

6. What remedial steps are being taken; and

7. The names and telephone numbers of the persons responsible for such remedial steps.

C. These telephone reports shall be confirmed in writing within five days of the discharge and submitted to the appropriate Ohio EPA district office. The report shall include the following:

1. The limitation(s) which has been exceeded;

2. The extent of the exceedance(s);

3. The cause of the exceedance(s);

4. The period of the exceedance(s) including exact dates and times;

5. If uncorrected, the anticipated time the exceedance(s) is expected to continue, and

6. Steps being taken to reduce, eliminate, and/or prevent recurrence of the exceedance(s).

D. Compliance Schedule Events:

If the permittee is unable to meet any date for achieving an event, as specified in the schedule of compliance, the permittee shall submit a written report to the appropriate district office of the Ohio EPA within 14 days of becoming aware of such situation. The report shall include the following:

1. The compliance event which has been or will be violated;

2. The cause of the violation;

3. The remedial action being taken;,

4. The probable date by which compliance will occur; and

PART III - GENERAL CONDITIONS (continued)

5. The probability of complying with subsequent and final events as scheduled.

E. The permittee shall report all instances of noncompliance not reported under paragraphs A, B, or C of this section, at the time monitoring reports are submitted. The reports shall contain the information listed in paragraphs B and C of this section.

F. Where the permittee becomes aware that it failed to submit any relevant application or submitted incorrect information in a permit application or in any report to the director, it shall promptly submit such facts or information.

13. RESERVED

14. DUTY TO MITIGATE

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

15. AUTHORIZED DISCHARGES

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than, or at a level in excess of, that authorized by this permit shall constitute a violation of the terms and conditions of this permit. Such violations may result in the imposition of civil and/or criminal penalties as provided for in Section 309 of the Act and Ohio Revised Code Sections 6111.09 and 6111.99.

16. DISCHARGE CHANGES

The following changes must be reported to the appropriate Ohio EPA district office as soon as practicable.

A. For all treatment works, any significant change in character of the discharge which the permittee knows or has reason to believe has occurred or will occur which would constitute cause for modification or revocation and reissuance. The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. Notification of permit changes or anticipated noncompliance does not stay any permit condition.

B. For publicly owned treatment works:

1. Any proposed plant modification, addition, and/or expansion that will change the capacity or efficiency of the plant;

2. The addition of any new significant industrial discharge; and

3. Changes in the quantity or quality of the wastes from existing tributary industrial discharges which will result in significant new or increased discharges of pollutants.

C. For non-publicly owned treatment works, any proposed facility expansions, production increases, or process modifications, which will result in new, different, or increased discharges of pollutants.

Following this notice, modifications to the permit may be made to reflect any necessary changes in permit conditions, including any necessary effluent limitations for any pollutants not identified and limited herein. A determination will also be made as to whether a National Environmental Policy Act (NEPA) review will be required. Sections 6111.44 and 6111.45, Ohio Revised Code, require that plans for treatment works or improvements to such works be approved by the Director of the Ohio EPA prior to initiation of construction.

D. In addition to the reporting requirements under 40 CFR 122.41(1) and per 40 CFR 122.42(a), all existing manufacturing, commercial, mining, and silvicultural dischargers must notify the Director as soon as they know or have reason to believe:

1. That any activity has occurred or will occur which would result in the discharge on a routine or frequent basis of any toxic pollutant which is not limited in the permit. If that discharge will exceed the highest of the "notification levels" specified in 40 CFR Sections 122.42(a)(1)(i) through 122.42(a)(1)(iv).

2. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the "notification levels" specified in 122.42(a)(2)(i) through 122.42(a)(2)(iv).

17. TOXIC POLLUTANTS

The permittee shall comply with effluent standards or prohibitions established under Section 307 (a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement. Following establishment of such standards or prohibitions, the Director shall modify this permit and so notify the permittee.

PART III - GENERAL CONDITIONS (continued)

18. PERMIT MODIFICATION OR REVOCATION

A. After notice and opportunity for a hearing, this permit may be modified or revoked, by the Ohio EPA, in whole or in part during its term for cause including, but not limited to, the following:

1. violation of any terms or conditions of this permit;

2. obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or

3. change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge.

B. Pursuant to rule 3745-33-06, Ohio Administrative Code, the permittee may at any time apply to the Ohio EPA for modification of any part of this permit. The filing of a request by the permittee for a permit modification or revocation does not stay any permit condition. The application for modification should be received by the appropriate Ohio EPA district office at least ninety days before the date on which it is desired that the modification become effective. The application shall be made only on forms approved by the Ohio EPA.

19. TRANSFER OF OWNERSHIP OR CONTROL

This permit cannot be transferred or assigned nor shall a new owner or successor be authorized to discharge from this facility, until the following requirements are met:

A. The permittee shall notify the succeeding owner or successor of the existence of this permit by a letter, a copy of which shall be forwarded to the appropriate Ohio EPA district office. The copy of that letter will serve as the permittee's notice to the Director of the proposed transfer. The copy of that letter shall be received by the appropriate Ohio EPA district office sixty days prior to the proposed date of transfer;

B. A written agreement containing a specific date for transfer of permit responsibility and coverage between the current and new permittee (including acknowledgement that the existing permittee is liable for violations up to that date, and that the new permittee is liable for violations from that date on) shall be submitted to the appropriate Ohio EPA district office within sixty days after receipt by the district office of the copy of the letter from the permittee to the succeeding owner;

C. The Director does not exercise his right within thirty days after receipt of the written agreement to notify the current permittee and the new permittee of his or her intent to modify or revoke the permit and to require that a new application be filed; and

D. The new owner or successor receives written confirmation and approval of the transfer from the Director of the Ohio EPA.

At anytime during the sixty (60) day period between notification of the proposed transfer and the effective date of the transfer, the Director may prevent the transfer if he concludes that such transfer will jeopardize compliance with the terms and conditions of the permit.

20. OIL AND HAZARDOUS SUBSTANCE LIABILITY

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Act.

21. SOLIDS DISPOSAL

Collected screenings, slurries, sludges, and other solids shall be disposed of in such a manner as to prevent entry of those wastes into waters of the state. For publicly owned treatment works, these shall be disposed of in accordance with the approved Ohio EPA Sludge Management Plan.

22. CONSTRUCTION AFFECTING NAVIGABLE WATERS

This permit does not authorize or approve the construction of any onshore or offshore physical structures or facilities or the undertaking of any work in any navigable waters.

23. CIVIL AND CRIMINAL LIABILITY

Except as exempted in the permit conditions on UNAUTHORIZED DISCHARGES or UPSETS, nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance.

24. STATE LAWS AND REGULATIONS

Nothing in this permit shall be construed to preclude the institution of any legal action nor relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by Section 510 of the Act.

PART III - GENERAL CONDITIONS (continued)

25. PROPERTY RIGHTS

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations.

26. UPSET

The provisions of 40 CFR Section 122.41(n), relating to "Upset," are specifically incorporated herein by reference in their entirety. For definition of "upset," see Part 1, DEFINITIONS.

27. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

28. SIGNATORY REQUIREMENTS

All applications submitted to the Director shall be signed and certified in accordance with the requirements of 40 CFR 122.22(b) and (c).

All reports submitted to the Director shall be signed and certified in accordance with the requirements of 40 CFR Section 122.22(b) and (c).

29. OTHER INFORMATION

A. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in a permit application or in any report to the Director, it shall promptly submit such facts or information.

B. ORC 6111.99 provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $25,000 per violation.

C. ORC 6111.99 states that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $25,000 per violation.

D. ORC 6111.99 provides that any person who violates Sections 6111.04, 6111.042., 6111.05., or division (A) of Section 6111.07 of the Revised Code shall be fined not more than twenty-five thousand dollars or imprisoned not more than one year, or both.

30. NEED TO HALT OR REDUCE ACTIVITY

40 CFR 122.41(c) states that it shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with conditions of this permit.

31. APPLICABLE FEDERAL RULES

All references to 40 CFR in this permit mean the version of 40 CFR which is effective as of the effective date of this permit.

67/NE

Application No. OH0010936

Ohio EPA Permit No. 3IO00000*GD

National Pollutant Discharge Elimination System (NPDES) Permit Program

P U B L I C N O T I C E

NPDES Permit to Discharge to State Waters

Ohio Environmental Protection Agency
Permits Section
1800 WaterMark Drive
P. O. Box 1049
Columbus, Ohio 43266-0149
(614) 644-2001

Public Notice No. OEPA-97-12-018
Date of Issue of Public Notice: December 10, 1997

Name and Address of Applicant: U. S. Department of the Army, Ravenna Army Ammunition Plant (RVAAP), 8451 State Route 5, Ravenna, OH 44266

Name and Address of Facility Where Discharge Occurs: U. S. Department of the Army, Ravenna Army Ammunition Plant (RVAAP), 8451 State Route 5, Ravenna, OH 44266

Location of Discharge: 006 - 41° 11' 30" N; 81° 02' 55" W

Receiving Water: an unnamed tributary entering Sand Creek at River Mile 2.22

This applicant receives, stores, maintains, and ships military ammunition and explosives and has 1 existing discharge point. The current operations of this discharger result in an average effluent flow of 5,000 gallons per day. Key parameters to be limited in the permit are as follows: Total Suspended Solids, COD, Total Trinitrotoluene, and pH.

Ohio EPA Permit No. 3IO00000*GD

Public Notice No. 97-12-018

On the basis of preliminary staff review and application of standards and regulations, the director of the Ohio Environmental Protection Agency will issue a permit for the discharge subject to certain effluent conditions and special conditions. The draft permit will be issued as a final action unless the director revises the draft after consideration of the record of a public meeting or written comments, or upon disapproval by the administrator of the U.S. Environmental Protection Agency. Any person may submit written comments on the draft permit and administrative record and may request a public hearing. A request for public hearing shall be in writing and shall state the nature of the issues to be raised. In appropriate cases, including cases where there is significant public interest, the director may hold a public hearing on a draft permit or permits prior to final issuance of the permit or permits. Following final action by the director, any aggrieved party has the right to appeal to the Environmental Board of Review.

Interested persons are invited to submit written comments upon the discharge permit. Comments should be submitted in person or by mail no later than 30 days after the date of this public notice. Comments should be delivered or mailed to both of the following locations: 1) Ohio Environmental Protection Agency, Division of Surface Water, Permits Section, 1800 Watermark Drive, P.O. Box 1049, Columbus, Ohio 43216-1049 and 2) Ohio Environmental Protection Agency, Northeast District Office, 2110 East Aurora Road, Twinsburg, Ohio 44087.

The Ohio EPA permit number and public notice numbers should appear next to the above address on the envelope and on each page of any submitted comments. All comments received no later than 30 days after the date of this public notice will be considered.

The application, fact sheets, permit including effluent limitations, special conditions, comments received, and other documents are available for inspection and may be copied at a cost of 25 cents per page at the Ohio Environmental Protection Agency at the address shown on page one of this public notice any time between the hours of 8 a.m. and 4:30 p.m., Monday through Friday. Copies of the public notice are available at no charge at the same address.

Mailing lists are maintained for persons or groups who desire to receive public notice for all applications in the state or for certain geographical areas. Persons or groups may also request copies of fact sheets, applications, or other documents pertaining to specific applications. Persons or groups may have their names put on such a list by making a written request to the agency at the address shown above.

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

6/2/97
ENV

George V. Voinovich
Governor

May 28, 1997

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 January 1, 1997 through March 31, 1997 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,

Graham Mitchell, Chief
Office of Federal Facilities Oversight

OHIO DSMOA

Quarterly Report

January 1, 1997 to March 31, 1997

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:

Ms. Martie Nauseda has replaced Janet Wright as our DSMOA Program Manager for Ohio.

Training:

One of the site coordinators for WPAFB attended Public Meeting training on January 15, 1997. The DoD Group Leader and two site coordinators for WPAFB attended mandatory health and safety training on January 9, 1997. One of the site coordinators for WPAFB attended Landfill Gas Management training in Columbus, Ohio on March 5, 1997.

Meetings:

The DoD Group Leader participated in three conference calls this quarter concerning the development of the new DSMOA/CA Manual. On January 17, 1997, a conference call concerning the content for Appendix B was held. On January 28, 1997 a conference call was held concerning the outline for Sections 5 and 6 of the manual. On March 14, 1997, a conference call was held concerning the draft of Section 5. For more details, please see current programmatic issues section below.

Programmatic Accomplishments:

The Ohio Tier 2 Meeting was held in Kettering, Ohio on January 15, 1997. Major issues discussed were the development of a coordination agreement between Ohio and U.S.EPA for oversight of DoD facilities in Ohio, establishing a framework to report success stories for the Ohio DoD sites, and establishing a meeting schedule for Tier 2.

Current Programmatic Issues:

Ohio EPA/OFFO personnel continue to be actively involved in the development of the DSMOA/CA Manual. The DoD group leader has participated in conference calls discussing sections of the manual, and has sent comments back on the proposed detailed outline. On March 5, we received the first draft of the manual and on March 18, Ohio EPA submitted written comments on this draft.

Our reimbursement for expenditures from DoD for the DSMOA for the last two quarters was delayed. After discussing the situation with Janet Wright, our DSMOA contact, we found that the error was that the Army Corps forgot to add the sites we added to our Cooperative Agreement, and that their Fiscal personnel thought we were charging for sites that were not part of our agreement. However, the situation has now been resolved, and a reimbursement cheque was received in early April.

RAVENNA ARMY AMMUNITION PLANT:

Document Review:

The following documents were reviewed during this reporting period:

Investigation-Derived Waste Characterization and Disposal Plan for the Phase 1 Remedial Investigation of High Priority Areas of Concern at the Ravenna Army Ammunition Plant. Received on December 16, 1996. Comments were submitted to Army Corps of Engineers (ACOE) on February 10, 1997.

Draft, Phase 1 Remedial Investigation Report for the Phase 1 Remedial Investigation of High Priority Areas of Concern at the Ravenna Army Ammunition Plant, Ravenna, Ohio. Received on December 20, 1996. Comments were submitted to ACOE on March 6, 1997.

On March 20, Ohio EPA reviewed all the responses to comments on the Phase 1 document and faxed OEPA comments on these responses to SAIC.

Site Visits:

January 9:	Ohio EPA personnel discussed investigation-derived waste (IDW) issues and observed liquid IDW neutralization.
February 7:	Ohio EPA personnel visited the site to tour the installation and discuss current remediation technologies.
February 13:	Ohio EPA personnel met with RVAAP to discuss the limited

Phase 1 Remedial report (RI) report discussions.

March 25: Ohio EPA personnel toured the site with RVAAP, and Ohio National Guard (ONG) to look at specific Areas of Concern (AOCs).

Meetings:

January 27: Restoration Advisory Board meeting in Paris Township.

January 28 and 29: Meetings at RVAAP to discuss site-related issues with ACOE, SAIC, and RVAAP.

January 28: Conference call between Army, U.S.EPA, Ohio EPA, Illinois, and Indiana concerning funding for restoration activities at Army sites.

February 19: Restoration Advisory Board meeting in Freedom Township.

March 19-20: Meetings at OEPA NEDO with SAIC, ACOE and IOC regarding Phase 1 report comment resolution.

March 19: Restoration Advisory Board meeting at Windham.

March 19: Ohio EPA personnel were interviewed by the FBI (via phone) regarding the phostoxin missing from the installation.

Miscellaneous:

Ohio EPA personnel participated in numerous phone calls with ACOE, RVAAP, SAIC, and OFFO SWDO regarding site-related issues.

Ohio EPA personnel also reviewed numerous documents regarding UXO issues.

Ohio EPA personnel sent a letter to RVAAP on 01/14/97 regarding the issue of whether or not it is necessary to receive a "Rule 13" authorization to conduct archaeological surveys in four high priority AOCs.

Ohio EPA sent a letter to RVAAP on 02/10/97 regarding the interpretation of Rule 13 issues.

Current Issues:

On February 6, Ohio EPA personnel toured the Ravenna Arsenal. During this tour, they observed Ohio National Guard troops setting up camp in one of the contaminated areas. After they left, the Commander of RVAAP had the Ohio National Guard moved from the site. One other incident happened this month when 4 canisters of "phostoxin" (used to kill ground hogs) were stolen from RVAAP. The fumes from this chemical are highly toxic. The FBI, Army, and Ohio State Patrol are investigating. Ohio EPA personnel were interviewed by telephone by the FBI on March 17, 1997. On April 1, the FBI will begin conducting polygraph tests on a limited number of personnel, included the Commander's Representative and the forester at RVAAP.

On March 4, 1997, the Director of Ohio EPA sent a the letter concerning funding for the installation restoration program at the Ravenna Arsenal. The projected funding for the cleanup of this site is .1 million dollars per year, much less than what is necessary to investigate and remediate this site. We have not yet received a response from the Army concerning this letter.

WRIGHT-PATTERSON AIR FORCE BASE:

Document Review:

The following documents were reviewed during this period:

Draft Site Specific Removal Action Plan for Operable Unit 7. Received on December 23, 1996. Comments were provided on January 15, 1997.

Draft-Final 30% Design for the Excavation of Landfill 12. Received on December 13, 1996. Comments were submitted on January 10, 1997.

Draft-Final Work Plan for the Capping of Landfill 11. Received on December 18, 1996. Comments were submitted on January 16, 1997.

Response to Comments to the Draft-final Remedial Investigation Report for Operable Unit 9. Received on December 5, 1996. Comments were submitted on January 6, 1997.

The Draft Treatability Study Work Plan for Operable Unit 8. Received on December 10, 1996. Comments were submitted on January 10, 1997.

The Final Conceptual Design for Operable Unit 8 Bioslurper System. Received on December 10, 1997. Comments were submitted on January 10, 1997.

The 30% Design for the Capping of Landfills 1 and 2. Received December 16, 1996. Comments were sent on January 16, 1997.

The Final Remedial Investigation Report for Operable Unit 8. Received January 27, 1997. Approval letter was submitted on February 18, 1997.

The 90% Design Document for the Leachate Collection Line at Operable Unit 1. Received on February 4, 1997. Comments were submitted on February 28, 1997.

Engineer's Certification Report for Landfill 5. Received on January 8, 1997. Comments were submitted on February 3, 1997.

The Work Plan for a Site Investigation at Burial Sites 5 & 6. Received on January 27, 1997. Comments were submitted on February 5, 1997.

The Draft Final Proposed Plan for Operable Unit 2. Received on January 16, 1997. Approval letter was submitted on February 5, 1997.

The Prefinal Design for Capping of Landfills 3,4,6 & 7. Received on February 3, 1997. Comments were submitted on February 28, 1997.

Red-lined Site Specific Removal Action Plan for Operable Unit 4. Received on February 10, 1997. Comments were submitted on February 2, 1997.

Draft-Final Addendum to the Site-Specific Work Plan for the Basewide Monitoring Program at WPAFB. Received on January 13, 1997. On March 5, a meeting was held between U.S.EPA, Ohio EPA, and WPAFB concerning collecting soil samples for the baseline sampling at OU2. This last remaining issue was resolved at this meeting.

Field Investigation Report for Operable Unit 11. Received on January 27, 1997. Comments were submitted on March 2, 1997.

The Site Specific Removal Action Plan for Operable Unit 7. Received on February 28, 1997. Comments were submitted on March 28, 1997.

The Explanation of Significant Differences to the Record of Decision for Operable Unit 1. Received on February 7, 1997. Approval letter was sent on March 7, 1997.

Final Work Plan for the Site Investigation at Burial Sites 5 and 6. Received on March 6, 1997. Approval letter was sent on March 18.

Final Work Plan for the Capping at Landfill 11. Received on February 28, 1997. Approval letter was sent on March 28.

The Draft Final Treatability Study for the Bioslurper System at Operable Unit 8. Received on February 1, 1997. Currently under review.

Draft-Final Engineering Evaluation/Cost Analysis for the Removal Action at Landfill 12. Received on March 13, 1997. Currently under review.

90% Design Package for the Excavation of Landfill 12. Received on March 13, 1997. Currently under review.

Draft-Final Action Memo for Spill Site 11. Received on March 5, 1997. Currently under review.

Site Visits:

January 14: Ohio EPA personnel observed skimmer pump operations at Operable Unit 2.

January 22: Ohio EPA personnel collected leachate well samples at OU1.

January 29: Ohio EPA personnel observed skimmer pump operations at OU2.

January 31: Ohio EPA personnel observed cap installation/maintenance at Landfills 5 and 11. Operation of skimmer pumps at Operable Unit 2 was also observed.

February 25: Ohio EPA, WPAFB, and ICI personnel performed a site walk over of Burial Sites 5 & 6.

Meetings:

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

January 14: Meeting between WPAFB and Ohio EPA concerning Current Conditions Risk Assessment for Basewide Monitoring Program.

February 7: Meeting between Ohio EPA, WPAFB, U.S.EPA, City of Dayton, and *Dayton Daily News* staff concerning the restoration program at WPAFB.

February 18: Meeting between Ohio EPA, WPAFB, and U.S.EPA concerning the contaminant transport model for the Basewide Monitoring Program.

February 25: Conference call between Ohio EPA and U.S.EPA concerning U.S.EPA approval of the Proposed Plan for OU2.

February 27: A conference call between Ohio EPA, WPAFB, and the Base contractor was held to discuss issues concerning piezometer installation SOPs at OU8.

March 4: Public meeting on the proposed plan for WPAFB Spill sites 2, 3, and 10.

March 5: Meeting to resolve soil sampling issue for WPAFB BMP Baseline sampling at OU2.

March 5: Environmental Advisory Meeting for WPAFB

March 13: Conference call was held between Ohio EPA, USEPA, and WPAFB to discuss the start up of the OU8 Treatability Study.

Accomplishments:

On January 14, the Ohio EPA and WPAFB met briefly with General Eikman, the new Air Force Materiel Commander, concerning team work and the environmental restoration program at WPAFB. This meeting was during a tour where the General was viewing various civil engineering projects on base, including the regrading of Landfill 11.

On February 16, The *Dayton Daily* News ran both an article and editorial on the environmental program at WPAFB. The article was very positive and focused on how Ohio EPA, U.S.EPA, and WPAFB worked as a team to solve problems and streamline the cleanup at the Base.

The public meeting for the proposed plan for WPAFB Spill Sites 2, 3, and 10 was held on March 4 at the Fairborn High School. No one from the public attended the meeting.

The Treatability Study at OU8, WPAFB commenced the week of March 11-14 to address residual petroleum-based hydrocarbon contamination. As of March 25, bioslurper activities are currently in full-time operation. Treatment operations consist of light non-aqueous phase liquid hydrocarbons (LNAPLs) recovery, ground water extraction, and bioventing (soil vapor recovery). Treatment is expected to last 3 months.

AIR FORCE PLANT #85:

Document Review:

The following documents were reviewed during this reporting period:

Public Health Assessment for Air Force Plant 85, Columbus, Franklin County, Ohio , Received on January 31, 1997. After review, document was filed with no comments.

Environmental Baseline Survey for Air Force Plant 85, Columbus, Ohio (October, 1996). Received on 3/6/97. Currently under review.

Site Visits:

There were no site visits during the reporting period.

Meetings:

January 30: A Restoration Advisory Board (RAB) meeting was held at the Whitehall Community Center. Terms of the recent sale of the plant and the current environmental situation was presented. The decision to not seat a formal RAB was made. In the future, Air Force will provide mailings and information sessions as needed.

Accomplishments:

In January, the sale of the plant for $15.3 million was publicly announced. The plant was purchased by a local development group. Proceeds from the sale should enhance environmental investigation and remediation efforts.

Sitewide hydrogeologic investigation analytical results were received in January/February and are currently undergoing data validation. A summary report is expected soon.

Current Issues:

Site 3 PCB remediation is still on hold pending additional funding.

Additional work is planned at the Building 3 Process Areas per Ohio EPA comments. Final closure of these areas should be readily achievable.

The Air Force is evaluating the possibility of utilizing Ohio's Voluntary Action Program to address a number of sites at the plant. Ohio EPA feels that the current DSMOA agreement will provide the flexible oversight to achieve site closures more efficiently and at a lower cost. Further discussions of this issue are planned.

SPRINGFIELD MPT (BECKLEY):

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.

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:

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 held concerning the current or future clean-up during this reporting period.

RICKENBACKER AGB:

Document Review:

The following documents were reviewed during this reporting period:

Draft Final Appendix A (Errata Document) for the Supplemental EBS on Parcels D1 and D2. Received on January 10, 1997. Comments were submitted on January 21, 1997.

Draft Finding of Suitability to Lease for Parcels D1 and D2. Received on January 10, 1997 . Comments were submitted on January 28, 1997.

Draft Final Supplemental Environmental Baseline Survey for the Electrical Substation. Received on January 17, 1997. Comments were submitted on January 29, 1997.

The Draft Phase II Remedial Investigation for the Rickenbacker ANGB. Received on January 31, 1997. Comments were submitted on March 31, 1997.

The Draft Final Finding of Suitability to Transfer for the Electrical Substation and the Draft Final Finding of Suitability to Grant an Easement for the Electrical Distribution System. Received on February 4, 1997. Comments were submitted on February 7, 1997.

The Draft Final Finding of Suitability to Lease for Parcels D1 and D2. Received on February 7, 1997. Comments were submitted on February 14, 1997.

No Further Remedial Action Planned Decision Documents for Sites 3, 4, 5, 10, 14, 26, 31, 32 and 33. Received during February 1997. Comments were submitted on February 25, 1997.

Site Visits:

January 7: Ohio EPA personnel observed the set-up for the electrosmosis using Lasagna Technology™.

Meetings:

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

January 22: A Project Team meeting was held in Cincinnati at IT Corp's office. A partnering exercise was conducted at the beginning followed by updates on current projects, setting up a schedule for the review of Decision Documents and a discussion of unscheduled items.

January 27: A conference call was held between the Rickenbacker Consensus Group to decide on which five success stories to do write first.

March 4-6: Meetings were held in San Antonio, Texas. A Project Team meeting was held on the afternoon of the 4th, a peer review on the 5th and conference calls on the morning of the 6th

Accomplishments:

Ohio EPA has drafted a Coordination Agreement between Ohio EPA and U.S. EPA concerning regulatory oversight duties at Rickenbacker ANG . This draft agreement is currently under reviewed by U.S.EPA.

The Consensus Group has been working on five success stories and recently completed preliminary drafts that have been passed on to the Ohio Tier II Team. Another five success stories were chosen and are currently being written.

The electroosmosis project using lasagna technology at Site 12 is underway. The

consultant collected samples for chemical analysis on March 26, 1997.

NEWARK AFB:

Document Review:

The following documents were reviewed this reporting period:

Ground Water Monitoring Well Abandonment at (Former) Newark Air Force Base, Ohio. 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.

Miscellaneous:

Records management. Since this facility was transferred on October 1, 1996, Ohio EPA personnel have begun the process of organizing the files and archiving draft documents, etc.

Newark Air Force Base is planning to abandon most of the monitoring wells installed during the Installation Restoration Program and Remedial Investigation. This work will begin the week of March 31.

TOLEDO AIR NATIONAL GUARD BASE:

Document Review:

The following documents were reviewed during this reporting period:

Draft Engineering Evaluation/Cost Analysis Approval Memorandum (January 1997) was reviewed and comments were submitted to ANG.

The Air National Guard submitted a request for NFRAP of Site 8 (Fire Training Area No. 5). OEPA did not concur with the recommendation and responded by requesting more sampling prior to the NFRAP designation.

Draft Engineering Evaluation/Cost Analysis Work Plan (February 1997) was reviewed and comments were submitted to ANG.

Site Visits:

There were no site visits during this reporting period.

Meetings:

January 15: EE/CA kick off meeting at Toledo Air National Guard Base with OEPA, Montgomery Watson and ANG.

MANSFIELD LANHAM:

Document Review:

The following documents were reviewed during this reporting period:

Draft Site Investigation Report for Mansfield Lanham. Received October 25, 1996. Currently under review.

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.

Miscellaneous:

The base environmental coordinator is Troy A. Crammer, (419)521-0323. Please address correspondence to him. Katherine Fairley, IRP Project Manager, ANGRC, (301)836-8724, is the current contact with the guard. Fritz LeBow is the HAZWRAP contact. The base changed its name to 179th Tactical Airlift Wing.

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

Document Review:

The following documents were reviewed during this reporting period:

No Further Remedial Action Planned Decision Documents for Sites S9, C5, M2, M3, M4, M5, M6, R3, S5, S6, and S7. Approval letter sent on January 15, 1997.

City of Kettering Work Plan for Phase II Building Demolition. Comments submitted on January 21, 1997.

City of Kettering Work Plan for Western Sewer Line Installation. Comments submitted on January 21, 1997.

Draft Closure Documents for the Oil Water Separators, Steam Vault Abandonment, and Low Level Radiation Sites. Comments submitted on March 5, 1997.

No Further Remedial Action Planned Decision Documents for Site C2A, S4, and S8. Approval letter sent on March 10, 1997.

Draft Supplemental Environmental Baseline Survey for Parcels A and F. Comments submitted on March 25, 1997.

Draft Finding of Suitability to Transfer for Parcels A and F. Comments submitted on March 25, 1997

Site Visits:

February 11:	Ohio EPA personnel accompanied WPI on the visual site inspection of buildings located within Parcel A

Meetings:

January 21:	Ohio EPA personnel met with City of Kettering Contractors to discuss comments on the Phase 2 Building Demolition Work Plan and Western Sewer Line Work Plan.
January 23:	Base Closure Team Meeting
January 23:	Restoration Advisory Board meeting.
February 27:	Base Closure Team Meeting
March 27:	Base Closure Team Meeting

Accomplishments:

Progress is continuing on the infrastructure improvements to DESC to convert it to

the Kettering Business Park. To date, all milestones on the accelerated schedule have been met. Ohio EPA has approved several NFRAP documents for the facility, and has completed its review of the draft FOST and Supplemental EBS for Parcels A and F. Transfer of these parcels to the City of Kettering on schedule for May 31, 1997.

Current Issues:

The Air Force Center for Environmental Excellence representative to the BCT continues to be reluctant to follow the established roles and responsibilities as it relates to the BCT decision making process and partnering at DESC. To date, this has not impacted the schedule, but it is impacting the partnerships of the BCT team. Ohio EPA will continue to work with the Air Force, City and U.S. EPA to try to ensure that this situation does not impact the schedules for transfer of the facility.

DEFENSE CONSTRUCTION SUPPLY CENTER (DCSC):

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.

YOUNGSTOWN AIR RESERVE 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 during this reporting period.

Current Issues:

The Site Investigation Report for YANG is overdue.

PLUM BROOK ORDNANCE WORKS:

Document Review:

The following documents were reviewed during this reporting period:

Site Investigations of G-8 Burning Ground. Ohio EPA comments were provided to IT Corp.on January 15, 1997.

Revised Site Investigations and Groundwater Investigation for the Plumbrook Ordnance Works. Received in March 1997. Currently under review.

Site Visits:

There were no site visits this reporting period.

Meetings:

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

SHARONVILLE ENGINEERING DEPOT:

Document Review:

The following documents were reviewed during this reporting period:

The *Final Sharonville Engineering Depot Limited Remedial Investigation Report.* Received on March 25, 1997. Currently under review.

Site Visits:

There were no site visits during this reporting period.

Meetings:

January 7: Conference call between Ohio EPA and ACOE addressing concerns at the Sharonville Engineering Depot site.

January 31: Conference call between Ohio EPA and ACOE concerning the need for further action at this facility.

Current Issues:

We have been working with the Army Corps of Engineers to resolve issues concerning metals results in the ground water for the former Sharonville Engineering Depot. On January 31, Ohio EPA had a conference call with ACOE to discuss how to modify the focused Remedial Investigation report. We also came to consensus with ACOE that no further action is necessary for this facility.

FORMER LOCKBOURNE AIR FORCE BASE:

Document Review:

The following documents were reviewed during this reporting period

The Free Product Removal Report for the Former Lockbourne Air Force Base. Received on January 10, January 30, and March 6, 1997. These report were informational documents. No comments were generated.

Site Visits:

There were no site visits during this reporting period.

Meetings:

There were no meetings concerning the current or future cleanup actions during this reporting period.

Miscellaneous:

The previous scheduled work has been delayed so that the investigation of the 1942 pipeline can be run concurrently with the base's investigation. The pipeline is on base and Rickenbacker Port Authority property.

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:

The following documents were reviewed during this reporting period:

Draft, Final Report, Site Investigation, Former Lordstown Ordnance Depot, Lordstown, Ohio. Currently under review.

Site Visits:

There were no site visits during this reporting period.

Meetings:

March 3: Conference call with the Army Corps of Engineers (ACOE), Maxim, and Ohio EPA personnel to discuss risk assessment and ecological assessment issues.

Miscellaneous:

January 3: Ohio EPA personnel wrote a memo to the Lordstown file regarding the use of soil screening numbers.

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:

There were no documents reviewed during this reporting period.

Site Visits:

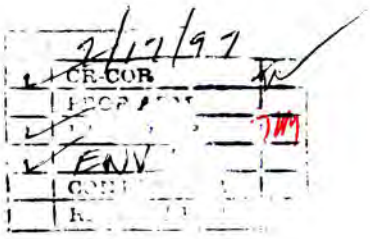
There were no site visits during this reporting period.

Meetings:

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

OhioEPA
State of Ohio Environmental Protection Agency

Southwest District Office
401 East Fifth Street
ayton, Ohio 45402-2911
(513) 285-6357
FAX (513) 285-6249



George V. Voinovich
Governor

July 15, 1997

5: 8/8/97
important but
Some week as
ECAS.
JK

JOHN CICERO
RAVENNA ARMY AMMUNITION PLANT
8451 STATE ROUTE 5
RAVENNA OH 44266-9297

Dear Mr. Cicero:

Headquarters, Army Corps of Engineers (HQUSACE), Department of Defense Service Representatives, and States have worked as a team to develop a new guide to the Defense State Memorandum of Agreement/Cooperative Agreement (DSMOA/CA) program. The guide describes the new CA process, which is a much more collaborative effort between the states and services to establish funding requirements for cleanup activities and regulatory oversight.

Ohio EPA, in cooperation with the Air Force Base Conversion Agency, has invited HQUSACE to present training on this new process to both Ohio EPA and Department of Defense installation, command and service representatives. Your involvement in this new process is important to the success of the DSMOA program in Ohio. Therefore we would like to invite you to attend this training, which will be held at Rickenbacker Air National Guard Base near Columbus, Ohio on August 19 and 20, 1997.

Attached to this letter is an outline of the material that will be covered, directions to Rickenbacker ANGB, and hotel information.

So that we can ensure that enough training materials are available, please RSVP by August 8, 1997 by calling Jo Davidson of my staff at (937) 285-6460. If you have any questions, please contact Bonnie Buthker of my staff at (937) 285-6469.

Sincerely,

Graham E. Mitchell
Chief, Office of Federal Facilities Oversight

cc: D. Jeffrey Smith, HQUSACE
Norman Endlich, PRC
Tony Clymer, AFBCA/OL-R
Bonnie Buthker, OFFO/SWDO
Pat Campbell, DERR/CO

DSMOA/CA Guide
Implementation and Orientation Workshop

Purpose: To provide implementation and an orientation to DSMOA/CA participants and stakeholders in order to increase their awareness and understanding of the revised CA Guide process.

Audience: Regional Environmental Coordinators
DSMOA Points of Contact and Support Staff
DoD Regional and Installation Level Personnel
State Regulators
Contractors

Location: Regional Workshops, state DSMOA offices, various DoD installations

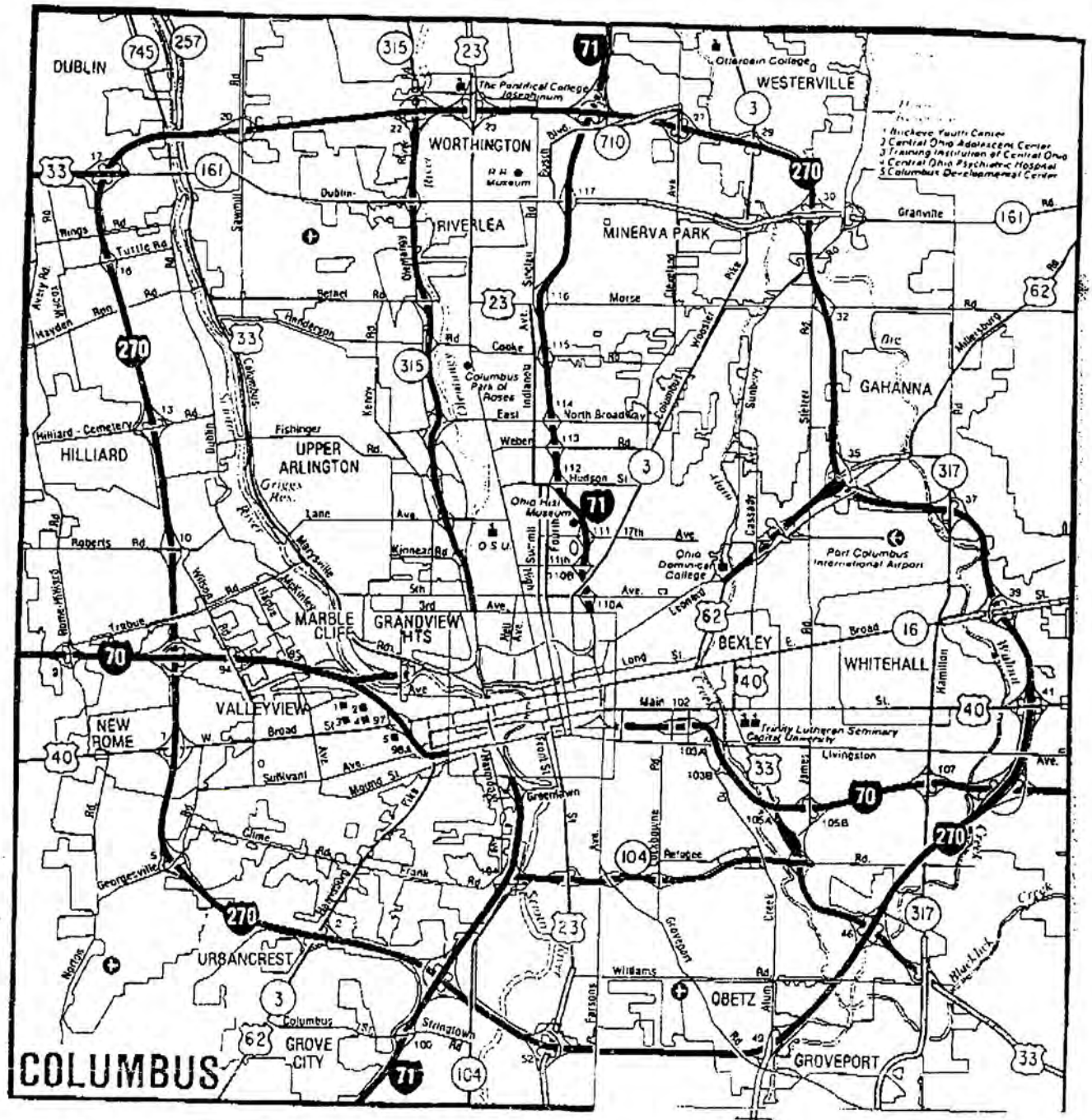
Duration: 1½ - 2 days

Training Objectives:

- Familiarize attendees with the contents and procedures for updating the DSMOA/CA Guide
- Provide attendees with practical experience in completing the CA application
- Identify roles and responsibilities of various participants and stakeholders
- Provide an overview of the development of the CA Guide
- Discuss the 6-step process in developing the CA application
- Identify reporting requirements
- Provide an evaluation mechanism to solicit input to modify and improve subsequent training sessions

Course Contents:

- Background (brief) in developing the manual; purpose of the CA Guide
- Contents of the CA Guide – use; procedures for updating
- DoD Budget Process and Devolvement
- The 6-step Process
  - discuss each step
  - review and practice in completing forms
  - determining installation cleanup requirements and tasks
- Contents of the CA application
- Transition and implementation
- Funding to the states
- Report requirements
- Partnering (role play, optional)
- Evaluation of the training

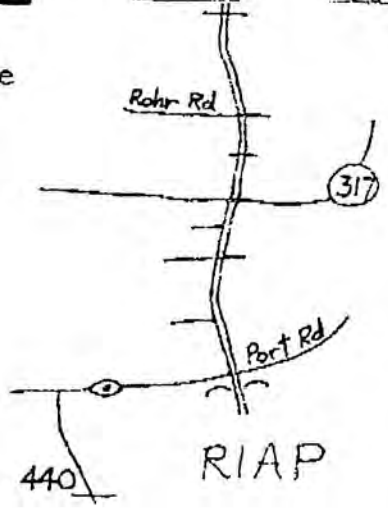


Rickenbacker is 10 miles south of Columbus at the end of Alum Creek Drive. Take Exit 49 from I-270 and go south 3.5 miles to the airport.

Turn right, just before the new Rickenbacker International Airport entrance, onto Port Road.

Turn left just past the military guard shack.

Building 440, Air Force Base Conversion Agency, is the small brick office on the right. Park in rear.



HOTEL INFORMATION
COLUMBUS, OH

Days Inn
I 70 and Brice Road
Columbus, OH
(614) 868-9290
$52.99 plus tax
$45.99 plus tax (gov't rate)

Holiday Inn East
4560 Hilton Corporation Drive
Columbus, OH
(Located at I-70 and S. Hamilton Rd.)
(Exit 107)
(614) 868-1380
$109 plus tax
$59 plus tax (gov't rate)

Lenox Inn
13700 St. Rt. 256
Reynoldsburg, OH
(614) 861-7800
$65 plus tax
$50 plus tax (gov't rate)

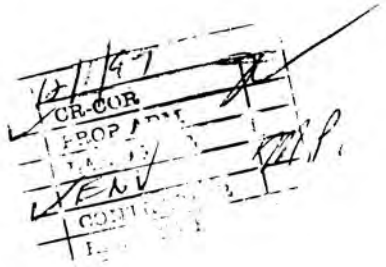
Ramada Inn
2124 S. Hamilton Road
Columbus, OH
(Located at I-70 and S. Hamilton Rd.)
(Exit 107A)
(614) 861-7220
$85 plus tax
$59 (gov't rate); will accept tax
exempt form

Ramada Inn South
1879 Stringtown Rd.
Grove City, OH
(Located at I-71 and Stringtown Rd.)
(Exit 100)
(614) 871-2990 or (800) 228-2828
$63 plus tax
$42 plus tax (gov't rate)

La Quinta Inn Columbus
2447 Brice Rd.
Reynoldsburg, OH
Located at I-70 and Brice Rd.
(Exit 110B)
(614) 866-6456
$51 plus tax
$45 plus tax (gov't rate)

Best Western East
2100 Brice Rd.
Reynoldsburg, OH
Located at I-70 and Brice Rd.
(Exit 110B)
(614) 864-1280
$59 plus tax
$50 plus tax (gov't rate)

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



George V. Voinovich
Governor

November 24, 1997

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, 1997 through September 30, 1997 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,

Graham Mitchell, Chief
Office of Federal Facilities Oversight

OHIO DSMOA

Quarterly Report

July 1, 1997 to September 30, 1997

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:

One of the OFFO Site Coordinator's has resigned. Her last day was September 12, 1997. Most of her duties have been transferred to the other OFFO Site Coordinator. Due to the decreasing work load in the Southwest District, we currently have no plans to fill this vacancy.

Training:

On August 19-20, 1997, Ohio's DSMOA/CA Workshop was held at Rickenbacker ANG. We had 30 people attend the workshop. Most were DoD installation personnel, but several Ohio EPA site coordinators also attended. Everyone felt the workshop was a success, and that it was a great kick-off for the CA application process in Ohio. Thanks to Headquarters, Army Corps of Engineers, for allowing Norman Endlich to give us the training.

The two OFFO Site Coordinators also attended U.S.EPA's HRS training in Columbus on July 14-18, 1997.

Meetings:

On August 15, a Ohio Tier 2 meeting was held. Topics included the data validation issue with the Gentile AFS Phase II Remedial Investigation, communication issues between the team members, and partnering issues among the teams.

On August 25, a Ohio Tier 2 meeting was held to discuss issues with the Rickenbacker Team, and to hold a parterning session with the Rickenbacker Port Authority, a new member to the Tier 2 Team.

On September 9-11, 1997, Headquarters, Army Corps of Engineers held their Eastern Regional DSMOA workshop in Pittsburgh, Pennsylvania. The DoD Group Leader,

DERR Grants Coordinator, and DERR Fiscal Officer attended the 2 1/2 day workshop. During the workshop, the DoD Group Leader gave a presentation on the state of Ohio's perspective on the DSMOA program, and facilitated breakout sessions for the states on various issues.

Also this last quarter, the DoD Group Leader participated in numerous phone calls on the new DSMOA/CA Manual. For more details, please see current programmatic issues section below.

Programmatic Accomplishments:

During the week of September 8, 1997, the Army Corps of Engineers removed a small disc that was emitting low levels of radiation from the front yard of the River Valley Local School in Marion, Ohio. This school was built on the former Marion Engineering Depot site (a FUDs), and OFFO has been coordinating our efforts with ACOE representatives. The disk and soil were shipped to WPAFB for disposal, and ACOE will continue their investigation into potential contamination at this site, and at the former Scioto Ordnance Plant, located 1/2 mile north of the school. Due to the interest in the Marion Engineering Depot, we will be adding this site to our DSMOA extension. The Scioto Ordnance Plant is already listed under our DSMOA.

Also during September, several site coordinators began to meet with their DoD counterparts to develop the 2-year work plan and 6-year narrative for their installations as part of the new CA process.

On September 18, the DoD Group Leader, DERR Grants Coordinator, and DERR Fiscal Officer had a meeting in Columbus to prepare the CA extension package for the DSMOA.

Current Programmatic Issues:

One other minor crisis happened with the DSMOA/CA guide in August. In an effort to get Air Force and Navy sign off on the manual, DoD Headquarters made unilateral changes to the guide. The states objected, with several states (including Ohio) stating they would pull their concurrence on the CA guide if the revisions weren't rescinded. After several conference calls between the states and DoD Headquarters, this issue was resolved.

During the week of August 18, a radiological survey and limited field sampling began at the River Valley Local School in Marion, Ohio. During the radiological survey, Ohio Department of Health found an area with elevated measurements of radiation. Preliminary soil sampling results indicate that benzo(a)pyrene has been detected in samples collected from the football field. This school was built on the former Marion

Engineering Depot site (a FUDs), and OFFO has been coordinating our efforts with ACOE representatives. Ohio Department of Health has also been conducting an epidemiology study of the graduates of the school and the area in general. Recently, they released their findings that there reason to believe that a higher than expected rate of leukemia that may be occurring among the graduates. Due to all the press and citizen interest on the facility, on August 22, a conference call was held to coordinate agency roles and responsibilities, and to develop a communication plan for the project.

RAVENNA ARMY AMMUNITION PLANT:

Document Review:

The following documents were reviewed during this reporting period:

Draft Final Phase 1 Remedial Investigation Report for the Phase 1 Remedial Investigation of High Priority Areas of Concern at the Ravenna Army Ammunition Plant, Ravenna, Ohio. Received on May 9, 1997. Comments were submitted on August 5, 1997.

Several draft Statements of Work (SOWs) for Load Line 1, Winklepeck Burning Grounds, and background determination were received at the end of June/beginning of July. Comments were submitted on July 3, 1997 and July 10, 1997.

Analytical Results for Monitoring Well Unsaturated Soil Investigation-Derived Waste (IDW). Received on July 7, 1997. No comments were generated.

Hazardous and Medical Waste Study No. 37-EF-5360-97, Relative Risk Site Evaluation, Ravenna Army Ammunition Plant, Ravenna, Ohio, 28 October - 1 November 1996. Received on April 8, 1997. Comments were submitted to USACHPPM on July 10, 1997.

Reviewed the draft public meeting presentation and provided comments to the Army's contractor on August 27, 1997.

Reviewed the Cooperative Agreement training manual on August 27, 1997.

Reviewed mustard agent information on September 2, 1997.

Site Visits:

July 16: Ohio EPA Personnel observed in-situ testing for explosives

July 20: Ohio EPA Personnel observed in-situ testing for explosives

July 23: Ohio EPA were on-site with Ohio National Guard (ONG) personnel to look at the Demolition Area and NACA Test Crash Area which are nearest to ONG training facilities.

August 14: Ohio EPA personnel were on-site to observe GPS for the installation's coordinates.

Meetings and Conference Calls:

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

July 8: Conference call between Ohio EPA and RVAAP personnel regarding RCRA closure at Building 1601

August 29: Conference call between Ohio EPA and RVAAP personnel regarding RCRA closures

September 3: Public meeting regarding Phase 1 RI results held at Ravenna High School

September 4: Meeting between Ohio EPA and Army IOC personnel to begin projections for the DSMOA/CA at the Ravenna Arsenal

September 16 - 17: Meeting between Ohio EPA and Army IOC to discuss RCRA issues, walk the RCRA Areas of Concern, transition in the new RCRA inspector, and complete the scoping for the two year and four year narratives for the Cooperative Agreement.

September 17: Restoration Advisory Board meeting in Windham

Miscellaneous:

Numerous phone calls with IOC, USACHPPM, ACOE, RVAAP, SAIC, OFFO SWDO, NGB, ONG, consultants, reporters, and the general public regarding site-related issues.

Numerous in-house discussions regarding site-related issues.

Prepared a memo on July 1, 1997 to CO DERR regarding IDW issues at the installation.

Prepared a memo for the National Guard Bureau (July 10, 1997) regarding OEPA oversight costs from 1994 - present.

Attended ONG exercises at Camp Grayling, MI on July 17 - 18, 1997.

Reviewed DHWM comments on the closure plans for the Deactivation Furnace, Building 1601, Open Burning Grounds, and Open Detonation Area.

Reviewed DSIWM comments on the Ramsdell Quarry Landfill groundwater situation.

Prepared a briefing memo for the governor's office regarding current investigations on September 12, 1997.

Prepared a rebuttal on September 15, 1997 to an erroneous newspaper article.

Prepared a detailed response on September 22, 1997 to a citizen's concerns regarding groundwater at the Ravenna Arsenal.

Prepared and finalized on September 23, 1997 the updated DSMOA/CA two-year narrative, four out-year narrative, and two year estimate of OEPA oversight hours.

Generated several emails and memos regarding residential well sampling in the vicinity of the RVAAP. Received authorization to pursue a Purchase Order to sample several wells. Begin to formalize the residential well sampling plan for wells in the vicinity of the installation. This sampling will be funded outside of the DSMOA.

WRIGHT-PATTERSON AIR FORCE BASE:

Document Review:

The following documents were reviewed during this period:

Draft Final Current Conditions Risk Assessment for the Basewide Monitoring Program. Received on May 2, 1997. Approval letter sent July 7, 1997.

Baseline sampling results from OU2 for the Basewide Monitoring Program at WPAFB. Received on July 16, 1997. Verbal comments were provided on August 12, 1997.

90% Design for the Construction of a French Drain for Spill Site 11, Operable Unit 8. Received on June 2, 1997. Comments were submitted on July 8, 1997.

The Action Memorandum for the Excavation and Removal of Landfill 12. Received on June 18. Comments were submitted on July 11, 1997.

Draft Final Remedial Investigation Report for Operable Unit 9 (Revision 2). Received on June 13, 1997. Comments were provided on July 9, 1997.

Draft Final Remedial Investigation Report for Operable Unit 9 (Revision 3) Received on July 17, 1997. Comments were provided on July 25, 1997.

Final (100% Design) for Regrading of Landfill 9. Received on June 30, 1997. Comments were submitted on July 9, 1997.

Surface Soil Sampling Plan for the DRMO, Operable Unit 9. Received on August 12, 1997. Comments were submitted on August 14, 1997.

Final Report for Landfill Cover Project for Landfill 11. Received on August 2, 1997. Approval letter was provided on September 10, 1997.

Draft Final Action Memorandum for the Excavation and Removal of Landfill 12. Received on September 4, 1997. Comments were provided on September 10, 1997.

Final Field Investigation Report for Operable Unit 11. Received on September 4. Approval letter was provided on September 10, 1997.

Draft Final Soil Sampling Plan for the DRMO, Operable Unit 9. Received on September 4, 1997. Comments were provided on September 10, 1997.

Final Remedial Investigation Report for Operable Unit 9. Received on September 11, 1997. Approval letter was provided on September 11, 1997.

Addendum to the Field Investigation for the Remedial Investigation at Operable Unit 4. Received on August 15, 1997. Comments were provide on September 15, 1997.

Request to Waive Requirement to Prepare and Submit a Work Plan for the Removal Action for Operable Unit 6. Approval letter sent on September 22, 1997.

Draft Treatability Study Report for Operable Unit 8. Received on August 22, 1997. Comments were provided on September 22, 1997.

Draft Future Conditions Risk Assessment for the Basewide Monitoring Program. Received on August 25, 1997. Comments were submitted on September 25, 1997.

Draft Final Record of Decision for Operable Unit 2. Received on September 11, 1997. Currently under review.

Draft Removal Action Work Plan for Landfill 12. Received on September 11, 1997. Currently under review.

Site Visits:

July 2:	Ohio EPA personnel provided oversight on the Bioslurper project at OU8.
July 28:	Ohio EPA personnel provided oversight at Landfills 5, 8, 6, 10 and 11.
August 8:	Ohio EPA personnel provided oversight at Landfills 5, 8, 6, 10 and 11.
August 12:	Ohio EPA personnel provided oversight on the regrading project at Landfill 6 .
August 21:	Ohio EPA Surface water, OFFO and WPAFB personnel conducted a site survey at Landfills 8, 10, and 5 to determine if temporary erosion controls were removed from the landfills and that the sites were in good condition.
August 25:	Ohio EPA personnel provided oversight on the regrading project at Landfill 6 and the Bioslurper project.
August 28:	Ohio EPA personnel provided oversight on the regrading project at Landfill 6 and the Bioslurper project.
September 18:	Ohio EPA personnel provided oversight on Landfills 1, 2, 6, 7 and 9 and Operable Unit 8.
September 22:	Ohio EPA personnel provided oversight on Landfills 1, 2, 6, 7 and 9 and Operable Unit 8.
September 24:	Ohio EPA personnel provided oversight on Landfills 1, 2, 6, 7 and 9 and Operable Unit 8.

Meetings and Conference Calls:

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

July 24:	Ohio EPA, U.S.EPA, and WPAFB met to discuss the mercury removal action at Heating Plant 2
August 12:	Ohio EPA, U.S.EPA, and WPAFB met to discuss the Baseline Sampling results for Operable Unit 2. Based on the sampling results, the agencies reached consensus to proceed with finalizing the Record of Decision (i.e. natural attenuation) for this Operable Unit.
August 13:	Ohio EPA, U.S.EPA, and WPAFB met to discuss the EE/CA for the Basewide Monitoring Program at WPAFB.
August 27:	Ohio EPA, WPAFB, and USEPA participated in a conference call to discuss the sampling event to be conducted at the DRMO.
September 19:	Ohio EPA met with WPAFB to finalize our 2 year work plan and 6 year narrative for the new CA.

Accomplishments:

On July 26, the leachate pipeline at Operable Unit 1 which connects to Fairborn's POTW, successfully came on line.

On July 23, a meeting was held between Ohio EPA and WPAFB concerning the mercury removal action at Heating Plant 2. Based on the results of this sampling from this removal, it appears that the mercury contamination at this facility has been adequately addressed.

On August 13, WPAFB conducted a tour of the landfills with the Environmental Advisory Board. During this tour, members provided suggestions on possible reuse of the landfills.

On September 29, WPAFB began mobilization for the excavation and removal of Landfill 12.

On September 30, U.S.EPA signed the Record of Decision for Operable Unit 2 at WPAFB.

AIR FORCE PLANT #85:

Document Review:

The following documents were reviewed during this period:

Draft Results of Soil, Ground-Water, Surface-Water and Streambed-Sediment Sampling at Air Force Plant 85, Columbus, OH, 1996. Received on August 12, 1997. This document provides a summary of the US Geological Survey's (USGS) data collection activities to determine site hydrogeology and contaminant characterization. Comments were submitted to USGS on September 5, 1997.

Draft Addendum to the Environmental Baseline Survey for Air Force Plant 85, Columbus, Ohio. Received on August 1, 1997. This document updates the current status of identified sites and provides Voluntary Action Program eligibility information and Phase I documentation. Comments were submitted on September 8, 1997.

Site Assessment, Incident No. 2531387; Air Force Plant #85. Received on September 16, 1997. This report addresses the investigations completed at UST #257 under the Bureau of Underground Storage Tank Regulations (BUSTR) program. Ohio EPA will defer comments to BUSTR.

Site Visits:

July 21:	Ohio EPA personnel observed field activities for plenum, sewer, and UST project
July 24:	Ohio EPA personnel observed field activities for plenum, sewer, and UST project
July 29:	Ohio EPA personnel observed field activities for plenum, sewer, and UST project
August 1:	Ohio EPA personnel observed field activities for plenum, sewer, and UST project
August 14:	Ohio EPA personnel observed field activities for plenum, sewer, and UST project

Meetings:

August 14:	Ohio EPA, Air Force and their contractor update projects at the site

August 14: Air Force, IT Corporation, and /Ohio EPA site walk through of the PCB transformer cleanups

Accomplishments:

Building 3- Plenum cleanup is complete. Approximately 15 cubic yards of contaminated material was removed.

Sanitary/storm sewer video investigation was completed in August.

Site assessment report was submitted to BUSTR for UST #257.

IT Corp. has cleaned 28 of 29 transformer vault locations. Cleanup has primarily involved pressure cleaning of cement floors/pads to the TSCA standard and encapsulation of the cleaned surface.

Miscellaneous:

Site 3 PCB remediation has new funding, the project will continue in October/November 1997.

Air Force is evaluating the possibility of utilizing Ohio's Voluntary Action Program to address a number of sites at the plant. Ohio EPA feels that the current DSMOA agreement will provide the flexible oversight to achieve site closures more efficiently and at a lower cost. Further discussions of this issue are planned.

Final title transfer of the property to the new owners is still pending.

Media Activity: Columbus Dispatch -7/11/97. "Executive Jet to lease site near airport" Executive Jet is interested in leasing Building 7 for use as a flight operations hangar.

SPRINGFIELD MPT (BECKLEY):

Document Review:

The following documents were reviewed during this reporting period:

Draft Quality Assurance Project Plan, Statement of Work, and Health and Safety Plan for the Springfield Air National Guard Base. Received on June 19, 1997. Comments were submitted on August 28, 1997.

Draft Site Specific Work Plan for Springfield Air National Guard Base. Received on July 29. Comments were sent on August 28, 1997.

Site Visits:

There were no site visits during this reporting period.

Meetings:

September 16: Ohio EPA personnel met with Air National Guard to resolve comments on the draft Remedial Investigation Work Plan.

BLUE ASH NGS:

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 held concerning the current or future clean-up during this reporting period.

RICKENBACKER AGB:

Document Review:

The following documents were reviewed during this reporting period:

Feasibility Study Data Acquisition Plan to fill data gaps for Sites 2, 21, 41, 42 and 4. Received on June 19, 1997. A conference call was held on June 26, 1997 to discuss any issues and was followed by a comment letter delivered to the base on July 15, 1997.

Responses to Comments on the Feasibility Study Data Acquisition Plan. Received on August 15, 1997 and discussed during a conference call on September 15, 1997.

Revised Feasibility Study Data Acquisition Plan to fill data gaps for Sites 2, 21, 41, 42 and 4. Received on September 23, 1997. Comments were resolved during a conference call on September 29, 1997.

Final No Further Remedial Action Planned Decision Documents for Sites 5, 7, 10, 13, 14, 15, 16, 22 and 26, the Former Sewage Water Treatment Plant, Building 439 and Building 71. Received on August 7, 1997. Some of these documents needed minor revisions and have all been approved as of September 30, 1997.

Second Set of Response to Comments on the Phase II Remedial Investigation Report. Received on June 11, 1997. The revised pages for Sections 1-5 and 7 were received on June 16, 1997 and incorporated both rounds of comments. Additional comments were sent to the base on August 5, 1997. Responses to these comments were received on August 21, 1997.

Site Visits:

There were no site visits during this reporting period.

Meetings:

July 15:	A Base Closure Project Team meeting was held on July 15, 1997 at Central District Office. Donna Kopeski substituted as facilitator for Ron Wroblewski who had a heart attack the previous Friday.
July 15:	Restoration Advisory Board Meeting was held at the Hamilton Township Community Center. George Kinney was elected as the new co-chair to replace Tim Richardson. The meeting focused on updating the community on the remedial investigation.
July 25:	A follow-up peer review for Sites 2 and 25 was held via conference call. The project was validated by the peer review team. U.S. EPA did not participate in the call.
August 15:	A Base Closure Project Team meeting was held at the base. This was followed by a partnering session.
August 25:	A meeting was held at the request of the BCT to discuss outstanding issues on the RI/FS effort with IT Corp. and the Rickenbacker Port Authority.
September 17:	A Project Team meeting was held in Chicago, U.S. EPA, on September 17, 1997.

Miscellaneous:

Work began at Site 6 the week of July 7, 1997. The building was removed prior to beginning the excavation of contaminated soil. On July 17 and 21, 1997, six unknown USTs were uncovered under the building. All USTs were 500 gallons or less in size.

Work began at Site 45 following the work at Site 6. USTs were removed from this site, as well as contaminated soil. Building 538 work began after Site 45 work was complete. USTs were removed at this location, as well as contaminated soil.

Accomplishments:

The second set of five success stories were finalized during July 1997 and copies were sent to Galileo Quality Institute to be placed in notebooks. Notebooks will be distributed to Tier I/Tier II members.

The electroosmosis project using lasagna technology at Site 12 is up and running at the Iron Test Cell. The BioCell is currently in the remediation phase.

The soil removals at Site 6 and Building 538 are complete. Two soil stockpiles are left at Site 45, otherwise, the work is also complete at this location.

Twelve NFRAP decision documents were signed by the BCT this quarter.

NEWARK AFB:

Document Review:

The following documents were reviewed during this reporting period:

Draft Finding of Suitability to Lease for Facilities 102 and 114, dated August 8, 1997. Ohio EPA submitted comments to AFBCA on August 19, 1997.

Site Visits:

There were no site visits during this reporting period.

Meetings:

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

Miscellaneous:

Began the new DSMOA cooperative agreement process for the new CA.

TOLEDO AIR NATIONAL GUARD BASE:

Document Review:

The following documents were reviewed during this reporting period:

Final Engineering Evaluation/Cost Analysis Memorandum. Received this quarter. Currently under review.

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:

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.

Miscellaneous:

The Ohio EPA site coordinator for this project, Ralph Baker, is no longer working on this site. A new project coordinator should be named next quarter.

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

Document Review:

The following documents were reviewed during this reporting period:

Draft Finding of Suitability to Transfer for Parcel D. Comments submitted on August 29, 1997.

Site Visits:

There were no site visits during this reporting period.

Meetings:

August 13:	Refresher course on partnering for the Base Closure Team
August 14:	A Base Closure Team meeting was held
August 14:	Restoration Advisory Board Meeting
August 27:	The Base Closure Team met for Gentile to try to develop a plan to resolve perceptions that are impacting the success of the team.
September 16:	A Base Closure Team meeting was held
September 17:	Conference call between the Base Closure Team to develop data validation procedures for revalidation of the data from the Phase II RI
September 18:	Conference call between the Base Closure Team to develop data validation procedures for revalidation of the data from the Phase II Remedial Investigation

Current Issues:

Though communication problems continue with the BRAC Cleanup Team at the former Defense Electronics Supply Center in Kettering, there has been some resolution of issues. On August 14, the BCT met and discussed what their roles are, and tried to resolve perceptions among the team members. This discussion continued on August 27, with the team developing a strategy for how to resolve perceptions and communication problems that are impacting the team. However, one major outstanding issue that remains and may effect the transfer dates of two parcels is the quality of data from the Phase II RI. Discussions are ongoing concerning U.S.EPA's proposal for an independent contractor to perform 100% validation of Pesticide/PCB and Chlorinated Herbicides data, with a minimum of 25% validation for VOCs, SVOCs, and metals.

Also, both the U.S.EPA Remedial Project Manager and Ohio EPA site coordinator for Gentile AFS have left the team. They will be replaced by new team members in October.

DEFENSE CONSTRUCTION SUPPLY CENTER (DCSC):

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.

YOUNGSTOWN AIR RESERVE STATION:

Document Review:

The following documents were reviewed during this reporting period:

United States Air Force, Installation Restoration Program, Site Investigation Report for Youngstown Air Reserve Station. Received on April 1, 1997. Comments submitted on June 14, 1997 (continuation from last quarter's report.)

Site Visits:

There were no site visits during this reporting period.

Meetings:

There were no meetings during this reporting period.

PLUM BROOK ORDNANCE WORKS:

Document Review:

The following documents reviewed during this reporting period:

Site Investigations of the Reservoir Number 2 Burning Ground, Wastewater Disposal Plant Number 2 and Powerhouse Number 2 Ash Pit. Received April 28, 1997. Currently under review.

Site Visits:

September 24: Ohio EPA personnel visited the site to observe monitoring well drilling and installation

Meetings:

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

SHARONVILLE ENGINEERING 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 LOCKBOURNE AIR FORCE BASE:

Document Review:

The following documents were reviewed during this reporting period

Final Sampling and Analysis Plan and Safety and Health Plan for the Phase II Site Investigation. Received on June 24, 1997. The document was reviewed and approved on July 15, 1997.

Site Visits:

July 15: Ohio EPA personnel observed field work

July 21: Ohio EPA personnel observed field work

July 25: Ohio EPA personnel observed field work

August 7: Ohio EPA personnel observed field work

September 16: Ohio EPA personnel observed field work

Meetings:

July 15: A kick-off meeting was held to brief everyone on the work schedule and answer any questions. This was followed by a site walk over.

August 18: A conference call was held with U.S. EPA, the Army Corps, ERM and Ohio EPA to discuss monitoring well development.

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.

Current Issues:

Recent sampling at the site indicates that contaminated ground water may be leaving the facility. ACOE will be forwarding plans to investigate this issue to Ohio EPA.

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:

The following documents were reviewed during this reporting period:

Response to Comments (RTC) on the draft Final Report for the Site Investigation at the

Former Lordstown Ordnance Depot. Verbal comments given to USACE.

Final Report for Site Investigation at Former Lordstown Ordnance Depot, Lordstown, Ohio. Received on July 29, 1997. The document was reviewed and comments sent to USACE on August 7, 1997.

Draft Work Plan, Remedial Investigation, Former Lordstown Ordnance Depot, Lordstown, OH. Received on July 25, 1997. The document was reviewed and comments sent to USACE on August 27, 1997. (Draft comments faxed to USACE on August 21, 1997).

Site Visits:

August 14: Ohio EPA personnel conducted a site visit to orient new groundwater personnel to the FUD, and to GPS in the installation's coordinates.

Meetings:

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

Miscellaneous:

Numerous phone calls with USACE and in-house discussions with DDAGW personnel regarding site-related 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:

There were no documents reviewed during this reporting period.

Site Visits:

There were no site visits during this reporting period.

Meetings:

July 30:	Meeting between Ohio EPA and ACOE concerning the Ridgewood Ordnance Plant, and whether a pump and treat system installed by the City of Cincinnati will address contamination found there. At the meeting, ACOE provided additional data (which had previously not been supplied to OEPA) that supported their position. Ohio EPA is reviewing this information.
August 22:	Meeting between Ohio EPA, ACOE, and the City of Cincinnati met to discuss future actions to be taken at the Ridgewood Ordnance Plant.

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

February 10, 1997

RE: Ravenna Army Ammunition Plant
Portage/Trumbull Counties
OAC 3745-27-13

Mr. Tim Morgan
Department of the Army
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, OH 44266-9279

Dear Mr. Morgan:

During a recent conversation, you inquired as to the definition of "grading" as it would be utilized in Ohio Administrative Code (OAC) 3745-27-13. Specifically, the request was made with respect to the potential for ruts to be left in the ground surface by logging vehicles in the vicinity of identified Areas of Concern (AOCs) that are being investigated as part of the Phase 1 Remedial Investigation (RI) at the installation. The question was raised as to whether or not the "smoothing over" of these ruts would constitute "grading" under OAC 3745-27-13.

In a conversation with Mr. John Watkins of Ohio EPA's Division of Solid and Infectious Waste Management (DSIWM) on 02/06/97, it was determined that this particular activity would not constitute "grading." It would, in fact, be considered as part of routine maintenance, and as such, the rule would not apply. However, the attempt should be made to minimize the potential for ground surface disturbance and potential exposure to contaminants during the above-referenced activities, especially in light of the fact that the nature and extent of the contamination at the Phase 1 RI AOCs has not been determined as of this date.

I trust that this correspondence answers your concern. If you have any questions, please do not hesitate to contact me at 216-963-1221.

Sincerely,

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

ETM.wmk

cc: Bob Princic, NEDO DERR
Bonnie Buthker, OFFO SWDO
John Watkins, NEDO DSIWM
Sheila Abraham, NEDO DHWM

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

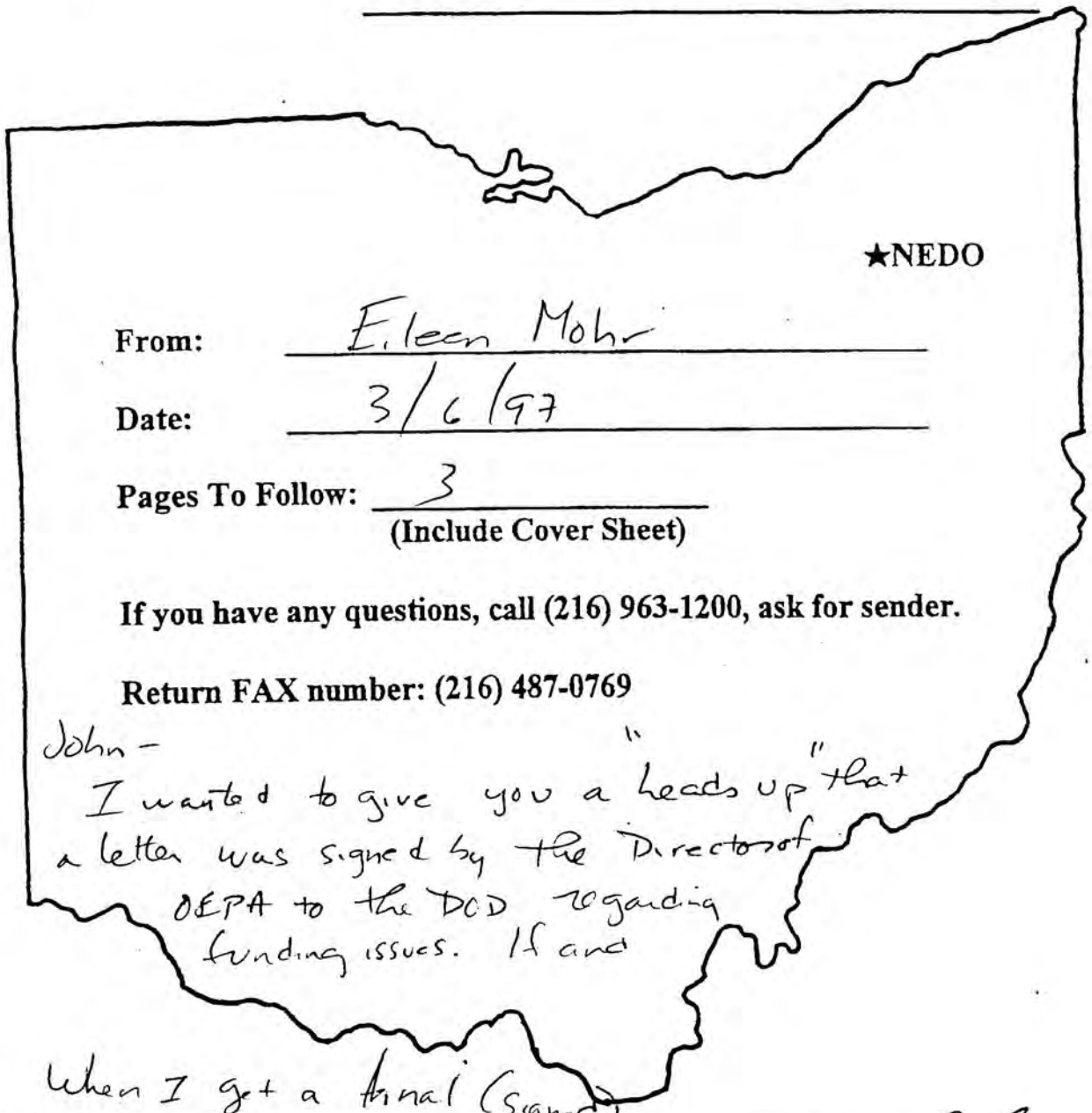
George V. Voinovich
Governor

FAX Transmittal Sheet

TO: John Cicero
RVAAP

FAX Number: 330-358-7314

Subject: Attached Letter



From: Eileen Mohr

Date: 3/6/97

Pages To Follow: 3
(Include Cover Sheet)

If you have any questions, call (216) 963-1200, ask for sender.

Return FAX number: (216) 487-0769

John -
I wanted to give you a "heads up" that a letter was signed by the Director of OEPA to the DOD regarding funding issues. If and when I get a final (signed) copy, I'll send it to you.

Eileen

* * * TRANSM. ION RESULT REPORT (MAR. 6.1997 20PM) * * *

TTI OHIO EPA NEDO

DATE	TIME	ADDRESS	MODE	TIME	PAGE	RESULT	PERS. NAME	FILE
MAR. 6.	3:18PM	330 358 7314	TES	1'24"	P. 3	OK		090

# : BATCH	C : CONFIDENTIAL	$: TRANSFER	P : POLLING
M : MEMORY	L : SEND LATER	@ : FORWARDING	E : ECM
S : STANDARD	D : DETAIL	F : FINE	> : REDUCTION

Mr. William Cohen, Secretary
U. S. Department of Defense
Office of the Secretary
Room 3E880
The Pentagon
Washington, D.C. 20301-1000

Dear Secretary Cohen:

The Ravenna Army Ammunition Plant (Ravenna) is one of the largest federal facilities in Ohio and a priority for cleanup and reuse. Limited sampling efforts have indicated significant concentrations of environmental contamination. For example, high levels of TNT, PCBs and lead have been detected in surface soils and sediments. Of particular importance, the TNT levels in some samples are greater than 10% which the Army considers reactive.

Ohio had noted positive signs in 1996 that the Army was beginning cleanup work at Ravenna. Characterization efforts began and the Army established a Restoration Advisory Board to involve the local stakeholders in the cleanup and reuse process. However, recent developments raise concerns about the Army's commitment to maintain the effort at Ravenna.

- On January 28, 1997, my staff participated in a conference call with staff from Industrial Operations Command (IOC) to discuss environmental restoration funding. In this call IOC staff pointed out that their DERA budget had been cut from $120 million in FY 1996 to $60 million in FY 1997. Ravenna would receive only $100,000 for FFY 1997 with future funding expected to remain at the same level. I am concerned that this funding level will not permit characterization efforts to continue or allow any necessary actions to protect human health and the environment.

- At the Federal Facility Forum in Dayton, Ohio on January 22-23, 1997, IOC staff informed us that the bases and depots that would receive munitions from Ravenna are full from base closures overseas. It was projected that it would be at least 2002 until munitions would be moved from Ravenna. I believe this will slow down cleanup and reuse efforts at Ravenna.

Ohio has made the cleanup and reuse of federal facilities a priority. We also believe that Ohio has a track record of success in working with your Department to clean up sites. In 1998, Ohio will complete cleanup of the Wright Patterson AFB near Dayton. Significant progress has been made to cleanup this Superfund site through efforts to improve working relationships (partnering efforts with Ohio, USEPA and the Air Force), streamlining of the cleanup process, and the use of innovative technologies and presumptive remedies. These efforts have reduced total cleanup costs by millions of dollars and reduced the schedule for cleanup by as much as 10 years. Ohio would like to establish a similar relationship with the Army and the Ravenna site. To make this effort successful the Army will need to make serious commitments to:

- Provide sufficient long term stable funding for the cleanup and reuse of Ravenna
- Provide funding and a commitment for the removal of munitions from Ravenna
- Work with Ohio and other stakeholders to jointly develop a strategic plan to integrate the components of cleanup, munitions removal, and reuse.

Although we are aware that funding for cleanup efforts at Department of Defense sites has been reduced, we believe the Army will save money in the long term if they address cleanup and reuse issues now. We look forward to working with the Army to meet these challenges. Please contact Bonnie Buthker at (937) 285-6469 or Graham Mitchell at (937) 285-6018 if you have any questions.

Sincerely,

Donald R. Schregardus
Director

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

August 13, 1997

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

Dear John:

On an annual basis, the Northeast District Office (NEDO) Division of Emergency and Remedial Response (DERR) holds a training experience for the division staff and management on a variety of topics. This year, we will be having two DERR staff members from our Ecological Assessment Unit (EAU) in Columbus provide training on the Qualitative Habitat Evaluation Index (QHEI). The QHEI is a visible, non-intrusive method of measuring surface water habitat quality by examining several characteristics in each of the following six categories: substrate, in-stream cover, riparian characteristics, channel characteristics, pool and riffle quality, and gradient and drainage area.

If possible, we would like to conduct our training session in the stream running through the gorge area on the northern section of the Ravenna Army Ammunition Plant (RVAAP) property. The date of the training is scheduled for Friday September 19, 1997. It would last approximately a few hours, and would be attended by a maximum of twenty-eight people. Of course, you and any other RVAAP employees would be more than welcome to join us during the training session.

Thank you for your consideration of this request. Please contact me at 216-963-1221 to let me know if this would be possible, and if so, what requirements would need to be met (for example, if you would need a list of names and how much in advance you would need the list, etc.).

Sincerely,

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

ETM.wmk

cc: Rod Beals, NEDO DERR
Bob Princic, NEDO DERR
Steve Love, NEDO DERR

RCRA HAZARDOUS WASTE GENERATOR
COMPLIANCE EVALUATION INSPECTION CHECKLIST

Company: US Army - Ravenna Ammunition Plant EPA I.D.: OH 5210020736

Street: 8451 St. Rt 5 City: Ravenna,

County: Portage State: Ohio Zip: 44266-9297

Mailing Address: (IF DIFFERENT FROM ABOVE)

Telephone: 330-358-7311 Fax: 330-358-7314

Owner/ Operator: (IF DIFFERENT FROM ABOVE)

Street:

City: State: Zip:

Inspection Date(s): 9/24/97 Time(s): 9 AM - 3:15 pm

Inspection announced? Yes X No ___ If so, how much advance notice given? 9/22/97

	Name	Affiliation	Telephone
Inspectors:	Ken Bardo	USEPA	312-886-7566
	Lisa Capron	US EPA	312-886-0878
Facility Rep(s):	Mark Patterson	US Army	330-358-7311

GENERATOR CLASSIFICATION	WASTE MANAGEMENT ACTIVITY
X Conditionally Exempt SQG (CESQG)	X Containers
___ Small Quantity Generator (SQG)	___ Tank(s)
___ Large Quantity Generator (LQG)	___ Other (specify)
___ No Generation	

CESQG: < 100 Kg (approx. 25-30 gallons) of waste in a calendar month

SQG: between 100 and 1000 Kg (about 25 to under 300 gallons) of waste in a calendar month

LQG: > 1000 Kg (~ 300 gallons) of waste in a calendar month or > 1 Kg of acutely hazardous waste in a calendar month

NOTE: *To convert from gallons to pounds: Amount in gallons x Specific Gravity x 8.345 = Amount in pounds*

POLLUTION PREVENTION

Note to the Inspector: This checklist has been developed to help the division in gathering general information about the pollution prevention practices initiated by companies across the state. Asking the company about each bullet point noted below the questions is not necessary. It is only necessary to ask the company the general questions about pollution prevention activities. If the company responds with one of the canned answers below, the appropriate box may be checked. If the company's response does not correspond to one of the options below, please record the answer in the space provided or in the remarks section.

1. Has the company undertaken any pollution prevention activities to reduce the amount of hazardous waste generated? Yes X No__ N/A__ RMK#__

   (a) ***If so,*** what has the company done to minimize hazardous waste generation?

   - ❑ A change in the process resulting in less waste
   - ❑ A change in the product resulting in less waste
   - ❑ Use of fewer and less toxic hazardous raw materials
   - ❑ Better operations/improved housekeeping
   - ❑ On-site recycling/reuse of hazardous materials
   - ❑ Sending waste off-site for recycling/reuse
   - ❑ Other activities (specify) have P2 plan, v. with generated thought investigative derived waste

   (b) ***If so,*** what hazardous wastes have been addressed?

   - ❑ Solvents
   - ❑ Paint related waste
   - ❑ Industrial process wastes (sludges, slags, contaminated waste waters, etc.)
   - ❑ Contaminated oils/hydraulic fluids
   - ❑ Off-spec chemicals
   - ❑ Fluorescent light bulbs
   - ❑ Used batteries
   - ❑ Shop rags
   - ❑ Other (specify) _____

   (c) ***If not,*** why hasn't the company considered pollution prevention?

   - ❑ The company just never thought about it
   - ❑ Lack of information about the alternatives that are practical for them
   - ❑ Lack of capital to make process changes
   - ❑ Lack of internal management support
   - ❑ The company does not generate enough hazardous waste to consider pollution prevention
   - ❑ Other reason given (specify) _____

2. Does the company plan to do pollution prevention activities in the future? Yes__ No X unless necessary N/A__ RMK#__

3. Would the company be interested in receiving additional information from the Ohio EPA about pollution prevention? Yes X No__ N/A__ RMK#__

REMARKS

RCRA HAZARDOUS WASTE FACILITY
COMPLIANCE EVALUATION INSPECTION CHECKLIST

Facility: US Army Ravenna Army Ammunition Plant

USEPA I.D.: OH 5210020736 HWFB No.: _____

Street: 8451 State Route 5

City: Ravenna State: OH Zip: 44266-9297

County: Portage Telphone: 330-358-7311

Fax No: 330-358-7314 PUCO No.: _____

Owner/Operator: _____

Street: _____

City: _____ State: _____ Zip: _____

Telephone: _____ Fax: _____

Inspection Date: 9/24/97 Time: 9Am - 3:15pm

Advance notice of inspection given? (yes) X (no) ____
If so, how far in advance? 9/22/97

	Name	Agency/Title	Phone
Inspectors:	Ken Bardo	US EPA	312-886-7566
	LISA CAPRON	US EPA	312 886-0878
Facility Representative:	Mark Patterson	DOA	330-358-7311

STATUS

Cond. Ex. SQG X SQG___ Large Quantity Generator___
Treatment___ Storage___ Disposal___ Transporter___

Part A Permit: (yes) X (no) ___ Part B Permit: (yes) X (no) ___
LDR Checklist Attached: (yes) X (no) ____

ACTIVITIES

Containers X
Tanks___
Wastepile___
Landfill___
Surface Impoundment___
Used oil burner___
Hazardous waste fuel burner/blender___
Incineration/Thermal treatment X
Land treatment___
Groundwater monitoring___

PERMIT STATUS

GENERAL REQUIREMENTS	Y/N/NA	RMK #
1. Has the owner/operator submitted a Part A application to Ohio EPA in accordance with OAC 3745-50-40?	Y	
When was the owner/operator's Part A submitted: _____		
2. Is the owner/operator operating in compliance with the terms and conditions of its HWFB permit?	NA	
If not, has a Permit Change Request (PCR) been submitted in accordance with 3745-50-51?		
If yes, what date was the PCR submitted? _____		
3. Has the owner/operator submitted a Part B?	Y	#1

PERMIT BY RULE REQUIREMENTS

4. Has there been a rule or statute <u>change</u> which has caused the owner/operator to become subject to Ohio's hazardous waste facility permitting requirements?	N	
a. If so, please describe the rule change below:		
b. What was the effective date of the rule or statute change in Ohio?		
c. Did the owner/operator submit a Part A to the Director in accordance with the requirements of OAC rule 3745-50-40(C)(D)?	NA	

NOTE: In accordance with 3745-50-40(D), owners/operators are required to submit the Part A within 30 days after the date they first become subject to Ohio's TSD facility standards. Small quantity generators who treat, store or dispose of wastes were required to submit a Part B by the effective date OAC Rule 3745-50-40. [See OAC Rule 3745-50-40]

d. Did the owner/operator notify the US EPA of its hazardous waste activity? [3745-50-40(C)(1)(a)]	Y	
i. What was the date of notification?	8/15/80	

	Y/N/NA	RMK #
f. **FOR OFF-SITE FACILITIES:** The sampling methods and procedures which will be used to inspect and, if necessary, analyze each movement of hazardous waste received at the facility to ensure that it matches the identification of the waste on the manifest [3745-65-13(C)]?	NA	
g. **FOR FACILITIES OPERATING SURFACE IMPOUNDMENTS EXEMPT FROM LAND DISPOSAL RESTRICTIONS UNDER 3745-59-04(A):**	NA	
Does the waste analysis plan include procedures and schedules for:		
i. The sampling of impoundment contents? [3745-65-13(B)(7)]	NA	
ii. The analysis of test data? [3745-65-13(B)(7)]	NA	
iii. The annual removal of residues which are not delisted or which exhibit the characteristic of a hazardous waste and either do not meet treatment standards (3745-59-44) or where no treatment standards have been established? [3745-65-13(B)(7)]	NA	
h. **Where applicable:** The methods which will be used to meet the additional waste analysis requirements of rules 3745-59-07, 3745-67-25, 3745-67-52, 3745-67-73, 3745-68-14, 3745-68-41, 3745-68-75 and 3745-69-02 of the OAC? [3745-65-13(B)(6)]	NA	

WASTE ANALYSIS PLAN - LDR REQUIREMENTS

NOTE: The following requirements identified in Question #7 applies to both on-site and off-site TSD facilities.

7. In accordance with OAC Rule 3745-65-13(B)(6), does the the facility's waste analysis plan includes analytical procedures necessary to ensure compliance with the land disposal restriction requirements of Chapter 3745-59, including:		
a. Procedures for conducting the TCLP for wastes which have a CCWE treatment standard?		#2
b. Procedures for conducting a total constituent analysis for wastes which have a CCWE treatment standard?		#2

Y/N/NA RMK #

2. Does the operating record include documentation required to be maintained under the land disposal restriction requirements of Chapter 3745-59? [3745-65-73(b)(9) through (14)] ____ #3

NOTE: The following recordkeeping requirements are applicable only to off-site TSDS.

3. Are manifests received by the facility signed and dated? [3745-65-71(A)(1)] NA ____

4. Is one copy given to the transporter, one copy sent to the generator within 30 days and one copy kept for at least 3 years? [3745-65-71(A)] NA ____

   a. If shipping papers are used in lieu of manifests (bulk shipments, etc.), are the same requirements met [3745-65-71(B)]? NA ____

   b. Are any significant discrepancies in the manifest, as defined in 3745-65-72(A) noted in writing on the manifest document? NA ____

5. Have any manifest discrepancies been reconciled within 15 days as required by 3745-65-72(B) or has the o/o submitted the required information to the Director? NA ____

6. If the facility has accepted any unmanifested hazardous wastes from off-site sources for treatment, storage, or disposal, has an unmanifested waste report containing all the information required by 3745-65-76(A) been submitted to the Director within 15 days? NA ____

REMARKS - OPERATING RECORD REQUIREMENTS

#1 - facility is in process of withdrawing Part B /or has withdrawn it.

#2 - waste analysis plan is part of part B permit application, however facility has ceased operation of its hazardous waste units.

#3 - facility has ceased operation, past operating records are retained at site files.

SECURITY REQUIREMENTS (OAC 3745-65-14) Y/N/NA RMK #

1. a. Would physical contact with the waste structures or equipment injure unknowing/unauthorized person or livestock entering the facility? [3745-65-14(A)(1)] — Y —

   b. Would disturbance of the waste cause a violation of the hazardous waste regulations? [3745-65-14(A)(2)] — — —

IF BOTH 1A AND 1B ARE NO, MARK QUESTIONS 2 AND 3 NOT APPLICABLE.

2. Does the facility have -

   a. A 24-hour surveillance system, or; — —

   b. An artificial or natural barrier and a means to control entry at all times? [3745-65-14(B)(2)(a)(b)] — Y — #2

3. Does the facility have a sign "Danger-Unauthorized Personnel Keep Out" at each entrance to the active portion of the facility and at other locations as necessary? [3745-65-14(C)] — N — #1

REMARKS - SECURITY REQUIREMENTS

#1 - open detonation area + heat deactivation furnace had no posted danger signs

#2 - entire facility is surrounded by a fence.

CONTINGENCY PLAN (OAC 3745-65-50 THROUGH 3745-65-56) Y/N/NA RMK #

1. Does the o/o have a written contingency plan which contains the following [3745-65-52(A)(B)(C)(D)(E)]:

   a. Actions to be taken by personnel in the event of an emergency? Y ____

   b. Arrangements or agreements with local or state emergency authorities? Y ____

   c. Names, addresses and telephone numbers of all persons qualified to act as emergency coordinator? Y ____

   d. A list of all emergency equipment including location, physical description and outline of capabilities? Y ____

   e. If required due to the actual hazards associated with the waste handled, an evacuation plan for facility personnel? [3745-65-52(F)]? NA ____

2. Is the contingency plan designed to minimize hazards to human health or the environment from fires, explosions or any unplanned release of hazardous waste or hazardous waste constituents to air, soil or surface water? [3745-65-51(A)] Y ____

3. Is a copy of the contingency plan and any plan revisions maintained on-site and has it been submitted to all local and state emergency service authorities that might be required to participate in execution of the plan? [3745-65-53(A)(B)] Y ____

4. Is the plan revised in response to rule changes, facility, equipment and personnel changes or failure of the plan? [3745-65-54] Y ____

5. Is an emergency coordinator who is familiar with all aspects of site operation and emergency procedures who has the authority to implement all aspects of the contingency plan designated at all times (on-site or on-call)? [3745-65-55] Y ____

6. If an emergency situation has occurred, has the emergency coordinator implemented all or part of the contingency plan and taken all of the actions and made all of the notifications necessary under 3745-65-56(A-J)? NA ____

PREPAREDNESS AND PREVENTION (OAC 3745-65-30 TO 3745-65-37)	Y/N/NA	RMK #
1. Is the facility operated to minimize the possibilty of fire, explosion, or non-planned release of hazardous waste? [3745-65-31]	Y	
2. Has there been a fire, explosion or non-planned release of waste at the facility since date of last inspection?	N	
a. If yes, was the contingency plan implemented? [3745-65-51(B)]	NA	
3. If required due to actual hazards associated with the waste, does the facility have the following equipment: [3745-65-32(A)(B)(C)(D)]		
a. Internal alarm system?		#5
b. Access to telephone, radio or other device for summoning emergency assistance?	Y	
c. Portable fire control equipment, spill control and decontamination equipment?	Y	
d. Water of adequate volume and pressure via hoses, sprinkler, foamers or sprayers?		#5
4. Is all required spill control and decontamination equipment, fire and communications equipment tested on a weekly basis and maintained as necessary? [3745-65-33(A)]		#5
a. Does the facility keep an equipment testing log required by 3745-65-33(B), including date and time of test, observations made, and date and nature of any repairs?		#5
5. If required due to the actual hazards associated with the waste, do personnel have immediate access to an emergency communication device? [3745-65-34]		#5
6. If required due to the actual hazards associated with the waste, is adequate aisle space maintained to allow unobstructed movement of emergency or spill control equipment? [3745-65-35]		#5
7. If required due to the actual hazards associated with the waste, has the facility attempted to make appropriate arrangements with local authorities to familiarize them with possible hazards and facility layout? [3745-65-37(A)]	Y	

OAC 3745-66 CLOSURE AND POST CLOSURE

	Y/N/NA	RMK #
1. Is a written closure plan on file at the facility which contains the following elements: [3745-66-12]?	Y	#6
a. A description of how each hazardous waste management unit will be closed in accordance with 3745-66-11?		#6
b. A description of how final closure will meet the requirements of 3745-66-11?		#6
c. An estimate of the maximum amount of hazardous waste ever in inventory?		#6
d. A description of steps taken to remove or decontaminate facility equipment containment systems, structures, soils, and all hazardous waste residues?		#6
e. The year closure is expected to begin and a schedule for the various phases of closure?		#6
f. A description of other activities necessary to ensure closure with the performance standards including ground water monitoring, leachate collection, and run-off control?		#6
2. Has the closure plan (and post-closure plan, if applicable) been amended 60 days prior to any changes in facility design, processes, or closure dates or 60 days after an unexpected event occurs which affects the closure plan? [3745-66-12(C)]		#6
3. Has the closure plan (and post-closure plan, if applicable) for surface impoundment, waste pile, land treatment or landfill units been submitted to the Director 180 days prior to beginning the closure process? [3745-66-12(D)]		#6
4. Has the closure plan (and post-closure plan, if applicable) **FOR ANY NON LAND DISPOSAL UNIT(S)** been submitted to the Director 45 days prior to beginning the closure process? [3745-66-12(D)]		#6
5. Within 90 days of receipt of the final volume of waste or Director's plan approval, if that is later, was all hazardous waste treated, removed, or disposed in accordance with the approved plan? [3745-66-13(A)]	NA	
6. Was closure completed in accordance with the approved plan within 180 days after receipt of final volume of waste or approval of the plan, if that is later? [3745-66-13(B)]	NA	
7. Did the owner/operator submit to the Director, within sixty (60) days after completion of closure, certification by both the owner/operator and an independent registered professional engineer that the facility has been closed in accordance with the approved closure plan? [3745-66-15]	NA	

OAC 3745-68 INCINERATION AND THERMAL TREATMENT

	Y/N/NA	RMK #
1. Before adding hazardous waste, is the unit brought to steady state utilizing an auxiliary fuel? [3745-68-73 or 3745-68-45]	NA	#1
a. List type of auxilliary fuel used: _____		
b. Is the process a batch thermal treatment process? _____		
c. Is the unit a boiler, industrial furnace, thermal treatment unit, or incinerator? _____		
d. Does the unit burn waste which is hazardous solely due to ignitability, reactivity, or combustibility?		

WASTE ANALYSIS REQUIREMENTS

NOTE: In addition to analyses required under 3745-65-13, the following are minimum requirements for wastes not previously burned/treated [3745-68-41 and 3745-68-75]

2. Is the operator conducting an analysis of any waste which has not been previously burned in the incinerator as required by 3745-68-41?	Na	#1
If so, does the analysis include a determination of the following:		
a. Heating value of the waste? [3745-68-41(A)]		
b. Halogen content of the waste? [3745-68-41(B)]		
c. Sulfur content of the waste? [3745-68-41(B)]		
d. Concentrations of lead and mercury in the waste? [3745-68-41(C)]		
i. If the o/o does not have lead and mercury analysis, is written documentation available to show that these elements are absent from the waste? [3745-68-41(C)]		

	Y/N/NA	RMK #
5. At closure, have all hazardous wastes and residues been removed? [3745-68-51 and 3745-68-81]		#3
6. Does the owner/operator burn hazardous wastes F020, F021, F023, F026 or F027?	N	
a. If yes, has the unit been certified by the Director [3745-68-52 and 3745-68-83]		
7. Does the facility open burn or detonate waste explosives within the isolation distances specified in 3745-68-82?		#1

REMARKS - INCINERATION/THERMAL TREATMENT REQUIREMENTS

#1 units have not been operated since at least 1993. and are undergoing closure.

#2 units are inspected weekly to ensure security of area

#3 closure plans have been submitted,

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

January 14, 1997

RE: RAVENNA ARMY AMMUNITION PLANT
PORTAGE/TRUMBULL COUNTIES
OAC 3745-27-13

Mr. Tim Morgan
Department of the Army
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, OH 44266-9279

Dear Mr. Morgan:

During our conversation of 01/09/97, you asked whether or not an additional authorization request under Ohio Administrative Code (OAC) 3745-27-13 ("Rule 13") was necessary in order to conduct intrusive activities (i.e. "shovel tests") as part of archaeological surveys to be conducted at the following high priority Areas of Concern (AOCs): Load Line 1, Load Line 3, Load Line 4, and Load Line 12. In addition, you requested clarification as to the boundaries of each AOC listed above.

I have reviewed the correspondence dated 08/14/96 from the Director of the Ohio EPA, in which the RVAAP was granted authorization to conduct intrusive activities at the eleven (11) designated high priority AOCs. It is the Agency's determination that this authorization is sufficiently broad, such that the "shovel tests" to be conducted as part of the archaeological surveys, can be considered to be encompassed by the initial authorization. As such, no additional request for authorization needs to be submitted for review and approval. However, the RVAAP is cautioned that if the scope of the proposed investigative activities were to change, there needs to be further discussions with the Ohio EPA, in order to ensure that the activities are still covered by the original authorization. In addition, be advised that the conditions for approval detailed in the Director's letter will be in effect for the archaeological surveys.

I have also reviewed the request for authorization that was submitted to the Ohio EPA by RVAAP with respect to the designated boundaries for the AOCs. The boundaries designated as the "property boundaries" on the maps supplied to the Agency constitute the AOC boundary, as of this point in time. These boundaries may or may not change as additional analytical information is received as part of the on-going investigative activities at the RVAAP.

I trust that this information is of assistance to you. 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

cc: Bob Princic, NEDO DERR
Sheila Abraham, NEDO DHWM
Catherine Stroup, CO Legal
Bonnie Buthker, OFFO SWDO

ETM:ddb
Printed on recycled paper

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 2/11/97
CR,COR
PROP ADM
LAND MGR
CONTRACTOR
RETURN FOR FU

George V. Voinovich
Governor

February 10, 1997

RE: Ravenna Army Ammunition Plant
Portage/Trumbull Counties
Investigation-Derived Wastes

Mr. Kevin Jasper
Project Manager
US Army Corps of Engineers
Louisville District
ATTN: CEORL-DL-B
P.O. Box 59
Louisville, KY 40201-0059

Dear Mr. Jasper:

The Ohio Environmental Protection Agency (OEPA) Division of Emergency and Remedial Response (DERR) has received and reviewed a copy of the document entitled "Draft, Investigation-Derived Waste Characterization and Disposal Plan for the Phase 1 Remedial Investigation of High Priority Areas of Concern at the Ravenna Army Ammunition Plant, Ravenna, Ohio." This document, which is dated December, 1996, was prepared for the U.S. Army Corps of Engineers, and was submitted to the OEPA for review and comment under the auspices of the Defense-State Memorandum of Understanding (DSMOA).

This comment letter serves to summarize the on-site meetings with respect to investigation-derived waste (IDW) issues, as well as providing comments on the IDW plan.

GENERAL COMMENTS:

Meetings were held on-site at the Ravenna Army Ammunition Plant (RVAAP) between representatives from the Industrial Operations Command (IOC), the Army Corps of Engineers (ACOE), Science Applications International Corporation (SAIC), RVAAP officials, and the OEPA, on January 27 - 29, 1997. During these meetings, the issue of IDW was discussed. The following issues and plans for action were discussed and agreed upon by all stakeholders present:

1. The intent of the Army and the ACOE is to dispose of four (4) drums of IDW that could potentially be hazardous for lead and/or chlordane, based upon the correlative environmental samples. TCLP testing will be conducted prior to disposal. The sampling plan and analytical results must be acceptable to the disposing facility.

2. Representatives of the ACOE will conduct further inquiries and research into the issue of whether some of the IDW could potentially be reactive wastes.

3. Representatives of the ACOE will attempt to obtain a copy of the NASA Plumbrook IDW plan that was referenced during the meetings.

4. The OEPA DERR site coordinator will contact OEPA's Division of Solid and Infectious Waste Management (DSIWM) for their determination on the handling of two general "categories" of wastes presented in the RVAAP plan. Specifically, (1) solid IDW that contains concentrations of explosives above the detection limit and/or metals concentrations above the determined background, or (2) solid IDW that neither contains explosives, nor metals concentrations above the determined background. These IDW wastes include unsaturated soils, saturated soils and sediments. (The contact has been made, the OEPA DERR is awaiting resolution. Once the determination has been made, the decision will be transmitted to the Army and the ACOE.)

   The Agency's position is that any solid wastes that contain explosives compounds above the detection limit and/or metals above background should be disposed of at a licensed solid waste facility.

5. The OEPA DERR site coordinator will contact the NASA Plumbrook site coordinator to discuss that installation's IDW plan. The initial contact has been made, and discussions are in process.

In addition, during the above-referenced meetings, the OEPA re-iterated that it is the responsibility of the Army and ACOE to dispose of all IDW in accordance with all applicable State and Federal laws and regulations. Two additional suggestions were made by the OEPA: that the solid wastes could be taken off-site and disposed of properly at a licensed facility, or that the non-hazardous wastes could be stored on-site until such time that a final remedy is in place, whereupon the IDW would be remediated at that time. Additional issues were raised by OEPA, as to whether an additional authorization under Ohio Administrative Code (OAC) 3745-27-13 would need to be granted, or if a Permit to Install (PTI) would need to be issued from the OEPA Division of Surface Water (DSW) if spreading, mulching, and seeding were permitted.

SPECIFIC COMMENTS:

In Section 1.0, please revise the following statement to read "The Phase 1 RI was conducted in compliance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and work plans *reviewed and commented on* by the Ohio Environmental Protection Agency (OEPA). The change in terminology makes this section more consistent with the specifics set forth in the DSMOA, regarding the role of each stakeholder. (pg. 1)

In Section 3.0, please revise the following statement to read: "The Facility-Wide SAP (USACE 1996b) and the Phase 1 RI SAP Addendum (USACE 1996a) contain the procedures used for containerizing and handling IDW." This comment reflects the removal of the word "approved" prior to the term "procedures." (pg. 7)

In Section 3.2, provide an explanation for why excess sediment from subaqueous settling pond sampling stations was placed back into the pond at the conclusion of the sampling event. Why wasn't this IDW containerized? (pg.7)

In Section 4.0 (pg. 9), please provide additional justification for the following, as currently, the following are not acceptable to the OEPA:

a. that unsaturated soils from the drilling of the monitoring wells are being classified as non-hazardous and non-contaminated without sample characterization because they are "outside of known source areas" (this comment is also applicable to Section 5.1, pg. 10); and,

b. that the IDW generated from LL1mw-063 is adequately characterized from IDW generated at a point 20 feet away. (The text gives no indication as to the direction of the other boring, local topography, groundwater flow direction, potential source areas, etc.)

In Section 5.0 (pg. 9):

a. change the sentence in the first paragraph to read: "Analytical results for the IDW are compared with these criteria to determine whether the wastes are potentially hazardous or non-hazardous." The revision reflects the fact that the wastes, not the waste containers are potentially hazardous or non-hazardous.

b. change the sentence in the text to read "For the characterization of wastes (e.g. soils, sediments, etc.) as non-hazardous or hazardous....." This revision reflects the removal of the term "solid" prior to the word "waste."

c. provide in the text the justification that none of the detected constituents are U-listed wastes (for example, 1,3,5-trinitrobenzene, 2,4-dinitrotoluene, and nitrobenzene).

d. the selected disposal facility should be contacted in order to ensure that the characterization plan is adequate for their needs. In addition, TCLP may be required by the disposal facility(ies) prior to acceptance. The presence of PCBs in some of the samples may also be an issue to the disposal facility(ies).

In Section 5.1.2, clarify that it is a USEPA IDW policy that is being referred to, as Ohio EPA does not have an IDW policy in effect. In addition, the disposition of IDW at specified sites (ex. Wright-Patterson and NASA Plumbrook), does not constitute OEPA policy.

Provide assurance, that "background" levels for metals truly represent "background" locations and concentrations.

It is acceptable to consolidate hazardous wastes that are being sent off-site for prior disposal, if the wastes are compatible, and as long as all applicable waste codes appear on the drum(s).

With respect to Table 5.1 - "Summary of Waste Classification and Recommended Disposal Options" - please refer to the previous OEPA general comment regarding the disposition of these investigation-derived wastes.

In the text of the report, provide a detailed explanation for the results presented in Appendix A - "Ravenna Analytical Results for IDW Characterization, Non-Detects Included in Average." Although an explanation was presented during the on-site meetings as to how several of the concentrations reported in the "average result" column exceeded those reported in the "maximum detect" column, a detailed explanation must be provided in the text of the plan.

In Appendix B, provide an explanation for the columns: "site background criteria", "site related" and "justification." In addition, please provide the reference for the source described as "USGS Ohio Reference Values." If these are the Ohio Farm Soils values, please be advised that they have minimal applicability as reference values.

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.wmk

cc: Bob Princic, NEDO DERR
Sheila Abraham, NEDO DHWM
Catherine Stroup, CO Legal
Bonnie Buthker, OFFO SWDO
Dave Seely, USEPA Region V
John Cicero, RVAAP
Bob Whelove, IOC
Todd Boatman, ACOE Nashville
Mike Saffran, ACOE Louisville
John Jent, ACOE Louisville
Steve Selecman, SAIC

IRP 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

George V. Voinovich
Governor

March 6, 1997

RE: Ravenna Army Ammunition Plant
Portage/Trumbull Counties
Phase 1 Investigative Report

Mr. Kevin Jasper
Project Manager
U.S. Army Corps of Engineers
Louisville District
ATTN: CEORL-DL-B
P.O. Box 59
Louisville, KY 40201-0059

RECEIVED
MAR 7 1997
By

Dear Mr. Jasper:

The Ohio Environmental Protection Agency (OEPA) has received and reviewed copies of the two-volume document entitled "Draft, Remedial Investigation Report for the Phase 1 Remedial Investigation of High Priority Areas of Concern at the Ravenna Army Ammunition Plant, Ravenna, Ohio." These documents, dated December, 1996, were prepared by the contractor for the U.S. Army Corps of Engineers (ACOE), Nashville District, under contract number DACA62-94-D-0029, and were received at OEPA on December 20, 1996.

The documents were reviewed by personnel in the Division of Emergency and Remedial Response (DERR) Northeast District Office (NEDO), DERR Central Office (CO) Environmental Assessment Unit (EAU), and NEDO Division of Drinking and Ground Waters (DDAGW). This letter reflects a compilation of comments from all reviewers, and will follow the same general format as the two-volume document.

It is the Agency's understanding that March 19-20, 1997, have been designated as a meeting time between all involved parties, such that resolution can be reached on any outstanding issues. It is also the OEPA's understanding that a comment resolution document will be submitted to the Agency prior to the designated meeting times. In addition, as the report is undergoing concurrent review by the ACOE and the Industrial Operations Command (IOC), the OEPA requests that copies of the ACOE's and IOC's comments, and the resultant comment resolution documents be submitted to this Agency, such that the OEPA is aware of any other potential issues raised by the other stakeholders.

The OEPA has the following comments on the two-volume document:

GENERAL COMMENTS

On both volumes of the report, remove the initial part of the title which indicates that this is a "remedial investigation report." As has been previously discussed, and which appears on page 1-4 of the Phase 1 Remedial Investigation (RI) report, the Phase 1 RI report is consistent with the requirements of a Site Investigation (SI), not a RI. (binder cover page and inside cover page)

Throughout the document it is stated that explosives were not detected in the groundwater at Load Line 1. In reviewing the data contained in Appendix G, it is apparent that the explosives data from three of the monitoring wells and the duplicate are invalid because the holding times were exceeded prior to the extraction. Thus the conclusion that explosives were not detected in the groundwater at Load Line 1 is based on very limited data consisting of samples collected from one monitoring well and two well points. The above information should be documented in the report.

Throughout the document concerning the analyses from the groundwater samples, references are made that no explosives and few site specific constituents were detected in the groundwater at the installation. These statements should be modified with a discussion explaining that most of the groundwater samples were collected around the perimeter of the Areas of Concern, not necessarily in areas exhibiting the greatest concentrations of contaminants in the soil. In addition, most of the groundwater data was collected from well points, not from properly installed and developed monitor wells. As stated prior to the investigative work commencing at the installation, samples obtained from well points can be used as a screening tool; however, the failure to detect constituents in groundwater samples collected from well points is not necessarily an indicator that the contaminant is not present in the groundwater at the facility. Only data from a sufficient number of properly located, installed, developed, and sampled monitoring wells can be used to determine that a constituent of concern is not present in the groundwater at the installation. In addition, as stated above, much of the explosives data collected from the monitoring wells are invalid because the holding times were exceeded. A section documenting the limitations of the groundwater data should be added to the report prior to the discussion of the groundwater monitoring results. All discussions in the report concerning groundwater results and/or conclusions drawn about the occurrence of groundwater contamination at the installation should be modified to address these concerns. (An abbreviated form of this comment can be found throughout this correspondence.)

VOLUME 1

ACRONYM LIST:

The acronym TCL stands for "target compound list." Please make the necessary revision.

EXECUTIVE SUMMARY:

The Agency is concerned that the executive summary be as accurate, and as self-explanatory as possible, as there is the potential for many readers of the document to only read this portion of the report.

Please review the specific comments on the documents and adjust the executive summary accordingly. For example, with respect to the new Relative Risk Site Evaluation (RRSE) ranking of the 11 AOCs, the list of Chemicals of Potential Concern (COPCs), etc.

Revise the following sentence to read: "The Phase 1 RI was conducted in compliance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, following work plans *reviewed and commented on* by the Ohio Environmental Protection Agency. This language is more consistent with the role of each stakeholder as specified in the Defense-State Memorandum of Agreement (DSMOA). (pg. xvii)

Revise the following statement: "Groundwater at RVAAP's 11 high-priority AOCs was investigated during the Phase 1 RI to preliminary assess....." The beginning portion of the statement would suggest that there is an understanding of groundwater conditions at each of the 11 high priority AOCs, which is not the case. The executive summary should also indicate that groundwater in several of the AOCs was evaluated based not on monitor wells, but from temporary well points. In addition, please keep in mind the OEPA's position regarding the use of analytical data from temporary well points. That is, 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. Refer to a more detailed discussion in the general comment section above. (pg. xviii)

With respect to Demolition Area # 2, clarification is requested regarding the assumption that contaminants in the soil are probably not migrating from the area via the surface water pathway. While this may be the case, sampling in all of the investigated AOCs has indicated that contamination can be highly localized. As such, perhaps other sample locations in the drainage areas would show contamination. (pg. xviii)

Please correct the duplicate reference to "inorganic, and inorganic" in the first sentence of the description of the Winklepeck Burning Grounds. (pg. xviii)

Remove the last sentence from the paragraph discussing Load Line 12 that: "The extent of sediment contamination was not determined at this AOC during the Phase 1 RI." The extent of contamination was not determined in any medium, at any AOC, during the Phase 1 RI. (pg. xx)

Clarify terms that are utilized throughout the executive summary, such as "widespread", "high", "low", etc. (pg. xx)

The section describing Upper and Lower Cobbs Pond indicates that explosives were not detected in pond sediments. This is not correct, as one sediment sample (CPCsd-007(p)) contained explosives. Please correct the text accordingly. (pg. xx)

In the section describing the Landfill North of Winklepeck Burning Ground (pg. xx):

1. modify the statement that indicates that there does not appear to be a defined source of contamination or evidence of contaminant migration in the area, as only limited trenching was conducted;

2. define the use of "risk screening criteria"; and,

3. clarify where and how the background concentrations for sediments were determined. Or, justify the application of soil background criteria to sediments.

On Table E.1 and the resulting discussion (pg. xxi-xxii):

1. there should be an indication of what constitutes an "action level";

2. the chemicals of potential concern listed in the groundwater column may not be all inclusive due to the limited amount of data collected, the limited amount of data collected from properly installed, developed, and sampled monitoring wells, the invalidity of some of the explosives and other organic compound data, and the placement of the sampling points in areas geographically distant from the areas in which elevated concentrations of installation-specific constituents are found in the soil. A footnote should be added to the table to indicate that this list of groundwater chemicals of potential concern may not be all inclusive due to these concerns;

3. it is indicated that groundwater was not sampled at Load Line 12. However, the data sheets in Appendix G indicate that at least one groundwater sample was obtained from a well point at this load line, and analyzed for volatile organic compounds. Modify this table accordingly;

4. was enough sampling conducted such that the statements that contaminant "migration is limited" and that "chemicals are not migrating away from the source area in large masses" can be made with confidence?;

5. the table should contain an explanation of the acronyms and symbols that are utilized; and,

6. provide the rationale for the use of USEPA Region IV sediment values, when the USEPA Ecotox Thresholds (1996) are available. In addition, other guidance available for sediment benchmarks include the *Ontario Ministry of Environment: Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario, 1994.* Although the latter document is from Canada, it is not inappropriate to use it here, since the benchmark values derived are based on studies with "fresh" water aquatic species.

Remove the statement that "there does not appear to be any widespread groundwater contamination at the site; however, this conclusion is based on limited data." The OEPA concurs that the data is *extremely* limited in nature. Also reference previous Agency comments regarding the use of groundwater data from temporary well points. (pg. xxii)

Revise the last bullet on page xxii. Contaminants are not as "sporadic" and as "isolated" as the text would imply. In addition, there has been migration-of contaminants from potential source areas to the nearby soils and sediments. Lastly, strike the sentence that "..... contamination does not appear to have reached the water table in significant concentrations", as the groundwater sampling that was conducted was too limited in scope to make this assessment.

Please revise the first bullet on page xxiii to read that: "Perimeter groundwater monitoring at Load Lines 1 and 2 suggests that contamination *may* not migrating from the RVAAP facility at these *limited* locations, *and at the specified depths."*

SECTION 1.0 - INTRODUCTION:

Revise the following sentence to read: "The Phase 1 RI was conducted in compliance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 following work plans *reviewed and commented on* by the Ohio Environmental Protection Agency. This language is more consistent with the role of each stakeholder, as specified in the Defense-State Memorandum of Agreement (DSMOA). (pg. 1-1)

Revise the number of AOCs that the text indicates are regulated under the different statutory programs (i.e. RCRA). (pg. 1-1)

Data Quality Objectives (DQOs) are much broader than the scope presented in the text of the report. DQOs are "qualitative and quantitative statements which specify the quality of the data required to support decisions and remedial response activities. DQOs are determined based on the end uses of the data to be collected." There are three main stages in the DQO process. Please refer to the appropriate Superfund guidance document, and modify the text accordingly. (pg. 1-4)

The text indicates that there are only "sparse private residences" on the land surrounding RVAAP. Although this may be true for some areas, there are also areas which are more heavily populated. This portion of the text should also discuss the more heavily populated areas. (pg. 1-5)

The text indicates that the "projectiles would explode and be ejected into the surrounding areas.... further flung projectiles are still in the field where they landed." Please clarify whether either of the above-described occurrences fall within or outside of the 200 acre area of RVAAP-05, or within or outside the burning pad or pit area. (pg. 1-9)

SECTION 2.0 - STUDY AREA INVESTIGATIONS:

It is unclear as to why only groundwater monitoring data for 1995 is included on Table 2.1. Data from soil investigations as early as 1983 are included on this table. This should be explained, or the additional historic groundwater information from the two RCRA monitoring systems should be added to this table.

Define in the text what constitutes a "geotechnical sample." (pg. 2-10)

Clarify whether 10% or 20% of the collected samples were analyzed for additional analyses of Target Analyte List (TAL) metals, Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs), pesticides, PCBs, and cyanide. In addition, please check the list of expanded constituents provided in the text, as there appears to be some redundancy. (pg. 2-13)

The report indicates that "after sample collection, any remaining sediment material was placed back in the pond." Provide an explanation for why this investigation-derived waste (IDW) was not properly containerized, prior to characterization and subsequent disposal. (pg. 2-13)

In the section describing groundwater sampling, please revise the portion of the text that indicates all groundwater samples were analyzed for VOC, SVOCs, pesticides/PCBs, metals, cyanide, and explosives. This is not the case, as in several instances, there was insufficient recharge in the temporary well points, which resulted in a reduced analytical suite of constituents. (pg. 2-14)

The text should clearly indicate that one of the monitor wells installed as part of Phase 1 activities had to be abandoned due to silting problems (i.e. LL1mw-066). (pg. 2-14)

The reference elevation to which the groundwater static water level elevations are measured should be added to Table 2.2. (pg. 2-15)

On Table 2.3 (Well Point Installation and Sampling Summary), the chart indicates that LL12wp-058 had water, but was not sampled. If this was due to insufficient recharge, that should be indicated in the text. (pg. 2-16)

In the first paragraph in subsection 2.3.1 and in the first paragraph on page 2-15, it is stated that eighteen temporary well points were installed at the installation. Table 2.3, however, only lists seventeen well points. The discrepancy should be rectified. (pgs. 2-15 and 2-16)

In the first paragraph on page 2-17, it states that a granular bentonite annular seal was tremied into the borehole. Field Change Order 005 included in Appendix E indicates that bentonite pellets, rather than granular bentonite, was used and that the bentonite pellets were poured and tamped rather than tremied. This paragraph should be modified to more accurately document the well installation procedures and materials. If granular bentonite was tremied into some of the wells and bentonite pellets were poured into other wells, this paragraph should indicate which wells were installed using which procedures.

The first paragraph on page 2-18, indicates that artificial sand packs were placed around the Geoprobe assembly in two well points. Field Change Order 013 indicates that a sand pack was installed around a slotted one-inch PVC riser (Geoprobe assembly?) in five well points. This apparent discrepancy should be clarified or rectified. Any changes to the sampling and analysis plans or to the workplans should be documented in the text of the report. In addition, the wells or well points affected by any such changes should be identified in the text of the report.

The four temporary well points that could not be sampled due to insufficient water should be identified in the last sentence of the first paragraph on page 2-18.

In the first paragraph of subsection 2.3.4, it states that monitoring wells LL1mw-063, -064, and -065, were slug tested prior to groundwater sampling. Documentation of the length of time that expired between the slug testing and the sampling event should be added to this paragraph. (pg. 2-18)

Please refer to comments in Section 4.0 regarding the background sampling program. (pg. 2-22)

Provide assurance to the Agency, that the requisite number of Quality Assurance/Quality Control (QA/QC) samples were obtained. (2-22)

SECTION 3.0 - ENVIRONMENTAL SETTING:

In the first full paragraph on page 3-4, a reference is made to well LL1mw-060. This well is not found on the site map, and no boring log for this well is included in Appendix A. It is possible that this is a typographical error and should be corrected, or the location and the boring log for this well should be submitted.

Clarify in the text that many of the residential wells surrounding the installation are developed into, and utilize, the unconsolidated aquifer. (pg. 3-6)

Table 3-1 indicates that there is no hydraulic conductivity value for LL1mw-065 because of insufficient data. The reason that insufficient data were collected should be documented. (pg. 3-8)

Figures 3.3 through 3.9 are potentiometric surface maps. The elevations of the reference points to static groundwater levels that were measured, the static water levels, the water level elevations, and the date(s) the water levels were measured should be tabulated and included in this section. The installation should also be aware that the groundwater flow directions determined by these maps are gross estimates. In order to more accurately determine groundwater flow directions, a sufficient number of piezometers, or monitor wells, screened at the level(s) in the same hydrostatic unit(s) should be installed, developed, and the static water levels measured. The minimum number of data points needed to determine groundwater flow direction is three. The map for Load Line 1 does not meet this requirement. Even at Load Line 1, where there are six reference points, the distance between the points results in much of the map being a gross estimate of groundwater flow. In addition, all static water levels at a particular unit should be collected within a 24-hour period. It is unclear if all of the static water level data at each AOC were collected during the same 24-hour period. The text should be modified to document that the groundwater flow directions that have been calculated are gross estimates. A discussion documenting the limitations of the data should be included in the report.

Water level elevations for well points LL2wp-058, and -057 should be added to Figure 3.4 if they are available. (pg. 3-10)

Well point LL4wp-060 is located on the wrong side of the 970 contour on Figure 3.5. This should be corrected. (pg. 3-11)

Clarify in the text whether or not the areas of the RVAAP facility that would "meet the federal definition of wetlands" are considered to be federally protected. (pg. 3-17)

The last bullet under the section "Site Conceptual Model" is not entirely accurate. Although there is not a large permanent work force, area residents are allowed on the installation property to fish and hunt. In addition, the Ohio National Guard conducts training exercises on portions of the RVAAP. There are also numerous residences surrounding the RVAAP installation, based upon the over 300-well logs

obtained from the Ohio Department of Natural Resources (ODNR) Division of Water. From a quick field check, these 300 well logs represent only about half of the residences actually located along the perimeter of the RVAAP. Thus, the number of human receptors is much greater than the discussion in this section suggests. The section should be modified accordingly. (pg. 3-18)

SECTION 4.0 - INVESTIGATION RESULTS:

General comments (throughout this entire section):

1. in all the AOC specific charts that detail the analytical results, please be aware that the Ohio Farm Soils numbers that are utilized have limited reference value;

2. on the specific chart for each AOC, please provide an explanation for the "site-related" and "justification" columns, especially for the explosives, VOCs, SVOCs, pesticides/PCBs, etc. results. For example, explosives are "site-related" because they were an integral component of the processes conducted at RVAAP, not because there is "no background data available;

3. provide an explanation for how a surface soil sample can contain a constituent that is considered to be "site related", and then subsurface samples in the same AOC contain the same constituent and it is not considered to be "site-related" (ex. aluminum at RVAAP-04);

4. the OEPA requests that the revised document contain for each AOC, a chart that details the analytical constituents and the corresponding results or the applicable detection limit;

5. indicate in the text whether or not the sample locations that were chosen in the field correspond with the approximate sample locations presented in the workplans. Also indicate whether the projected number of samples were obtained during the sampling event;

6. clarify whether or not drainage ditch sediment results are being compared to background soil data (refer to related comments below, and also related comments concerning protection of the ecosystem);

7. on the figures depicting the concentrations of certain metals, please clarify the basis on which the metals were selected;

8. the text should be adjusted to indicate that in areas where an expanded analysis was conducted that it only verifies the presence or absence of those constituents (assuming good analytical quality assurance/quality control - QA/QC - is in place) at that particular sampling location, not necessarily within the entire AOC;

9. in the beginning portion of each AOC's description, there should be a brief discussion of the usability of the data collected from each AOC, from each medium, and why some data was rejected;

10. on the maps depicting soil/sediment results, the sample location numbers should appear on the map;

11. delete the portions of text that indicates that toluene is a common laboratory artifact, as that has not been this Agency's experience;

12. provide documentation to support the statements in the text that "...although concentrations of TNT in some surface soils are very high, the compounds appear to be immobile in the soils.";

13. in several portion of the text, there is a distinction made between the relative concentrations of total Polynuclear Aromatic Hydrocarbons (PAHs) vs. total carcinogenic PAHs. The text should indicate which PAHs are considered to fall into each group;

14. some of the figures are missing units on the distribution/concentration charts, for example figures 4.11, 4.17, and 4.33. In addition, utilize the correct units on Figure 4.39;

15. caution should be exercised when discussing the analytical groundwater results. This statement is made for several reasons: the fact that a number of the groundwater analytical results were determined to be invalid; the fact that temporary well point data would only indicate minimal values, and would not definitely prove the absence of contamination; and that many of the monitoring well and well point locations are on the perimeter of the AOCs which *may* indicate that groundwater migrating from an AOC is not contaminated, but does not necessarily mean that groundwater within the AOC is not contaminated. (By no means does this comment intend to convey the impression that the Agency is not in agreement with the locations of the monitoring wells and well points, just that caution needs to be exercised when trying to discuss the results.);

16. dibenzofuran was detected in various samples from Load Line 2, Load Line 3, and Load Line 12. What is the potential for other furans and/or dioxin to exist? Perhaps this class of contaminants should be a constituent of concern during Phase 2 investigations;

17. please note that the screening of sediments based upon criteria for soil may not be protective of the ecological receptors;

18. in a spot check of the correlation between concentrations of constituents reported on the data tables in Section 4.0 "Investigation Results" to the concentrations reported in the text, it was discovered that on page 4-16 (second full paragraph), the maximum concentration of 2,4,6-TNT is reported as 4,400 mg/kg. Table 4.1 indicates that the maximum concentration of the compound detected is 4,400 ug/l. This discrepancy should be corrected. The rest of the text and tables in this section should be checked for similar errors. It would facilitate the use of the text and tables if both were reported in the same units; and,

19. the same symbol is used for monitoring wells and well points on Figure 4.7. The key for the figure indicates that this symbol is for monitoring wells. Because there are significant differences between monitoring wells and well points, either there should be different symbols for the two, or the key should be changed to indicate that the symbol is being used for both. All figures in this section should be modified accordingly.

Section 4.1 should indicate the percentage of data usability, and summarize which samples were rejected, and on what basis. In addition, there should be a discussion of the split samples i.e., how "close" the analytical results were to the initial sample, etc.. (pg. 4-1)

More detailed discussion regarding the "background" samples needs to be presented in the text, especially in light of the fact that so much emphasis is placed on the usage of "background" sample results in the discussion of potential future work and risk issues (pgs. 4-1 - 4-2). For example:

1. which samples are the designated "background" sample locations? How was it determined that these are "unaffected" by facility operations?

2. provide additional lithologic information on the "background" samples, i.e. soil type, grain size, etc.

3. the text indicates that three samples from five AOCs were obtained to make 15 background samples? On what basis were the AOCs and locations chosen?

4. why were only "site-related" metals analyzed, not a full TAL metal scan plus explosives, etc. Background should be established for all metals, since a metal would be included as a chemical of concern when the concentration of metals in AOC samples exceed the concentrations of metals in background samples. (Documentation regarding the sample location and analyses etc. could not be found in the workplan... if you are aware of where it is written, please inform the Agency.);

5. documentation, including the actual calculations for background values must be provided to the Agency for review;

6. please be aware of the limited applicability of Ohio Farm Soils data to this installation. The concentrations of various metals reported in this paper were based upon a limited sampling population, and no samples were obtained from the Portage/Trumbull County area in the generation of the concentration ranges;

7. provide further clarification on the sediment background concentrations. For example, were actual "background" sediment samples obtained? Or are the "sediments" (especially those present in drainage swales that have flow on an intermittent basis) being compared to the soil "background" data? (This type of comparison would be consistent with the Hazard Ranking System (HRS) rules, as by definition, there are no intermittently flowing streams in Ohio....however, refer to # 10 below.);

8. the sediment discussion should also contain a brief description of any correlation between sample results and grain size and Total Organic Carbon (TOC) analyses;

9. in three places, on pages 4-1 and 4-2, there is the notation that $p > 0.05$. Is this a typographical error, i.e. should $p < 0.05$?; and,

10. please note that the screening of sediments based upon criteria for soil may not be protective of the ecological receptors.

With respect to the discussion on Demolition Area # 2 (RVAAP-04):

1. provide an explanation for why only one sample out of thirty was analyzed for a full suite of constituents (pg. 4-3);

2. the full analysis will only indicate whether or not the constituents are present at that sampling location, not necessarily at the entire AOC (pg. 4-3);

3. clarify whether or not "process-related metals" are the same as "site-related contaminants" (pg. 4-3); and,

4. what does the symbol at sampling location DA2so-001-006 signify (pg. 4-10, figure 4-2)?

With respect to the discussion on Winklepeck Burning Grounds (RVAAP-05), provide an explanation for the rejected analytical data for explosives (pg. 4-17).

In the section discussing Load Line 1 (RVAAP-08):

1. it appears that LL1mw-069 on Figure 4.7 should actually be LL1wp-069. This should be verified and corrected. (pg. 4-40)

2. the text indicates that the lead concentration in LL1sd-028 could be site related. There may be other samples in which lead is site-related (pg. 4-49);

3. the explosives in groundwater discussion on pg. 4-50 needs to be modified in light of previous OEPA comments;

4. in the section that discusses the sampling results, please modify the following statement to read that "although explosives are present in over half of the samples, the extreme north and south ends of the load line appear to be free of explosives contamination *at the specified sampling locations.*"; (pg. 4-52)

5. on page 4-52, the text indicates that methylene chloride was detected in low concentrations at LL1wp-068. The concentration of methylene chloride from this sample was reported to be 11 ug/l. This is more than twice the Maximum Contaminant Level (MCL) for this compound. Modify the discussion accordingly;

6. sediment sample LL1sd-049 does contain explosives contamination, and as a result, the second bullet on page 4-53 under the sediment discussion needs to be modified; and,

7. the groundwater section needs to be modified, as the results from three of the six sampling points are invalid. In addition, please refer to previous Agency comments regarding temporary well point data, and to the general comment section above.

In the discussion of Load Line 2:

1. on Figure 4.13, it is unclear as to the location of LL2wp-058. This should be clarified. In addition, it is not clear as to why some of the well points are indicated by a red dot, and some are indicated by a green dot. Please provide clarification;

2. the text indicates that "Again, even where concentrations of these compounds are high, they do not appear to be mobile in the surface soils or to influence sediment chemistry in drainage ditches." If this is the case, then explain how explosives were found in Kelly's Pond. (pg. 4-64);

3. modify the statement in the text to read: "However, storm drains, drainage ditches on the north and west sides of the load line, and the outfall from Kelly's Pond do not possess explosives contamination *at the selected sampling locations.*"; (pgs 4-75 - 4-76) and,

4. the first bullet under the heading "groundwater" on page 4-76 states that explosives contamination from Load Line 2 and Kelly's Pond do not appear to be migrating to groundwater. However, 0.34 ug/l of TNT were detected at LL2mw-059. This bullet should be modified accordingly. The second bullet states that Kelly's Pond would be the most immediate upgradient source of contaminants to the monitoring wells at Load Line 2. However, there isn't sufficient data or information to determine what interconnections exist between the groundwater and the pond to draw this conclusion. This bullet should be modified accordingly.

In the discussion of Load Line 4:

1. on page 4-94, modify the last sentence to read "These analytes are considered to be SRCs at *Load Line 4.*";

2. revise Figure 4.25 with respect to the notations made on the figure (i.e., there needs to be a plot for several sampling locations detailing the relative concentrations of selected inorganic constituents);

3. please refer to previous general comments regarding groundwater issues and the fact that the screening of sediments based upon soil criteria may not be protective of ecological receptors;

4. in Section 4.7.3, the text indicates that the well points at Load Line 4 are downgradient of the settling pond. The potentiometric map (Figure 3.5) indicates that LL4wp-059 is not downgradient of the settling pond. Although it is recognized that these potentiometric maps are an estimate of groundwater flow directions based upon very limited data, the information in the text of the report should agree with the information on the figures and maps included in the report. This section should be modified accordingly; and,

5. in Section 4.7.3, the text indicates that three well points were installed at Load Line 4. The data sheets in Appendix G indicate that there were four well points (LL4wp-001, -059, -060, and -061). The map of the well point locations does not include the location of LL4wp-001. This apparent discrepancy should be corrected or clarified, and this section modified accordingly. If well point LL4wp-001 exists, the location should be added to Figure 3.5.

There appears to be some discrepancy between the designations used for the buildings on Figures 4.29 (pg. 4-122) through 4.34 (pg. 4-131) and in the text. For example, it is unclear whether FE-904 and FE-900 as referred to in the text are the same as buildings 904 and 900 on the above-referenced figures. Elsewhere in the discussions concerning this unit, buildings 900 and 904 are referenced. At other AOCs at this installation, FE-904 and 904 would refer to two different buildings. At this AOC, however, it appears that the two designations refer to the same place. This should be clarified. The discussion concerning Load Line 12 in Section 4.0 should be modified such that the maps and all of the text use the same identifiers for the same buildings.

On page 4-141, there is a discussion of the analytical results at Building 1200 and Dilution/Settling Pond. The text indicates that "No explosives were detected in soil samples near Building 1200, so it is unlikely that there is a source of explosives at this site." If Building 1200 was utilized for de-milling operations, it is likely that there is a source of explosives here. In addition, if this is not a source area, then what is the source of the explosives found in five of the seven sediment samples?

Modify the following statements related to the Landfill North of Winklepeck Burning Grounds (RVAAP-19) on page 4-152:

1. revise the statement under the explosives discussion to read "No explosive compounds were detected in *the sampled* groundwater in the *Landfill* North of Winklepeck Burning Grounds.";

2. the text should indicate that the concentration of nickel (110 ug/l) detected in the sample obtained from LNWwp-019 exceeds the State of Ohio MCL (100 ug/l) for this constituent; and,

3. revise the first statement in the discussion of the results to read "No explosives were detected in soil, sediment, or groundwater in the Landfill North of Winklepeck Burning Grounds *at the sampled locations.*"

With respect to the Cobbs Pond Complex (RVAAP-29):

1. revise the statement to read "No explosives compounds were detected in the *sampled* groundwater from the *temporary well points at* the Cobbs Pond AOC (pg 4-160); and,

2. revise the statement in the discussion/summary of results section to read "Concentrations of inorganic chemicals in drainage sediments were below the background criteria with the exception of a single detection of manganese above background, so it appears that contaminants *may* not be leaving the ponds."

SECTION 5.0 - RISK EVALUATION:

Please clarify the section of the text that describes the use of unfiltered groundwater in the risk assessment process. Actually, it is standard practice in the State of Ohio for risk assessment calculations to be based on filtered groundwater samples for metals data. The installation may want to modify Section 5.2 accordingly. (pg. 5-2)

Modify the portion of Section 5.3.1 that describes the current land use at RVAAP. Additional usage includes: deer hunting, timbering near AOCs, harvesting hay fields, tapping maple trees; deployment/training exercises for the Ohio National Guard, etc. (pg. 5-2)

Please justify the use of surface water by wildlife only, when an aquatic habitat is present. Please also discuss the impact on ecological receptors. (pg. 5-2)

On page 5-3, revise the statement in the text that indicates that "residential groundwater use occurs outside the facility, with most of the residential wells tapping into the Sharon Conglomerate." This revision is requested, as a number of well logs obtained from ODNR clearly indicate that the unconsolidated unit is also an important aquifer in the area.

In Section 5.3.3 that details selected exposure pathways:

1. on page 5-3, the text states that inhalation while showering has not been considered when determining the groundwater risk, because no VOCs have been detected in the groundwater. It seems that it is premature to conclude that the inhalation route of exposure should be eliminated based upon the limited amount of groundwater data currently available. The groundwater data that are available are not necessarily from the more highly contaminated areas of the AOCs investigated to date. In addition, VOCs have been detected in some of the RCRA groundwater monitoring well samples. This section should be modified accordingly; and,

2. all appropriate surface water and sediment associated pathways for human as well as ecological receptors need to be included.

The reference for ASTM, 1995 could not be found. Please include all cited references in the "references" section. (pg. 5-3)

The last sentence on page 5-3 is incomplete. The rest of this sentence should be added to the document.

In Section 5.4.1 - Screening Levels (pgs. 5-4 and 5-5):

1. please note that the State of Ohio does not have any screening values at the present time. The "Generic Numerical Standards" (GNS) which were developed for the Voluntary Action Program (VAP) are *single* chemical *clean-up* standards, and are not to be used to eliminate chemicals out of the risk assessment;

2. please explain the rationale for developing screening values for industrial land use when the future land use is undetermined. For the purposes of risk evaluation, it is assumed that the RVAAP land could be used as farmland in the future. OEPA agrees that these values should be used with caution since land use restrictions would be a pre-requisite for any land use other than residential;

3. revise the bottom of page 5-4 and the top of page 5-5, as it appears that a portion of the text is repeated;

4. other guidance that should be utilized with respect to sediment screening includes the previously referenced Ontario guidance document; and,

5. please explain why the chemicals exceeding the leach screen would not be considered as Chemicals Of Potential Concern (COPCs). Also, please specify the leach screen that is discussed in this section.

On page 5-6, there is a discussion regarding the process by which a decision was made concerning whether chemicals detected in the groundwater are retained as COPCs. Once again, it seems premature to eliminate compounds from the list of COPCs based upon the limited groundwater data available, particularly considering the locations of the groundwater sampling points, and that most of the data are not from properly installed, developed, and sampled monitoring wells. The subsection under the "Groundwater" heading on this page should be modified accordingly.

On page 5-9, fourth bullet - please refer to previously stated OEPA concerns regarding the groundwater data from a limited number of monitor wells, the fact that a number of sample results were reported to be invalid, and the usage of analytical data from temporary well points. As such, it is difficult to make any definitive statements regarding existing groundwater quality at each of the AOCs, as well as on an installation-wide basis. (pg. 5-9)

On page 5-9, fifth bullet - please explain the relevance of the USGS soil background study to the site-specific conditions at the RVAAP. (Refer to previous OEPA comments regarding the use of Ohio Farm Soils data.)

In the AOC specific discussions regarding groundwater, a distinction should be made between primary MCLs and secondary MCLs. Primary MCLs are set for health reasons, while secondary MCLs are set primarily for aesthetic considerations.

The second bullet at the top of page 5-11 states that manganese was detected above the MCL. The concentration of manganese detected in the sample from the well point referenced in the text (LL1wp-068) is 3,120 ug/l which is much greater than two times the MCL (50 ug/l). In fact, manganese is greater than the secondary MCL in most of the groundwater samples that were analyzed. This section is unclear, and should be modified.

Please refer to previous OEPA comments regarding the application of soil criteria to sediment data. Adjust the text of Section 5.0 as necessary.

On Table 5.2 - Soil Screening Levels:

1. please delete the column with the "Proposed Ohio Generic Soil Standard" values. (Please refer to prior OEPA comments regarding this issue.);

2. please provide the exposure parameters used to derive the "Calculated Risk-Based Screening Levels;

3. in comparison to the USEPA Region IX Preliminary Remediation Goals (PRG) tables, in the calculated risk-based screening levels, many values for the residential levels are as much as an order of magnitude higher than the Region IX values, and the industrial levels are higher than Region IX tables by about a factor of three. Please provide an explanation. Some of the values for organic chemicals (including acenaphthene, anthracene, butyl benzyl phthalate, and chrysene) are dependent on the soil saturation limit, since beyond the soil saturation, the chemical would be encountered as a free product and needs to be addressed differently;

4. please note that there are several discrepancies in the tables with respect to the toxicity values available for certain chemicals, and/or the source of a certain value used in the table such as: the toxicity value for aluminum (available), HMX (source?), tetryl (source?), cobalt (available), copper (available), manganese (source?), 2-butanone (available), and the screening value for lead for industrial land use; and,

5. please confirm that no organic chemicals were detected alphabetically past the letter "D", as dibutylphthalate is the last chemical listed in the table.

On Table 5.3 - Groundwater Screening Levels - please include the values for copper, iron, lead, manganese, zinc, bis(2-ethylhexyl)phthalate, heptachlor, heptachlor epoxide, and methylene chloride (dichloromethane) in the column for Ohio State values. Also please note that a risk-based level could be calculated for aluminum.

On Table 5.3, it is indicated that there are no State or Federal MCLs for methylene chloride. Methylene chloride is also known as dichloromethane. Although the compound name methylene chloride is not found on the MCL list, dichloromethane is included. Thus, the State and Federal MCL for methylene chloride is 5 ug/l. The table should be modified accordingly. In addition, it appears that the screening level should be changed to the MCL.

On Table 5.4 - Sediment Screening Levels - please refer to previous OEPA comments regarding the applicability of Region IV sediment criteria. Please note that the Region IV screening values are higher, by as much as an order of magnitude or more, than the USEPA Ecotox thresholds, or the Ontario values.

On Table 5.5 - Chemicals of Potential Concern at RVAAP -

1. please delete the term "potential" from the title of the table. The initial list of chemicals consists of the chemicals of potential concern. After the selection process, the final list refers to the chemicals of concern. Please note that the Chemicals of Concern (COCs) are likely to change based upon this comment document;

2. please delete the reference to the Ohio GNS for VAP as the State of Ohio screening values (see previous comments);

3. chemicals that lack screening values should not be deleted from the list of COPCs;

4. the table indicates that groundwater was not sampled at Load Line 12. Although only one groundwater sample was collected and analyzed solely for VOCs, it is inaccurate to state that the groundwater was not sampled. This table should be modified to more accurately reflect that groundwater sampling occurred at Load Line 12;
5. considering that nickel was detected in a groundwater sample from the Landfill North of Winklepeck Burning Grounds at a concentration above the MCL, it should be included as a COPC for this AOC and medium; and,

6. identify in the footnotes that NS = not sampled.

In Tables 5.6 - 5.29:

1. please delete the column for the "Ohio Screening Level";

2. chemicals that were not screened out based on the screening process should not be eliminated from the list of COPCs;

3. the columns "site-related" and "justification" are not accurate or consistent in the application of criteria to eliminate chemicals. Please provide a discussion;

4. indicate which screens are designated by which letter; and,

5. some chemicals that are not listed in the screening table are included in later tables. Please provide an explanation.

SECTION 6.0 - CONCLUSIONS AND RECOMMENDATIONS:

Explosives were discovered in the Cobbs Pond complex, as well as in drainage sediments from the Building 1200 area. Adjust the text accordingly. (pg. 6-1)

The fourth bullet in this section needs to be revised. Analytical data has shown that contamination has migrated horizontally from suspected source areas in many AOCs. In addition, the OEPA reiterates previous comments regarding groundwater issues, i.e., the use of data from temporary well points, the minimal number of monitor wells at the RVAAP, and the fact that most monitor well locations are on the perimeter of identified AOCs, not directly located in suspected or known source areas. (pg. 6-1) (This comment is also applicable to the AOC-specific discussions throughout this section.)

Revise the fifth bullet to read "Perimeter groundwater monitoring at Load Lines 1 and 2 suggests that contamination *may* not be migrating from the RVAAP facility via groundwater at these locations." (pg. 6-1)

Refer to OEPA comments below regarding the re-prioritization of the eleven (11) high priority AOCs that were investigated during Phase 1, as the OEPA is not in agreement with the re-ranking. (pgs. 6-1 - 6-2)

The last bullet under Section 6.1.5 appears in be in the wrong section. This should be corrected. (pg. 6-4)

In Section 6.1.7, buildings FJ-904 and FJ-900 are referenced. As previously mentioned in this correspondence, there is already some confusion concerning the designation of the buildings at Load Line 12. This section only furthers this confusion, because now in addition to the 900, 904, 900 FE, and 904 FE designations, there are also FJ-900 and FJ-904 designations. There should be consistent designations for these buildings. Modify the text accordingly.

The section describing investigative activities at Load Line 12 indicates that "the extent of sediment contamination was not determined at this AOC during the Phase 1 investigation." The Agency requests that this statement either be removed, or revised to reflect the fact that the extent of contamination was not determined at any of the AOCs during the Phase 1 investigative process. (pg. 6-5)

In the section describing the Landfill North of Winklepeck Burning Grounds, the statement needs to be revised that indicates that "There does not appear to be a defined source of contamination or evidence of contaminant migration in the area." This statement needs to be tempered, as there was minimal sampling from trenching at this AOC. (pg. 6-6)

In the section describing Upper and Lower Cobbs Pond, please remove the statement that "Explosives were not detected in pond sediments." Nitrobenzene was detected at a level of 0.380 mg/kg in sediment sample CPCsd-005(p). (pg. 6-6)

Based upon the data obtained from the Phase 1 RI, there is evidence that a Feasibility Study (FS) will be warranted at the eleven (11) AOCs that have been investigated. (pg. 6-6)

Revise the bullet on page 6-7 to read "Evaluate potential off-site contamination migration potential via surface water *and sediment pathways from the 11 high priority AOCs studied during the Phase 1 RI.*" (pg. 6-7)

SECTION 7.0 - REFERENCES:

Please provide the proper format, and complete citations, for references presented in this section and utilized in the generation of this report. (pgs 7-1 - 7-2)

VOLUME 2

APPENDIX E - PROJECT QUALITY ASSURANCE SUMMARY:

Please revise the following statement to read "These documents were reviewed and approved by USACE-Nashville District, *and reviewed and commented on by the Ohio EPA*, prior to implementation. This language is more consistent with the role of each stakeholder, as defined in the DSMOA. In addition, it is OEPA's understanding that USEPA did not review and provide comments on these documents. (pg. E-3)

Provide further details on the laboratory audit conducted by SAIC, and the corrective actions that were initiated on the part of the laboratory. (pg. E-6)

Field Change Order (FCO) 011 indicates that the preservation techniques were modified due to the amount of silt in the samples. Was the change in preservation technique clearly indicated on the Chain of Custody (COC) form, such that the appropriate holding times were met by the laboratory?

On FCO 014, please provide additional discussion regarding the endpoint for well development. For example, since 5 NTUs was determined to be not achievable, were additional volumes of water removed from the monitoring well(s)?

Please provide legible copies of FCOs 017 and 018.

APPENDIX F - DATA QUALITY ASSESSMENT:

Please define "definitive" level data reporting. (pg. F-7)

On Table F-1, please confirm whether or not trip blanks were submitted with the groundwater samples collected at Load Lines 4 and 12. (pg. F-11)

On Table F-8, please confirm whether the organic analyses included "matrix spike recovery" and "field duplicate sample analyses."

Please discuss the basis for the criteria established for the data validation. Pre-determined criteria have been established for specific USEPA analytical procedures including LCS, MS, and RPD. (pgs F-10 and onwards)

Please discuss why two separate analyses could not be performed for explosives versus other parameters to prevent the problem with excess dilution of a sample. (pg. F-36)

The information provided does not include the total number of samples collected. This is necessary in order to determine the frequency of detection of samples with a high detection limit. Please provide further discussion. (Table F-10)

The COC records indicate that the cooler temperatures were sometimes above 5 degrees Centigrade. In future sampling events, it should be ensured that cooler temperatures remain at 4 degrees C or less.

On Attachment F-3, please check the following for all the data listed: date collected, date shipped, date received, date extracted, and date analyzed. For example, on pages F-126 and F-128, there are indications that certain analyses were conducted prior to the sample being collected or shipped. In addition, please confirm that SDG numbers 26570 took over a week for shipping to take place.

APPENDIX G - PARAMETERS MEASURED IN SOILS, SEDIMENT, AND, GROUNDWATER:

Please refer to previous OEPA comments regarding the necessity of preparing a chart that details each sample collected, the constituents analyzed, and the resulting concentrations or the applicable detection limit.

Refer to previous OEPA comments regarding the necessity of providing a brief description in Section 4.0 that discusses the validity of the analytical results on an AOC by AOC basis.

This section of the report should contain a chart that details the lab and data qualifiers as well as the validation codes.

Most of the groundwater VOC data included in this appendix indicates the detection of acetone and methylene chloride. These detections are commonly disregarded based upon the occurrence of the compounds in the blanks. It is disturbing, however, that the concentrations of methylene chloride that are detected are usually above the MCL of 5 ug/l for the compound. In addition, bis (2-ethylhexyl) phthalate is detected in a number of samples and is discounted due to the method blank data. There is concern with data when these laboratory contaminants show up with such regularity, and at such high concentrations. The laboratory protocol should be reviewed and corrected so that this does not happen in the future. In addition, the data for the blanks associated with these samples should be included in this appendix such that the association between the occurrence of these compounds in the blanks and the samples can be reviewed.

In several cases, the laboratory qualifiers indicate that a compound was detected, however, the result is flagged as an estimated concentration. The same data has later been flagged as being non-detect. It is unclear how the end result can be that a compound is determined to be non-detect, after the laboratory has determined that the analyte is present. This should be clarified. In some cases, the discussions in Section 4.0 would change if the data flag had not been changed to a non-detect. If it is deemed unacceptable for the data flags to be changed, the above-referenced discussions may require modification.

Provide an explanation for why the detection limits for certain explosives (i.e. HMX, RDX, and tetryl) are higher than for other explosive compounds.

The detection limits for HMX and RDX achieved during this investigation were 20 ug/l. For the RCRA groundwater monitoring program, the detection limits normally achieved for these compounds are 1 ug/l. It is unclear as to why the detection limits for these compounds is higher for this investigation than for the regular RCRA monitoring program. This should be clarified.

On several soil and sediment samples, there are indications that a diluted sample was analyzed, then an un-diluted sample was analyzed. The report should clearly indicate why this occurred, and which results are utilized in the text of the report for decision-making purposes.

On sample LL1ss-009-0010-SO (pg. G-99), please provide an explanation for the variation in the concentration for 2,4,6-TNT (i.e. in a diluted sample 23,000 ug/kg, and in an un-diluted sample 230,000 ug/kg.) Please also provide an explanation for the variation found in samples: LL1ss-039-0044-SO (pg. G-145 for 2,4,6-TNT); LL1ss-039-0045-FD (pg. G-146 for 2,4,6-TNT); and, LL1ss-075-0680-SO (pg. G-165 for 2,4,6-TNT).

The explosives suite for sample LL1ss-029-0033FD indicates that the list of explosives that can be analyzed for by this method is larger than what was looked for in the Phase 1 investigative effort. Provide documentation to the OEPA that the current list of explosives that is being analyzed for is adequate, as the characterization efforts at RVAAP continues into the next phase(s). (pg. G-128)

Confirm that the soil samples that were solely analyzed for "site-related" metals constitute the "background" samples (for example, pgs G-347, G-348, G-395, etc.). Refer to previous OEPA comments regarding the designated background samples.

Provide an explanation for several of the elevated detection limits, i.e. for the semi-volatile analyses for samples: LL12sd-028(d)-0039-SD (pg. G-598); CPCsd-007(p)-0656-SD (pg. G-620); and, CPCsd-007(p)-0657-FD (pg. G-623). (Not inclusive)

According to the laboratory data sheet on page G-665, it appears that the groundwater sample from LL1wp-067 was not analyzed for the entire suite of inorganic constituents. This should be explained.

APPENDIX J - INVESTIGATION-DERIVED WASTE MANAGEMENT REPORT:

Please refer to previous OEPA comments regarding the investigation-derived waste (IDW) plan that was submitted to the ACOE's attention on February 10, 1997.

APPENDIX K - RELATIVE RISK AOC EVALUATIONS:

In the revised ranking, it is proposed that Demolition Area # 2, Load Line # 4, Building 1200, the Landfill North of Winklepeck Burning Ground, and Upper/Lower Cobbs Pond be re-ranked as medium priority AOCS. The Agency is not in agreement with this proposal and requests discussion during the scheduled comment resolution meeting on the revised relative risk rankings proposed in this document. Please refer to more detailed comments below regarding this issue.

The proposed relative risk site evaluation (RRSE) scores need to be re-evaluated based upon the fact that the Ohio Screening Values can not be utilized in this section, and that some of the Ontario sediment standards may be applicable to several of the samples obtained. In addition, previous OEPA comments regarding the usage and applicability of temporary well point data and perimeter monitoring needs to be taken into account during the ranking process.

The OEPA requests that the following AOCs remain as high priority AOCs based upon the following reasons:

1. Demolition Area # 2 - this area should remain a high priority AOC due to access issues, the presence of identified unexploded ordnance (UXO) during the Phase 1 investigation and the potential for unexploded bombs to be buried in a portion of this area. In addition, no groundwater data was collected as part of the Phase 1 investigation, and therefore, groundwater cannot be ranked. Ohio Screening values should also not be utilized in the ranking process. Also, a portion of this AOC has had closure plans submitted under the RCRA program, and there is the possibility that any existing-contamination outside of the RCRA portion would handled by the CERCLA investigation and clean-up.

During a 02/21/97 conference call between OEPA, IOC, RVAAP, IRI, ACOE, and SAIC there was discussion on the mechanism that would be utilized to deal with contamination beyond the boundary of the RCRA units. It was agreed that if contamination was discovered beyond the horizontal boundaries of the RCRA units, if (given the nature of the AOC) it was difficult to ascertain the source of the contamination or document that contamination was exclusively due to the RCRA unit, that contamination could be addressed by a different regulatory process (CERCLA). OEPA NEDO Division of Hazardous Waste Management (DHWM) would require a statement in the closure plan to the effect that the contamination would be addressed.

2. Load Line # 4 - as a major production area, this Load Line should remain a high priority. The conclusion section of the Phase 1 RI report indicates that this load line appears to be one of the "most highly-contaminated AOCs investigated during the Phase 1 RI at RVAAP."

3. Upper/Lower Cobbs Pond complex - this AOC should remain a high priority, as a sediment sample obtained from this complex contained explosives; there are demonstrated ecological receptors; and, this area is utilized for fishing (even though the RVAAP maintains a "catch and release policy.")

Please explain how the groundwater was ranked at the Winklepeck Burning Grounds (RVAAP-05) when no groundwater data was obtained during Phase 1 activities. The evaluation worksheet should be marked "not sampled." (pg. K-10)

It is unclear how the ratio for DNT on the RRSE worksheet for groundwater at Load Line 2 was calculated. The ratio reported is 1; however, dividing the maximum concentration by the standard would result in a ratio of 2.6. This should be clarified, or corrected.

It is unclear how the ratings of the Contaminant Hazard Factor (CHF) are determined. For example, the maximum concentration of manganese detected in the groundwater at Load Line 4 was 2,670 ug/l. The CHF ratio is 2, and the rating is moderate. At Upper/Lower Cobbs Pond, the maximum concentration of manganese detected in the groundwater is 3020 ug/l, and the CHF ratio is also 2. The rating, however, is minimal. This should be explained.

Please provide an explanation for how it was determined that the groundwater at the Landfill North of Winklepeck Burning Grounds is "confined." As defined on the worksheet, this means that the potential for contaminant migration from the source is limited due to geologic structures, or physical controls. The geologic structure or

physical controls limiting the migration of contamination from this AOC should be identified. Also please refer to previous OEPA comments regarding the limited nature of the groundwater sampling at this AOC. (pg. K-39)

I look forward to meeting with you and representatives of RVAAP, IOC, ACOE, and SAIC on March 19-20, 1997 to resolve these issues. In the interim, 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.wmk

cc: Rod Beals, NEDO DERR
Bob Princic, NEDO DERR
Diane Kurlich, NEDO DDAGW
Sheila Abraham, NEDO DHWM
Virginia Wilson, NEDO DSIWM
Jarnal Singh, NEDO DSIWM
Manjusha Bhide, CO DERR EAU
Catherine Stroup, CO Legal
Bonnie Buthker, OFFO SWDO
John Cicero, RVAAP
Tim Morgan, RVAAP
Bob Whelove, IOC
Todd Boatman, ACOE Nashville
Mike Saffran, ACOE Louisville
John Jent, ACOE Louisville
Steve Selecman, SAIC
Dave Seely, USEPA Region V

IRP 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

CONTRACTOR FWD FOR Information Compliance as applicable

TO 4/2/97
CR-CCR
ENGR ADM
LAND MGR
CONTRACTOR 4/2/97
RETURN FOR

WBT

George V. Voinovich
Governor

April 1, 1997

RE: Ravenna Army Ammunition Plant
Portage/Trumbull Counties

Mr. Bob Whelove
Environmental Engineer
HQ Army Industrial Operations Command
ATTN: AMSIO-EQE
Rock Island, IL 61299-6000

Dear Mr. Whelove:

I would like to take this opportunity to provide input to the Industrial Operations Command (IOC) regarding the working relationship that exists between personnel from the IOC, the Army Corps Of Engineers (both the Nashville and Louisville Districts), the Ravenna Army Ammunition Plant (RVAAP), Science Applications International Corporation (SAIC) and the Ohio Environmental Protection Agency (OEPA), on the RVAAP project. The CERCLA portion of this project is being conducted under the auspices of the Defense-State Memorandum of Agreement (DSMOA).

Since the inception of the project, it has been apparent that all parties are committed to fostering a partnering relationship - willing to dialogue on issues and establishing an outcome that is acceptable to all concerned, as well as making the best use of limited financial resources. The site investigations and sampling that were conducted during the Phase 1 investigations at the high priority Areas of Concern (AOCs) are quality work, as are the associated workplans and reports. The continued involvement of the Nashville Army Corps of Engineers (ACOE), in addition to the Louisville ACOE, has provided much needed continuity and expertise on this project. The Agency also appreciates the IOC's continued interest/input into this project, the invitation to the OEPA to participate in the Relative Risk Site Evaluation (RRSE) work at the unranked AOCs, as well as the willingness to request additional funding for future investigative activities. It is hoped that this team will remain intact as we continue on with the future phases of this project.

The OEPA looks forward to our scheduled scoping meetings in May 1997, as the project moves into the second phase of work at the agreed-upon high priority AOCs.

Please pass along my sincere thanks to all those involved in this project.

Sincerely,

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

RECEIVED
APR 2 1997
By

ETM.wmk

cc: Rod Beals, NEDO DERR
Bob Princic, NEDO DERR
Bonnie Buthker, OFFO SWDO
John Cicero, RVAAP
Todd Boatman, Nashville ACOE
Kevin Jasper, Louisville ACOE
Steve Selecman, SAIC

Printed on recycled paper

RAVENNA ARMY AMMUNITION PLANT MEETING

April 17, 1997
11:00 to 12:00

Conference call participants:

Ohio EPA: *Sheila Abraham, Eileen Mohr*
I.O.C.: *Bob Whelove*
I.R.: *Bill Engold*
U.S. COE: *Kevin Jasper, John Ghent, Todd Boatman*
S.A.I.C.: *Steve Selectman, Rich Carter*

The conference call was requested by the Army to discuss issues related to the Ravenna Arsenal RCRA closure areas, specifically the Deactivation Furnace.

In the most recent closure plan discussions between the Agency and the Army (conference call, February 12, 1997, see notes in the files), it was suggested that the nature and extent of contamination be assessed prior to decisions on the closure mechanism (i.e., whether closure would be risk-based, as opposed to clean closed). On the issue of delineation between the RCRA closure areas and the areas that would be addressed under CERCLA, it was agreed that if contamination was discovered beyond the horizontal boundaries of the RCRA units, if (given the nature of the site) it was difficult to ascertain the source of the contamination or document that the contamination was exclusively due to the RCRA unit, that contamination could be addressed by a different regulatory process (CERCLA). DHWM would require a statement in the closure plan to the effect that such contamination would be addressed.

John Ghent (U.S. COE) focused on how to define the boundaries of the RCRA closure areas, given that contamination attributable to the areas addressed under CERCLA was widespread in the Winklepeck Burning Grounds, where some of the RCRA closure areas are located. He proposed that, given the difficulty of verifying the quality of previous data, the 1994 closure plan submittal for the Deactivation Furnace be used as a resource to focus in on the areas of contamination. He proposed setting the boundaries of the RCRA unit and excavating (to achieve closure) based on the data presented in that document, and then using confirmatory sampling to document that closure, within the boundaries of the RCRA unit had been completed as per the applicable regulations. He suggested that the confirmatory samples could assist in the validation of prior data.

Sheila asked for a written proposal from the Army, perhaps in a draft form initially, rather than as a formal response to the NOD, so that the Agency could evaluate the proposal. Basically, the Army is suggesting a delineation of the horizontal extent of contamination attributable to the RCRA unit based on existing information. Vertical contamination would be addressed by a 12' trench (down to the water table) to assist in site characterization. Sheila indicated that she had reviewed the 1996 Closure Plan; she would now need to review the 1994 closure plan. Further, the Agency had already reviewed the 1994 closure plan, and the deficiencies noted needed to be addressed. Bob Whelove stated that the Army did not agree with some of the deficiencies that had been cited. A brief discussion of the 1994 closure plan ensued, and it was apparent that the

ChicEPA

SHEILA ABRAHAM
Originator

PHONE CONVERSATION RECORD

Conversation with:
Name BOB WHELOVE, TODD BOATMAN
Company KATHY DOMINIC, TIM MORGAN
Address (RUAAP)

Phone

Subject

Date JULY 9 1997
Time 10:02 (AM) PM

☐ Originator Placed Call
☒ Originator Received Call
W.O. NO.

Notes: (UNSCHEDULED) CONFERENCE CALL WITH BOB WHELOVE (I.O.C.) TODD BOATMAN (U.S. COE) KATHY DOMINIC (SAIC) TIM MORGAN (RUAAP)

- FACILITY WISHES TO DELAY SUBMITTAL OF 1601, OB + OI) CLOSURE PLANS. - TO AUGUST 30, 1997

- FACILITY WILL SENT IN "DRAFT FINALS" TO THE DO - 1601 AROUND JULY 29'-30'
OB } AROUND JULY 30'
OI) }

- FACILITY WOULD APPRECIATE COMMENTS FROM DO PRIOR TO SUBMITTAL OF FINALS TO THE DIRECTOR'S OFFICE.

- DA: DO WILL REVIEW, DEPENDING ON OTHER CONSTRAINTS. NO TURN AROUND SCHEDULES ON THE PART OF THE AGENCY CAN BE GUARANTEED.

☐ File
☐ Tickle File ___/___/___
☐ Follow-Up By:
☐ Copy/Route To:

Follow-Up-Action: INFORM LEGAL, (MARK)

Originator's Initials SA

COMMENTS ON THE (MAY 1997) DRAFT PROPOSAL FOR THE DEACTIVATION FURNACE AREA AT RVAAP

Comment # 1(page #1): I. Overview of the Deactivation Furnace Area (DFA) and Figures 2 & 3:
Please note that AOC 39 (Open Burning Grounds) is a subset of AOC 5 (Winklepeck Burning Grounds). The issue needs to be addressed as AOC 39 does not appear in previous closure plans, including the December 1996 Closure Plan. Please also clarify if the Figures 2 and 3 are accurately labeled and referenced in the text.

Comment # 2(page #1): I. Overview of the Deactivation Furnace Area (DFA):
The facility has the option of explicitly identifying those activities at the Winklepeck Burning Grounds that pertain to pre-RCRA management of hazardous waste.

Comment # 3(page #1): I. Overview of the Deactivation Furnace Area (DFA):
The No.2 fuel oil constituents may need to be factored into the constituents of concern at the burn pit area, as necessary. Please also clarify if a potential for unexploded ordinances exists in the area of the DFA.

Comment # 4(page #1): I. Overview of the Deactivation Furnace Area (DFA):
As mentioned in the comments in the cover letter, levels of the constituents of concerns (COCs) in the slag (stated to be present in the DFA) could be compared to COCs in the slag in other areas; this data could be used to substantiate the difficulty of delineating the boundaries of the RCRA unit.

Comment # 5(page #2): I. Overview of the Deactivation Furnace Area (DFA):
Please clarify if the DFA structures currently on-site will be removed as part of the closure process.

Comment # 6(page #2): I. Overview of the Deactivation Furnace Area (DFA):
Please note that the list of COCs listed as components of the ash residue historically detected at the DFA is not complete. For example, chromium and lead were identified in the September 1996 Closure Plan for Building 1601 (Container Storage Unit) as ash residue constituents (and appear to have been omitted from this draft proposal). The Agency would recommend providing as complete a list as possible.

Comment # 7(page #2): II. Geology:
Comments from the Division of Ground Water (DGW) will be provided under separate cover.

Comment # 8(page #2): IIIA. RCRA Investigations:
Please address the Agency's comments on previous closure plans, including the 1994 Closure plan used as a basis for this proposal. In particular, the 1994 remediation goals need to be justified in any stand-alone closure plan formally submitted to the Agency. Further, the background levels, and thus the remediation goals cited for beryllium and arsenic need to be adequately substantiated by the data. This comment is also applicable to Section III. B RCRA Closure plans (page 3).

Comment # 9(page #2): IIIA. RCRA Investigations:
Table 7 appears to be missing from the package provided for the Agency's review. Please clarify if the Table 7 referred to (comparing levels of antimony, arsenic and beryllium) is Table 4.

Comment # 10(page #3): III.B RCRA Closure Plans:
Adequate data should be provided to the Agency to substantiate that no contamination of the soil with explosive compounds, including all degradation products was encountered. Based on the data provided in Tables 2A, 2B and 2C, the explosive compounds levels in the soil appear to have been analyzed only during the preliminary sampling event on December 15, 1989 and in 5 locations during the March 11 - 14, 1991 sampling event. The rationale for not analyzing for the explosives on the interior west side of the DFA needs to be provided.

Comment # 11(page #3): III.B RCRA Closure Plans:
Please note that the remediation clean-up limits for the site related metals need to be protective of human health and the environment. Alternatively, if high background levels for particular COCs (such as arsenic and beryllium) are an issue, the background levels need to be adequately substantiated in the stand-alone closure plan formally submitted to the Agency. In general, a previous Closure Plan (such as the September 1994 one, in this case) that has not been approved by the Agency is not referenced or utilized as the basis for site-related closure levels and decisions.

Comment # 12(page #4): III.B RCRA Closure Plans:
As stated in the cover letter, decisions taken to delineate the boundary of the RCRA unit need to be defensible, and supported by the data. One possible method of addressing this issue could be an evaluation of available and relevant data to demonstrate that there is no (statistically significant) variation between the contaminants of concern in the RCRA unit (DFA) area and the surrounding area (Winklepeck Burning Grounds) that is proposed to be addressed by the CERCLA process. The south side of the DFA needs also to be explicitly addressed. This comment is also applicable to Section IV (Conclusions), Section V (Action Plan) and Figure 13.

With reference to the remediation goals, please note that DHWM and the facility need to agree on appropriate background levels, and thus remediation goals, for the inorganic constituents of concern. Issues related to using the proposed 1994 Remediation Clean up Levels remain unresolved, specifically in relation to arsenic and beryllium. This comment is also applicable to Figures 3/8 and 9.

Comment # 13(page #4): III.C 1996 CERCLA Investigation:
Please clarify if all RCRA COCs were addressed during the Phase I (CERCLA) Remedial Investigation conducted at Winklepeck Burning Grounds. The issue is important if the area beyond the "line in the sand" proposed by the facility will be addressed through the CERCLA process. The comment is applicable to Figures 11 and 12.

Comment # (page #4): IV. Conclusions:
Please refer to the previous comment on the importance of defensible decisions when delineating the boundary of the RCRA unit. Although every effort will be made to evaluate RVAAP in a site-specific manner, please note that the situations discussed in the RCRA Closure guidance typically refer to historical off-site source contamination, and not to solid waste management units (SWMUs) created by the facility. DHWM agrees that the existing historical data (even though the data validation process has not been reviewed by the Agency) appears to document that the deepest contamination is directly below the DFA.

Comment # 14(page #4): IV. Conclusions B:
Any additional comments from the Division of Ground Water (DGW) will be provided under separate cover.

Comment # 15(page #5): V. Action Plan:
Please refer to previous comments on the definition of the boundary between the RCRA and CERCLA areas and the 1994 Remediation Clean-up Levels. Please also note that future land use decisions are highly hypothetical at this point in the process.

Comment # 16 Figures 5 and 6:
Any additional comments from the Division of Ground Water (DGW) will be provided under separate cover.

Comment # 17 Figure 8 (Grid Sampling Locations):
Sampling location #6 (preliminary sampling on December 18, 1989) appears to have omitted from the figure.

Comment # 18 Table 3 (Risk Assessment Data):
The relevance of this table is unclear, given the current proposed plan to "clean close" to appropriate remediation levels (based on background).

End of Comments

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

7/14/97

George V. Voinovich
Governor

July 10, 1997

RE: Ravenna Army Ammunition Plant
Portage/Trumbull Counties
USACHPPM RRSE Report

Mr. James R. Sheehy
Environmental Engineer
U.S. Army Center for Health Promotion
and Preventive Medicine
Hazardous and Medical Waste Program
MCHB-DC-EHM/Bldg. E-1677
Aberdeen Proving Ground - Edgewood Area, MD 21010-5422

Dear Mr. Sheehy:

The Ohio Environmental Protection Agency (OEPA) has received and reviewed a copy of the two-volume report entitled "Hazardous and Medical Waste Study No. 37-EF-5360-97, Relative Risk Site Evaluation, Ravenna Army Ammunition Plant, Ravenna, Ohio, 28 October - 1 November 1996." The report was generated by the U.S. Army for Health Promotion and Preventive Medicine (USACHPPM) for the unranked Defense Environmental Restoration Account (DERA) - eligible Areas of Concern (AOCs) at the Ravenna Army Ammunition Plant (RVAAP), and was received by the OEPA on April 8, 1997.

As a stakeholder in the investigations at the RVAAP, the OEPA has the following comments on the Relative Risk Site Evaluation (RRSE) report:

1. The term "site" should be replaced with the term "Area of Concern" throughout the RRSE report to be consistent with the terminology utilized at the RVAAP.

2. In the executive summary, it should be noted that Phase 1 Remedial Investigations (RI) were conducted ~~at eleven (11) high priority AOCs:~~ RVAAPs - 4, 5, 8, 9, 10, 11, 12, 13, 18, 19, and 29. Scoping documents have been developed, and additional funding is currently being pursued for Phase 2 RIs at the Winklepeck Burning Ground and Load Line 1. (also - pgs. 2 and 5)

3. Please confirm that the RRSE process does not evaluate a surface soil ecological endpoint. (pgs. 2-3)

4. The OEPA notes that at each AOC at the RVAAP, that there is the potential for contaminants to migrate to the groundwater. The OEPA does not agree that the potential for groundwater contamination exists solely at RVAAPs-23, 26, and 35. (pgs. 3 and B-3)

5. Provide clarification in the text that the groundwater data obtained at RVAAP-26 was solely utilized to evaluate this particular AOC, and not RVAAPs-23 and 25 in addition to this AOC. (pg. 3)

6. The text of the report should indicate whether the sediment concentrations are being reported on a dry-weight, or wet-weight basis. (pg. 4)

cf. Repositories

7. The text indicates that "The contaminant hazard factor (CHF) can then be determined by computing the sums of the ratios for all identified contaminants and comparing this number to standard values." The standard values that are utilized throughout the course of the RRSE must be defined in the document. (pg. 4, and throughout section"C")

8. Provide further clarification for the statements that "The only significant modification to the Sampling Plan is that ecological receptors are not present throughout the entire installation. They are only present at RVAAP-34, RVAAP-36, RVAAP-38." The OEPA is not in agreement with this assessment, as there are ecological receptors throughout the installation. (pg. 5)

9. With respect to RVAAP-32 (40 and 60 mm firing range) and RVAAP-36 (pistol range), further discussions regarding investigation and remediation will need to ensue, subsequent to the promulgation of the Department of Defense (DOD) Range Rule. The Range Rule is a cohesive process (from range identification to close out) that addresses unexploded ordnance (UXO) and other constituents at closed, transferring, or transferred ranges. (pgs. B-8, C-42, and C-55)

10. Revise the following statement when it appears in the report: "Not evaluated. There is no groundwater associated with this site." The statement should read "Not evaluated. The groundwater associated with this Area of Concern was not evaluated." Please refer to comment # 4 detailed above. (pgs. C-2, C-5, C-8, C-11, C-14, C-17, C-24, C-27, C-39, C-42, C-45, C-49, C-55, C-58, and C-60)

11. In several AOC descriptions in "Section C" of the report regarding both the surface water and sediment ecological endpoints, there are the statements that the media were not evaluated, as the surface water (or sediment) does not impact any critical habitat, as defined in the *Primer.* The definition of a "critical habitat" should be presented in the report. (pgs. C-3, C-5, C-8, C-11, C-15, C-17, C-22, C-24, C-27, C-31, C-36, C-39, C-42, C-46, C-49, C-53, C-55, C-58, and C-61)

12. Soils with explosive constituents are considered to be ordnance and explosive wastes (OEW) if the concentrations are sufficient to be reactive and present an imminent safety hazard. Given this definition, the minimal sampling conducted during the RRSE, the concentration of 23,000 mg/kg of 2,4,6-TNT in a soil sample from RVAAP-03 (Demolition Area # 1), the undefined boundaries of this AOC, and the use of this area by the Ohio National Guard (ONG), the OEPA requests further discussion on the ranking of this AOC as only a medium priority. The OEPA believes that this should be a high priority AOC based upon the above-detailed reasons. Further investigative activities need to be conducted at this AOC, such that the nature and extent of contamination can be determined, and appropriate controls put in place (ex. fencing) in order to prohibit access to this AOC. (pgs. C-5 and C-6)

13. RVAAP-18 (Load Line 12 Treatment Plant) is being evaluated in conjunction with RVAAP-12 (Load Line 12 and Dilution/Settling Pond) as part of the Phase 1 RI (and subsequent) activities being conducted at the installation. RVAAP-12 has been designated, with Agency concurrence, as a high priority AOC. The RRSE report indicates that RVAAP-18 was scored as a low priority AOC during the Fall 1996 investigative activities. Please correct the discrepancy in the text of the report. (pg. C-18)

14. The report states that "Groundwater from near this area may be used for irrigation purposes, however, the shallow groundwater is not used for drinking water." This statement should be corrected, as well logs obtained by OEPA for numerous residences in the vicinity of the installation indicate that the shallow, unconsolidated materials are utilized for drinking water purposes. (pgs. C-21, C-31, and C-52)

15. In the section describing the Fuze and Booster Area Settling Tanks (RVAAP-26), please clarify whether any of the tanks have been utilized since being emptied, cleaned, and covered in 1971, or if that only applies to the tanks at Load Line 11. In addition, is there any reason to believe that the following contaminants could also be present at RVAAP-26: lead azide, lead styphnate, and/or propellants? (pg. C-30)

16. Does the potential presence of UXO factor into the RRSE score? For example, it would seem reasonable to expect that the potential presence of UXO at either RVAAP-32 (40 and 60 mm Firing Range) or RVAAP-36 (Pistol Range) would increase the priority of these AOCs. This is especially true in light of the fact that access to the AOCs is not restricted in any manner. (pgs. C-42, and C-55)

17. Provide clarification in the text as to why the surface water/human endpoint for RVAAP-34 (Sand Creek Disposal Area) was not evaluated. Clearly, the close proximity of Sand Creek to this AOC would indicate that there is surface water associated with this AOC. (pg. C-49)

18. The text indicates for RVAAP-35 (Building 1037, Laundry Waste Water Tank) that "HMX was detected in the subsurface soil at a concentration of 1.3 mg/kg, but is insoluble in water and is not in the *Primer.* HMX was not used to determine the CHF for groundwater." Please provide the reference to substantiate the statement that HMX is insoluble in water. (pg. C-52)

19. With respect to RVAAP-38 (NACA Test Area), please provide further clarification regarding the statements that there is no surface water associated with this AOC. There is clearly a surface water body in the vicinity of this AOC, as well as identified drainage areas. In addition, please be advised that the ONG is currently utilizing a portion of the NACA Test Area as part of their training grounds, which would most likely increase the receptor pathway factor, and potentially increase the priority of this AOC. Further discussion is warranted. (pgs. C-60 - C-62)

20. In Appendix D (Data Summary):
    a. the detection limit for each compound (or the obtained concentration) should clearly be reported in the chart; and
    b. USACHPPM should cross-check all the analytical results presented in Volume 2, with the results reported in this Appendix. For example,
    in water sample # 263W, the concentration for chromium was mis-reported. Subsequent to USACHPPM's review of all the data, the OEPA will review Volume 2 and Appendix D in more detail.

21. In Volume 2, Analytical Results:
    a. what impact did the exceedance of holding times for mercury have on the reported analytical results?;
    b. the case narrative indicates that the "first copper result in RVAAP-332 is being reported." Is this the highest concentration?;
    c. the acceptable recovery ranges for each analyte should be reported;
    d. in several instances, the case narratives would indicate that some of the reported data would have qualifiers associated with the concentrations (ex. "J" for estimated), yet no qualifiers were attached to the reported data. Please provide an explanation;
    e. the case narrative for RVAAP-231B (semi-volatile organic compound - SVOC - analysis) indicates that this sample was re-extracted with surrogate solution outside of the fourteen day extraction holding time. What impact does this have on the reported analytical results? Was the 40 day analytical holding time also exceeded?;
    f. in the SVOC case narrative, the text indicates that "laboratory water was used for a matrix spike and matrix spike duplicate for the water sample because an adequate amount of water sample was not provided." Please provide a discussion, on what, if any, impact this would have on the reported analytical results; and,
    g. confirm that the detection limits reported for thiodiglycol of 21.8 mg/kg and 22.5 mg/kg, are the lowest detection limits achievable.

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.wmk

cc: Bob Princic, NEDO DERR
Rod Beals, NEDO DERR
Bonnie Buthker, OFFO SWDO
Brian Tucker, CO DERR EAU
Sheila Abraham, NEDO DHWM
Diane Kurlich, NEDO DDAGW
Virginia Wilson, NEDO DSIWM
Jarnal Singh, NEDO DSIWM
John Cicero, RVAAP
Todd Boatman, Nashville ACOE
Kevin Jasper, Louisville ACOE
John Jent, Louisville ACOE
LtCol Tom Tadsen, RVAAP
Maj Joe Knott, National Guard Bureau
Steve Selecman, SAIC
David Seely, USEPA Region V
Tim Morgan, RVAAP
Bob Whelove, IOC

OhioEPA

State of Ohio Environmental Protection Agency

Northeast District Office
' E. Aurora Road
sburg, Ohio 44087-1969
(216) 425-9171
FAX (216) 487-0769

TO 8/6/97
CR-COR
PROP ADM
LAN...
ENV
CONTRACTOR
RETURN FOR FILE

George V. Voinovich
Governor

August 5, 1997

RE: Ravenna Army Ammunition Plant
Portage/Trumbull Counties
Revised Phase 1 Investigative Report

Mr. Kevin Jasper
Project Manager
U.S. Army Corps of Engineers
Louisville District
ATTN: CEORL-DL-B
P.O. Box 59
Louisville, KY 40201-0059

Dear Mr. Jasper:

The Ohio Environmental Protection Agency (OEPA) has reviewed the two-volume document entitled "Draft Final, Phase 1 Remedial Investigation Report for the High Priority Areas of Concern at the Ravenna Army Ammunition Plant, Ravenna, Ohio." This document, dated May 1997, was prepared by the contractor for the U.S. Army Corps of Engineers (USACE), Nashville District, under contract number DACA-62-94-D-0029, and was received by OEPA on May 9, 1997.

The document was reviewed by the project coordinator in the Division of Emergency and Remedial Response (DERR), Northeast District Office (NEDO), and risk assessment personnel in the DERR, Central Office (CO), Environmental Assessment Unit (EAU). The document was reviewed with respect to the previously-agreed upon comment resolution table. This correspondence reflects a compilation of comments from both reviewers, and will follow the same general format as the two-volume Phase 1 Remedial Investigation Report.

As the number of corrections that need to be made are minimal, the OEPA recommends that subsequent to the revisions, the appropriate number of copies of replacement pages be submitted to all stakeholders, including the two information repositories located at the Ravenna, OH and Newton Falls, OH libraries. These replacement pages could easily be inserted into the existing document, and as such, the report would be considered a final submission by OEPA.

1. The acronym TCL stands for "target compound list." Please make the necessary revision. (pg. xii)

2. In two places on page 4-1, there is the notation that $p > 0.05$. Is this a typographical error, i.e. should $p < 0.05$? If so, please make the necessary correction to the text. (pg. 4-1)

3. Please provide a correction for the sample designated as DAso-006. The utilized symbol does not have a corresponding figure in the legend. (pg. 4-11, figure 4-2)

4. Previously, OEPA requested further documentation that the toluene that was observed in several samples could potentially be a laboratory artifact. In many places in the text, an explanatory sentence was added which indicated that the origin of this particular volatile organic compound (VOC) was unknown. This approach is acceptable to OEPA, and the same sentence should be added to the appropriate portions of the text on pages 4-90, 4-154, and 4-155.

CF: AMSE?-IR(RIVERMOSE) 8/15/97

5. On Figure 4.45 (pg. 4-106), several plots of the relative concentrations of selected inorganic elements (barium, cadmium, lead, and manganese) appear to be missing for several sampling locations. Please add these to the figure.

6. Please correct the following sentence in the text on page 4-107 to read as follows: "Figure 4.27 shows the distribution of pesticides/PCBs in surface soils at Load Line 4."

7. Provide the correct units for the relative concentrations of PCBs and pesticides in surface soils at Load Line 12 on Figure 4.33. (pg. 4-131)

8. Values for aluminum, cobalt, copper, and 2-butanone were not included in Table 5.2. All Region IX soil Preliminary Remediation Goals (PRGs) should be confirmed. Numerous errors in values have been discovered on this table, including the values listed for TNT, HMX, and TNB. Please make the necessary corrections to Table 5.2. (pgs. 5-16 - 5-20)

9. The Ohio Maximum Contaminant Levels (MCLs for the following constituents were omitted from Table 5.3: bis(2-ethylhexyl)phthalate, heptachlor, heptachlor epoxide, and dichloromethane (methylene chloride). The action levels for lead and copper were also omitted from Table 5.3. Lastly, Secondary Maximum Contaminant Levels (SMCLs) for the following constituents were not included in this table: manganese and zinc. Please make the necessary corrections to Table 5.3. (pgs 5-21 - 5-22)

10. Table 5.5 is actually a list of chemicals of concern. The chemicals listed on Table 5.5 passed an initial screen which qualifies the compounds as concerns. Continued evaluation of the chemicals will determine the risk of site-related materials and further refine the list of chemicals. As such, please delete the word "potential" from the title of this table. In addition, chemicals that lack screening values should not be eliminated from the list of chemicals of concern. This is especially true for explosives found in some sediments. For instance, in many areas (Winklepeck Burning Grounds, Load Lines 1 - 4, Load Line 12, and Building 1200), sediment concentrations of 2,4,6-trinitrotoluene clearly exceeded the residential surface soil screen. Although soil screens and ecological sediment screens have very different receptors that are being protected, generally the ecological sediment screening values are lower than residential soil screening values for the same constituent. Intuitively, chemicals that exceed screening values in other media that do not have specific screening values for sediment should remain as chemicals of concern in sediment. Please add the appropriate chemicals to the list of chemicals of concern. (pg. 5-25)

11. In Appendix F, please revise the statement in the second full paragraph to read "The project properly performs analysis for all analytical requests, with the exception of an inadvertent omission of some metal parameters for *water* sample LL1MW-067, where the COC was marked for 11 metals instead of the planned 23 metals." (pg. F-10)

12. With respect to the Investigation-Derived Waste (IDW) report, the following comments are noted:

    a. characterization of the soil IDW from the drilling of monitoring wells outside of known areas of contamination was conducted by the contractor for the USACE (pg. J-16); and,

    b. with respect to the disposal of contaminated (but not hazardous) solid IDW, please note that the only two currently available options are to either dispose of the IDW at a permitted facility, or stage it at the installation pending treatment in conjunction with the appropriate AOC remediation. (pgs. J-17 and J-18)

13. With respect to Appendix K (Relative Risk AOC Evaluations):

    a. provide the source(s) of the concentrations utilized as the standards in the Relative Risk Site Evaluations (RRSE). Several of the standard concentrations utilized differ from the initial draft of the Phase 1 report; and,

    b. Winklepeck Burning Grounds should be designated as RVAAP-05, not RVAAP-12 (pg. K-4).

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

Sincerely,

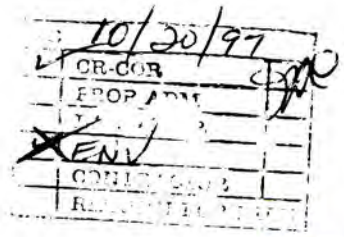
Eileen T. Mohr
Project Coordinator
Division of Emergency and Remedial Response

ETM.wmk

cc: Rod Beals, NEDO DERR
Bob Princic, NEDO DERR
Diane Kurlich, NEDO DDAGW
Marlene Emanuelson, NEDO DHWM
Virginia Wilson, NEDO DSIWM
Brian Tucker, CO DERR EAU
Catherine Stroup, CO Legal
Bonnie Buthker, OFFO SWDO
John Cicero, RVAAP
Tim Morgan, RVAAP
Bob Whelove, IOC
Todd Boatman, USACE Nashville
John Jent, USACE Louisville
LtCol Tom Tadsen, ONG
Maj Joe Knott, NGB
David Seely, USEPA Region V
Steve Selecman, SAIC

Repositories

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

October 17, 1997

RE: Ravenna Army Ammunition Plant
Portage/Trumbull Counties
Access Issues at 11 AOCs

Mr. Mark Patterson
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, OH 44266-9297

Dear Mr. Patterson:

This correspondence serves as a follow-up to your memo dated 09/23/97, and our meeting of 09/29/97 regarding access issues at eleven (11) Areas of Concern (AOCs) that are within the area of the Ravenna Army Ammunition Plant (RVAAP) that is proposed to be transferred to the Ohio National Guard (ONG). These areas of concern are as follows: Erie Burning Grounds (RVAAP-02); Demolition Area # 1 (RVAAP-03); C Block Quarry (RVAAP-06); Sand Creek Sewage Treatment Plant (RVAAP-20); Depot Sewage Treatment Plant (RVAAP-21); Unit Training Equipment Site Underground Storage Tank that is currently on ONG property (RVAAP-23); Reserve Unit Maintenance Area Waste Oil Tank (RVAAP-24); Building 854, PCB Storage (RVAAP-27); Mustard Agent Burial Site (RVAAP-28); Ore Pile Retention Pond (RVAAP-31); Sand Creek Disposal Landfill (RVAAP-34); and, NACA Test Area (RVAAP-38).

The Ohio Environmental Protection Agency (OEPA) entered into a Defense-State Memorandum of Agreement (DSMOA) with the Department of Defense (DoD) in order to expedite the clean-up of hazardous waste sites on DoD installations within the State of Ohio and to ensure compliance with the applicable State laws and regulations of Ohio. From my reading of the DSMOA document, I do not believe that OEPA has the legal authority to dictate to the ONG, the National Guard Bureau (NGB), or the Army as to whether a specific AOC can or cannot be used for training purposes. In addition, the method(s) utilized to restrict access to certain areas is the decision of the Army and National Guard. These decisions, and any resulting liability would rest with the National Guard and the Army.

The OEPA offers the following comments on the proposed method(s) for access restrictions based upon the above understanding, existing data, and proposed time frame for further investigations under the Defense Environmental Restoration Program (DERP):

Erie Burning Grounds (RVAAP-02):

The Preliminary Assessment (PA) indicates that this AOC is approximately 35 acres in size, was utilized from 1941 to 1951 to conduct open burning of explosives and related items, and is now a swamp due to the result of wildlife (i.e. beaver) activities. Currently, two sides of the Erie Burning Ground are fenced. RVAAP-02 has been listed as a high priority AOC, based upon the sampling and Relative Risk Site Evaluation (RRSE) work conducted by the United States Army Center for Health Promotion and Preventive Medicine (USACHPPM) in Fall, 1996.

Recent preparation of the updated DSMOA/CA (Cooperative Agreement) has resulted in this AOC tentatively being scheduled for the preparation of a Scope of Work (SOW) in Federal Fiscal Year (FFY) 1999, with preparation and execution of the workplans and reports to be completed in the following four FFYs. Based upon the fact that this AOC is currently under water, and that it is proposed to be studied on a more detailed level in the very near future, the installation of signs (at appropriate sighting distances) prohibiting access on the two un-fenced sides would be appropriate. In addition, signs prohibiting access are recommended to be placed on the existing fencing.

Demolition Area # 1 (RVAAP-03):

The PA indicates that this AOC is approximately 1.5 acres in size and was utilized from 1941 through 1949 for the thermal treatment of munitions by open burning and detonation. Munition fragments, fuzes, etc. have been found outside of the bermed area. This AOC, based upon the recent revision of the DSMOA/CA is tentatively scheduled for preparation of a SOW, and development and execution of workplans in FFY 2000-2003. Based upon the results of the USACHPPM studies, this AOC's proximity to RVAAP-38, and past usage of this area by military personnel, etc., the OEPA strongly recommends the fencing and posting of signs in this area such that access is prohibited. In addition, the OEPA would recommend that an area outside of the AOC boundary delineated in the PA be swept by trained Explosive Ordnance Disposal (EOD) personnel in order to ensure that the area outside of the bermed area does not contain Unexploded Ordnance (UXO).

C Block Quarry (RVAAP-06):

The PA indicates that this AOC is an abandoned, unlined borrow pit that is approximately 0.3 acres in size. This AOC was utilized during a period of time in the 1950s for disposal of annealing process wastes, spent pickle liquor, as well as (apparently) a few drums of unknown contents. This AOC is reported to be heavily forested and has been ranked as a low priority based upon the recent USACHPPM investigations. The ranking of this AOC may change, subsequent to the evaluation of the groundwater pathway. This AOC is tentatively scheduled for scoping activities during FFY 2000-2003, based upon the updated DSMOA/CA. Posting of signs prohibiting access, placed at appropriate sighting intervals, would be appropriate.

Sand Creek Sewage Treatment Plant (RVAAP-20):

The PA indicates that this treatment plant consisted of two Imhoff tanks, two trickling filters, and a final clarifier which operated under a NPDES permit. Sludge was dried in two beds contained within a "greenhouse" type structure and spread in unknown locations. It is my understanding that the treatment plant was closed in accordance with the applicable regulations in 1993, and that the open tanks have been backfilled and compacted with clean fill. Based upon this information, posting of signs prohibiting access, placed at appropriate sighting intervals, would be appropriate.

Depot Sewage Treatment Plant (RVAAP-21):

The PA indicates that this plant was similar in design to RVAAP-20, and consisted of two Imhoff tanks, two small trickling filters, and a chlorinator. Sludge was hauled to the George Road Sewage Treatment Plant for disposal, and the effluent was discharged to Hinckley Creek under a NPDES permit. It is my understanding that the treatment plant was closed in accordance with the applicable regulations in 1993, and that the open tanks have been backfilled and compacted with clean fill. Based upon this information, posting of signs prohibiting access, placed at appropriate sighting intervals, would be appropriate.

Unit Training Equipment Site Waste Oil Tank (RVAAP-23):

According to the PA, this underground tank, removed in 1989, held waste oil from shop maintenance areas and was composed of predominantly crankcase and transmission oils, gear lubricants, and hydraulic/brake fluids. This AOC was ranked as a medium priority on the RRSE during the recent USACHPPM investigations. The updated DSMOA/CA projects that scoping and development and execution of work plans will be completed during FFY 2000-2003. Given this information, and the fact that this area directly abuts building T-102, posting of signs at appropriate sighting intervals prohibiting access, would be appropriate. In addition, given that this area is in close proximity to the water supply well for the maintenance shop, collecting a water sample for the appropriate laboratory analyses would be recommended.

Reserve Unit Maintenance Area Waste Oil Tank (RVAAP-24):

According to the PA, this above-ground tank, emptied and in-operational since 1993, held waste oil from shop maintenance areas and was composed of predominantly crankcase and transmission oils, gear lubricants, and hydraulic/brake fluids. This AOC was ranked as a low priority on the RRSE during the recent USACHPPM investigations. The updated DSMOA/CA projects that scoping of this AOC will be completed during FFY 2000-2003. Given this information, posting of signs prohibiting access and placed at appropriate sighting intervals, would be appropriate.

Building 854, PCB Storage (RVAAP-27):

This AOC consists of an area of approximately 50 feet x 250 feet located within a wooden building with concrete floors and transite siding. The Army is currently in contact with the OEPA PCB Unit in order to ensure that closure of the building is in compliance with all applicable Toxic Substances Control Act (TSCA) regulations. As of this date, all transformers have been removed and the only materials left on-site are trays and buggies that were utilized for the containment of electrical equipment. Posting of signs on the outside of the building in order to prohibit access would be appropriate. In addition, posting of signs would be recommended in areas where PCBs could have potentially migrated from the building (i.e., bay doors, etc.). Sampling of soils in these areas (ex. outside of bay doors, etc.) for PCBs, would also be warranted.

Mustard Agent Burial Site (RVAAP-28):

The PA indicates that a U.S. Army agency excavated a suspected mustard agent burial site in 1969 and that all items that were recovered were empty, and no contamination was detected. However, later reports state that an "undocumented source" indicated that the site had not been correctly identified, and was actually adjacent to the investigation area, and is now "enclosed" by a fallen cyclone fence. The soil samples obtained during the USACHPPM investigation, indicated that the samples were non-detect for thiodiglycol (a breakdown product of mustard agent). However, the OEPA notes that the detection limits for this compound may have been slightly elevated. The updated DSMOA/CA workplan indicates that the potential for the existence of this burial site will be more thoroughly researched during FFY 1999, with any required work being conducted in the following fiscal years. The Agency also notes that this AOC is in close proximity to areas currently utilized by the ONG for training purposes. As such, the OEPA would recommend the usage of appropriate non-intrusive geophysical techniques in order to determine if there is any potential for canisters/drums/containers (etc.) to exist in this area. Subsequent to the survey(s), it would be appropriate to fence off and appropriately sign an area larger than the suspected burial area in order to prohibit access. Intrusive activities should be minimized in this area.

Ore Pile Retention Pond (RVAAP-31):

The description in the PA indicates that this AOC is a small, unlined surface impoundment that was constructed during the 1950s in order to abate the run-off from manganese ore piles. Soil samples obtained by Mogul Corp. indicated the presence of unspecified concentrations of RDX and TNT from soil samples obtained from the vicinity of the ore piles. The PA also indicates that this AOC maintains a current NPDES permit, and that sampling of the discharge by the facility does not reveal the presence of manganese contamination (detection limits unspecified). It is the OEPA's understanding that the on-site ore piles are currently being removed by the Defense Logistics Agency (DLA). Based upon this information, it would be appropriate to install signs (at designated sighting intervals) in order to prohibit access to this area.

Sand Creek Disposal Road Landfill (RVAAP-34):

The 1996 USACHPPM investigation indicates that this AOC was utilized as a disposal site for concrete, wood, asbestos debris, and fluorescent lighting tubes. The report indicates that access to this AOC is not restricted in any manner. Based upon the sampling that was conducted, the AOC scored as a high priority on the RRSE. The updated DSMOA/CA projects that this AOC will be scoped in FFY 1999, with the development and execution of the workplans and Phase 1 and II final reports taking place in the following four FFYs. Based upon this information, and the relatively small size of this AOC (based upon your memo), it would be appropriate to install fencing and signs in order to restrict access to this AOC. Prior to conducting any intrusive activities, it should be verified that there is no potential for UXO to exist in this area.

NACA TEST AREA (RVAAP-38):

Please refer to OEPA correspondence dated 10/03/97 regarding this particular AOC.

In addition to the above comments, the OEPA offers the following for your consideration:

1. Intrusive activities, and the development of any potential wastes (i.e. soil cuttings) should be minimized. Authorization to conduct intrusive activities under Ohio Administrative Code (OAC) 3745-27-13 has already been granted under two previous authorizations, and as such, no additional request for authorization needs to be submitted for installing fencing, or the posting of signs.

2. An on-going training program should be developed and executed, in order to educate personnel about the need for adherence to the access controls that would be selected and erected.

3. An inspection schedule and maintenance program should be instituted in order to provide for periodic inspection and repair (if necessary) of the selected access controls. There should be periodic removal of vegetation in order to ensure that signs are easily visible.

4. The effectiveness of the chosen access controls should be re-evaluated on a periodic basis. This would include providing a mechanism for reporting encroachment onto a particular AOC, and determining whether or not additional access controls would be warranted.

The OEPA reiterates that this correspondence serves to offer suggestions, advice, and comments on the proposed method(s) for access restriction. This correspondence should not be taken, or interpreted, as approval for any action taken by the ONG, NGB, and/or Army.

I trust that this correspondence adequately addresses the OEPA's position regarding this issue. If you have any questions, please do not hesitate to contact me at 330-963-1221.

Sincerely,

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

ETM.wmk

cc: Bob Princic, NEDO DERR
Rod Beals, NEDO DERR
Catherine Stroup, CO Legal
Bonnie Buthker, OFFO SWDO
John Cicero, RVAAP
LtCol Tom Tadsen, RVAAP
Bob Whelove, IOC
Kevin Jasper, USACE/Louisville
Todd Boatman, USACE/Nashville
Maj Joe Knott, NGB

OAC 3745-9-09 THROUGH 3745-9-10

3745-9-09 Maintenance and modification of wells.

(A) Casings and the tops of wells shall be protected against entrance of contaminants at all times.

(B) If a casing deteriorates to such an extent that contaminants may enter the well, the casing shall be replaced, or the well shall be completely filled with grout.

(C) If any part of the pump or any connection malfunctions or becomes defective in such a fashion that contaminants may enter the well, the pump or connection shall be promptly repaired or replaced as necessary to prevent contaminants from entering the well.

(D)(1) Wells shall be disinfected in a manner satisfactory to the Director after maintenance or modification is performed, and before water is taken from the well for use.

(2) If the well is of such a use that its construction would require plan approval under 3745-9-03, the well shall be sampled for coliform group bacteria in a manner satisfactory to the Director after maintenance or modification is performed, and before water is taken from the well for human consumption. No water shall be supplied from said well for human consumption until the sampling demonstrates the absence of bacteria in harmful amounts.

(E) Existing wells not in compliance with the requirements set forth in 3745-9-07 shall be improved so as to meet such requirements

(1) if the top of the casing is buried, when excavation is done to expose the top of the casing, or

(2) in all other instances,

(a) whenever a drilling rig is placed over the well, or

(b) whenever the pump is removed for any purpose, and the well is to be kept in service.

(F) If casing is installed in a previously-constructed well, either to comply with paragraph (B) above or for any other purpose, such casing shall meet all requirements of 3745-9-06, and shall be installed in compliance with all requirements of 3745-9-05.

(G) If the Director determines that any well, any part of a well, or any appurtenance thereto has been constructed in such a fashion, or is being maintained in such a fashion, or has deteriorated to such an extent, that contaminants may enter ground water, the Director may issue an order to have such work performed on the well, including filling the well as described in 3745-9-10 (B) and (C), as he deems necessary to insure that contaminants do not enter ground water.

(Effective February 15, 1975)

3745-9-10 Abandonment of test holes and wells.

(A) Upon completion of testing, a test hole shall be either completely filled with grout or such other material as will prevent contaminants from entering ground water, or converted into a well, construction of which shall comply with all applicable requirements of this Chapter 3745-9.

(B) If a well containing walls is not being used for obtaining ground water or for determining the quality, quantity, or level of ground water, such well shall either be completely filled with grout or such other material as will prevent contaminants from entering ground water, or maintained in strict compliance with all applicable requirements of Regulation 3745-9-09.

(C) All wells not governed by (B) above and which are being used neither for obtaining ground water nor for determining the quality, quantity, or level of ground water shall be either completely filled with grout, or maintained in strict compliance with all applicable requirements of 3745-9-09.

(Effective February 15, 1975)

ORC 6111.42

§ 6111.42 Water planning, powers and duties of environmental protection agency.

The environmental protection agency shall:

(A) Collect, study, and interpret all available information, statistics, and data pertaining to the supply, use, conservation, and replenishment of the underground and surface waters in the state;

(B) Be authorized to cooperate with and negotiate for the state with any agency of the United States government or agency of any other state pertaining to the water resources of the state;

(C) Be authorized to perform stream gauging and contract with the United States government or any other agency for the gauging of any streams within the state;

(D) Have authority to furnish information to all public officials, offices, and agencies of and in the state, and to farmers, well drillers, water consumers, industries, and any other persons seeking information regarding water resources;

(E) Prescribe such regulations subject to and in accordance with sections 119.01 to 119.13 of the Revised Code, for the drilling, operation, maintenance, and abandonment of wells as are deemed necessary by the director of environmental protection to prevent the contamination of the underground waters in the state, except that such regulations shall not apply to wells for the provision of water for human consumption unless they are used, or are for use, by a public water system as defined in section 6109.01 of the Revised Code. No person shall violate any such regulation.

(F) Have access to all information and statistics which any public authority within the state has available which the director deems pertinent to its duties;

(G) Have authority to prepare an accurate map and description of the territorial boundaries of proposed watershed districts within the state. Such map and description shall follow the property line, section line, half section line, or patent line which is nearest to the hydrologic boundary of the proposed watershed district. There shall be not less than fifteen nor more than eighteen proposed watershed districts in the state and each shall be composed of one or more major river watersheds. When a map and a description of a proposed watershed district has been completed, the director shall cause a copy thereof to be filed with the secretary of state and the board of county commissioners of each county contained in whole or in part within the territorial boundaries of such proposed watershed district.

Ohio EPA
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

November 03, 1997

RE: Ravenna Army Ammunition Plant
Portage/Trumbull Counties
Investigation-Derived Wastes

Mr. Robert Whelove
Environmental Engineer
Restoration and Engineering Division
HQ Army Industrial Operations Command
AMSIO-EQE
Rock Island, IL 61299-6000

Dear Mr. Whelove:

The purpose of this correspondence is to state the Ohio Environmental Protection Agency's (Ohio EPA's) position regarding the disposition of investigative-derived wastes (IDW) that have been generated, and will continue to be generated, during investigative activities conducted at the various Areas of Concern (AOCs) at the Ravenna Army Ammunition Plant (RVAAP).

The IDW was generated, and will be generated, as part of the Remedial Investigation (RI) activities being conducted at the installation. On-site investigative activities are being conducted in accordance with workplans that have been reviewed and agreed-upon by the following stakeholders: Industrial Operations Command (IOC); United States Army Corps of Engineers (USACE); RVAAP personnel; and Ohio EPA. Copies of all pertinent workplans and reports have also been sent to the United States Environmental Protection Agency (USEPA). On-site investigative activities are also being conducted with oversight from the USACE and Ohio EPA.

The Ohio EPA's position is as follows:

1. all generated IDW shall be containerized and characterized in accordance with previously reviewed and agreed-upon workplans and reports. This step forms the basis for the following procedures:

2. all contaminated liquid IDW (including decontamination fluids, development and purge waters from groundwater wells, etc.) subsequent to the receipt and approval of the analytical results by personnel from Ohio EPA's Division of Surface Water (DSW), can be sent through the Load Line 12 pinkwater Waste Water Treatment Plant (WWTP).

3. all generated solid IDW that are determined to be hazardous in nature shall be disposed of off-site at a licensed facility, in accordance with all applicable State and Federal rules, laws, and regulations.

4. all generated solid IDW that is determined to be non-hazardous but contaminated, (i.e.: including metal concentrations above determined background concentrations; and/or any detectable concentrations of explosives compounds, pesticides/PCBs, Volatile Organic Compounds, Semi-Volatile Organic Compounds) may be temporarily stored at the point of generation (i.e. within the AOC) in a manner that does not constitute a risk to human health or the environment, until final remediation of the AOC is initiated. This option is available solely if the AOC is to be remediated. The Ohio EPA will not consider this option at an AOC for which a No Further Action (NFA) is proposed or anticipated.

5. all generated solid and liquid IDW that is determined to be uncontaminated by analytical methods (i.e. cuttings from background monitor well locations, cuttings from background soil borings, purge and development water from background groundwater wells, etc.) can be permanently stored on the installation property. This does not include any decontamination fluids.

We trust that this correspondence clarifies the Ohio EPA's position regarding the issue of IDW. If you have any questions, please do not hesitate to contact Eileen Mohr at 330-963-1221 or Catherine Stroup (Ohio EPA, Central Office, Legal) at 614-644-3037.

Sincerely,

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

Catherine Stroup
Senior Staff Attorney
CO Legal

ETM.w mk

cc: Bob Princic, NEDO DERR
Rod Beals, NEDO DERR
Kurt Princic, NEDO DSIWM
Diane Kurlich, NEDO DDAGW
Graham Mitchell, OFFO SWDO
Bonnie Buthker, OFFO SWDO
Steve Selecman, SAIC
Lisa Balderson, CO Legal DSIWM
David Seely, USEPA Region V
John Cicero, RVAAP
Mark Patterson, RVAAP
Kevin Jasper, USACE Louisville
Todd Boatman, USACE Nashville

since 1827

MASON & HANGER CORPORATION

RAVENNA ARMY AMMUNITION PLANT

January 28, 1997

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

Subject: CLOSURE PLANS
RAVENNA ARMY AMMUNITION PLANT
OH5 210 020 736

Reference: Three (3) Certified letters from the Ohio EPA to the Commander's Representative dated January 23, 1997, subject as above

Dear Sir:

The referenced letters directed RVAAP to revise the Closure Plans that were submitted last fall for the installation's Open Burning and Open Detonation Grounds and for Building 1601.

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) sets of the records that were developed in response to the receipt of the referenced letters. Please furnish a set of the records to Mr. Dennis Versluys, AMSIO-EQM, and retain a set 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 CORPORATION

W. B. Talmon, Jr.
Site Manager

WBT:wbt

cc: Robert Whelove/AMSIO-EQE
ACTS File
Closure Plan File
Reading File

8451 State Route 5 • Ravenna, Ohio 44266-9297 • 330-358-7400 • fax 330-358-7414

ENFORCEMENT ACTION TRACKING

POC NAME John A. Cicero, Jr. PH.(330) 358-7311
MSC: IOC
INSTALLATION: RAVENNA AAP

RECORD NUMBER : 32
RECORD'S FY : 97

1. REGULATORY REQUIREMENT RCRA_C
2. ENFORCEMENT ACTION TYPE WL IF CMPA, AGREEMENT TYPE
3. DATE OF ACTION 01/23/1997 4. ACTION # 20736-32-RCRA_C-WL

5. FINDINGS:

FINDING # / TYPE OF FINDING	DESCRIPTION	STATUS	DATE	1383 NUMBER
0001 - A	NOD RE CLOSURE PLAN FOR BLDG. 1601	U	01/23/1997	RVAP050394

FINDING SUMMARY
TOTAL : 1
ADMINISTRATIVE: 1
OPERATIONAL: 0
PROJECT: 0

6. STATUS OF ACTION STATUS DATE
UNRESOLVED 01/23/1997

7. ISSUING AGENCY(S) STATE

8. PREVIOUS OR REPEAT INOV's

9. CORRECTIVE ACTIONS MILESTONES

TARGET	ACTUAL	MILESTONE
02/26/1997	01/01/1900	SUBMISSION OF REVISED CLOSURE PLAN

10. REASON FOR NON-COMPLIANCE
THE INSTALLATION HAS SUBMITTED A CLOSURE PLAN COVERING BUILDING 1601, ITS HW STORAGE FACILITY. THE OHIO EPA HAS IDENTIFIED DEFICIENCIES IN THE CLOSURE PLAN, AND HAS REQUIRED THAT THE INSTALLATION SUBMIT A REVISED PLAN THAT SATISFACTORILY ADDRESSES THE DEFICIENCIES.

ENFORCEMENT ACTION TRACKING

POC NAME John A. Cicero, Jr. PH. (330) 358-7311
MSC: IOC
INSTALLATION: RAVENNA AAP

RECORD NUMBER : 33
RECORD'S FY : 97

1. REGULATORY REQUIREMENT RCRA_C
2. ENFORCEMENT ACTION TYPE WL IF CMPA, AGREEMENT TYPE
3. DATE OF ACTION 01/23/1997 4. ACTION # 20736-33-RCRA_C-WL

5. FINDINGS:

FINDING # / TYPE OF FINDING	DESCRIPTION	STATUS	DATE	1383 NUMBER
0001 - A	NOD RE CLOSURE PLAN FOR RVAAP'S OB GROUNDS	U	01/23/1997	RVAP050394

FINDING SUMMARY
TOTAL : 1
ADMINISTRATIVE: 1
OPERATIONAL: 0
PROJECT: 0

6. STATUS OF ACTION STATUS DATE
UNRESOLVED 01/23/1997

7. ISSUING AGENCY(S) STATE

8. PREVIOUS OR REPEAT INOV's

9. CORRECTIVE ACTIONS MILESTONES

TARGET	ACTUAL	MILESTONE
02/26/1997	01/01/1900	SUBMISSION OF REVISED CLOSURE PLAN RE RVAAP'S OB GROUNDS

10. REASON FOR NON-COMPLIANCE
THE INSTALLATION HAS SUBMITTED A CLOSURE PLAN COVERING ITS OPEN BURNING GROUNDS. THE OHIO EPA HAS IDENTIFIED DEFICIENCIES IN THE PLAN, AND HAS REQUIRED THAT THE INSTALLATION SUBMIT A REVISED PLAN THAT SATISFACTORILY ADDRESSES THE DEFICIENCIES.

ENFORCEMENT ACTION TRACKING

POC NAME John A. Cicero, Jr. PH. (330) 358-7311
MSC: IOC
INSTALLATION: RAVENNA AAP

RECORD NUMBER : 34
RECORD'S FY : 97

1. REGULATORY REQUIREMENT RCRA_C
2. ENFORCEMENT ACTION TYPE WL IF CMPA, AGREEMENT TYPE
3. DATE OF ACTION 01/23/1997 4. ACTION # 20736-34-RCRA_C-WL

5. FINDINGS:

FINDING # / TYPE OF FINDING	DESCRIPTION	STATUS	DATE	1383 NUMBER
0001 - A	NOD RE CLOSURE PLAN FOR RVAAP'S OD GROUNDS	U	01/23/1997	RVAP050394

FINDING SUMMARY
TOTAL : 1
ADMINISTRATIVE: 1
OPERATIONAL: 0
PROJECT: 0

6. STATUS OF ACTION STATUS DATE
UNRESOLVED 01/23/1997

7. ISSUING AGENCY(S) STATE

8. PREVIOUS OR REPEAT INOV's

9. CORRECTIVE ACTIONS MILESTONES

TARGET	ACTUAL	MILESTONE
02/26/1997	01/01/1900	SUBMISSION OF REVISED CLOSURE PLAN

10. REASON FOR NON-COMPLIANCE
THE INSTALLATION HAS SUBMITTED A CLOSURE PLAN REGARDING ITS OPEN DETONATION GROUNDS. THE OHIO EPA HAS IDENTIFIED DEFICIENCIES IN THE PLAN, AND HAS REQUIRED THAT THE INSTALLATION SUBMIT A REVISED PLAN THAT SATISFACTORILY ADDRESSES THE DEFICIENCIES.

NOD's CLOSURE PLANS

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

TO 2/21/97
CR-COR
PROP ADM
LAND MGR
CONTRACTOR
RETURN FOR FILE

REPLY TO
ATTENTION OF

February 21, 1997

SIORV-CR (200-1a)

Mr. Donald R. Schregardus, Director
Ohio Environmental Protection Agency
1800 Watermark Drive
P.O. Box 1049
Columbus, Ohio 43215-1049

Dear Mr. Schregardus,

The Ravenna Army Ammunition Plant requests an extension for the submittal of responses to the Notice of Deficiencies issued regarding the closure plans for the Open Burning Grounds, Open Detonation Area, and Building 1601. This request is necessary to allow for the procurement of Architect-Engineering (A-E) Services through the Corps of Engineers (COE). A new task order is required to have a consultant prepare the revised closure plans. Negotiations have begun. It is anticipated the A-E will be under contract by April 15, 1997. We request you allow us to respond to your deficiencies notices not later than July 30, 1997. This schedule allows sufficient time for the movement of funds to the Corps of Engineers, the task order award, and preparation of responses to the comments with revised closure plans. Every effort will be made to expedite the process. With our next submittal we will provide an anticipated schedule for the environmental restoration activities required by the revised closure plans.

Close coordination of schedules is necessary to allow the plant adequate time to respond to your agency's requirements. With continued staffing reductions, it has become necessary that a majority of the effort for environmental restoration be contracted out. Adequate time is required to accommodate the contracting process.

Your points of contact for this action are Mr. Bill Ingold, AMSIO-IRI, (309) 782-1395, and Mr. Robert Whelove, AMSIO-EQE, (309) 782-1092.

John A. Cicero, Jr.
Commander's Representative

mailed certified
184-870-122
2/21/97

Copies Furnished:
Ms. Sheila Abraham, Division of Hazardous Waste Management, Northeast District Office, Ohio Environmental Protection Agency, 2110 East Aurora Road, Twinsburg, OH 44087-1969
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-EQM, (Mr. Versluys), Rock Island, IL 61299-6000
Commander, U.S. Army Industrial Operations Command, ATTN: AMSIO-IRI, (Mr. Ingold), Rock Island, IL 61299-6000
Commander, U.S. Army Industrial Operations Command, ATTN: AMSIO-IRG, (Ms. Vermost), Rock Island, IL 61299-6000
U.S. Army Corps of Engineers, Nashville District, ATTN: CEORN-ER-H (Mr. Todd Boatman), P.O. Box 1070, Nashville, TN 37202
U.S. Army Corps of Engineers, Louisville District, ATTN: CEORN-DL-B (Mr. Kevin Jasper), P.O. Box 59, Louisville, KY 40201-0059

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 3/11/97
CR-COR
DEOP ADM
LAND MGR
CONTRACTOR 3/11/97
RETURN FOR FILE

George V. Voinovich
Governor

March 10, 1997

RE: RAVENNA ARMY AMMUNITION PLANT - SUBMISSION OF REVISED CLOSURE PLANS

Mr. John J. Cicero, Jr.
Commander's Representative
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna OH 44266-9297

Dear Mr. Cicero:

On February 24, 1997 the Ohio EPA received a copy of your request for an extension, up to July 30, 1997, for the submittal of responses to the Notices of Deficiency (NODs)issued by the Director, Ohio EPA on January 23, 1997. The NODs were sent to the Ravenna Army Ammunition Plant (RVAAP), in regards to the closure plans submitted for the Open Burning Grounds, Open Detonation Area, and Building 1601.

Ohio EPA has no legal mechanism to grant an extension to the period of time in which a facility is required to respond to an NOD for a closure plan. Please be advised that since a response was not received by Ohio EPA within the 30 day period allowed, RVAAP is in violation of the Ohio Administrative Code (OAC) 3745-66-12(D)(4), and that RVAAP will remain in violation until the response is submitted. However, the Ohio EPA is willing to meet with you in order to clarify any issues of concern, and to expedite a timely submittal.

Should you have any questions, please feel free to contact me at (216) 963-1290.

Sincerely,

Sheila Abraham
Environmental Specialist
Division of Hazardous Waste Management

SA:ddb

cc: Thomas Crepeau, DHWM, CO
Mark Navarre, Legal, CO
Carolyn Princic, DHWM, NEDO
Marlene Emanuelson, DHWM, NEDO
Montee Suleiman, DHWM, CO
CF. IOC, EQM, EQE, IRG, IRI, AP4-I
COE NASHVILLE
COE LOUISVILLE
3/11/97

since 1827
MASON & HANGER CORPORATION
RAVENNA ARMY AMMUNITION PLANT

March 12, 1997

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

Subject: CLOSURE PLANS
RAVENNA ARMY AMMUNITION PLANT
OH5 210 020 736

Reference: 1. Three (3) Certified letters from the Ohio EPA to the Commander's Representative dated January 23, 1997, subject as above

2. A letter from the Ohio EPA dated March 10, 1997, subject as above

Dear Sir:

The referenced certified letters directed RVAAP to revise the Closure Plans that were submitted last fall for the installation's Open Burning and Open Detonation Grounds and for Building 1601. The installation was given 30 days following the receipt of the letters in which to complete the necessary revisions. The installation was unable to submit the revised closure plans in a timely fashion, and consequently received a warning letter from the Ohio EPA (reference 2).

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) sets of the records that were developed in response to the receipt of the latest letter from the Ohio EPA. Please furnish a set of the records to Mr. Dennis Versluys, AMSIO-EQM, and retain a set 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 CORPORATION

W. B. Talmon, Jr.
Site Manager

WBT:wbt

cc: Robert Whelove/AMSIO-EQE
ACTS File
Closure Plan File
Reading File

ENFORCEMENT ACTION TRACKING

POC NAME JOHN A. CICERO, JR. PH. 330-358-7311
MSC: IOC
INSTALLATION: RAVENNA AAP

RECORD NUMBER : 32
RECORD'S FY : 97

1. REGULATORY REQUIREMENT RCRA_C
2. ENFORCEMENT ACTION TYPE WL IF CMPA, AGREEMENT TYPE
3. DATE OF ACTION 01/23/1997 4. ACTION # 20736-32-RCRA_C-WL

5. FINDINGS:

FINDING # / TYPE OF FINDING	DESCRIPTION	STATUS	DATE	1383 NUMBER
0001 - A	NOD RE CLOSURE PLAN FOR BLDG. 1601	U	01/23/1997	RVAP050394

FINDING SUMMARY
TOTAL : 1
ADMINISTRATIVE: 1
OPERATIONAL: 0
PROJECT: 0

6. STATUS OF ACTION STATUS DATE
UNRESOLVED 01/23/1997

7. ISSUING AGENCY(S) STATE

8. PREVIOUS OR REPEAT INOV's

9. CORRECTIVE ACTIONS MILESTONES

TARGET	ACTUAL	MILESTONE
04/30/1997	01/01/1900	SUBMISSION OF REVISED CLOSURE PLAN

10. REASON FOR NON-COMPLIANCE
THE INSTALLATION HAS SUBMITTED A CLOSURE PLAN COVERING BUILDING 1601, ITS HW STORAGE FACILITY. THE OHIO EPA HAS IDENTIFIED DEFICIENCIES IN THE CLOSURE PLAN, AND HAS REQUIRED THAT THE INSTALLATION SUBMIT A REVISED PLAN THAT SATISFACTORILY ADDRESSES THE DEFICIENCIES.

ENFORCEMENT ACTION TRACKING

POC NAME JOHN A. CICERO, JR. PH.330-358-7311
MSC: IOC
INSTALLATION: RAVENNA AAP

RECORD NUMBER : 33
RECORD'S FY : 97

1. REGULATORY REQUIREMENT RCRA_C
2. ENFORCEMENT ACTION TYPE WL IF CMPA, AGREEMENT TYPE
3. DATE OF ACTION 01/23/1997 4. ACTION # 20736-33-RCRA_C-WL

5. FINDINGS:

FINDING # / TYPE OF FINDING	DESCRIPTION	STATUS	DATE	1383 NUMBER
0001 - A	NOD RE CLOSURE PLAN FOR RVAAP'S OB GROUNDS	U	01/23/1997	RVAP050394

FINDING SUMMARY
TOTAL : 1
ADMINISTRATIVE: 1
OPERATIONAL: 0
PROJECT: 0

6. STATUS OF ACTION STATUS DATE
UNRESOLVED 01/23/1997

7. ISSUING AGENCY(S) STATE

8. PREVIOUS OR REPEAT INOV's

9. CORRECTIVE ACTIONS MILESTONES

TARGET	ACTUAL	MILESTONE
04/30/1997	01/01/1900	SUBMISSION OF REVISED CLOSURE PLAN RE RVAAP'S OB GROUNDS

10. REASON FOR NON-COMPLIANCE
THE INSTALLATION HAS SUBMITTED A CLOSURE PLAN COVERING ITS OPEN BURNING GROUNDS. THE OHIO EPA HAS IDENTIFIED DEFICIENCIES IN THE PLAN, AND HAS REQUIRED THAT THE INSTALLATION SUBMIT A REVISED PLAN THAT SATISFACTORILY ADDRESSES THE DEFICIENCIES.

ENFORCEMENT ACTION TRACKING

POC NAME JOHN A. CICERO, JR. PH. 330-358-7311
MSC: IOC
INSTALLATION: RAVENNA AAP

RECORD NUMBER : 34
RECORD'S FY : 97

1. REGULATORY REQUIREMENT RCRA_C
2. ENFORCEMENT ACTION TYPE WL IF CMPA, AGREEMENT TYPE
3. DATE OF ACTION 01/23/1997 4. ACTION # 20736-34-RCRA_C-WL

5. FINDINGS:

FINDING # / TYPE OF FINDING	DESCRIPTION	STATUS	DATE	1383 NUMBER
0001 - A	NOD RE CLOSURE PLAN FOR RVAAP'S OD GROUNDS	U	01/23/1997	RVAP050394

FINDING SUMMARY
TOTAL : 1
ADMINISTRATIVE: 1
OPERATIONAL: 0
PROJECT: 0

6. STATUS OF ACTION STATUS DATE
UNRESOLVED 01/23/1997

7. ISSUING AGENCY(S) STATE

8. PREVIOUS OR REPEAT INOV's

9 CORRECTIVE ACTIONS MILESTONES

TARGET	ACTUAL	MILESTONE
04/30/1997	01/01/1900	SUBMISSION OF REVISED CLOSURE PLAN

10. REASON FOR NON-COMPLIANCE
THE INSTALLATION HAS SUBMITTED A CLOSURE PLAN REGARDING ITS OPEN DETONATION GROUNDS. THE OHIO EPA HAS IDENTIFIED DEFICIENCIES IN THE PLAN, AND HAS REQUIRED THAT THE INSTALLATION SUBMIT A REVISED PLAN THAT SATISFACTORILY ADDRESSES THE DEFICIENCIES.

ENFORCEMENT ACTION TRACKING

POC NAME JOHN A. CICERO, JR. PH. 330-358-7311

MSC: IOC RECORD NUMBER : 35

INSTALLATION: RAVENNA AAP RECORD'S FY : 97

1. REGULATORY REQUIREMENT RCRA_C
2. ENFORCEMENT ACTION TYPE INOV IF CMPA, AGREEMENT TYPE
3. DATE OF ACTION 03/10/1997 4. ACTION # 20736-35-RCRA_C-INOV

5. FINDINGS:

FINDING # / TYPE OF FINDING	DESCRIPTION	STATUS	DATE	1383 NUMBER
0001 - A	NOV RE FAILURE TO SUBMIT CLOSURE PLANS IN A TIMELY FASHION	U	03/10/1997	RVAP050394

FINDING SUMMARY

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

6. STATUS OF ACTION STATUS DATE
UNRESOLVED 03/10/1997

7. ISSUING AGENCY(S) STATE

8. PREVIOUS OR REPEAT INOV's

9. CORRECTIVE ACTIONS MILESTONES

TARGET	ACTUAL	MILESTONE
03/20/1997	01/01/1900	MEETING WITH THE OHIO EPA RE SCHEDULE FOR SUBMISSION OF REVISED CLOSURE PLANS

10. REASON FOR NON-COMPLIANCE

THE INSTALLATION FAILED TO SUBMIT REVISED CLOSURE PLANS COVERING ITS OPEN BURNING AND OPEN DETONATION GROUNDS, AND ITS HW STORAGE BUILDING, IN A TIMELY FASHION. AS A CONSEQUENCE, THE OHIO EPA HAS ISSUED A NOTICE OF VIOLATION TO THE INSTALLATION. THE INSTALLATION MUST MEET WITH THE REGULATORS, AND NEGOTIATE A SCHEDULE FOR THE SUBMISSION OF THE REVISED DOCUMENTS.

OhioEPA
State . 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

April 29, 1997

Mr. Tim Morgan
Forester/ Land Manager
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, OH 44266-9296

Dear Mr. Morgan:

With reference to your recent query on the weekly testing required of the Ravenna Army Ammunition Plant (RVAAP) under the Ohio Administrative Code (OAC) for the Open Burning, Open Detonation, Deactivation Furnace and Building 1601 areas, please be aware that these areas are currently evaluated for compliance with the Hazardous Waste Interim Facility Standards, as set forth in 3745-65.

Specifically, the general inspection requirements, as set forth in 3745-65-15, are two-fold. As per 3745-65-15 (A), the owner or operator is required to inspect the facility on a weekly basis for malfunctions and deterioration, operator errors, and discharges that may cause or lead to the release of hazardous waste or hazardous waste constituents into the environment or present a threat to human health. Based on the current inactive status of the OB, OD, Building 1601 and DFA areas, the potential for malfunction and for additional operator errors and discharges does not appear to exist. Ohio EPA would however recommend that these areas are inspected weekly to ensure that additional deterioration, including dumping of waste, and subsequent discharges do not occur.

The second portion of the general inspection requirements, as set forth in 3745-65-15 (B) require the owner or operator to develop and follow a written schedule for inspecting all monitoring equipment, safety and emergency equipment, security devices and operating and structural equipment necessary to prevent, detect, or respond to environmental or human health hazards. None of this equipment appears to be required in the OB, OD, Building 1601 and DFA areas, given the current inactive status of these areas.

The weekly testing and maintenance of equipment requirements is further addressed in OAC 3745-65-33. The regulation states that "All facility communications or alarm systems , fire protection equipment, spill control equipment, and decontamination equipment, where required, shall be tested on a weekly basis and maintained as necessary to assure its proper operation in the event of an emergency". Again, based on the inactive nature of the OB, OD, and DFA areas, it appears that no such equipment is required in these areas. In the case of Building 1601, the

container storage area, such equipment is currently not required as no hazardous waste is being stored there. However, if that situation changes, the appropriate regulations should be adhered to.

Also, as discussed, are copies of the small quantity and conditionally exempt generator checklists. I hope these will be a resource and help you ascertain your regulatory requirements.

If you have any questions regarding this letter or the hazardous waste regulations, please feel free to contact me at (216) 963-1290.

Sincerely,

Sheila Abraham

Sheila Abraham
Environmental Specialist
Division of Hazardous Waste Management

SA:ddb

cc: Marlene Emanuelson, DHWM, NEDO
Jeff Mayhugh, DHWM, CO
Eileen Mohr, DERR, NEDO
Mark Navarre, Legal, CO

Enclosure

FACSIMILE HEADER SHEET

Nashville District
Corps of Engineers

Mail: CEORN-ER-H, PO Box 1070, Nashville, TN 37202-1070
Fed Ex: RM A528, 110 9th Ave South - US Court House Annex

Date: **07/22/97**

Number of pages including cover sheet: ____

To:	John Cicero
Phone:	(330) 358-7311
Fax phone:	(330) 358-7314
CC:	

From:	**Todd H. Boatman**
Phone:	(615) 736-2048
Fax phone:	(615) 736-2861

NASHVILLE
HTRW Design Center

REMARKS: ☐ Urgent ☐ For your review ☐ Reply ASAP ☐ Please comment

John, here is a first draft of the letter I promised to write for you re our conference call with the OEPA on 8 July. Please review and comment as soon as possible. Bob W. is also reviewing this.

Thanks.

-Todd

The document being faxed ☐ will also ☐ will not be transmitted to the recipient by conventional delivery mail.

REVISED CLOS PLAN LTR 7/24/97

SENDER:

- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

MR. DONALD SCHREGARDUS
OHIO EPA
1800 WATERMARK DR.
COLUMBUS, OH 43215-1049
MAILROOM

4a. Article Number

P184-870-135

4b. Service Type

☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery

5. Signature (Addressee) JUL 8 5 1997

8. Addressee's Address (Only if requested and fee is paid)

6. Signature (Agent) Thos. L. Bruce

PS Form 3811, December 1991 ★U.S. GPO: 1992—323-402 **DOMESTIC RETURN RECEIPT**

Is your RETURN ADDRESS completed on the reverse side?

Thank you for using Return Receipt Service.

SIMILE HEADER SHEET

Nashville District
Corps of Engineers

Mail: CEORN-ER-H, PO Box 1070, Nashville, TN 37202-1070
Fed Ex: RM A528, 110 9th Ave South - US Court House Annex

Date: 07/23/97
Number of pages including cover sheet: ____

To: Cicero / Patterson
Phone: (330) 358-7311
Fax phone: (330) 358-7314
CC:

From: Todd H. Boatman
Phone: (615) 736-2048
Fax phone: (615) 736-2861

REMARKS: ☐ Urgent ☐ For your review ☐ Reply ASAP ☐ Please comment

John / Mark, here is the proposed EPA letter with Bob's comments addressed. Please let me know if you would like anything else added.

Thanks.

-Todd

7/23/97
COR
ENV

The document being faxed ☐will also ☐will not be transmitted to the recipient by conventional delivery mail.

Mr. Donald R. Schregardus, Director
Ohio Environmental Protection Agency
1800 Watermark Drive
P.O. Box 1049
Columbus, Ohio 43215-1049

Dear Mr. Schregardus,

The Ravenna Army Ammunition Plant would like to thank the Ohio EPA for its assistance in developing an approach to the closure of the Building 1601, Open Burning Grounds, and Open Detonation Area RCRA units at this facility. The complexity in delineating contamination from the RCRA units that are in the midst of larger, CERCLA evaluated areas, has prompted plant personnel to deviate from its previous closure plans. Ms. Sheila Abraham, Northeast Office, Division of Hazardous Waste Management, has been of great help in allowing us to move forward with new closure plans in a timely manner. Unfortunately, due to contracting restraints, we were unable to meet our original schedule for submittal of these plans.

In a conference call with Ms. Abraham on July 9, 1997, plant personnel conveyed its wishes to delay submittal of the final closure plans until August 30, 1997. Furthermore, we asked to incorporate comments from the Ohio EPA on a draft set of plans, concurrently reviewed by the Army, to be submitted on July 30, 1997. While agreeing to review the draft closure plans, Ms. Abraham stated that due to uncertain agency constraints, the Ohio EPA would not be able to guarantee any turn around schedules at this time.

We certainly understand that unscheduled events can interrupt the best of schedules. However, the agency must understand if comments are not received in a timely fashion, it could require further contracting actions on the part of the Army. As a result, additional costs to the Army would be incurred, as well as delays in the submittal of closure plans. We would like to assure the agency that we will continue to work, with you, in good faith towards a timely closure of these RCRA units.

John A. Cicero, Jr.
Commander's Representative

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

7/24/97
ENV

REPLY TO
ATTENTION OF

July 24, 1997

SIORV-CR (200-1a)

Subject: Submission of Revised Closure Plans, Ravenna Army Ammunition Plant

Mr. Donald R. Schregardus, Director
Ohio Environmental Protection Agency
1800 Watermark Drive ,
P.O. Box 1049
Columbus, OH 43215-1049

Dear Mr. Schregardus,

The Ravenna Army Ammunition Plant would like to thank the Ohio EPA for its assistance in developing an approach to the closure of Building 1601, Open Burning Grounds, and Open Detonation Area RCRA units at this facility. The complexity in delineating contamination from the RCRA units that are in the midst of larger, CERCLA evaluated areas, has prompted plant personnel to deviate from its previous closure plans. Ms. Sheila Abraham, Northeast Office, Division of Hazardous Waste Management, has been of great help in allowing us to move forward with new closure plans in a timely manner. Unfortunately, due to contracting restraints, we were unable to meet our original schedule for submittal of these plans.

In a conference call with Ms. Abraham on July 9, 1997, plant personnel conveyed its wishes to delay submittal of the final closure plans until August 30, 1997. Furthermore, we asked to incorporate comments from the Ohio EPA on a draft set of plans, concurrently reviewed by the Army, to be submitted on July 30, 1997. While agreeing to review the draft closure plans, Ms. Abraham stated that due to uncertain agency constraints, the Ohio EPA would not be able to guarantee any turn around schedules at this time.

We certainly understand that unscheduled events can interrupt the best of schedules. However, the agency must understand if comments are not received in a timely fashion, it could require further contracting actions on the part of the Army. As a result, additional costs to the Army would be incurred, as well as delays in the submittal of closure plans. We would like to assure the agency that we will continue to work with you, in good faith, towards a timely closure of these RCRA units.

mailed certified 7/24/97

Your points of contact for this action are Mr. Bill Ingold, (309) 782-1395, and Mr. Robert Whelove, Jr., (309) 782-1092 at U.S. Army Industrial Operations Command, and Mr. Mark Patterson, (330) 358-7311 at Ravenna AAP.

Sincerely,

John A. Cicero, Jr.
Commander's Representative

Copies Furnished:
Ms. Sheila Abraham, Division of Hazardous Waste Management, Northeast District Office, Ohio Environmental Protection Agency, 2110 East Aurora Road, Twinsburg, OH 44087-1969
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-EQM, (Mr. Versluys), Rock Island, IL 61299-6000
Commander, U.S. Army Industrial Operations Command, ATTN: AMSIO-IRI, (Mr. Ingold), Rock Island, IL 61299-6000
Commander, U.S. Army Industrial Operations Command, ATTN: AMSIO-IRG, (Ms. Vermost), Rock Island, IL 61299-6000
U.S. Army Corps of Engineers, Nashville District, ATTN: CEORN-ER-H (Mr. Todd Boatman), P.O. Box 1070, Nashville, TN 37202
U.S. Army Corps of Engineers, Louisville District, ATTN: CEORL-DL-B (Mr. Kevin Jasper), P.O. Box 59, Louisville, KY 40201-0059

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

September 12, 1997

RE: DRAFT CLOSURE PLAN COMMENTS
RAVENNA ARMY AMMUNITION PLANT
OPEN DETONATION AREA
CONTAINER STORAGE AREA
OPEN BURNING GROUNDS

John Cicero, Jr.
Commander's Representative
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, OH 44266-9297

Dear Mr. Cicero:

On July 31, 1997 the Ohio EPA received your documents dated July 1997, regarding the Draft Revised Closure Plans for the Ravenna Army Ammunition Plant's (RVAAP) Container Storage Area Unit (Building 1601), Open Burning Grounds (OB), and Open Detonation Area (OD), located within the RVAAP installation at 8451 State Route 5, Ravenna, Ohio.

Pursuant to the Ohio Administrative Code (OAC) rule 3745-66-12(D)(4), I am providing you with a statement of deficiencies in the draft revised closure plans, outlined in Attachment A (Container Storage Unit (Building 1601)); Attachment B (Open Burning Grounds); Attachment C (Open Detonation Area).

As in these drafts the final modified closure plans should be prepared in accordance with the following editorial protocol or convention:

1. Old language is overstruck, but not obliterated.

2. New Language is capitalized.

3. Page headers should indicate date of submission.

4. If significant changes are necessary, pages should be re-numbered, table of contents revised, and complete sections provided as required.

The final modified closure plan should be submitted to: Ohio Environmental Protection Agency, Division of Hazardous Waste Management, Attn: Tom Crepeau, Manager, Data Management Section, P.O. Box 1049, Columbus, Ohio 43216-1049. a copy, with an additional copy to facilitate ground water review, should be sent to : Gregory Orr, Ohio EPA, Northeast District Office, 2110 East Aurora Road, Twinsburg, Ohio 44087.

Upon review of the re-submittal, the Ohio EPA will prepare and issue a final action approving or modifying such plan. If you wish to arrange a meeting to discuss your responses to this letter, please feel free to contact me at (330) 963-1189.

Sincerely,

Gregory Orr
Environmental Specialist
Division of Hazardous Waste Management

GO:ddb

cc: Marlene Emanuelson, DHWM, NEDO
Bob Princic, DERR, NEDO
Sheila Abraham, DERR, NEDO
Diane Kurlich, DGW, NEDO
Eileen Mohr, DERR, NEDO
Mark Navarre, Legal, CO
Montee Suleiman, DHWM, CO

Enclosures

ATTACHMENT A

COMMENTS ON THE DRAFT REVISED CLOSURE PLAN FOR THE RAVENNA ARMY AMMUNITION PLANT (RVAAP) CONTAINER STORAGE UNIT (BUILDING 1601) HAZARDOUS WASTE STORAGE UNIT

1. **General Description:**

(page 1-1): With reference to the description of the period when waste was stored in Building 1601, please clarify the statement that "The last shipment of waste was received at the facility in July 1993" and the statement that "The last drum of waste was shipped off-site from Building 1601 in April 1994". This is of concern, since the applicable regulatory time limits on the storage of hazardous waste (generated by RVAAP) should have been adhered to. Alternatively, if the facility was functioning as a receiving entity for the treatment of hazardous waste as authorized by an emergency permit or under interim status, this should be clarified.

2. **General Description:**

(page 1-3): Please note that areas identified in Figure 1-2 as 39, 40 and 41 are omitted from the explanatory legend under the figure. RVAAP shall identify them in the figure or delete them.

3. **Section 1.5.1 Waste Managed:**

(page 1-10): RVAAP shall discuss the housekeeping practices at the facility in more detail. Particularly the potential for contaminant migration out of the docking doors during cleaning activities should be discussed. Targeted soil sampling shall also be incorporated in the sampling plan. This comment also applies to **Section 1.5.3** (page 1-13) and **Section 2.3.3** (page 2-3).

4. **Section 2.1 Closure Performance Standard:**

(page 1-10): In the second bullet item on this page, the third "MCLG" (3rd line) shall be replaced by the words "rinseate standard". Technically, the rinseate or "clean" standard (and not the MCLG) is 15 times the practical quantitation limit for the analyte.

5. **Section 2.3.2 Decontamination and Disposal of the Burn Trays from the Open Burning Area:**

(page 1-10): The word "which" shall to be added after the words "OB closure plan" or the first sentence of this section may need to be split into two to facilitate understanding.

6. **Section 3.1 Expected Year of Closure:**

(page 3-1): RVAAP shall verify if closure is currently expected to begin in 1997. Alternatively, RVAAP can specify the fiscal year when closure is expected to commence.

7. **Section 3.8 Milestones:**

(page 3-2): The first sentence of the second paragraph of this section shall be modified to facilitate understanding.

8. **Appendix B:**

(page 11): RVAAP shall clarify if the "Background Criterion" in Table 4-1 refers to the remediation standard of mean + 2 standard deviations. If this is the case, additional supporting detail, including sampling locations, shall be provided to substantiate the levels proposed to be used.

End of comments on the Container Storage Area (Building 1601)

ATTACHMENT B

COMMENTS ON THE DRAFT REVISED CLOSURE PLAN FOR THE RAVENNA ARMY AMMUNITION PLANT (RVAAP) OPEN BURNING GROUNDS HAZARDOUS WASTE STORAGE UNIT

1. **Section 1.1 General Description:**

   (page 1-5): RVAAP shall reconcile the statement on page 1-5 that waste treatment at the facility began in 1984 with the statements on pages 1-1 and 1-17 that burns were conducted in the trays from 1980.

2. **Section 2.1.5.2 Roll-Off Contents - Refractory Material and Other Solids:**

   (page 2-7): RVAAP shall modify the statement that "the characteristic of reactivity will not be present" (4th line of the 2nd paragraph of this section) to "the characteristic of reactivity should not be present" or "is not present".

3. **Section 2.7 Criteria for Evaluating Adequacy and Section 2.7.2 Schedule for Inspections:**

   (page 2-27): RVAAP shall modify the reference to the SAP (Sampling and Analysis Plan) in the first sentence in both sections should be modified as a SAP is not being provided for this unit.

4. **Section 3.0 Closure Schedule:**

   (page 3-1): Please note that the RCRA unit is being defined, for the purposes of unit closure, as the open burn trays and associated appurtenances. The underlying soil is being excluded from the definition of the unit, on the understanding that the soil will be remediated as necessary under the CERCLA process. The closure certification does not, then, need to be linked to remediation of the soils in the area. Please be advised that if appropriate remediation is not carried out, Ohio EPA, Division of Hazardous Waste Management retains authority under the regulatory processes to enforce remediation. The language in Section 3.1 (Expected Year of Closure), 3.4 (Closure Completion) and Section 3.8 (Milestones) shall be appropriately modified.

5. **Section 3.1 Expected Year of Closure:**

   (page 3-1): RVAAP shall verify if closure is expected to begin in 1997. Alternatively, the facility shall specify the fiscal year when closure is expected to commence.

End of comments on the Container Storage Area (Building 1601)

ATTACHMENT C

COMMENTS ON THE DRAFT REVISED CLOSURE PLAN FOR THE RAVENNA ARMY AMMUNITION PLANT (RVAAP) OPEN DETONATION AREA HAZARDOUS WASTE STORAGE UNIT

1. **Section 1.5 Open Detonation Area Unit Description:**

(page 1-14): The Sampling and Analysis Plan (SAP) states that when the portion of Sand Creek immediately down slope from the southern boundary of the RCRA unit where sampled during the Phase I RI no explosive or metal levels above background were detected. This (surface water and sediment) data along with the data collected on Sand Creek as a part of the Part B permit process shall be provided or discussed to demonstrate that the creek has or has not been impacted by activities conducted in the regulated unit, given the proximity of the creek to the RCRA unit. The issue needs to be discussed since Sand Creek lies external (laterally) to the area defined in this closure plan as the RCRA regulated unit, and theoretically, any contamination found shall be addressed through the RCRA closure process.

2. **Section 2.3.3 Remediation Procedures:**

(page 2-4 to 2-8): RVAAP shall modify this section to include time for the Ohio EPA Division of Hazardous Waste Management (DHWM) inspector to review and evaluate the construction design package when it is finally prepared. The evaluation shall also be inserted in the Milestones Section (3.8)

3. **Section 2.4 Decontamination Efforts:**

(page 2-9): RVAAP shall indicate that efforts will be taken to ensure that the structural integrity of the 30-mil geomembrane liner is not breached by decontamination activity, particularly the earth moving equipment.

4. **Section 3.1 Expected Year of Closure:**

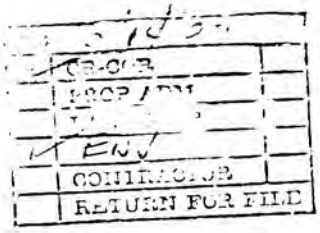
(page 3-1): RVAAP shall verify if closure is expected to begin in 1997. Alternatively, RVAAP shall specify the fiscal year when closure is expected to commence.

5. **Section 3.8 Milestones:**

(page 3-3): RVAAP shall modify this section to include time for the construction design package to be evaluated by the DHWM inspector. The approval of the inorganic remediation standards as soon as they are finalized (based on RI background date) shall also be inserted in the timeline.

End of comments on the Open Detonation Area

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



George V. Voinovich
Governor

October 10, 1997

RE: DRAFT CLOSURE PLAN COMMENTS
FOR GROUND WATER
RAVENNA ARMY AMMUNITION PLAN
OPEN DETONATION AREA
CONTAINER STORAGE AREA
OPEN BURNING GROUNDS
DEACTIVATION FURNACE

John Cicero, Jr.
Commander's Representative
Ravenna Army Ammunition Plant
8451 State Route 5
Ravenna, OH 44266-9297

Dear Mr. Cicero:

On July 31, 1997 the Ohio EPA received your documents dated July 1997, regarding the Draft Revised Closure Plans for the Ravenna Army Ammunition Plant's (RVAAP) Container Storage Area Unit (Building 1601), Open Burning Grounds (OB), and Open Detonation Area (OD), located within the RVAAP installation at 8451 State Route 5, Ravenna, Ohio.

Pursuant to the Ohio Administrative Code (OAC) rule 3745-66-12(D)(4), I am providing you with a statement of deficiencies in the draft revised closure plans regarding ground water issues, outlined in Attachment A (Container Storage Unit (Building 1601)); Attachment B (Open Burning Grounds); Attachment C (Open Detonation Area), Attachment D (Open Burning Ground/Open Demolition Area Ground Water Monitoring Plan), and Attachment E (Deactivation Furnace).

As in these drafts the final modified closure plans should be prepared in accordance with the following editorial protocol or convention:

1. Old language is overstruck, but not obliterated.

2. New Language is capitalized.

3. Page headers should indicate date of submission.

4. If significant changes are necessary, pages should be re-numbered, table of contents revised, and complete sections provided as required.

The final modified closure plan should be submitted to: Ohio Environmental Protection Agency, Division of Hazardous Waste Management, Attn: Tom Crepeau, Manager, Data Management Section, P.O. Box 1049, Columbus, Ohio 43216-1049. a copy, with an additional copy to facilitate ground water review, should be sent to : Gregory Orr, Ohio EPA, Northeast District Office, 2110 East Aurora Road, Twinsburg, Ohio 44087.

CF: AMSIO-EQE (R. WHELOVE)
AMSIO-IR (W. INGOLD) (R. VERMEET)
ACE, [illegible] (K. JASPER)

Upon review of the re-submittal, the Ohio EPA will prepare and issue a final action approving or modifying such plan. If you wish to arrange a meeting to discuss your responses to this letter, please feel free to contact me at (330) 963-1189.

Sincerely,

Frank Poplatek

for Gregory Orr
Environmental Specialist
Division of Hazardous Waste Management

GO:ddb

cc: Marlene Emanuelson, DHWM, NEDO
Bob Princic, DERR, NEDO
Sheila Abraham, DERR, NEDO
Diane Kurlich, DGW, NEDO
Eileen Mohr, DERR, NEDO
Mark Navarre, Legal, CO
Montee Suleiman, DHWM, CO

Enclosure

ATTACHMENT A

COMMENTS ON THE DRAFT REVISED CLOSURE PLAN FOR THE CONTAINER STORAGE UNIT (BUILDING 1601) HAZARDOUS WASTE TREATMENT UNIT

1. The original DDAGW comments concerning ground water concerns have been adequately addressed. However, in the period between the NOD and the present, it has come to the attention of the DDAGW that the original description of the geologic setting (Section 1.4.1.1, page 1-7) needs a minor modification. The facility indicates that the unconsolidated glacial materials at the site are the Kent and Hiram Tills. Although the Kent Till may be present at the site, it is probably concealed by the younger Lavery Till. As mapped by George W. White (Glacial Geology of Northeastern Ohio, Bulletin 68, Division of Geological Survey, Ohio Department of Natural Resources, 1982), the glacial materials on the western portion of the Ravenna Army Ammunition Plant are Lavery Till, while the Hiram Till is found on the eastern portion of the site. In addition, in the Phase I Remedial Investigation (RI) Report prepared by the Army as part of its CERCLA commitments, the glacial deposits are described (Section 3.1.1, page 3-1) as being the Lavery and Hiram Tills. In order to maintain consistency not only with the above referenced paper by White, but also with documents previously submitted by the facility, the discussion in Section 1.4.1.1 should be modified to discuss the Lavery Till rather than the Kent Till. The facility is referred to Section 3.1.1 of the Phase I RI Report for replacement language concerning the Lavery Till. References to the Kent Till in other portions of the closure plan (e.g., Section 1.4.1.2, page 1-8) should also be changed to reference the Lavery Till instead.

End of Comments

ATTACHMENT B

COMMENTS FOR THE DRAFT REVISED CLOSURE PLAN FOR THE OPEN BURNING (OB) AREA HAZARDOUS WASTE TREATMENT UNIT

1. In Section 1.4.1.1, page 1-8, the facility indicates that the unconsolidated glacial materials at the site are the Kent and Hiram Tills. Although the Kent Till may be present at the site, it is probably concealed by the younger Lavery Till. As mapped by George W. White (Glacial Geology of Northeastern Ohio, Bulletin 68, Division of Geological Survey, Ohio Department of Natural Resources, 1982), the glacial materials on the western portion of the RAAP are Lavery Till, while the Hiram Till is found on the eastern portion of the site. In addition, in the Phase I Remedial Investigation (RI) report prepared by the Army as part of its CERCLA commitments, the glacial deposits are described (Section 3.1.1, page 3-1) as being the Lavery and Hiram Tills. In order to maintain consistency not only with the above referenced paper by White, but also with documents previously submitted by the facility, the discussion in Section 1.4.1.1 of the draft closure plan should be modified to discuss the Lavery Till rather than the Kent Till. The facility is referred to Section 3.1.1 of the Phase I RI report for replacement language concerning the Lavery Till. References to the Kent Till in other portions of the closure plan (e.g., Section 1.4.1.1, page 1-9; Section 1.4.1.2, page 1-10) also should be modified to reference the Lavery Till instead.

2. To add clarity, in the key for Figure 1-6, DET-4 should be changed to OBG-4.

3. On Table 1-1, the concentration of total lead in monitoring well OBG-4 should be 59 mg/L.

4. During a September 16, 1997, meeting between the Army and the Ohio EPA and a follow-up phone conversation between the Ohio EPA and the Army's consultant, SAIC, it was decided that possible ground water and soil contamination at the RCRA unit in the Open Burning Grounds will be investigated under the larger CERCLA investigation being conducted at this site. Any ground water or soil remediation also will be conducted under the CERCLA program. The RCRA closure will focus strictly on the decontamination and removal of the metal burn trays and associated refractory materials at Pad 38. This decision is based on the fact that prior to RCRA, burning of explosives and other materials at Pad 38 and else where at the site took place on the ground surface. After RCRA, this burning took place only on the burn trays at Pad 38. The area around the burn trays regulated under RCRA is just one small portion of a much larger site in which burning occurred on the ground. Thus it is more appropriate for any possible soil contamination at the RCRA site to be investigated and remediated along with the larger site being addressed under CERCLA. Any ground water contamination would most probably be related to the burning that took place on the ground surface (and thus to contaminated soils) rather than to the burning that was conducted on the burn trays.

Remediation of any ground water contamination would probably not be successful unless the contaminated soils also are addressed. Thus, the investigation of possible ground water contamination as well as its remediation, if necessary, is also being deferred by RCRA to be included in the larger CERCLA project involving the entire Burning Grounds area.

Because of the above change in how the site is being handled, references to the proposed RCRA ground water monitoring program (e.g., pages 1-15, 1-17, and 2-1; Section 2.5) should be modified or deleted accordingly. A discussion of why the ground water and soils investigation and remediation are being deferred by RCRA to the CERCLA program should be added to the closure plan. In addition, the last sentence of Section 3.4 on page 3-1 should be modified to read, "Closure certification will remain pending until the soils and ground water at the OBG have been evaluated and remediated, if necessary, under the CERCLA program.

5. It is unclear why aluminum, manganese, selenium, and zinc are included on Table 1-2, "Constituents of Concern for the Open Burning Area," but are not included on Table 2-1, "Performance Standards," or Table 2-2, "Chemical Analyses of Rinseate Samples for Selected Compounds of Interest." It seems that if a parameter is a constituent of concern, it should be included in the list of performance standards and also should be included in the list of parameters for which the rinseate samples are analyzed. This should be clarified or corrected. In addition, it appears that the compound 2,4,5-trinitrotoulene that appears on Table 1-2 should actually be 2,4,6-trinitrotoulene. This should be corrected.

ATTACHMENT C

COMMENTS FOR THE DRAFT REVISED CLOSURE PLAN FOR THE OPEN DETONATION (OD) AREA HAZARDOUS WASTE TREATMENT UNIT

1. In Section 1.4.1.1, page 1-7, the facility indicates that the unconsolidated glacial materials at the site are the Kent and Hiram Tills. Although the Kent Till may be present at the site, it is probably concealed by the younger Lavery Till. As mapped by George W. White (Glacial Geology of Northeastern Ohio, Bulletin 68, Division of Geological Survey, Ohio Department of Natural Resources, 1982), the glacial materials on the western portion of the RAAP are Lavery Till, while the Hiram Till is found on the eastern portion of the site. In addition, in the Phase I Remedial Investigation (RI) report prepared by the Army as part of its CERCLA commitments, the glacial deposits are described (Section 3.1.1, page 3-1) as being the Lavery and Hiram Tills. In order to maintain consistency not only with the above referenced paper by White, but also with documents previously submitted by the facility, the discussion in Section 1.4.1.1 of the draft closure plan should be modified to discuss the Lavery Till rather than the Kent Till. The facility is referred to Section 3.1.1 of the Phase I RI report for replacement language concerning the Lavery Till. References to the Kent Till in other portions of the closure plan (e.g., Section 1.4.1.1, page 1-8; Section 1.4.1.2, page 1-9) also should be modified to reference the Lavery Till instead.

2. The following inorganics have been added to the list of site specific constituents of concern for soils: aluminum, antimony, beryllium, calcium, cobalt, copper, iron, magnesium, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and zinc. However, not all of these parameters (i.e., antimony, calcium, cobalt, copper, iron, magnesium, manganese, nickel, potassium, sodium, and vanadium) have been added to the site specific list of parameters for ground water. The list of site specific constituents of concern for ground water and soils should be the same. The list of site specific parameters proposed for ground water analyses on pages 2-11 and 2-12 should be modified accordingly.

3. In Appendix E, Section 2.3, page 7, the facility states that ground water is present at approximately 8 feet below ground surface. Boring logs for the four monitoring wells installed at the site indicate that ground water was encountered from 5.7 to 29.3 feet below ground surface. This section should be modified accordingly.

End of Comments

4. In the second paragraph on page 6, the facility indicates that it will treat metals data from the analysis of unfiltered ground water samples collected prior to December 1995 separately from metals data from the analysis of filtered ground water samples collected from December 1995 to the present when preforming statistical analyses. The closure plan for the Open Detonation area (Section 2.5, page 2-12) indicates that the background data set for the ground water metals data will include only the data collected after December 1995. This seems to imply that the total metals data (unfiltered) collected prior to December 1995 will not be used in the statistical analyses. This apparent discrepancy between the closure plan and the ground water sampling plan should be rectified and/or clarified and the documents modified accordingly.

End of Comments

ATTACHMENT D

COMMENTS FOR THE DRAFT AMENDMENT TO THE OPEN BURNING GROUND/OPEN DEMOLITION AREA GROUND WATER MONITORING PLAN

1. During a September 16, 1997, meeting between the Army and the Ohio EPA and a follow-up phone conversation on September 23, 1997, between the Ohio EPA and the Army's consultant, SAIC, it was decided that possible ground water and soil contamination at the RCRA unit in the Open Burning Grounds will be investigated under the larger CERCLA investigation being conducted at the site. Any ground water or soil remediation also will be conducted under the CERCLA program. The RCRA closure will focus strictly on the decontamination and removal of the metal burn trays and associated refractory materials at Pad 38. This decision is based on the fact that prior to RCRA, burning of explosives and other materials at Pad 38 and else where at the site took place on the ground surface. After RCRA, this burning took place only on the burn trays at Pad 38. The area around the burn trays at Pad 38 is just one small portion of a much larger site in which burning occurred on the ground. Thus it is more appropriate for any possible soil contamination at the RCRA site to be investigated and remediated along with the larger site being addressed under CERCLA. Any ground water contamination would most probably be related to the burning that took place on the ground surface (and thus to contaminated soils) rather than to the burning that was conducted on the burn trays. Remediation of any ground water contamination would probably not be successful unless the contaminated soils also are addressed. Thus, the investigation of possible ground water contamination as well as its remediation, if necessary, is also being deferred by RCRA to be included in the larger CERCLA project involving the entire burning grounds area.

   Because of the above change in how the Open Burning Grounds is being handled, all references to the Open Burning Grounds should be deleted from this document.

2. The analytical parameters for ground water should include all of the constituents of concern for the soils in the Open Detonation Area. Therefore the following constituents, included on Table 1-2 of the closure plan for the OD Area, should be added to the list of ground water analytical parameters (Table E-4-1) of the amended ground water sampling plan: antimony, calcium. cobalt, copper. iron, magnesium, nickel, potassium, sodium, and vanadium. In addition, the MCL for barium is 2000 ug/L and the MCL for thallium is 2 ug/L. Table E-4-1 should be modified accordingly.

3. The third sentence in Section 5 should be modified to read, "All metals samples will be filtered and acidified in the field immediately upon withdrawal from the well, using disposable 0.45-micron filters.

ATTACHMENT E

COMMENTS FOR THE DRAFT APPROACH TO THE CLOSURE OF THE DEACTIVATION FURNACE

1. Provisions for the monitoring of ground water in accordance with OAC 3745-65-90 through 94 in the event that site specific contamination is discovered to exist at or below the seasonal high ground water table is not included in the draft closure proposal. As per Comment 10 of the March 31, 1997, Notice of Deficiency, such a provision should be included in the closure plan.

2. On page 2 of the draft closure proposal, the facility indicates that a 12 foot deep trench was dug at the deactivation furnace site and that no ground water was encountered. Any observations concerning the glacial materials and/or bedrock observed in this trench also should be added to the section summarizing site geology. In addition, any site specific geologic information from the boring logs of the borings historically advanced in the immediate area of the deactivation furnace for soil sampling purposes also should be added to the closure plan. The discussion of the glacial materials present at the site should be revised to indicate that Lavery Till is present on the western portion of the site (as per the mapping of George W. White, 1982, Glacial Geology of Northeastern Ohio, Bulletin 68, Division of Geological Survey, Ohio Department of Natural Resources, and the Ravenna Army Ammunition Plant, Phase I Remedial Investigation (RI)Report, Section 3.1.1). The facility is referred to Section 3.1.1 of the Phase I RI Report for replacement language concerning the Lavery Till. All references to the Kent Till that may appear in other sections of the closure plan also should be changed to refer to the Lavery Till, instead.

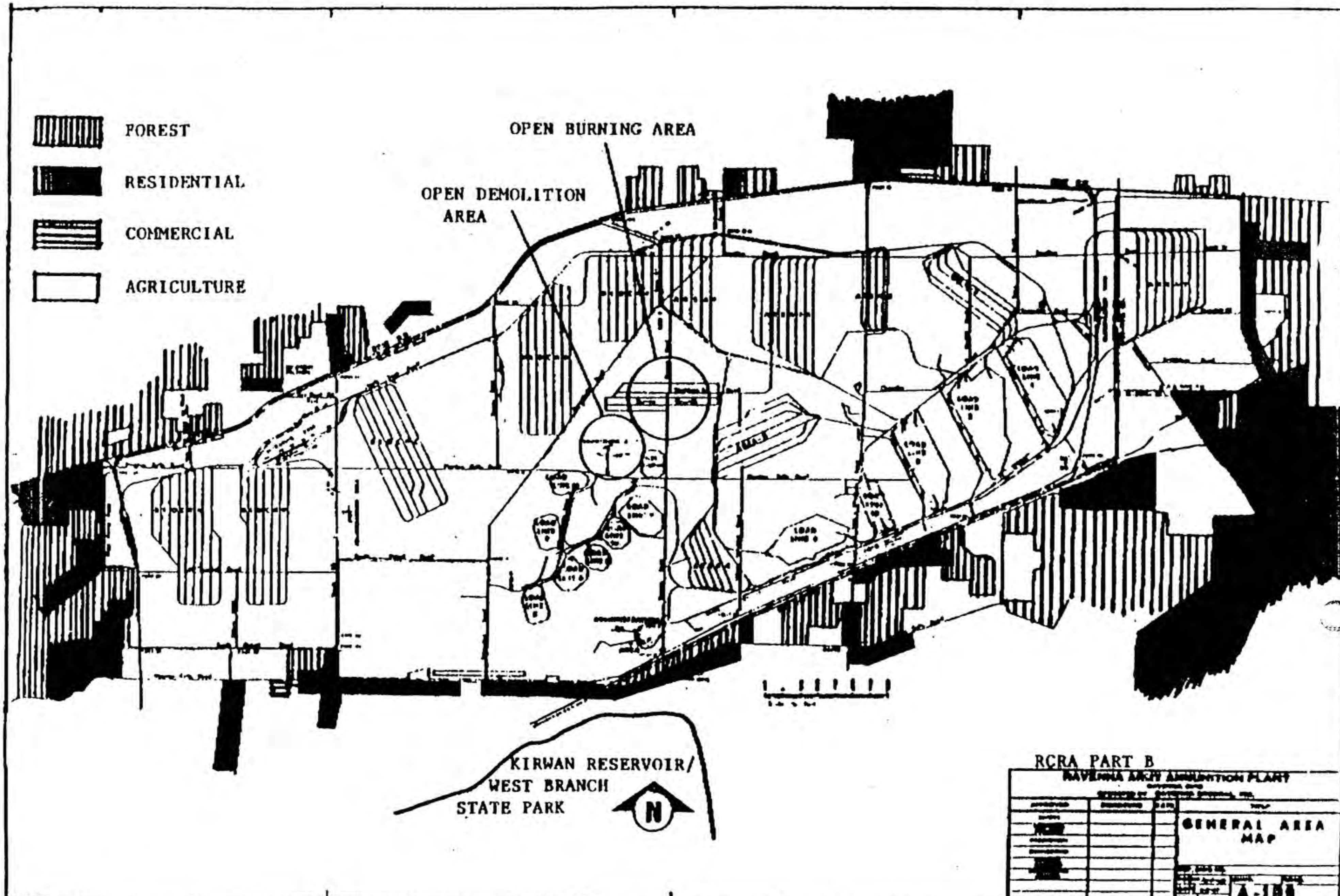
3. In Section V, Action Plan, the facility proposes to drill two 20-feet deep borings within the RCRA area to verify that the static ground water level is below any soil contamination and to define the vertical extent of the soil contamination. Advancing only two borings to the ground water table will not provide data representative of the entire RCRA unit. It is recommended that a grid system be employed to provide representative sampling to determine the full vertical extent of soil contamination.

4. It appears the company is not including explosive compounds in the list of the contaminants of concern at the deactivation furnace site. This decision is based on historical data that indicates that explosives are not present in the soils in detectable concentrations. However, in looking at the historical data, it appears that if background samples are not considered, samples were collected from only eleven points within the area potentially contaminated by operations at the unit. Considering the variability of explosive concentrations in soils over a very short distance, it seems premature to omit explosive compounds from the contaminants of concerns based on sampling at only 11 points within the area potentially contaminated by operations at the unit. Thus explosive compounds should be included in the list of parameters analyzed during soil sampling conducted for closure of this unit. Explosive compounds also should be included in the list of ground water monitoring parameters if such monitoring becomes necessary at the site.

End of Comments

MAJOR LAND US. ADJACENT TO
THE RAVENNA ARMY AMMUNITION PLANT

Revision No.:
Date: 06/12/92



IRP File

4/28/97
CR-COR
PROP ADM
LAND MGR
CONTRACTOR
RETURN FOR FILE
4/28/97

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

April 24, 1997

RE: Ravenna Army Ammunition Plant
Portage/Trumbull Counties
Residential Well Sampling

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

CONTRACTOR
FWD FOR
☐ Information
☐ Compliance as applicable
☐ Reply NLT_____

Dear Mr. Cicero:

The purpose of this correspondence is to request additional funding under the Defense-State Memorandum of Understanding (DSMOA) to conduct residential well sampling in the vicinity of the Ravenna Army Ammunition Plant (RVAAP). It is my understanding that the money that is currently encumbered under the DSMOA for sampling is solely for a 10% split-sampling of an investigation that the installation is in the process of conducting. Although residential well sampling is not currently being conducted at the installation, the Ohio Environmental Protection Agency (OEPA) believes that residential well sampling is warranted based upon the sole reliance on groundwater in this area for private and public water supplies, as well as intense public interest regarding the RVAAP installation.

The OEPA has obtained and evaluated over 300 residential water well logs around the perimeter of the RVAAP from the Ohio Department of Natural Resources (ODNR). During the field location process, it became apparent that these 300 water well logs represented approximately half of the water supply wells in the local area. During future stages, the OEPA will also contact the Portage and Trumbull County Health Departments in order to determine if the health departments have any additional well logs on file. However, the well logs obtained from ODNR were sufficient to determine the typical depths of the wells and the general geology in the vicinity of the RVAAP.

Utilizing the information on the well logs, and the information currently available on the various Areas of Concern (AOCs) at the RVAAP, the OEPA has tentatively chosen three general areas that should be included in an *initial* sampling of water supply wells. These areas are as follows and are delineated on the attached map:

1. Area A - appears to be downgradient of Load Line 1, Load Line 2, and Griggy's Pond. The wells in this area are predominantly completed in sand and gravel. Although most of the well logs indicate that there is surficial clay overlying the sand and gravel, depending on the lateral continuity of the clay, the recharge for the wells in this area may include the areas around Load Lines 1 and 2 and/or Griggy's Pond.

2. Area B - appears to be downgradient of Load Line 12. The well logs indicate that these water supply wells may be completed in sandstone, however, they are relatively shallow. Although the upper 30 to 45 feet of the wells are cased, most of the logs then indicate an open borehole to a depth of 65 feet. The well logs also indicate that there are some sand and gravel layers between the surficial clays and the underlying bedrock. The western end of this area tends to be in closer proximity to the RVAAP.

RECEIVED
APR 28 1997
By_____

3. Area C - does not appear to be downgradient of any currently identified high priority AOCs at the RVAAP. However, the well logs indicate that the water supply wells in this area may be in the same glacial valley that has been reported to run through the RVAAP. The wells in this area are in glacial sand and gravel, range from 40 to 200 feet deep, and are reported to produce up to 100 gallons per minute (gpm). Samples that would be obtained from the northern end of this area may give some indication as to whether activities at the RVAAP have impacted on the water quality in this buried valley aquifer.

Currently, the OEPA would anticipate sampling approximately 25 water supply wells for the following constituents: explosives, Target Analyte List (TAL) metals, and several general water quality constituents (i.e. total dissolved solids, alkalinity, nitrate, chloride, and sulfate). The list was generated by reviewing the Potential Chemicals of Concern (PCOCs) identified at the installation, as well as adding several general water quality constituents such that mass balance calculations can be conducted, and Piper Diagrams constructed. This list of constituents, and the projected number of sampling locations could potentially change based upon PCOCs identified and the groundwater flow directions determined, during future sampling events on the installation. The Agency would anticipate conducting the initial residential well sampling event during the fourth quarter of federal fiscal year (FFY) 1997.

Please advise the OEPA as to whether or not federal funds can be made available for this proposed residential well sampling event.

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.wmk

cc: Rod Beals, NEDO DERR
Bob Princic, NEDO DERR
Diane Kurlich, NEDO DDAGW
Sheila Abraham, NEDO DHWM
Virginia Wilson, NEDO DSIWM
Bonnie Buthker, OFFO SWDO
Catherine Stroup, CO Legal
Pat Campbell, CO DERR
Marg Tullis, CO DERR
Bob Whelove, IOC
Todd Boatman, ACOE Nashville
Kevin Jasper, ACOE Louisville
Tim Morgan, RVAAP
Dave Seely, USEPA Region V