Ohio Environmental Protection Agency (OEPA)
And
Ravenna Army Ammunition Plant (RVAAP)
1987 Correspondences

31785

OhioEPA
State of Ohio Environmental Protection Agency

Northeast District Office
2110 E. Aurora Road
Twinsburg, Ohio 44087-1969
(216) 425-9171

Richard F. Celeste
Governor

TO	1/13/87	
	CB COR	
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	~~HSP ADM~~	
	RAI 1/13	
X	Return For File	

January 8, 1987

RE: U.S. ARMY ARSENAL
PORTAGE COUNTY
OH5 210-020-736
#02-67-0550

U. S. Army Arsenal
State Route 5
Ravenna, Ohio 44266

Attn: Robert Kasper, Commanders Representative

Dear Mr. Kasper:

On December 23, 1986, and January 8, 1987, I received letters and documents from Mr. Cooper and you in response to my previous letter dated November 25, 1986. The information provided in the December 23, 1986, submittal indicates that R.A.I. has corrected the violations (#1 and #2) noted in my November 25, 1986 letter. The January 7, 1987 submittal, however, failed to properly address the violation noted for Load Line #6 in item #2 of my November 25, 1986 letter.

At a minimum, the following is needed in order for the Load Line #6 operator's waste analysis plan to meet the requirements of OAC 3745-65-13 and 40 CFR Part 265.13:

1. The plan must be specific in listing each parameter for which the ash will be analyzed. What type of reactivity testing will be done? Will you test for sulfide and/or cyanide?

2. The rationale for your choice of parameters must be explained. This should not be limited only to the chosen parameters, but should also clarify why other parameters (such as E.P. Toxicity) are not chosen.

3. The sampling methods and laboratory analysis methods must be specified. This should include the SW-846 method number where applicable. Your contractor laboratory personnel should be able to assist you with this information. Also, the plan must specify the type of sampling devise(s), the type of sample containers, preservation methods, and holding times.

4. The discussion on the frequency of repeat sampling needs to be expanded to explain the need for this sampling and the rationale for the chosen frequency. What conditions would justify a reduced sampling in the future? Are there any conditions which could require an increased sampling frequency in the future?

Please note that this office is obligated to initiate an enforcement referral if the above items are not corrected and documentation of the corrections received by the end of this month. Please revise your waste analysis plan according to the above comments and submit the revised plan to this office as soon as possible, but not later than the end of this month.

Should you have any questions, please contact me at (216) 425-9171.

Sincerely,

Donald F Easterling

Donald F. Easterling
Environmental Scientist
Division of Solid and Hazardous Waste
Management

DFE/sp

cc: Dave Metzner, DSHWM, Central Office

29.00

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OhioEPA
State of Ohio Environmental Protection Agency

Northeast District Office
2110 E. Aurora Road
Twinsburg, Ohio 44087-1969
(216) 425-9171

Richard F. Celeste
Governor

February 11, 1987

RE: U.S. ARMY ARSENAL
PORTAGE COUNTY
OH5-210-020-736
#02-67-0550

U.S. Army Arsenal
State Route 5
Ravenna, Ohio 44266

2/12/87
CR COR
CONT ADM
ADM
2/12/87
File

Attn: Robert Kasper
Commanders Representative

Dear Mr. Kasper:

On January 30, 1987, I received a revised waste analysis plan from Mr. Robert Summers. This plan adequately addressed all of the items listed in my letter dated January 8, 1987.

All violations noted in my inspection letter dated November 25, 1986, appear to have been corrected with the exception of items 6 and 7. As noted previously, items 6 and 7 are continuing violations which have been referred to the U.S. EPA for their action on these matters. Therefore, any correspondence or inquiries regarding items 6 and 7 should be directed to U.S. EPA, Region V.

Should you have any questions, please contact me at (216) 425-9171.

Sincerely,

Donald F Easterling

Donald F. Easterling
Envrionmental Scientist
Division of Solid and Hazardous Waste
Management

DFE/sp

cc: Dave Metzner, DSHWM, Central Office
Catherine McCord, U.S. EPA, Region V

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Physics International Company
A Subsidiary of ROCKCOR, an OLIN Company
TACTICAL SYSTEMS GROUP

July 1, 1987

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

Subject: Remedial Action Plan for Items 6 and 7 of the NOV ltr dtd 11/25/86

Reference:
1. Ohio EPA ltr dtd 25 Nov 86, SAB
2. Ltrs, Region 5, USEPA, Chicago, IL dtd 15 Apr 87, SAB
3. Minutes of Meeting held at Ravenna AAP 15 May 87

Dear Sir:

As requested in the meeting conducted at Ravenna Army Ammunition Plant on 15 May 87, the following remedial action plan is forwarded for your review and transmittal to U. S. Environmental Protection Agency, Region 5, 230 South Dearborn Street, Chicago, IL 60604, ATTN: William E. Muno, Chief, RCRA Enforcement Section.

The plan has been designed to address each item separately. In addition, the plan has been developed to delineate action(s) to be taken initially and those assumed action(s) that will be taken based on the results of the soil boring samples.

It should be noted that in both Items 6 and 7 corrective action has/had been taken to address the situation.

Attached at Inclosure 1 and 2 is the remedial action plan addressing corrections to deficiencies identified in Items 6 and 7 of reference 1.

Physics International will start to implement the plan immediately upon notification of approval from USEPA.

Sincerely,

Robert R Summers
Robert S. Summers
Manager, LAP
TACTICAL SYSTEMS PRODUCTION DIVISION

2 Attachments

EASTERN DIVISION • 901 SEVILLE [illegible] BOX 1004 • WADSWORTH, OHIO 44281-0904 • (216) 336-8801

ENCLOSURE 1

PHYSICS INTERNATIONAL COMPANY

REMEDIAL ACTION PLAN
FOR
PINK WATER TREATMENT TANK

LOAD LINE #6

1. INTRODUCTION:

The pink water and evaporation shed was constructed in the early 1980s and was used to filter waste water generated from operations involving TNT, RDX, and HMX. The tank is constructed of eight inch reinforced concrete. The overall dimensions are 12′ x 12′, with a four foot side wall. The interior is divided with an eight foot divider, located four feet from the north end.

The smaller end of the tank is the receiving end, and also provides for the initial settling of contaminants; from there the liquid is transferred to the holding, or evaporation, area of the tank.

1.1 BACKGROUND:

During a routine annual inspection of the RCRA facility by the Ohio EPA in the latter part of 1985, it was noted that cracks were visible along the vertical side walls. Through visual inspection of both the inside and outside of the tank wall, it was suspected that liquid may have been allowed to pass through the cracked areas to the soil.

To correct the noted deficiencies, a liner constructed of 3/32" PVC T/L Type 651 was installed in the tank to prevent any migration of liquid through the wall.

The tank is under RCRA Part A interim status, and a closure plan is on file (See Attachment 1, Closure Plan.)

2.0 SAMPLING PROCEDURES:

2.1 SAMPLING RATIONALE:

The tank received explosive contaminated wastewaters for treatment. The explosive contaminated wastewaters contained the compounds of trinitrotoluene (TNT), cyclotrimethylene-trinitramine (RDX), and cyclotetramethylene-tetranitramine (HMX). The sampling at graduated soil depths (with subsequent analyses) adjacent to the exterior of the treatment tank walls will assess possible leakage.

2.2 SAMPLING LOCATION & SAMPLING TYPES

Samples will be taken from all four (4) sides of the structure, as near to the structure as sampling equipment will allow. Sampling of soil around the entire structure will insure all potential directional paths of possible leakage will be investigated.

Attachment 2 delineates the specific sampling sites as selected around the periphery of the treatment tank. Each site will encompass three (3) (each) sequential 16" depths; giving a 48" vertical boring that will begin at grade level and terminate at 12" below the tank's foundation level. Each 16" bore, mixed to establish a homogeneous mixture, will have a representative sample taken from each mixture. Each sample site will generate three (3) samples: 0" to 16" level sample; 16" to 32" level sample; and 32" to 48" level sample. There will be 12 sample sites, with a total of 36 samples. All spoils from the sample sites, along with the borehole, will be covered until final action is determined for the treatment tank.

2.3 EQUIPMENT DESCRIPTION

Forty-eight inch core samples will be taken, utilizing a split-spoon sampler. In the event a core sampler of this type is not readily available, the alternative sampling device will be an auger-type apparatus that will extract incremently each 16" depth interval.

2.4 EQUIPMENT CLEANING:

The sampling apparatus will be cleaned prior to taking each sample. All sampling equipment will be swabbed with acetone with deionized water for cleaning/decontaminating, utilizing fresh solvent, swab, and deionized water each time.

2.5 ADDITIONAL SAMPLING:

All parties concerned will review the analyses of the samples to determine the scope of possible additional sampling.

3.0 ANALYTICAL PROCEDURES:

3.1 METHOD OF ANALYSIS:

Attachment #3 provides analytical methodology. Analytical instrumentation employed will be that of gas chromatography-mass spectroscopy (GC/MS). The methodology and instrumentation is state-of-the-art relative to explosive compounds contained within soil matrices.

3.2 ANALYTICAL SERVICE ORGANIZATION:

The laboratory that will be employed to perform the analyses as well as administering the sampling procedures has an established record in the field of explosive analyses. The laboratory, Thermo Analytical, Inc., has provided explosive analytical services to other organizations within the field. These services included the determination of TNT, RDX, and HMX with soil samples.

3.3 ANALYTICAL RESULTS

The selected analytical laboratory will be required to document its analytical and quality control procedures.

4.1 VALIDATION:

5.1 REPORTS:

After the results have been validated, a report will be forwarded to the USEPA.

5.2 COURSES OF ACTION:

Depending on the analytical results, one of the following actions may be defined and agreed upon by the Army EPA, USEPA, and Physics International EPA:

A. If no (or insignificant) explosive contamination is found, terminate investigation.

B. If extent of contamination is defined, recommend corrective action.

C. If contamination is present in all core samples, develop and implement program to sample deeper and over more surface area.

6.0 CORRECTIVE ACTION:

All corrective action plans will be deferred until the results have been obtained, evaluated, and approved by the Army, USEPA, and Physics International.

ATTACHMENT 1 TO ENCLOSURE 1

PINK WATER TANK:

The pink water treatment tank will be run until all water has been evaporated. The maximum amount of pink water should be approximately 3,000 gallons. If weather conditions are such that evaporation will be slow, the steam pressure in the heating coils may be raised to speed up the process. Present data indicates that the maximum time for complete evaporation will be two weeks. Upon completion of evaporation all plumbing will be removed and taken to the burning ground for thermal treatment. The sludge in the tank will be removed and taken to the burning ground for thermal treatment. Present experience indicates that the maximum amount of sludge would not exceed 100 pounds.

The tank will then be steam cleaned. The water generated in this process will be pumped into drums. Steam cleaning will be repeated until the cleaning water is clear. The tank will then be tested with a suitable indicator such as Websters Reagent. Cleaning will continue until there is no indication of contamination on the walls or floor of the tank.

The cleaning water will be treated at the RAI Pink Water Treatment Facility, if possible, at the time of closure. If such treatment is not possible, the water will be evaporated in the drums. Steam coils will be placed in the drums to facilitate evaporation. Upon completion of the cleaning process, the drums will be taken to the burning ground for thermal treatment.

SOLID WASTES:

All solid wastes generated including those generated during cleanup of the buildings will be taken to the burning ground for thermal treatment. The maximum estimated amount would not exceed ten 55 gallon drums of material. The drums will also be decontaminated by thermal treatment. All treated metal parts will be checked with Websters Reagent to insure all explosives have been decomposed.

Samples of the ash residue at the burning ground will be taken for chemical analysis to insure no hazardous waste remains.

All buildings, including the Pink Water Treatment Facility, are the property of the U. S. Government and will be returned to the control of Ravenna Arsenal upon closure of operations of Physics International.

ATTACHMENT 3 TO ENCLOSURE 1

PROCEDURE: HPLC OF EXPLOSIVES (For TNT RDX, & HMX)

A. SAMPLE PREPARATION

Water samples are shaken to bring the solids into suspension. An aliquot of the sample is taken and extracted with 1,2-dichloroethane. The 1,2-dichloroethane extract is injected into a liquid chromatograph (LC) for separation and quantitative analysis of explosives.

B. STANDARD PREPARATION

Aqueous standards are prepared by dissolving weighed amounts of explosive in a milliliter (ml) of spectrograde acetone. Volume of acetone should be kept at a minimum because its presence interferes with chromatographic results and dilutions to final volume in a volumetric flask with distilled water. Standard solutions are analyzed using the same procedure that is used for the water samples. A standard curve is prepared and the concentration of the explosive in the sample is calculated. Care should be taken to avoid prolonged exposure of the explosive standards or samples to light.

C. LC ANALYSIS PROCEDURE (F/ TNT, RDX, & HMX)

Ten-ml of 1,2-dichloroethane is added to a 10-ml water sample in a 125-ml separatory funnel. The solvent-water mixture is shaken for one minute and then the layers allowed to separate for another minute. The bottom 1,2-dichloroethane layer is drained for explosive analysis. The 1,2-dichloroethane is loaded into a DuPont Automatic Sample Injector which injects 10 μl into the LC. If the explosive is too concentrated, the 1,2-dichloroethane is diluted or a 1 ml water sample is extracted with 10-ml of solvent and reanalyzed as before. If the explosive is less than the detectable limits, a 70-ml sample is extracted with 7-ml of 1,2-dichloroethane and a 260 μl aliquot is injected in the LC by the DuPont Automatic Sample Injector.

D. LC PARAMETERS - INSTRUMENT

DuPont 848, Pump
DuPont 833, Flow Controller
DuPont 834, Sampler Controller
Chromatronix Model CRS-104, Digital Readout Integrator
Linear Instruments, 1 mv Recorder
Column: DuPont 4.6 mm diameter x 25 cm
Packing: DuPont Zorbax Sil
Eluant: 1,2-dichloroethane, distilled and filtered through a silica gel (1" diameter by 5' long)
Flow Rate: 1 ml/minute
Column Pressure: 1200 PSI
Analysis Time: 75 minutes

LC PARAMETERS - INSTRUMENT (Continued)

Pumping Mode: Constant Flow
Auto-Sampler Nitrogen Pressure: 20 PSI
Sampler and Purge Timer: 20 seconds
Sample Injection: Automatic
Gradient: 0 percent 3 hold
Autogradient: 0

E. FLOW CONTROLLER

Resistor Calibration: 35
Linear Setting: 35
Viscosity Compensation: 81
Temperature Switch: Medium
Resistor Loop: 0.4-0.8 CPS, 0.6-2.5-ml/minute

F. DETECTOR

Readout: Optical Density
Range: 0.1 Absorbance Units Full Scale
Reference Cell: Nitrogen Purge
Fixed Wavelength: 254 nm

G. DETECTION LIMITS:

TNT = 0.005 mg/l
RDX = 0.01 mg/l
HMX = 0.05 mg/l

SAMPLE PRESERVATION AND STORAGE.

SAMPLE COLLECTED IN A ONE LITER GLASS AMBER BOTTLE WITH TEFLON LINED CAP AND STORED IN THE DARK AND KEPT COOL (4°C)

ENCLOSURE 2

PHYSICS INTERNATIONAL COMPANY

REMEDIAL ACTION PLAN

OPEN BURNING SITE
IN
RVAAP'S OPEN DEMOLITION AREA

1.0 INTRODUCTION; BACKGROUND:

The area was established as an open demolition area in 1948 (approximate) and currently operates under Permit RCRA Part "A" Interim status, which was granted to the Army for the Ravenna Army Ammunition Plant in 1981. Physics International Company, as a tenant organization, was granted use of an assigned area in the open demolition grounds.

During a routine inspection of the open demolition area by the Ohio EPA during the last half of 1985, it was noted that open burning had been conducted by Physics International Company on the fringe of the open demolition area (See attached drawings, Attachment 1 and 1A.)

All parties involved in this operation were advised to discontinue future operations of this type. Open burning was discontinued immediately, and the following remedial action plan was prepared.

2.0 SAMPLING PROCEDURES:

In order to compare the areas of open demolition and open burning occurrences, soil samples will be taken from the two (2) areas. A total of seven (7) samples are scheduled for the two areas; five (5) samples will be taken within the area where the open burning occurred, and two (2) samples will be taken in the open demolition area.

2.1 SAMPLING RATIONALE:

The two samples taken from the open demolition area adjacent to the open burning area will be used to determine if a higher sulfide level exists in the area where the open burning took place.

2.2 SAMPLING LOCATION:

The attached drawings depict the approximate location where samples will be taken. It should be noted that thorough sampling of the open burn area has been planned. This is insure that the entire fringe (horseshoe) area is sampled, although burning occurred in the mouth of the horseshoe only.

2.3 EQUIPMENT DESCRIPTION:

Since sample acquisition is a ground surface activity, the actual sampling tool used will be a prepackaged, disposable, sterile plastic scooper. The scooper will be used to scarify the sample site, acquire the sample, and transfer the sample into the recommended sample container. A new sterile scooper will be used for each sample.

2.4. EQUIPMENT CLEANING:

This activity is not applicable since all sampling will be performed by means of using a new sample tool for each respective sample site.

2.5 ADDITIONAL SAMPLING:

Should the open burning site sulfide concentration show concentrations substantially greater than the open demolition area, additional sampling will be conducted that will determine a perimeter of the area exhibiting excessive concentrations. Additional expansion of the sampling area will be approached very cautiously because of the potential presence of unexploded ordnances (UXO). The site area will be swept with a metal detector in order to locate UXOs prior to sample gathering.

3.0 ANALYTICAL PROCEDURES:

3.1 ANALYTICAL METHODS:

Attachment #2 delineates the applicable analytical method to be employed by the assigned laboratory. The referenced method is a USEPA revision to method 9030 (total sulfides determination) per SW-846, 3rd edition.

3.2 LABORATORY:

Thermo Analytical, Inc. shall be the analytical service employed as well as the agent administering the sampling. Analyses and sampling shall be set forth per referenced published regulatory guidelines mentioned in section 3.1 of this enclosure.

3.3 VALIDATION OF RESULTS:

The selected analytical laboratory will be required to document its analytical and quality control procedures.

4.0 EVALUATION:

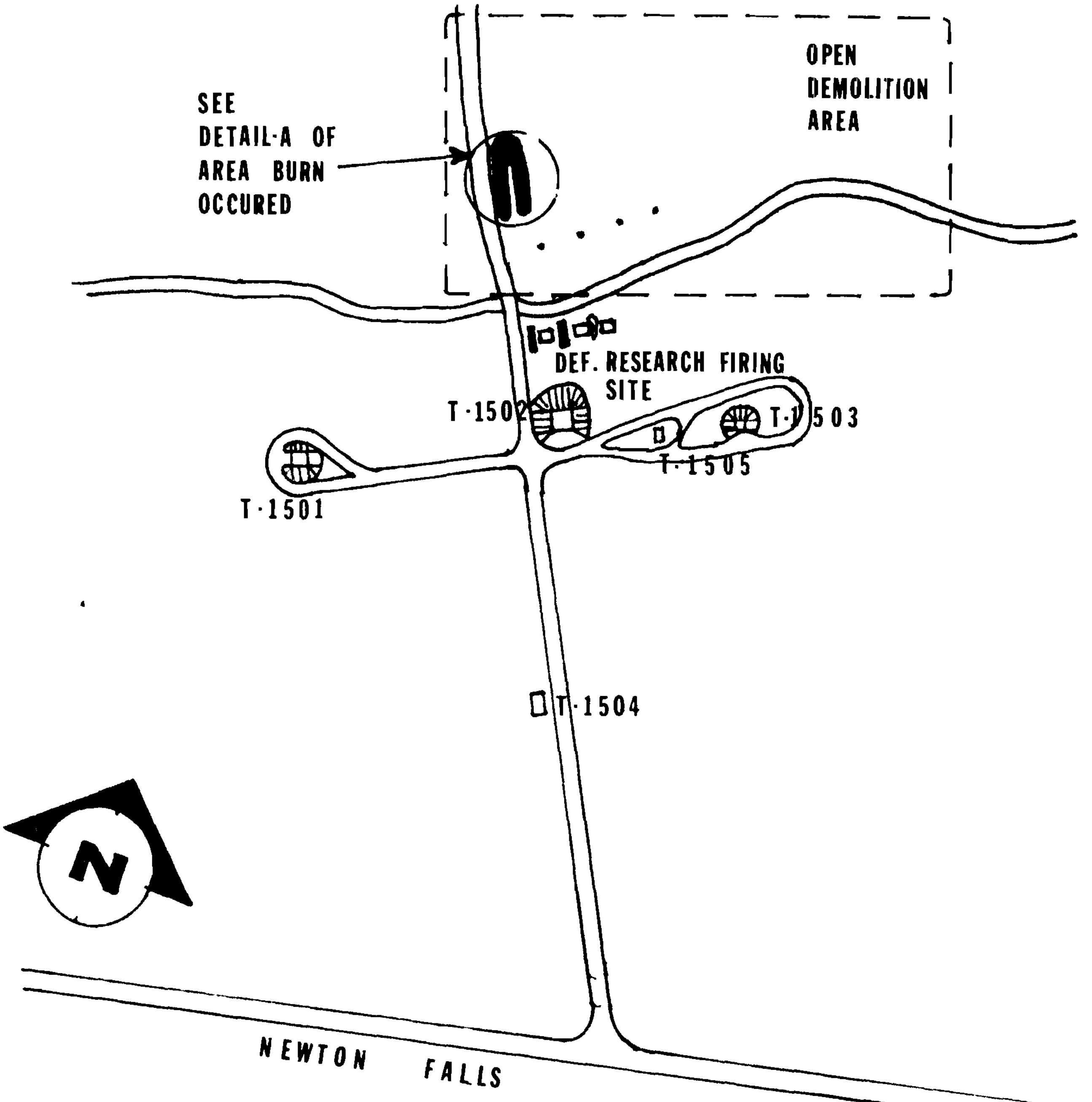
4.2 COURSES OF ACTION:

Since this is an approved open demolition area permitted under Permit RCRA Part "A" interim status, and sulfides in this area, if any, do not pose an environmental hazard, actions should be deferred other than continual surveillance to insure open burning does not occur.

5.0 CORRECTIVE ACTION:

Those areas identified as exhibiting excessive concentration of sulfides would be marked on a plant drawing and included in the demolition area closure plan for decontamination when the open demolition area is no longer required.

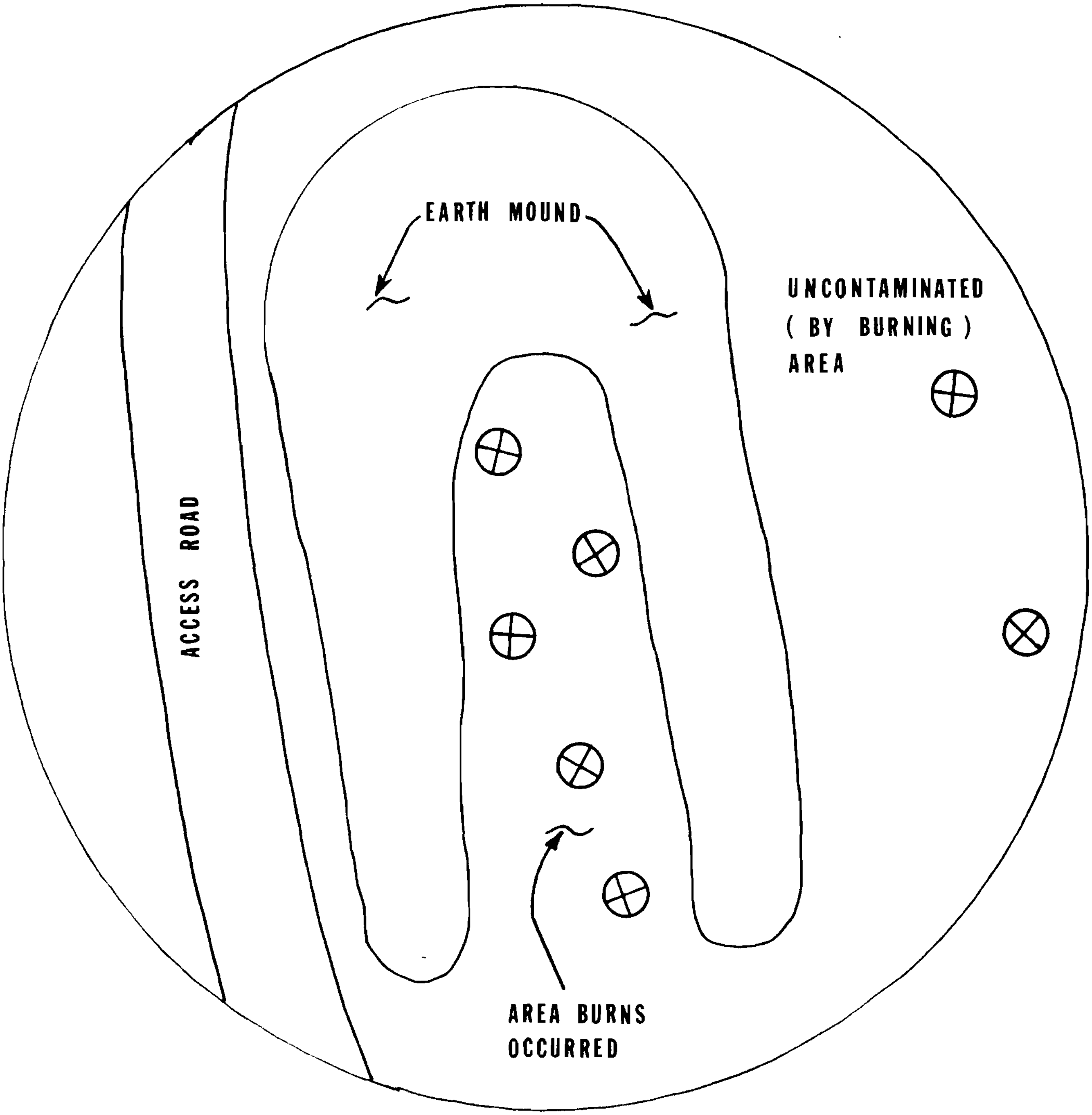
ATTACHMENT 1 TO ENCLOSURE 2



RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OHIO
OPERATED BY RAVENNA ARSENAL, INC.

Detail · A

CORE SAMPLE SITES ⊕



RAVENNA ARMY AMMUNITION PLANT DEMOLITION AREA

ATTACHMENT 2 TO ENCLOSURE 2

DRAFT

METHOD 9030
Sulfides

Prepared for:

Office of Solid Waste
U.S. Environmental Protection Agency
Washington, DC 20460

April 25, 1987

Contract No. 68-01-7266
Dynamac

GEN27/12

DRAFT

APR 25 1987

METHOD 9030

SULFIDES

1.0 SCOPE AND APPLICATION

1.1 The distillation procedure described in this method is designed for the determination of sulfides in aqueous and solid waste materials and effluents.

1.2 This method provides only a semi-quantitative determination of sulfide compounds considered "acid-insoluble" (e.g., CuS and SnS_2) in solid samples. Recovery has been shown to be 20 to 40% for CuS, one of the most stable and insoluble compounds, and 40 to 60% for SnS_2 which is slightly more soluble.

1.3 This method is not applicable to oil or multiphasic samples or samples not amenable to the distillation procedure.

1.4 Method 9030 is suitable for measuring sulfide concentrations in samples which contain between 0.2 and 50 mg of sulfide.

2.0 SUMMARY OF METHOD

2.1 For acid-soluble sulfide samples, separation of sulfide from the sample matrix is accomplished by the addition of sulfuric acid to the sample. The sample is heated to 70°C and the hydrogen sulfide (H_2S) which is formed is distilled under acidic conditions and carried by a nitrogen stream into zinc acetate gas scrubbing bottles where it is precipitated as zinc sulfide.

2.2 For acid-insoluble sulfide samples, separation of sulfide from the sample matrix is accomplished by suspending the sample in concentrated hydrochloric acid by vigorous agitation. Tin(II) chloride is present to prevent oxidation of sulfide to sulfur by the metal ion (as in copper(II)), by the matrix, or by dissolved oxygen in the reagents. The prepared sample is distilled under acidic conditions at 100°C under a stream of nitrogen. Hydrogen sulfide gas is released from the sample and collected in gas scrubbing bottles containing zinc(II) and a strong acetate buffer. Zinc sulfide precipitates.

2.3 The sulfide in the zinc sulfide precipitate is oxidized to sulfur with a known excess amount of iodine. Then the excess iodine is determined by titration with a standard solution of phenyl arsine oxide (PAO) or sodium thiosulfate until the blue iodine starch complex disappears. As the use of standard sulfide solutions is not possible because of oxidative degradation, quantitation is based on the PAO or sodium thiosulfate.

3.0 INTERFERENCES

3.1 Aqueous samples must be taken with a minimum of aeration to avoid volatilization of sulfide or reaction with oxygen, which oxidizes sulfide to sulfur compounds that are not detected.

3.2 Reduced sulfur compounds, such as sulfite and hydrosulfite, decompose in acid, and may form sulfur dioxide. This gas may be carried over to the zinc acetate gas scrubbing bottles and subsequently react with the iodine solution yielding false high values. The addition of formaldehyde into the zinc acetate gas scrubbing bottles removes this interference. Any sulfur dioxide entering the scrubber will form an addition compound with the formaldehyde which is unreactive towards the iodine in the acidified mixture. This method shows no sensitivity to sulfite or hydrosulfite at concentrations up to 10 mg/kg of the interferrent.

3.3 Interferences for acid-insoluble sulfides have not been fully investigated. However, sodium sulfite and sodium thiosulfate are known to interfere in the procedure for soluble sulfides. Sulfur also interferes because it may be reduced to sulfide by tin(II) chloride in this procedure.

3.4 The iodometric method suffers interference from reducing substances that react with iodine, including thiosulfate, sulfite, and various organic compounds.

4.0 APPARATUS AND MATERIALS

4.1 Distillation apparatus as shown in Figure 1.

4.1.1 Three neck flask with 24/40 standard taper joints, 500-mL.

4.1.2 Dropping funnel with 24/40 outlet joint, 100-mL.

4.1.3 Purge gas inlet tube with coarse frit and 24/40 joint.

4.1.4 Purge gas outlet, 24/40 joint reduced to 1/4 in. tube.

4.1.5 Gas scrubbing bottles, 125 mL, with 1/4 in. o.d. inlet and outlet tubes. Impinger tube must not be fritted.

4.1.6 1/4 in. o.d. Teflon or polypropylene tubing. Do not use rubber.

<u>NOTE</u>: When analyzing for acid-insoluble sulfides, the distillation apparatus is identical to that used in the distillation procedure for acid-soluble sulfides except that the tubing and unions downstream of the distillation flask must be all Teflon, polypropylene or other material resistant to gaseous HCl. The ground glass

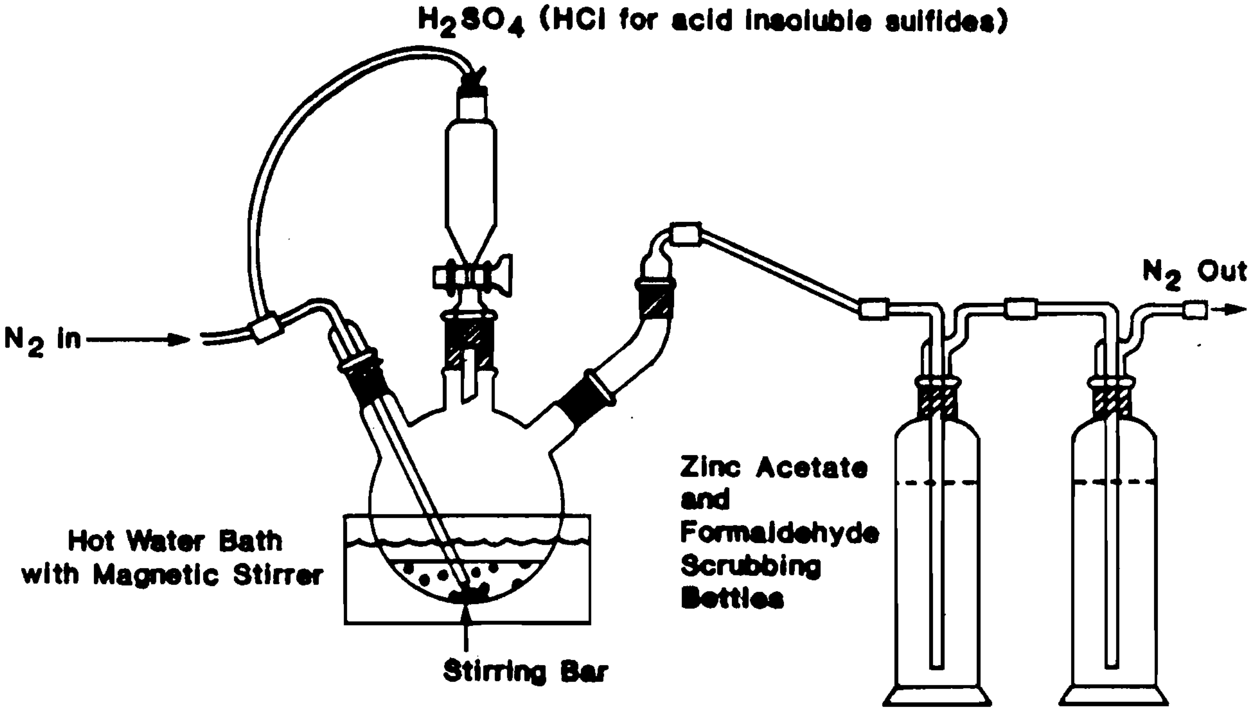


Figure 1. Gas Evolution Apparatus.

joints should be fitted with Teflon sleeves to prevent seizing and to prevent gas leaks. Pinch clamps should also be used on the joints to prevent leaks.

4.2 Hotplate stirrer.

4.3 pH meter.

4.4 Nitrogen regulator.

4.5 Flowmeter.

5.0 REAGENTS

5.1 Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

5.2 ASTM Type II water (ASTM D-1193-77 (1983)). All water used in this method will be Type II unless otherwise specified.

5.3 Zinc acetate solution for sample preservation (2N), $Zn(CH_3COO)_2 \cdot 2H_2O$. Dissolve 220 g of zinc acetate dihydrate in 500 mL of water.

5.4 Sodium hydroxide (1N), NaOH. Dissolve 40 g of NaOH in water and dilute to 1 liter.

5.5 Formaldehyde (37% solution), CH_2O. This solution is commercially available.

5.6 Zinc acetate for the scrubber.

5.6.1 For acid-soluble sulfides: Zinc acetate solution (approximately 0.5M). Dissolve about 110 g zinc acetate dihydrate in 200 mL of water. Add 1 mL hydrochloric acid (concentrated), HCl, to prevent precipitation of zinc hydroxide. Dilute to 1 liter.

5.6.2 For acid-insoluble sulfides: Zinc acetate/sodium acetate buffer. Dissolve 100 g sodium acetate, $NaC_2H_3O_2$, and 11 g zinc acetate dihydrate in 800 mL of water. Add 1 mL concentrated hydrochloric acid and dilute to 1 liter. The resulting pH should be 6.8.

5.7 Acid to acidify the sample.

5.7.1 For acid-soluble sulfides: Sulfuric acid (concentrated), H_2SO_4.

5.7.2 For acid-insoluble sulfides: Hydrochloric acid (9.8N), HCl. Place 200 mL water in a liter beaker. Slowly add concentrated HCl to bring the total volume to 1 liter.

5.8 Starch solution. Use either an aqueous solution or soluble starch powder mixtures. Prepare an aqueous solution as follows. Dissolve 2 g soluble starch and 2 g salicylic acid, $C_7H_6O_3$, as a preservative, in 100 mL hot water.

5.9 Nitrogen.

5.10 Iodine solution (approximately 0.025N).

5.10.1 Dissolve 25 g potassium iodide, KI, in 700 mL water in a 1-liter volumetric flask. Add 3.2 g iodine, I_2. Allow to dissolve. Dilute to 1 liter and standardize as follows. Dissolve approximately 2 g KI in 150 mL of water. Pipet exactly 20 mL of the iodine solution to be titrated and dilute to 300 mL with water. Titrate with 0.025N standardized phenylarsine oxide or 0.025N sodium thiosulfate until the amber color fades to yellow. Add starch indicator solution. Continue titration drop by drop until the blue color disappears.

5.10.2 Run in duplicate.

5.10.3 Calculate the normality as follows.

$$\text{Normality } (I_2) = \frac{\text{mL of titrant} \times \text{normality of titrant}}{\text{sample size in mL}}$$

5.11 Sodium sulfide nonahydrate, $Na_2S \cdot 9H_2O$. For the preparation of standard solutions to be used for calibration curves. Standards must be prepared at pH = 12.

5.12 Tin(II) chloride, $SnCl_2$, granular.

5.13 Titrant.

5.13.1 Standard phenylarsine oxide solution (PAO) (0.025N), C_6H_5AsO. This solution is commercially available.

<u>Caution:</u> PAO is toxic.

5.13.2 Standard sodium thiosulfate solution (0.025N), $Na_2S_2O_3 \cdot 5H_2O$. Dissolve 6.205 ± 0.005 g $Na_2S_2O_3 \cdot 5H_2O$ in 500 mL water. Add 9 mL 1N NaOH and dilute to 1 liter.

5.14 Sodium hydroxide (6N), NaOH. Dissolve 240 g of sodium hydroxide in 1 L of water.

6.0 SAMPLE COLLECTION, PRESERVATION, AND HANDLING

6.1 All samples must have been collected using a sampling plan that addresses the considerations discussed in Chapter Nine of this manual.

6.2 All aqueous samples must be preserved with zinc acetate and sodium hydroxide. Use four drops of 2N zinc acetate solution per 100 mL of sample. Adjust the pH to greater than 9 with 6N sodium hydroxide solution. Fill the sample bottle completely and stopper with a minimum of aeration. The treated sample is relatively stable and can be held for up to seven days. If high concentrations of sulfide are expected to be in the sample, continue adding zinc acetate until all the sulfide has precipitated. Samples must be cooled to 4°C during storage.

6.3 Sample Preparation:

6.3.1 For an efficient distillation, the mixture in the distillation flask must be of such a consistency that the motion of the stirring bar is sufficient to keep the solids from settling. The mixture must be free of solid objects that could disrupt the stirring bar. Prepare the sample using one of the procedures in this section then proceed with the distillation step (Section 7.0).

6.3.2 If the sample is aqueous and contains no visible solids, or solids that can be suspended briefly by inverting the sample container, no preparation of the sample is necessary. Shake the sample container to suspend the solids, then quickly decant the appropriate volume (up to 250 mL) of the sample to a graduated cylinder, weigh the cylinder, transfer to the distillation flask and reweigh the cylinder to the nearest milligram.

6.3.3 If the sample is aqueous but contains soft clumps of solid, it may be possible to break the clumps and homogenize the sample by placing the sample container on a jar mill and tumble or roll the sample for a few hours. The slurry may then be aliquotted and weighed as above to the nearest milligram then diluted with water up to a total volume of 250 mL to produce a mixture that is completely suspended by the stirring bar.

6.3.4 If the sample is primarily aqueous, but contains a large proportion of solid, the sample may be roughly separated by phase and the amount of each phase measured and weighed to the nearest milligram into the distillation flask in proportion to their abundance in the sample. Water may be added up to a total volume of 250 mL. As a guideline, no more than 25 g dry weight or 50 g of sludge can be adequately suspended in the apparatus.

6.3.5 If the sample contains solid objects that can not be reduced in size by tumbling, the solids must be broken manually. Clay-like solids should be cut with a spatula or scalpel in a crystalizing dish. If the solids can be reduced to a size that they can be suspended by the stirring bar, the solid and liquid can be proportionately weighed.

6.3.6 Non-porous harder objects, for example stones or pieces of metal, may be weighed and discarded. The percent weight of non-porous objects should be reported and should be used in the calculation of sulfide concentration if it has a significant effect on the reported figure.

7.0 PROCEDURE

For acid-soluble sulfide samples, go to 7.1
For acid-insoluble sulfide samples, go to 7.2

7.1 Acid-Soluble Sulfide:

7.1.1 In a preliminary experiment, determine the approximate amount of sulfuric acid required to adjust a measured amount of the sample to pH less than or equal to 1. The sample size should be chosen so that it contains between 0.2 and 50 mg of sulfide. Place a known amount of sample or sample slurry in a beaker. Add water until the total volume is 200 mL. Stir the mixture and determine the pH. Slowly add sulfuric acid until the pH is less than or equal to 1.

> CAUTION: Toxic hydrogen sulfide may be generated from the acidified sample. This operation must be performed in the hood and the sample left in the hood until the sample has been made alkaline or the sulfide has been destroyed.

From the amount of sulfuric acid required to acidify the sample and the mass or volume of the sample acidified, calculate the amount of acid required to acidify the sample to be placed in the distillation flask.

7.1.2 Prepare the gas evolution apparatus as shown in Figure 1 in a fume hood.

7.1.2.1 Prepare a hot water bath at 70°C by filling a crystallizing dish or other suitable container with water and place it on a hotplate stirrer. Place a thermometer in the bath and monitor the temperature to maintain the bath at 70°C.

7.1.2.2 Assemble the three neck 500-mL flask, fritted gas inlet tube, and exhaust tube. Use Teflon sleeves to seal the ground glass joints. Place a Teflon coated stirring bar into the flask.

7.1.2.3 Place into each gas scrubbing bottle 10 ± 0.5 mL of the 0.5M zinc acetate solution, 5.0 ± 0.1 mL of 37% formaldehyde and 100 ± 5.0 mL water.

7.1.2.4 Connect the gas evolution flask and gas scrubbing bottles as shown in Figure 1. Secure all fittings and joints.

7.1.3 Carefully place an accurately weighed sample which contains 0.2 to 50 mg of sulfide into the flask. If necessary, dilute to approximately 200 mL with water.

7.1.4 Place the dropping funnel onto the flask making sure its stopcock is closed. Add the volume of sulfuric acid calculated in Step 7.1.1 plus an additional 50 mL into the dropping funnel. The bottom stopcock must be closed.

7.1.5 Attach the nitrogen inlet to the top of the dropping funnel gas shut-off value. Turn on the nitrogen purge gas and adjust the flow through the sample flask to 25 mL/min. The nitrogen in the gas scrubbing bottles should bubble at about five bubbles per second. Nitrogen pressure should be limited to approximately 10 psi to prevent excess stress on the glass system and fittings. Verify that there are no leaks in the system. Open the nitrogen shut-off valve leading to the dropping funnel. Observe that the gas flow into the sample vessel will stop for a short period while the pressure throughout the system equalizes. If the gas flow through the sample flask does not return within a minute, check for leaks around the dropping funnel. Once flow has stabilized, turn on magnetic stirrer. Purge system for 15 minutes with nitrogen to remove oxygen.

7.1.6 Heat sample to 70°C. Open dropping funnel to a position that will allow a flow of sulfuric acid of approximately 5 mL/min. Monitor the system until most of the sulfuric acid within the dropping funnel has entered the sample flask. Solids which absorb water and swell will restrict fluid motion and, therefore, lower recovery will be obtained. Such samples should be limited to 25 g dry weight.

7.1.7 Purge, stir, and maintain temperature of 70°C for a total of 90 minutes from start to finish. Shut off nitrogen supply. Turn off heat.

7.1.8 Proceed to step 7.3 for the analysis of the zinc sulfide by titration.

7.2 Acid-Insoluble Sulfide

7.2.1 As the concentration of HCl during distillation must be within a narrow range for successful distillation of H_2S, the water content must be controlled. It is imperative that the final concentration of HCl in the distillation flask be about 6.5N and that the sample is mostly suspended in the fluid by the action of the stirring bar. This is achieved by adding 50 mL of water, including water in the sample, 100 mL of 9.8N HCl, and the sample to the distillation flask. Solids which absorb water and swell will resrict fluid motion and, therefore, lower recovery will be obtained. Such samples should be limited to 25 g dry weight.

7.2.2 If the matrix is a dry solid, weigh a portion of the sample such that it contains 0.2 to 50 mg of sulfide. The solid should be crushed to reduce particle size to 1 mm or less. Add 50 mL of water.

7.2.3 If the matrix is aqueous, then a maximum of 50 g of the sample may be used. No additional water may be added. As none of the target compounds are volatile, drying the sample may be preferable to enhance the sensitivity by concentrating the sample. If less than 50 g of the sample is required to achieve the 0.2 to 50 mg of sulfide range for the test, then add water to a total volume of 50 mL.

7.2.4 If the matrix is a moist solid, the water content of the sample must be determined (Karl Fischer titration, loss on drying, or other suitable means) and the water in the sample included in the total 50 mL of water needed for the correct HCl concentration. For example, if a 20 g sample weight is needed to achieve the desired sulfide level of 0.2 to 50 mg and the sample is 50% water then 40 mL rather than 50 mL of water is added along with the sample and 100 mL of 9.8N HCl to the distillation flask.

7.2.5 Weigh the sample and 5 g $SnCl_2$ into the distillation flask. Use up to 50 mL of water, as calculated above, to rinse any glassware.

7.2.6 Assemble the distillation apparatus as in Figure 1. Place 100 ± 2.0 mL of zinc acetate/sodium acetate buffer solution and 5.0 ± 0.1 ml of 37% formaldehyde in each gas scrubbing bottle. Tighten the pinch clamps on the distillation flask joints.

7.2.7 Add 100 ± 1.0 mL of 9.8N HCl to the dropping funnel and connect the nitrogen line to the top of the funnel. Turn the nitrogen on to pressurize the dropping funnel headspace.

7.2.8 Set the nitrogen flow at 25 mL/min. The nitrogen in the gas scrubbing bottles should bubble at about five bubbles per second. Purge the oxygen from the system for about 15 minutes.

7.2.9 Turn on the magnetic stirrer. Set the stirring bar to spin as fast as possible. The fluid should form a vortex. If not, the distillation will exhibit poor recovery. Add all of the HCL from the dropping funnel to the flask.

7.2.10 Heat the water bath to the boiling point (100°C). The sample may or may not be at the boil. Allow the purged distillation to proceed for 90 minutes at 100°C. Shut off nitrogen supply. Turn off heat.

7.2.11 Proceed to step 7.3 for the analysis of the zinc sulfide by titration.

7.3 Titration of Distillate

7.3.1 Pipette a known amount of standardized 0.025N iodine solution (See 5.10.3) in a 500-mL flask, adding an amount in excess of that needed to oxidize the sulfide. Add enough water to bring the volume to 100 mL. The volume of standardized iodine solution should be about 65 mL for samples with 50 mg of sulfide.

7.3.2 If the simple distillation for acid-soluble sulfide is being used, add 2 mL of 6N HCl. If the distillation for acid-insoluble sulfides is performed, 10 mL of 6N HCl should be added to the iodine.

7.3.3 Pipette both of the gas scrubbing bottle solutions to the flask, keeping the end of the pipette below the surface of the iodine solution. If at any point in transferring the zinc acetate solution or rinsing the bottles, the amber color of the iodine disappears or fades to yellow, more 0.025N iodine must be added. This additional amount must be added to the amount from 7.3.1 for calculations. Record the total volume of standardized 0.025N iodine solution used.

7.3.4 Prepare a rinse solution of a known amount of standardized 0.025N iodine solution, 1 mL of 6N HCl, and water to rinse the remaining white precipitate (zinc sulfide) from the gas scrubbing bottles into the flask. There should be no visible traces of precipitate after rinsing.

7.3.5 Rinse any remaining traces of iodine from the gas scrubbing bottles with water, and transfer the rinses to the flask.

7.3.6 Titrate the solution in the flask with standard 0.025N phenylarsine oxide or 0.025N sodium thiosulfate solution until the amber color fades to yellow. Add enough starch indicator for the solution to turn dark blue and titrate until the blue disappears. Record the volume of titrant used.

$$\frac{(\text{mL of } I_2 \times \text{N of } I_2) - (\text{mL of titrant} \times \text{N of titrant})}{\text{sample weight (kg)}} \times 16.03 = \text{sulfide (mg/kg)}$$

8.0 QUALITY CONTROL

8.1 All quality control data must be maintained and available for reference or inspection for a period of three years. This method is restricted to use by or under supervision of experienced analysts. Refer to the appropriate section of Chapter One for additional quality control requirements.

8.2 A method blank should be run once in twenty analyses or per analytical batch, whichever is more frequent.

8.3 Controls are prepared from water and a known amount of sodium sulfide. A control should be run with each analytical batch of samples, or once in twenty samples. Recovery should be 100 ± 10 for the entire method including distillation procedure.

8.4 A matrix spike should be run for each analytical batch or every 20 samples, whichever is more frequent, to determine matrix effects. If recovery is low, acid-insoluble sulfides are indicated. A matrix spike sample is a sample brought through the whole sample preparation and analytical process.

8.5 Calibration curves must be composed of a minimum of a blank and three standards. A calibration curve should be made for every hour of continuous sample analysis. The three standards should be sulfide solutions at concentrations above, below, and at the expected/found concentration of the sample.

8.6 Verify the calibration curve with an independently prepared check standard every 20 samples or once per analytical batch whichever is more frequent.

9.0 METHOD PERFORMANCE

9.1 Accuracy - The percent recovery was calculated as the sulfide concentration in the spiked sample minus the sulfide concentration in the unspiked sample divided by the spiking concentration times one hundred. Percent recovery is a basic accuracy measurement indicating the closeness of an individual measurement or an average of a number of measurements to the true value. Accuracy for this method was determined by three independent laboratories by measuring percent recoveries of spikes for both clean matrices (water) and actual waste samples. The results are summarized below.

For Acid-Soluble Sulfide

Accuracy of titration step only
Lab A 84-110% recovery
Lab B 110-122% recovery
Accuracy for entire method for clean matrices (H_2O)
Lab C 94-106% recovery
Accuracy of entire method for actual waste samples
Lab C 77-92% recovery

Spiking levels ranged from 0.4 to 8 mg/L

For Acid-Insoluble Sulfide

The percent recovery was not as thoroughly studied for acid-insoluble sulfide as it was for acid-soluble sulfide.

Accuracy of entire method for model waste samples
Lab C 21-81% recovery

Spiking levels ranged from 2.2 to 22 mg/kg

9.2 Precision - Precision is defined as a measure of agreement among individual measurements of the same property under similar conditions. The precision is reported as the coefficient of variation (CV) which equals the standard deviation divided by the mean times one hundred.

For Acid-Soluble Sulfide

Precision of titration step only
Lab A CV% 2.0 to 37
Lab B CV% 1.1 to 3.8
Precision of entire method for clean matrices (H_2O)
Lab C CV% 3.0 to 12
Precision of entire method for actual waste samples
Lab C CV% 0.86 to 45

For Acid-Insoluble Sulfide

Precision of entire method with model wastes
Lab C CV% 1.2 to 42

9.3 Detection Limit - The detection limit was determined by analyzing seven replicates at 0.45 and 4.5 mg/L. The detection limit was calculated as the standard deviation times the student's t-value for a one-tailed test with n-1 degrees of freedom at 99% confidence level. The detection limit for a clean matrix (H_20) was found to be between 0.2 and 0.4 mg/L.

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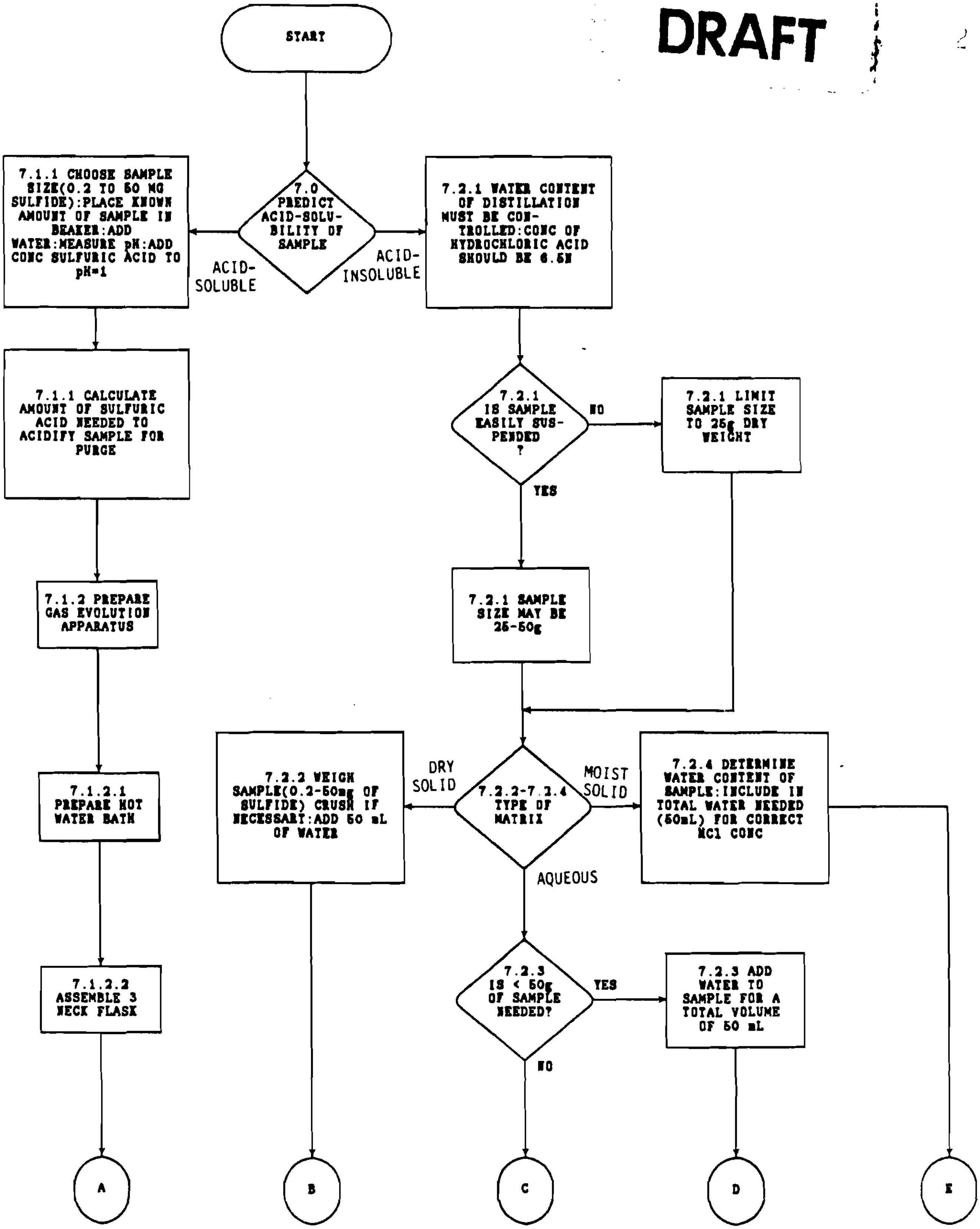
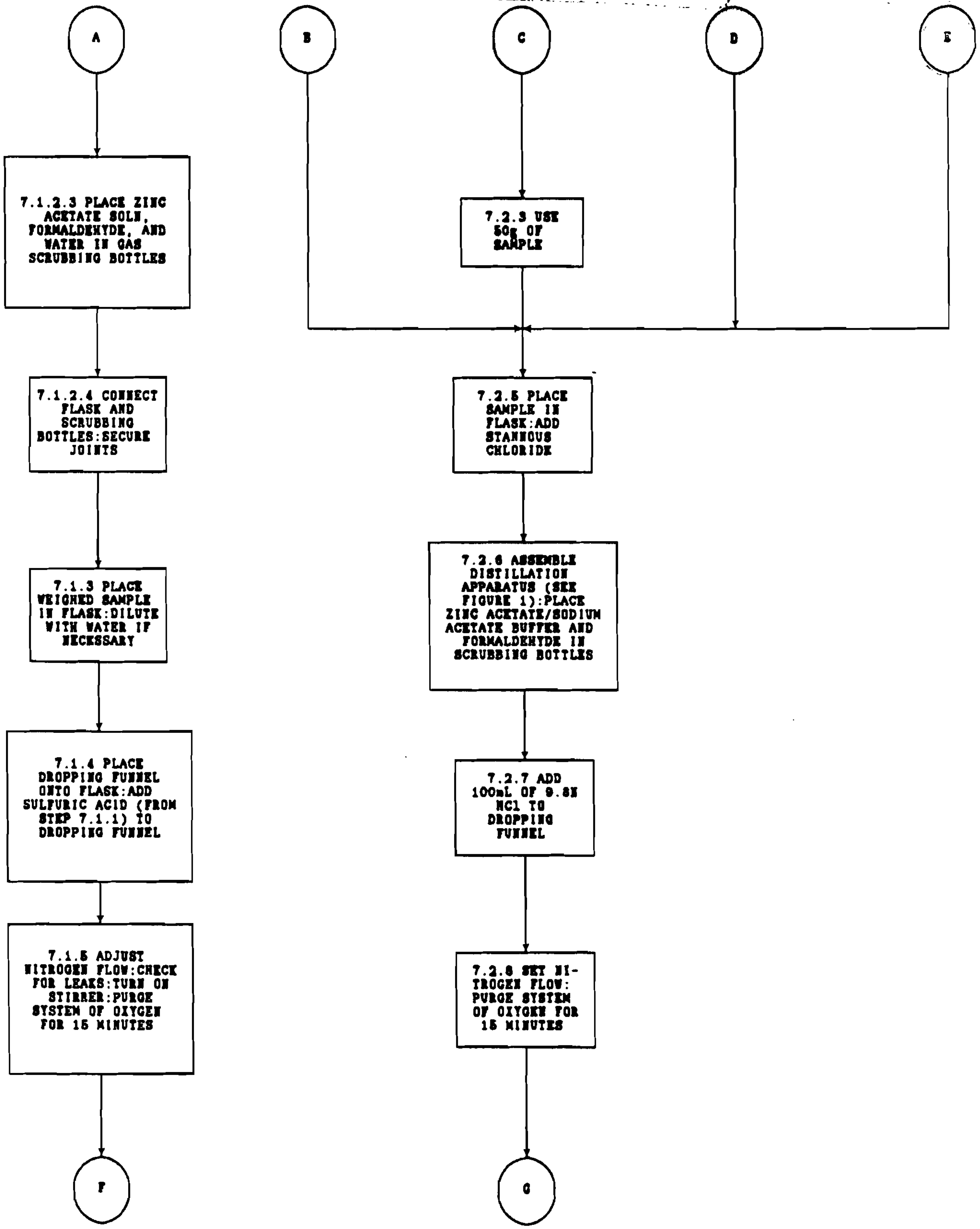
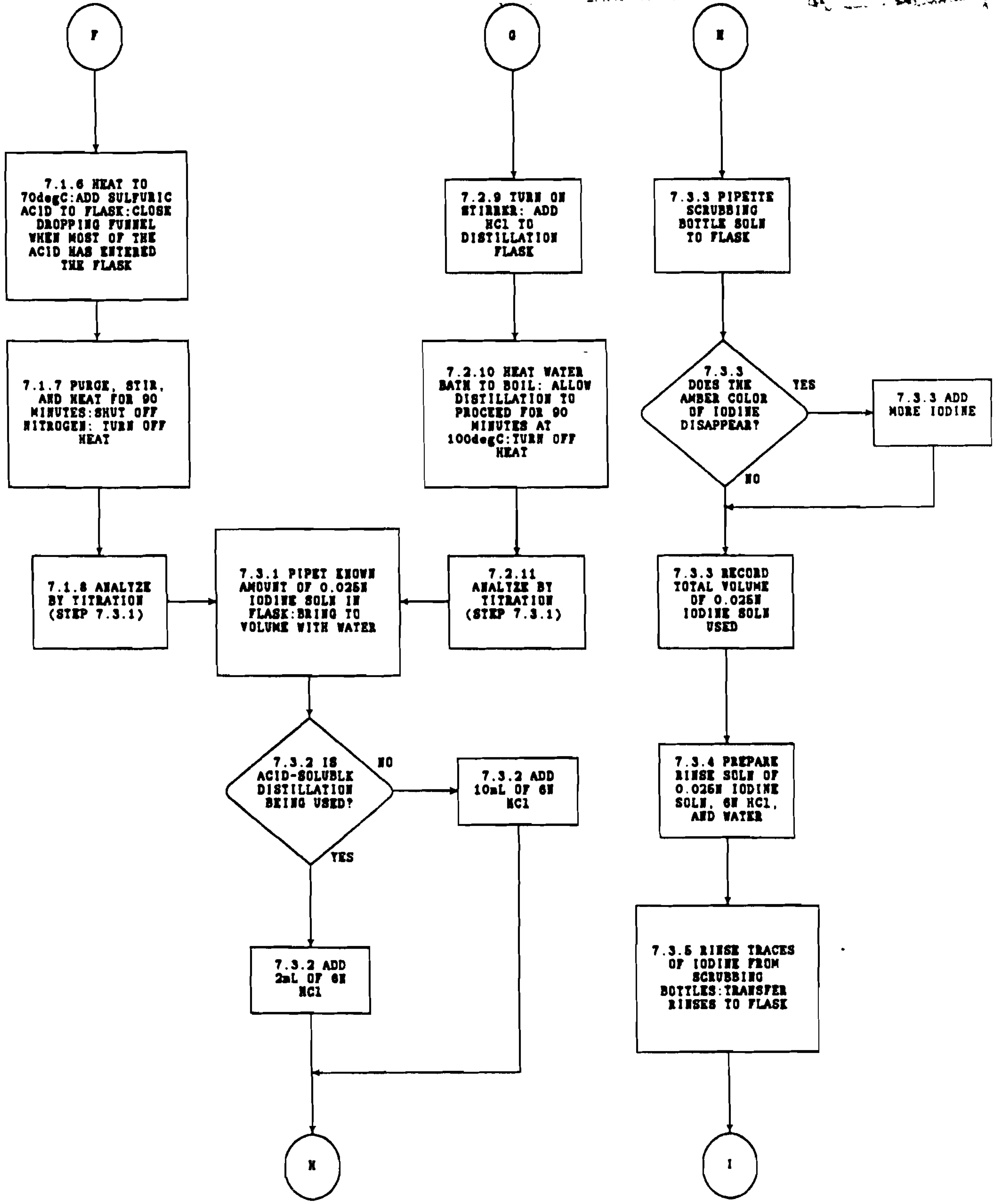

START
7.0 PREDICT ACID-SOLUBILITY OF SAMPLE
ACID-SOLUBLE
ACID-INSOLUBLE
7.1.1 CHOOSE SAMPLE SIZE(0.2 TO 50 MG SULFIDE):PLACE KNOWN AMOUNT OF SAMPLE IN BEAKER:ADD WATER:MEASURE pH:ADD CONC SULFURIC ACID TO pH=1
7.2.1 WATER CONTENT OF DISTILLATION MUST BE CONTROLLED:CONC OF HYDROCHLORIC ACID SHOULD BE 6.5N
7.1.1 CALCULATE AMOUNT OF SULFURIC ACID NEEDED TO ACIDIFY SAMPLE FOR PURGE
7.2.1 IS SAMPLE EASILY SUSPENDED ?
NO
7.2.1 LIMIT SAMPLE SIZE TO 25g DRY WEIGHT
YES
7.1.2 PREPARE GAS EVOLUTION APPARATUS
7.2.1 SAMPLE SIZE MAY BE 25-50g
7.1.2.1 PREPARE HOT WATER BATH
7.2.2 WEIGH SAMPLE(0.2-50mg OF SULFIDE) CRUSH IF NECESSARY:ADD 50 mL OF WATER
DRY SOLID
7.2.2-7.2.4 TYPE OF MATRIX
MOIST SOLID
7.2.4 DETERMINE WATER CONTENT OF SAMPLE:INCLUDE IN TOTAL WATER NEEDED (50mL) FOR CORRECT HCl CONC
AQUEOUS
7.1.2.2 ASSEMBLE 3 NECK FLASK
7.2.3 IS < 50g OF SAMPLE NEEDED?
YES
7.2.3 ADD WATER TO SAMPLE FOR A TOTAL VOLUME OF 50 mL
NO
A
B
C
D
E


A
B
C
D
E
7.1.2.3 PLACE ZINC ACETATE SOLN, FORMALDEHYDE, AND WATER IN GAS SCRUBBING BOTTLES
7.2.3 USE 50g OF SAMPLE
7.1.2.4 CONNECT FLASK AND SCRUBBING BOTTLES:SECURE JOINTS
7.2.5 PLACE SAMPLE IN FLASK:ADD STANNOUS CHLORIDE
7.1.3 PLACE WEIGHED SAMPLE IN FLASK:DILUTE WITH WATER IF NECESSARY
7.2.6 ASSEMBLE DISTILLATION APPARATUS (SEE FIGURE 1):PLACE ZINC ACETATE/SODIUM ACETATE BUFFER AND FORMALDEHYDE IN SCRUBBING BOTTLES
7.1.4 PLACE DROPPING FUNNEL ONTO FLASK:ADD SULFURIC ACID (FROM STEP 7.1.1) TO DROPPING FUNNEL
7.2.7 ADD 100mL OF 9.8N HCl TO DROPPING FUNNEL
7.1.5 ADJUST NITROGEN FLOW:CHECK FOR LEAKS:TURN ON STIRRER:PURGE SYSTEM OF OXYGEN FOR 15 MINUTES
7.2.8 SET NITROGEN FLOW: PURGE SYSTEM OF OXYGEN FOR 15 MINUTES
F
G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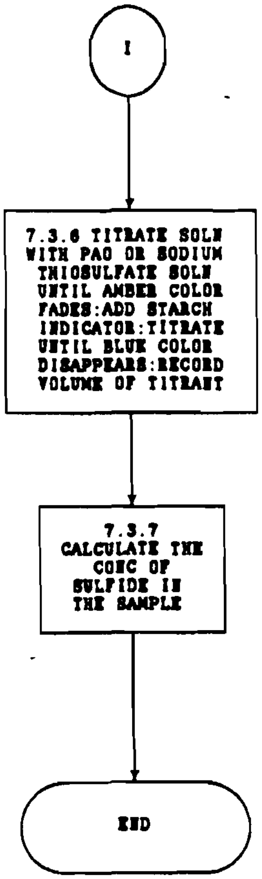
7.1.6 HEAT TO 70degC:ADD SULFURIC ACID TO FLASK:CLOSE DROPPING FUNNEL WHEN MOST OF THE ACID HAS ENTERED THE FLASK
7.1.7 PURGE, STIR, AND HEAT FOR 90 MINUTES:SHUT OFF NITROGEN: TURN OFF HEAT
7.1.8 ANALYZE BY TITRATION (STEP 7.3.1)
G
7.2.9 TURN ON STIRRER: ADD HCl TO DISTILLATION FLASK
7.2.10 HEAT WATER BATH TO BOIL: ALLOW DISTILLATION TO PROCEED FOR 90 MINUTES AT 100degC:TURN OFF HEAT
7.2.11 ANALYZE BY TITRATION (STEP 7.3.1)
7.3.1 PIPET KNOWN AMOUNT OF 0.025N IODINE SOLN IN FLASK:BRING TO VOLUME WITH WATER
7.3.2 IS ACID-SOLUBLE DISTILLATION BEING USED?
NO
7.3.2 ADD 10mL OF 6N HCl
YES
7.3.2 ADD 2mL OF 6N HCl
H
H
7.3.3 PIPETTE SCRUBBING BOTTLE SOLN TO FLASK
7.3.3 DOES THE AMBER COLOR OF IODINE DISAPPEAR?
YES
7.3.3 ADD MORE IODINE
NO
7.3.3 RECORD TOTAL VOLUME OF 0.025N IODINE SOLN USED
7.3.4 PREPARE RINSE SOLN OF 0.025N IODINE SOLN, 6N HCl, AND WATER
7.3.5 RINSE TRACES OF IODINE FROM SCRUBBING BOTTLES:TRANSFER RINSES TO FLASK
I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7.3.6 TITRATE SOLN WITH PAO OR SODIUM THIOSULFATE SOLN UNTIL AMBER COLOR FADES:ADD STARCH INDICATOR:TITRATE UNTIL BLUE COLOR DISAPPEARS:RECORD VOLUME OF TITRANT
7.3.7 CALCULATE THE CONC OF SULFIDE IN THE SAMPLE
END

OhioEPA

State of Ohio Environmental Protection Agency

Northeast District Office
2110 E. Aurora Road
Twinsburg, Ohio 44087-1969
(216) 425-9171

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Toward A Cleaner Environment
15 Year Anniversary
1972 - 1987

Richard F. Celeste
Governor

October 21, 1987

RE: RAVENNA ARMY AMMUNITION PLANT
PORTAGE COUNTY
OH5-210-020-736
and #02-67-0550

Ravenna Army Ammunition Plant
State Route 5
Ravenna, Ohio 44266

Attn: Robert Casper,
Commander's Representative

Dear Mr. Casper:

On October 13, 1987, I conducted an inspection of the Physics International (Load Line #6) and RAI facilities located at the Ravenna Army Ammunition Plant. The inspection was conducted in order to determine compliance with both State and Federal regulations for handling of hazardous wastes. The issues involving potential leakage from the evaporation tank and burning/disposal by Physics International were not included in this evaluation since these issues are being addressed by U.S. EPA.

No violations were noted during the inspection of Ravenna Arsenal, Inc.

The inspection of Physics International revealed the following violation and/or concern:

> During the past year Don Davis performed a significant roll in hazardous waste management at Load Line #6, but did not receive annual training as required by OAC 3745-65-16 and 40 CFR part 265.16.

submitted 11/20

During the inspection it was brought to my attention that Physics International plans to close the evaporation tank in the near future. Please note that Federal rules require a 45 day notice prior to the expected date of closure and Ohio rules require 180 days notice. Therefore, you will need to submit as soon as possible the tank closure plan and a cover letter providing notice that you intend to close the tank. Two copies of the plan and cover letter should be sent to Tom Crepeau of our Columbus Office and one copy should be sent to our Northeast District Office. A copy should also be sent to U.S. EPA Region V.

I am aware that you included the tank closure plan as part of the remedial action plan which you submitted to U.S. EPA on July 2, 1987. Although these two plans deal with the same unit, it is possible to process these plans separately. I believe the best course of action would be to submit a revised closure plan which incorporates the type of soil investigation which you described in the remedial action plan. This would allow resolution of closure issues in a timely manner. Also, any corrective action issues which are not resolved in the closure process could be addressed separately, if any such issues remain after closure.

Within 30 days of receipt of this letter, please submit the closure plans as indicated above and submit documentation of the corrected personnel training to this office.

Please contact me at (216) 425-9171 if you have any questions.

Sincerely,

Donald F Easterling

Donald F. Easterling
Environmental Scientist
Division of Solid and Hazardous Waste
Management

DFE/sp

cc: Dave Sholtis, DSHWM, Central Office
Debby Berg, DSHWM, NEDO

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

Toward A Cleaner Environment
15 Year Anniversary 1972 - 1987

Richard F. Celeste
Governor

November 30, 1987

RE: RAVENNA ARMY AMMUNITION PLANT
PORTAGE COUNTY
OH5-210-020-736
#02-67-0550

Ravenna Army Ammunition Plant
State Route 5
Ravenna, Ohio 44266

Attn: Robert Casper, Commanders Representative

Dear Mr. Casper:

On November 19, 1987, this office received documents from Mr. Robert Summers of Physics International Company. The documents included personnel training records and a closure plan for the pink water evaporation tank at load line #6.

Our review of the personnel training documents indicated that the training violation noted in my letter dated October 21, 1987, has been corrected.

Our review of the evaporation tank closure plan revealed that the following revisions are needed:

1. The concentration of contaminants which will be left in place and considered to be adequately clean should be reevaluated. This office cannot accept a clean standard of 1500 mg/kg; particularly when the oral LD_{50} (rat) for RDX is 200 mg/kg and the subcutaneous LD_{10} (cat) is 200 mg/kg for TNT (according to Sax, Dangerous Properties of Industrial Materials). Please note that Sax indicates that RDX has a high toxicity through oral, dermal, and intravenous routes while TNT has a high toxicity through subcutaneous routes and a moderate toxicity through oral and dermal routes. In addition, Sax indicates that TNT "has been implicated in aplastic anemia."

   I believe an adequate approach would be to set the clean standard at the detection limits of the compounds. Since the soils in the vicinity of the tank appear to have a moderately high clay content and the explosive compounds are almost insoluble in water, the amount of soil which will need to be removed is likely to be limited. In the event that sampling reveals a large area of contamination, a revised closure plan could be submitted to resolve cleanup measures for the larger area.

2. Section 265.111 (c)(9) indicates that the tank will be covered with a substantial membrane. Please clarify the type of membrane which will be used.

3. Paragraph b of the above section states that excavated soils will be flame treated. Please describe the treatment equipment, the process and the proposed location for this activity. The treatment level which is attainable should also be specified.
4. The schedule for implementing the closure should be revised to remain within the time periods specified in 40 CFR part 265.113 (A) and (B) and OAC 3745-66-13 (copy attached).
5. Since this is an in-ground tank, please consider changing the sampling depth interval from the proposed 0-4 feet to 2-6 feet.
6. The description of landfill-type closure on page 7 should be supplemented with a statement which clarifies that if clean closure is not possible, a revised closure plan will be submitted for this type of closure. This revised plan would need to include the information listed in 40 CFR part 265.197 and 265.310 (copy attached) and OAC 3745-68-10.
7. Please indicate the detection limits of the Websters Reagent test method referenced on page 8 of the closure plan.

If you have any questions, please contact me.

Sincerely,

Donald F Easterling

Donald F. Easterling
Environmental Scientist
Division of Solid & Hazardous Waste Management

DFE:mjo

Enclosure

cc: Dave Sholtis, DSHWM, CO
Catherine McCord, USEPA, Region V
Robert R. Summers, Physics International Co, Wadsworth

TELEPHONE OR VERBAL CONVERSATION RECORD For use of this form, see AR 340-15; the proponent agency is The Adjutant General's Office.	DATE 4/20/87

SUBJECT OF CONVERSATION
Suitable Landfill Locations At RVAAP As Determined By U. S. AEHA & 6 April 87 RVAAP Site Visit

INCOMING CALL

PERSON CALLING Capt. Greg Porter	ADDRESS U. S. AEHA Ground Water & Solid Waste Aberdeen Proving Grd, MD	PHONE NUMBER AND EXTENSION ATV: 584-2024
PERSON CALLED T. M. Chanda	OFFICE Environmental Engineer	PHONE NUMBER AND EXTENSION ATV: 346-3221

OUTGOING CALL

PERSON CALLING	OFFICE	PHONE NUMBER AND EXTENSION
PERSON CALLED	ADDRESS	PHONE NUMBER AND EXTENSION

SUMMARY OF CONVERSATION

Capt. Porter called into this office to convey the selected locations at RVAAP that deemed suitable for the proposed sanitary landfill. These site selections were based upon AEHA's reviewal of collected data as obtained by Capt. Porter during his RVAAP data gathering mission on 6 April 87 and 7 April 87.

It was determined that five sites were best afforded to support a sanitary landfill. The following description provided by Capt. Porter along with this office's comments delineates these sites. The attached A-109 Map provides further clarification to these sites.

Location #1 - At Greenleaf Road & South Patrol Road Intersection - The northwest quadrant at the intersection.

This office's comments: Could be potential site, however, a low lying area does persist to the west of this location. Will require physical examination by this office.

Location #2 - At the Intersection of George Road & Newton Falls Road - The northeast quadrant using Newton Falls Road as a south boundary for the site.

This office's comments: A good site with high ground but location would have to be moved approximately 300 - 500 ft. north in order not to intersect with drainage stream running in a southeast to northeast direction.

Location #3 - East of Wilcox Wayland Road & south of Newton Falls Road between two major creeks that cross Wilcox Wayland Road north of creek running east into LL#4 and south of Big & Little Paul's Pond Area.

This office's comments: Very low lying area, considerable amount of area surface run off. Area immediately east of site location maintains a considerable amount of standing water. Site would not be conducive to regulated landfill conditions.

TELEPHONE OR VERBAL CONVERSATION RECORD For use of this form, see AR 340-15; the proponent agency is The Adjutant General's Office.	DATE 4/20/87

SUBJECT OF CONVERSATION
Suitable Landfill Locations At RVAAP As Determined By U. S. AEHA & 6 April 87 RVAAP Site Visit

INCOMING CALL

PERSON CALLING	ADDRESS	PHONE NUMBER AND EXTENSION
Capt. Greg Porter	U. S. AEHA Ground Water & Solid Waste	ATV: 584-2024
PERSON CALLED	**OFFICE**	**PHONE NUMBER AND EXTENSION**
T. M. Chanda	Environmental Engineer	ATV: 346-3221

OUTGOING CALL

PERSON CALLING	OFFICE	PHONE NUMBER AND EXTENSION
PERSON CALLED	**ADDRESS**	**PHONE NUMBER AND EXTENSION**

SUMMARY OF CONVERSATION

Location #4 - Directly within Sandcreek Sewage Disposal Facility

This office's comments: Delete proposed location for obvious reasons.

Location #5 - North of Remalia Road and west of Randall Road southern border of proposed site would be near Remalia Road.

This office's comments: Being only familiar with the outer periphery of this area site acceptability was uncertain. This site would require field survey to determine suitability.

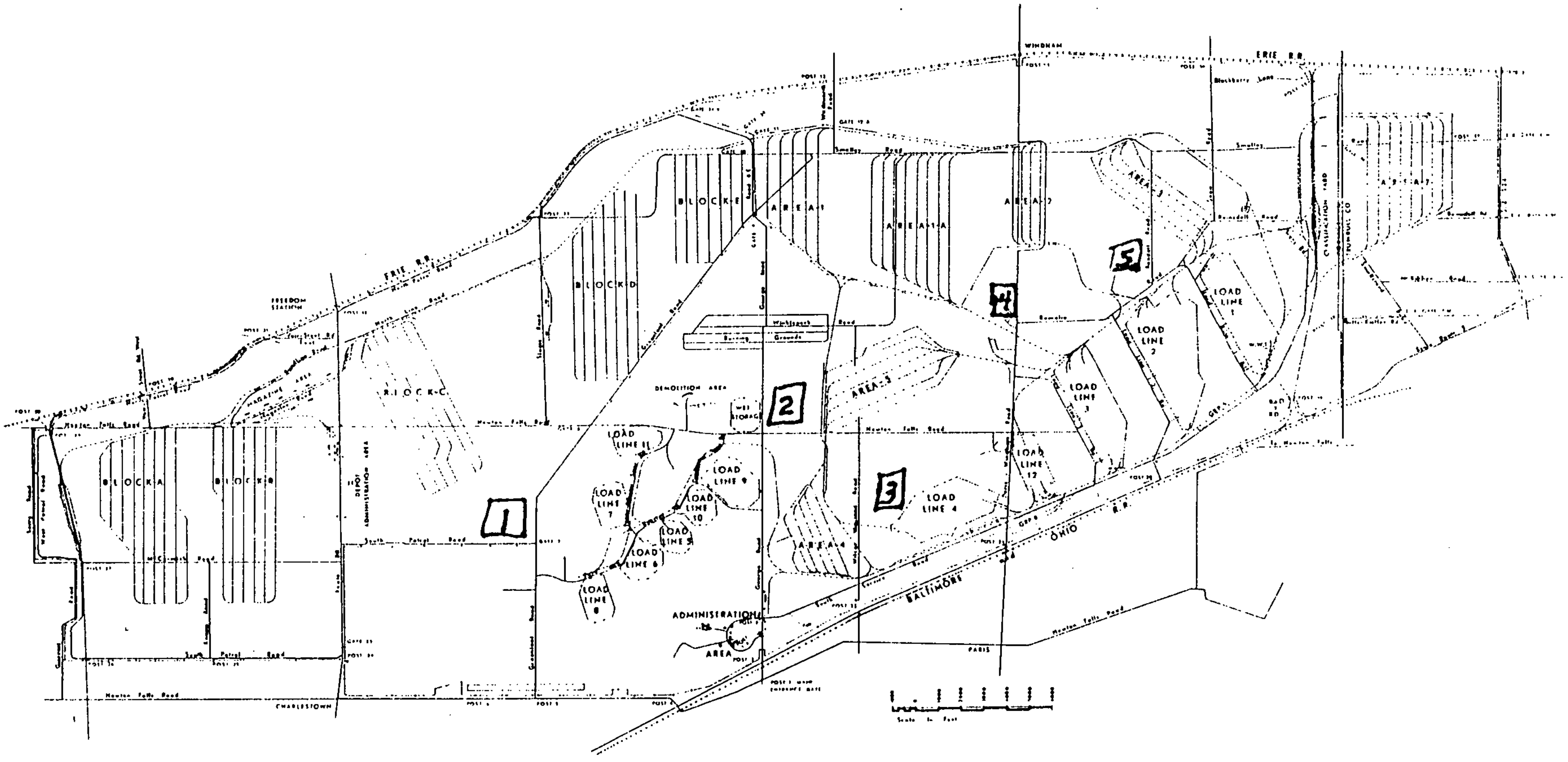
Capt. Porter said that he would cancel site Location #3 & #4 from any other discussion. The remaining three sites would remain open for further study. Porter said that he would provide time for this installation to review the acceptability of the three proposed sites. Porter indicated that he would make another telephone call to this installation to provide a list of materials for his Survey/Sampling Team that's scheduled for July 87. At the time of Capt. Porter's next telephone call, he'll discuss what conclusions have been determined by this installation regarding the three above mentioned sites.

T. M. Chanda

NOTE: During Capt. Porter's next call to this office, it will be requested that he send a formal list of materials to this installation so that the proper channels of funding can be activated to support the July 87 survey crew.

cf: N. Wulff
R. J. Kasper
H. R. Cooper
R. E. Holford
File

Proposed SiTes For New RVAAP SaniTary LandFill As Per USAEHA RecommendATio



N

[*] → Recommended SiTes.

RAVENNA ARMY AMMUNITION PLANT
RAVENNA OHIO
OPERATED BY RAVENNA ARSENAL, INC

APPROVED	SIGNATURE	DATE	TITLE
SAFETY			GENERAL AREA MAP
TECHNICAL MANAGER			
PRODUCTION			
ENGINEERING			
GENERAL MANAGER			REF DWG NO
COMMANDING OFFICER			DRWN [illegible] CHKD
			DATE [illegible] A-109
			SCALE [illegible]

cc: N. Wulff R. Kasper
H. Cooper
R. Holford
file

TELEPHONE OR VERBAL CONVERSATION RECORD

For use of this form, see AR 340-15; the proponent agency is The Adjutant General's Office.

DATE
4-29-87

SUBJECT OF CONVERSATION
New RVAAP Sanitary Landfill Site Selection - U. S. Army Environmental Hygiene Agency (AEHA) Survey Project

INCOMING CALL

PERSON CALLING Lt. Greg Porter	ADDRESS U.S. AEHA Aberdeen Proving Ground MD	PHONE NUMBER AND EXTENSION
PERSON CALLED T.M. Chanda	OFFICE RAI, Environmental Engineer	PHONE NUMBER AND EXTENSION AV: 346-3221

OUTGOING CALL

PERSON CALLING	OFFICE	PHONE NUMBER AND EXTENSION
PERSON CALLED	ADDRESS	PHONE NUMBER AND EXTENSION

SUMMARY OF CONVERSATION

Lt. Porter called to find out if this office had completed the field investigative work pertinent to the three suitable sites that had been agreed upon in the last telephone conversation between this office and Lt. Porter; date 4/20/87.

Yes, the field investigative work had been completed but one area of concern to acceptability, quantity distance (QD) parameters, wasn't finalized yet with respective in-plant personnel. The addressing of the QD aspect had been an oversight by this office which has now been corrected and is presently under a "Review for Comment" process.

Lt. Porter then asked for a summary regarding the geophysical aspects of the three mentioned sites. The following was conveyed to Lt. Porter:

<u>Site 1 (South Patrol and Greenleaf Rd. Site)</u>

The site was not considered to be a prime candidate for a landfill site because of:

1. Northern half of site has a significant sloping terrain decreasing from East to West.
2. The area within the Southeastern and half of the Southwestern quadrant pose as a significantly depressed area of contour with standing surface water.
3. Due to the significant sloping terrain, site construction spoils could potentially not achieve adequate quantities for cover material requirements.
4. The QD impacts this area significantly due to inbound, outbound and holding area for explosive shipments. This explosive handling area does maintain characteristics that would pose extreme difficulty in relocation.

<u>Site 2 (Northeast quadrant formed by the intersection of George & Newton Falls Rd.)</u>

The field observations made, delete this site from any future considerations. This is contrary to initial comments made in the 4/20/87 telephone conversation; for reasons being:

1. The site supports a major depressed area which is positioned in the center of the site. With the land mass that this depression occupies it would be

DA FORM 1 APR 66 751 REPLACES EDITION OF 1 FEB 58 WHICH WILL BE USED.

★ GPO: 1968 O — 313-775 84

impossible during site construction to generate enough cover material for landfill operations.

Site #3 (North of Remalia & West of Randall Rd.)-(was listed as Location #5 in 4/20/87 telephone transcript between this office and Lt. Porter).

This site is relatively level with a slight Southward slope. The topography warrants further considerations as a potentially good site. There are two drawbacks (one of which can be rectified) that do currently pose reservations to the best candidate for a landfill site - they are:

1. The site has two drainage ditches (one entering in from the South and the other from the East) which traverse in a Northwest direction through the site. The drainage ditches which are relatively constant with running water can be rerouted around or away from the site. How much of an undertaking this would requir is uncertain without surveying the natural drainage of the area.

2. The Northwest corner of the site is approximately 800-1,000 ft. away from an ammunition sectionalizing building (currently inactive) and the site's Northeast corner is approximately 1,250 ft. away from an above ground magazine area. There could be potential problems with QD based upon the respective in-plant personnel comments.

After the physical synopsis of each site, Lt. Porter was inclined to delete sites #1 and #2 based upon the mentioned disadvantages. Site #3 would appear to have good potential however QD may subject the site as unfavorable. In any case, Lt. Porter would have to return to RVAAP's data file to search for other possible sites. He did mention that there were other feasible sites on the installation. The sites he originally selected were due primarily to remote locations and distance from the installation's boundary. He would like to find at least three potentially good sites at RVAAP to make it worthwhile venture for his survey team.

Lt. Porter said he'll call back to this office 5/11/87 to discuss other site selections and to provide a list of materials that will be requried during the survey team's visit. This office informed Lt. Porter that it would be helpful to know what materials will be required however it will be necessary to send a formal request for materials to this installation so that the proper channels of funding can be implemented. Lt. Porter said that when the survey sites have been confirmed at RVAAP he'll forward a formal request of materials. This request will be sent with enough lead time to satisfy the funding requirements.

TM Chanda

T. M. Chanda

TMC:ejm

TELEPHONE OR VERBAL CONVERSATION RECORD

For use of this form, see AR 340-15; the proponent agency is The Adjutant General's Office.

DATE
15 June 1987

SUBJECT OF CONVERSATION U. S. AEHA's NEW RVAAP SANITARY LANDFILL SITE SURVEY - GROUNDWATER MONITORING TO ESTABLISH DIRECTIONAL FLOWS OF FIRST SIGNIFICANT SOURCE

INCOMING CALL

PERSON CALLING	ADDRESS	PHONE NUMBER AND EXTENSION
PERSON CALLED	OFFICE	PHONE NUMBER AND EXTENSION

OUTGOING CALL

PERSON CALLING	OFFICE	PHONE NUMBER AND EXTENSION
T. M. CHANDA	ENVIRONMENTAL ENGINEER	297-3221
PERSON CALLED	ADDRESS	PHONE NUMBER AND EXTENSION
MR. DAVID BUDD	OHIO EPA - NORTHEAST DISTRICT SOLID WASTE DIVISION TWINSBURG, OHIO	(216) 425-9171

SUMMARY OF CONVERSATION

REF: RAI TELECON TRANSCRIPT WITH AEHA's LT. PORTER DATED 28 MAY 87, Subject: SITE SELECTION FOR A NEW RVAAP SANITARY LANDFILL.

Questioned Mr. Budd regarding concerns he would have with USAEHA's installation of groundwater monitoring wells upon proposed sites. It was indicated to Budd that these wells would only penetrate the first 10 feet of the first subsurface source; noting that these wells would probably not penetrate any deeper than 30 feet and that their primary purpose was to establish directional flow patterns. Budd was given the list of materials that would be utilized in developing these wells.

Budd responded without any objections to the installation of these shallow wells provided that at some point in time after satisfying their intended purpose, the wells will be properly capped. The wells were looked upon as an acceptable means for generating data in the investigative survey of site selection.

Also in the conversation, Budd was informed that Ohio Drilling was to begin installing the groundwater monitoring wells for the existing RVAAP landfill on 17 Jun 87. However this office indicated that it was questionable as to having the full compliment of analytical data into Budd's office by 30 June 87. The wells and well sampling would be completed by 30 Jun 87, but it would probably be unlikely the contracted laboratory would be completed with the prescribed analytical parameters by the assigned date. Mr. Budd indicated that he would not show any concern, knowing the project would only be late by a few weeks rather than a few months. Budd also mentioned that he would not require a formal explanation to the slight delay; however, if this office would deem it necessary to file a formal notice of record for the delay, then so be it.

cf: N. Wulff
R. Kasper
H. Cooper
J. Watson
G. Wolfgang
L. Butler
File

T. M. CHANDA

TMC:jb

DA FORM 1 APR 65 751 REPLACES EDITION OF 1 FEB 58 WHICH WILL BE USED.

cf: ~~[illegible]~~
~~T. Chanda~~
File

RAVENNA ARSENAL INC.
A Subsidiary of Physics International Company
8451 STATE ROUTE 5
RAVENNA, OHIO 44266-9297

Telephone (216) 358-7111

Autovon 346-3210

July 2, 1987

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

TO: Ohio Environmental Protection Agency
Northeast District Office
ATTN: David O. Budd
2110 East Aurora Road
Twinsburg, OH 44087-1969

Subject: Groundwater Monitoring Wells for the Sanitary Landfill - RVAAP

Dear Sir:

This letter is to confirm telephone conversation between you and Larry Butler in July 2, 1987. We wish to bring you current with our efforts on subject project since we met with you on May 26, 1987.

Ohio Drilling Company drilled the four (4) monitoring wells in the locations discussed in our meeting; these wells were drilled on June 17 and June 18, 1987. Water samples were taken on June 26, 1987, three (3) for each well at different levels in the Sharen Conglomerate, or a total of twelve (12) samples. The samples were forwarded to Wadsworth Laboratories and the results are expected about July 15, 1987.

Ravenna Arsenal, Inc. in conjunction with Ohio Drilling Company expects to forward a final report to you by July 31, 1987. After you have time to review the report, a meeting can be arranged to discuss any unresolved items. After we receive your approval we will proceed with casing and screening the wells so we may comply with future sampling requirements.

Sincerely,

RAVENNA ARSENAL, INC.

H.R. Cooper

H. R. Cooper
Plant Engineer

LB:jb

RAVENNA ARMY AMMUNITION PLANT

RAVENNA ARSENAL, INC.

SCOPE OF WORK
TO
ESTABLISH A SANITARY LANDFILL
GROUNDWATER MONITORING PROGRAM

The following scope of work (SOW) is mandated by Ohio EPA regulatory guidelines pertinent to the permitted management practices of the sanitary landfill operations at the Ravenna Army Ammunition Plant. A regulatory suspense date has been given as June 30, 1987.

Phase I and II of the SOW describes the parameters that must be satisfied in order to meet compliancy by the mentioned suspense date.

RAI will obtain an experienced contractor that has the capability to meet all the requirements of the SOW up to the point of routine sampling and analyses of the groundwater monitoring wells.

PHASE I

1. Establish the geohydrologic environment specific to Ravenna Army Ammunition Plant's landfill site. This will require:

    a. Literature research and site survey (w/boring samples to establish the physiography, soil conditions, and geologic stratigraphy of the site. This survey portion of Phase I will depict the geological setting down into the prominent subsurface acquifier that is considered the most likely source of potable water for the general locale. This action will entail a comprehensive report of findings; noting types, depths, consistencies or inconsistencies of the geological environments and water bearing stratas prior to and including the prominent acquifier (freshwater - clearwater zone).

    b. A subsurface hydrology scheme based upon the geological survey findings will be reported that provides data pertinent to all subsurface water bearing stratas (down to and including the area's prominent potable water supply). The main objective in establishing the subsurface hydrological environment is to determine depth and directional flow of the water bearing stratas.

c. Both the geological and subsurface hydrological data required shall also satisfy those areas described in Regulation 3745-27-06 Part (d), (e), (i), (ii), (iii) of the Ohio Administrative Code.

2. Based upon the obtained hydrogeological data of the sanitary landfill determine the most suitable site to install one (1) upgradient and three (3) downgradient groundwater monitoring (GWM) wells. GWM wells location should be supported with a rationale that is applicable to the effectiveness in monitoring leachate migration within the subsurface acquifiers.

3. Provide a descriptive summary as to the prescribed depth of the GWM wells detailing the type of materials and equipment utilized in the construction and installation, methodology and techniques of well construction and installation (e.g. protection of wells from surface water run-off contamination) and the expected sampling equipment and sampling technique to be used in the acquisition of samples. The construction and location of GWM wells shall comply with regulatory guidelines setforth in Chapter 3745-9 of the Ohio Administrative Code.

4. All information responsive to Items #1, #2 and #3 of Phase I will be compiled into a formal document, that in turn, will be presented to the Ohio EPA, Northeast District Office, Solid Waste Division. This document will represent RVAAP's preliminary design submittal for review by the regulatory agency. The author of the preliminary design submittal will be made available to field questions, respond to recommendations and make any necessary additions as may be applicable to the Ohio EPA review process and their final approval.

PHASE II

1. Phase II will not be implemented until final approval is given upon the preliminary design submittal and any addendums made to it. Final approval shall be determined by Ohio EPA's acceptance of the proposed scope as described in the design submittal.

2. The following will respond to Phase II:

   a. Purchasing of materials and a service contractor to drill and install GWM wells as described by approved design submittal.

   b. Purchase necessary equipment to meet the prescribed sampling techniques. This purchasing of the sampling equipment is anticipated to be minimal in expectance of utilizing in-plant equipment available from RCRA GWM program.

FINANCIAL CONSIDERATIONS

Currently from interviewing private service/contractor agencies already involved with identical work as previously described within this SOW, a completed project usually meets expenditures between sixteen to twenty thousand dollars ($16,000 - $20,000). These estimated figures must be used with some reservations due to recommendations that may be proposed by the Ohio EPA following their reviewal process. These recommendations can affect initial estimated costs. Areas that have potential for surpassing estimated costs are as follows:

1. Additonal GWM wells be installed beyond what is proposed within the SOW.
2. Recommendations prescribe additional geohydrological study be performed further than what exists within the preliminary design submittal.
3. GWM wells to extend deeper into the subsurface to satisfy regulatory considerations.
4. Existing sampling equipment not suitable for prescribed methodologies employed in sample acquisition.
5. Purchasing additional well construction materials to satisfy regulatory concerns.

At this time and as best as can be ascertained, the costs meet the proposed SOW as mentioned within this submittal should not exceed twenty thousand dollars ($20,000). However, in order to make aware to the propenent of funding, there is possibility of unexpected costs to arise over and beyond what is presently mentioned pending the final approval of the preliminary design submittal by the Ohio EPA.

Ravenna AAP

Groundwater Monitoring Program

Milestone Schedule

Receipt of Ohio EPA Notice of Deficiency	September 30, 1986
Complete survey of requirements, prepare scope of work and estimate and submit request for funds to Government	November 15, 1986
Project funded by AMCCOM	**December 22, 1986
Solicit bids and award subcontract for complete monitoring system	February 8, 1987
Preliminary design package completed and submitted to Ohio EPA for approval	March 8, 1987
Final approval of design received from Ohio EPA	**May 8, 1987
Monitoring wells completed	June 8, 1987
Groundwater samples collected	June 15, 1987
Analyses of groundwater samples received and submitted to Ohio EPA	June 30,1987
Final as-built well data submitted to Ohio EPA	June 30, 1987

* Dates shown are the latest the activity can be completed without delaying completion of the project beyond the June 30, 1987 deadline.

** Indicates a milestone activity not under Ravenna Arsenal, Inc. control

Ravenna AAP

Groundwater Monitoring System

Cost Estimate

Ravenna Arsenal, Inc. will subcontract the preparation of the preliminary design submission and the installation of the wells.

Prepare preliminary design submission for EPA approval (See Phase I of scope of work for details)	
Estimated lump sum cost for a qualified geohydrological consultant.	$15,000
Installation of Wells	
Estimated cost for drilling and installation of 4 wells including material costs. 4 @ $4,000	$16,000
Purchase of Equipment	
Estimated cost of sampling equipment identified in the approved sampling plan. (Accesories for the existing RCRA monitoring pump).	$1,000
	$32,000

CONDITIONS

This estimate anticipates and allows for some porblems which would normally be expected to occur.

It assumes the following:

1. Four wells would be sufficient to satisfy EPA (One upgradient and three downgradient).
2. The required well depth will not exceed 125' (Based upon conversations with Ohio EPA about other wells in the area).
3. No highly unusual conditions will be found which will require an abnormal amount of subsurface investigation and tests.
4. The existing sampling equipment which was procured for the RCRA monitoring program will be approved for use in this landfill monitoring program.
5. No purchase of analytical equipment is included since RAI intends to contract the analysis of the samples.

OhioEPA

State Of Ohio Environmental Protection Agency

1049, 361 East Broad St., Columbus, Ohio 43266-0149
5-8565

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

32014
8-25-87

28.15

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TELEPHONE OR VERBAL CONVERSATION RECORD

For use of this form, see AR 340-15; the proponent agency is The Adjutant General's Office.

DATE 8/18/87

SUBJECT OF CONVERSATION Current status to establishing interim operational standards for RVAAP's HW activities during State Part B reviewal process.

INCOMING CALL

PERSON CALLING Ed Lim (Return Call)

ADDRESS Ohio EPA
Solid & Hazardous Waste Div
Columbus, OH

PHONE NUMBER AND EXTENSION 618-481-7256

PERSON CALLED T. M. Chanda

OFFICE Environmental Engineer

PHONE NUMBER AND EXTENSION 216-297-3221

OUTGOING CALL

PERSON CALLING

OFFICE

PHONE NUMBER AND EXTENSION

PERSON CALLED

ADDRESS

PHONE NUMBER AND EXTENSION

SUMMARY OF CONVERSATION

Recent series of events that have preceded this telephone conversation:

1. 7/30/87 - Ohio EPA (messr: B. Carey) informs this office that the regulatory agenc is prepared to issue RVAAP's exemption request with inclusion to the approval that RVAAP submit a State RCRA Part B application for all HW activities and that RVAAP ceas & desist any further HW activities following the project encompassing the M-15 propellant burning exemption request approval. This office informs OHEPA that RVAAP can submit a Part B application, but cannot agree to curtail RVAAP HW activities during interim period between the time RVAAP submits application and the State issues permit, which could be up to two years. RVAAP had critical needs to its mission that had to be supported by HW treatment and storage. RVAAP had to respond to demilitarization of "non-spec" explosives in storage, demil of stored munition items and the proposed project for LL #7. Ohio EPA would further discuss this amongst themselves and return a call to this office.

2. 7/31/87 - Ohio EPA (messrs: Carey & Lim) called this office to say that alternatives were very limited to provide any leeway for RVAAP to conduct HW activities without possessing a State permit to operate. This office indicated that this was an unfair imposition to RVAAP, especially since it was the State's decision not to administer a permit to RVAAP since Federal regulatory guidelines were and still are under a proposed phase pertinent to waste explosive OB & OD. This office was interested in pursuing a positive approach that would be mutually agreeable to both parties rather than the negative approach of total shut down. After further discussion, it appeared the LL #6 (Physics International) State RCRA operating permit could be the means to resolving RVAAP's situation for interim status between State RCRA permit request and permit issuance; OHEPA would study the document potential.

3. 8/3/87 - This office contacts OHEPA (messrs: Carey & Lim). OHEPA is uncertain to the effectiveness of the LL #6 document to support RVAAP HW activities. OHEPA isn't sure amending the document would result in revision rather than modification; a modification of the permit would require the Hazardous Waste Facility Review Board to process the permit (2 month minimum lead-time) vs. a revision which could be handled expeditiously by the State EPA office. The amending of this document to accomodate

Phone conversation cont'd

RVAAP HW activities has to be further reviewed; preferably through a face-to-face discussion between both parties to explore the potential of such action. This office agreed that a meeting would be beneficial at the earliest convenience. RVAAP's representatives would travel to the State office. This office would contact the OHEPA to confirm the meeting date.

4. 8/4/87 - This office contacts OHEPA's, B. Carey, to set meeting date for 6 Aug. 87 at 9:30 AM OHEPA Headquarters, Columbus, OH. Carey indicates that, if possible, have ready an 18 month prospectus of HW activities that have potential of occurring at RVAAP. The 18 month time frame is mentioned since it was estimated that this will be the time it will take to issue a permit. It was indicated that this prospectus would be available at time of meeting.

5. 8/6/87 - OHEPA represented by B. Carey, E. Lim & E. Kitchen meet with RVAAP's representatives N. Wulff, G. Wolfgang, and T. Chanda. The following is a synopsis of meeting.

a. RVAAP presents their proposed 18 month HW activities schedule relative to OB operations for Comp B, Nitroguanidine, M-1 propellant, the demil projects for the 152MM and 90MM projectiles, and the generated quantities expected from the Load Line 7 project. During the presentation, RVAAP stresses the importance (from an ammunition/explosive safety stand point) in handling of these items while still in a chemical state of stability versus a state of instability that renders to a potential for spontaneous detonation and impact to human health and the environment.

b. EPA provides discussion as to how would be the best means to alter the LL #6's permit to meet RVAAP's HW activities. It's determined that Ravenna Arsenal, Inc. would be the ultimate operator for RVAAP's HW activities. This was based upon description provided which delineated RAI's contractual responsibilities to the U.S. Army and its role of monitor for RVAAP's tenant activities.

c. EPA decides it will approach the HWFRB from an informal panel discussion in proposing that the existing LL #6 permit would be revised to accomodate the RVAAP 18 month prospectus and address RAI as the prime operator for all HW activities.

d. EPA also requests, that RVAAP;s representatives upon returning to their installation, forward a copy of RAI's contractual responsibilities delineating the overseership of tenant organizations' environmental activities as well as a copy of a "Net-Alert" notice describing the self detonation of abandoned nitrocellulose residues.

e. OHEPA indicated that they would be unable to issue approval of RVAAP's exemption request for the M-15 propellant container project until there's a present resolution to the other concerns at RVAAP operating without a permit unitl such a time one is issued. OHEPA feels strongly that the Findings & Order section of the exemption request approval should describe what will transpire up to the point RVAAP is issued a state permit.

f. OHEPA had given a quick review of RVAAP's Part B Storage Permit

Request (including the later addendums) which was submitted in July 1986 and had found this submittal as being fairly complete to OHEPA'S requirements for a State operating permit application. RVAAP indicated that further revision would have to be made especially in areas addressing the proposed LL #7 activity.

g. Discussion ended with OHEPA saying they would wait for the requested RVAAP information before approaching the HWFRB.

6. 8/7/87 - This installation forwards requested information to OHEPA via express mail.

7. 8/12/87 - This office calls B. Carey to find out the result of informal meeting between OHEPA and HWFRB. Carey was not in meeting; E. Kitchen and E. Lim met with the HWFRB. Carey suggest calling Lim; Kitchen is on vacation. Carey indicates he's doing an in-depth reviewal of RVAAP's previous Part B submittal. A lot of the document information he has read is very satisfactory. Cary suggests that RVAAP respond to the State Part B request by allowing him to finish his review; at which point he would provide a list of additional data that RVAAP would have to supply for document completion. This office agreed to the approach, but indicated that there would be additions made relative to additional wastes with their respective quantities. Carey was then asked to transfer this office over to Lim's office. Lim was not in, message was left to call this office.

8. 8/18/87 - Lim contacts this office to discuss meeting with HWFRB. Lim indicated that HWFRB did not accept the permit amendment as a revision; it had to go as a modification. The reason being primarily that the quantities were too great over what originally had existed within the permit. Also, LL #6's description was not definitive enough to incorporate RVAAP's HW activities (relative to location and treatment technique). Lim indicated there was no accomplishment of progress; the situation is still unresolved. Lim really sees no other recourse for RVAAP except to file an emergency permit (different from an exemption request) each time there's implementation of a project until RVAAP receives its State permit. In filing an emergency permit request (which takes about 5 days to approve) RVAAP will have to justify its action based upon factors of eminent harm (explosion and worker exposure to a dangerous work environment). This is in contrast to an exemption request which justifies said action will not have impact to human health or the environment. This office has some reservation to this rationale because of the fact there'll be a misuse of the request's intended purpose; just as there had been, according to OHEPA, of the exemption request. RVAAP's frequency to request an emergency permit to

conduct HW activities (as described in the 18 month prospectus) will have to be a mutually agreed action. RVAAP has no objection in pursuing this route, but OHEPA (all parties concerned) must accept this as being the best alternative for interim status prior to permit issuance. Lim indicated he would try to gain the acceptance of this approach by the respective decision makers. Lim said for this office to contact him Thursday afternoon; he should, by then, have some answer.

9. 8/20/87 - Lim contacted by this office. Lim has not been able to talk with Mr. Charles Taylor (gives final decision on action prior to review by OHEPA's Director). Lim said as soon as he can get in to see Taylor he'll present RVAAP's situation and the proposed plan of action discussed between Lim and this office on 8/18/87.

10. 8/21/87 - Bob Carey (OHEPA) called this office to convey a message from Ed Lim who was on travel. Lim had talked with Charles Taylor regarding RVAAP's M-15 propellant container decontamination as well as the other expected RVAAP hazardous waste projects that will be occuring within the next eighteen months. As per Lim (via Carey,) RVAAP should address the M-15 propellant container project as a submittal under Ohio Revised Code (ORC) 3734.02 (J). This ORC affords an activity to be implemented under what is termed as a "temporary emergency permit". This permit allows a hazardous waste activity to be conducted when there's imminent and substantial danger to public health/safety or environment and when there's immediate need for treatment, storage, or disposal of hazardous waste; of which there's no other regulatory permit authorized to conduct such activity. This is how OHEPA wants to deal with present RVAAP hazardous waste concerns until there's issuance of State RCRA Part B. Tentatively if RVAAP submits this emergency permit request within 2 to 3 days RVAAP should be given notice to begin propellant burning by 9/3/87. Carey instructed this office to forward the emergency permit request to a Mr. Thomas Crepeau with a copy to Carey's attention. This office mentioned that due to the purpose of intent of this emergency permit, the current stored M-1 propellant (980 pounds) will be incorporated into the M-15 OB project. Carey had no objections to the additional material.

Carey was asked the status on his review of RVAAP's previous RCRA Part B submittal. Carey said he had begun to review it, but had not finished it to provide a summary of what areas would require additional information from this installation to generate a complete document. Carey would be going on vacation for the week of 24 Aug 87 so he would not finish his review till the week of 31 Aug 87. This office indicated the need for an expeditious handling of the RCRA B submittal to alleviate the compromising position RVAAP is placed into by the utilization of the emergency permit. Carey agreed and would expedite the review, contact Mr. Don Easterling of OHEPA District Office and then immediately schedule a meeting date at RVAAP to discuss what will be required in order to develop a complete State RCRA Part B submittal. This office will be waiting for further word from Carey.

Phone Conservation cont'd

This office will be waiting for further word from Carey.

Tom Chanda

TC/wp

cc: N. Wulff
R. Kasper ✓
H. Cooper
G. Wolfgang
File