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DEPARTMENT OF THE ARMY

US ARMY TOXIC AND HAZARDOUS MATERIALS AGENCY

ABERDEEN PROVING GROUND, MARYLAND 21010-5401

REPLY TO ATTENTION OF

AMXTH-IR-A

14 MAR 1988

MEMORANDUM FOR: Commander, Ravenna Army Ammunition Plant Ravenna, OH 44266-9297

SUBJECT: Ravenna Army Ammunition Plant, Reports 132 and 132R

1. In September 1978, this Agency performed an initial assessment (records search) of the subject installation. This report was updated in April 1981.

2. Prior to the initial assessment, your environmental office was requested to provide pertinent documents and information for use by the assessment team in preparing the subject reports.

3. This Agency does not anticipate further need for the materials that were furnished. Therefore, these files, consisting of one box (encl 1), are being returned to you under separate cover. It is important that these files be maintained in your environmental office to assist you in responding to other outside agency requests.

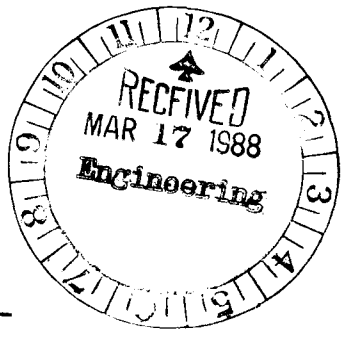
4. Point of contact at this Agency for this action is Ms. Lisa D. Botluk, AUTOVON 584-3182.

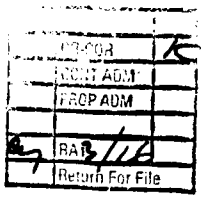
FOR THE COMMANDER:

Encl fwd sep

ANDREW W. ANDERSON
Chief
Installation Restoration Division

USATHAMA
INSTALLATION
ASSESMENT
BACKUP DATA





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1982 REPORT

INSTALLATION REASSESSMENT

OF

RVAAP

USA THMA

DRXTH-AS-IA-81132A

REASSESSMENT OF RAVENNA ARMY AMMUNITION PLANT, RAVENNA, OHIO
Report No. 132R

J.D. Wienand, J.J. Cichowicz, and N.P. Leibel

CHEMICALS SYSTEMS LABORATORY
Environmental Technology Division
Installation Restoration Branch
Aberdeen Proving Ground, Md. 21010

December 1982

Report for Period Apr. 8-10, 1981

Prepared for:

COMMANDER
Ravenna Army Ammunition Plant
Ravenna, Ohio 44266

and

U.S. ARMY TOXIC AND HAZARDOUS MATERIALS AGENCY
Assessment Division
Aberdeen Proving Ground, Md. 21010

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

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16. DISTRIBUTION STATEMENT (of this Report)

Distribution limited to the U.S. Government Agencies only for protection of privileged information evaluating another command: Dec 82. Other requests for this document must be referred to: Commander, Ravenna Army Ammunition Plant, Ravenna, Ohio 44266.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

An onsite installation assessment was conducted on Apr. 8-10, 1981, at Ravenna Army Ammunition Plant (RVAAP), Ohio, to determine the presence of toxic or hazardous materials and to assess the potential for offpost migration. Based on the findings of this assessment, a survey is not recommended at this time.

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REASSESSMENT

OF

RAVENNA ARMY AMMUNITION PLANT, OH

Report No. 132R

CONCUR:

ROBERT J. KASPER
Commander's Representative
Ravenna Army Ammunition Plant

APPROVED:

JOHN D. SPENCE
Colonel, CmlC
Commanding

SUMMARY

A reassessment of the 1978 installation assessment was conducted at Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio, to determine if previous nonsurvey conditions had changed and if such changes, coupled with current environmental regulations, had altered the contaminant migration/hazard situation.

RVAAP lies in the glaciated Allegheny Plateau section of the Allegheny Plateau Province. Due to the low permeability of the surface soils, surface drainage is the primary avenue of dissipation of rainfall events, yielding a high potential for surface migration of contaminants. At present, there is no water quality information to indicate contaminant migration occurs via surface drainageways.

Potential problem areas at RVAAP include security of the reported mustard burial site in the old demolition ground, the possibility of explosives residues in the settling ponds, and contaminant sources from the Winklepeck Burning Grounds and old dump site in the Block C area.

The location of training areas within the inhabited building quantity safety limits of Magazine Storage Area No. 7 and Magazine Areas B and C constitutes a potential safety problem.

No survey by the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA) is recommended at this time; however, it is recommended that RVAAP: coordinate with the U.S. Army Environmental Hygiene Agency (USAEHA) to include Winklepeck Burning Ground, landfills, and the old dump site in the Block C magazine area in future water quality monitoring programs; continue to send water quality monitoring data to USATHAMA; adequately fence and post the suspected mustard burial site;

sample old settling ponds for explosives residues; leak test the underground petroleum, oil, and lubricant (POL) tanks; and review current training agreements for U.S. Army Reserve and National Guard units to ensure compliance with quantity distance safety requirements.

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1.0 GENERAL

1.1 PURPOSE OF THE REASSESSMENT

An onsite records search was conducted at Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio, in 1978, to assess past and current use of toxic and hazardous materials, as well as the potential for these substances to migrate off the installation.

A reassessment was conducted at RVAAP in 1981 to determine if previous nonsurvey conditions had changed and if such changes, coupled with environmental regulations, had altered the contaminant migration/hazard situation.

All information concerning operations existing at the time of the original assessment was reviewed. However, this report includes only information where significant changes have occurred and where additional information was discovered.

Unless otherwise indicated, this report is based on the information made available to the Team at the time of the revisit records search (Apr. 8-10, 1981).

1.2 AUTHORITY

U.S. Army Materiel Development and Readiness Command (DARCOM) Regulation 10-30, Mission and Major Functions of the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA), May 22, 1979.

1.3 INTRODUCTION

1. A reassessment of RVAAP was undertaken on Apr. 8-10, 1981.
    a. Presurvey instructions were forwarded to RVAAP to outline the reassessment scope, provide guidelines, and obtain advance information for review by the Records Search Team.

b. RVAAP personnel were briefed on the purpose of the reassessment program by a Chemical Systems Laboratory (CSL) representative for USATHAMA on Apr. 8, 1981.

c. Various Government agencies were contacted from Mar. 9 to Apr. 7, 1981, for documents pertinent to the records search. Agencies contacted included:

(1) Department of Defense Explosives Safety Board (DDESB);

(2) U.S. Army Environmental Hygiene Agency (USAEHA);

(3) U.S. Geological Survey (USGS);

(4) U.S. Army Engineer Waterways Experiment Station (WES);

(5) Defense Technical Information Center (DTIC);

(6) Chemical Systems Laboratory (CSL); and

(7) U.S. Environmental Protection Agency (EPA), Environmental Photographic Interpretation Center (EPIC).

2. The onsite phase of the records search was conducted from Apr. 8-10, 1981. The following personnel were assigned to the Team:

a. 1LT Joseph Wienand, team leader (CSL).

b. Mr. Jerome Cichowicz, chemist (CSL).

c. Mr. Norman P. Leibel, senior engineer (AAI Corp.).

3. In addition to the review of the records, interviews were conducted with former and current employees. A brief ground tour of the installation was made.

4. Findings are based on the records made available at the time of the search and are current as of that time. Where conspicuous discrepancies existed, attempts were made to determine the correct information by interviewing personnel (if available) involved in preparing the original data.

5. Document production services were provided by Environmental Science and Engineering, Inc. (ESE), Gainesville, Fla.

1.4 HISTORY

RVAAP remains a Government-owned, contractor-operated (GOCO) installation (standby status), and the managing contractor continues to be Ravenna Arsenal, Inc. (RAI).

Since 1971, RVAAP's mission has been the maintenance of load, assemble, and pack facilities; the receipt, storage, and shipment of ammunition, explosives, equipment, inert and critical materials; and the capability to accommodate containerized cargo.

1.5 LEASES

There are a number of permits and support agreements at RVAAP, but only two leases are currently in effect: one for storage of explosives in three magazines and one for apiarian purposes. App. A is a list of permits, agreements, and leases currently in effect at the installation.

A facilities contract is currently in effect with the Firestone Defense Research and Products Division (formerly the Firestone Tire and Rubber Company Defense Research Division) for the use of Load Line 6 and three igloos. This contract was let since completion of the 1978 assessment and is effective through June 1983.

1.6 LEGAL ACTIONS

There are currently no legal actions against RVAAP involving hazardous or harmful materials migrating offpost.

1.7 ENVIRONMENTAL SETTING

1.7.1 GEOLOGY

RVAAP lies in the glaciated Allegheny Plateau section of the Appalachian Plateau Province. The western and northern portions of the plant display low hills and a dendritic surface drainage pattern. Eastern and southern portions are characterized by an undulating to moderately level surface, reflecting less stream dissection of the original glacial drift surface. Kettles are present throughout the plant. Elevations range

from 366 meters (m) above mean sea level (MSL) in the west to 279 m in the east.

1.7.2 BIOTA

Reportedly, there are no endangered species on the installation. Several bald cypress (Taxodium distichum), mentioned in the 1978 assessment, were reported to have been planted by installation personnel to determine if the species would grow in this location.

An additional rare plant identified on the installation is the ginseng (Panax quinquefolium). It was reported that many, if not all, of the rare plant species on the installation were planted by early settlers who brought these species from their native areas.

2.0 PAST AND CURRENT ACTIVITY REVIEW

2.1 SOURCES OF CONTAMINATION

2.1.1 INSTALLATION OPERATIONS

Industrial Operations

Industrial operations currently include the receiving and shipping of explosives, munitions, strategic and critical materials, and vehicle maintenance.

A small motor pool is operated in Bldg. 1084 to maintain installation vehicles; minor maintenance, fluid changes, and lubrication are the primary operations. Waste oils and solvents are collected and burned in the main boiler.

During the 1950s and 1960s, munitions were renovated between major plant operational periods. These operations usually lasted 1 to 2 years and involved paint removal, cleaning, and repainting of munition bodies. Various acid and alkali solutions, such as solutions of chromic acid, phosphoric acid, and sodium hydroxide, were used in dip tanks. Sec. 2.1.2 describes disposal of spent solutions.

Lessee Industrial Operations

The Firestone Defense Research and Products Division utilizes Load Line 6 for research and development (R&D) of armor-piercing shaped charges. The types of explosives generally used in the R&D effort include TNT, octols, Composition B, and RDX compounds. Load Line 12, last occupied in 1967 by Hercules Alcon and used for aluminum chloride production, has been demolished since the 1978 assessment, and the masonry rubble was disposed of in the Ramsdell Quarry landfill.

Proof and Surveillance Testing

The Firestone Defense Research and Products Division still uses the demolition ground, just north of Load Line 11, and three of the four cubicles at Load Line 6 for detonation tests of armor-piercing shaped charges. These areas are periodically cleaned, and all rounds are accounted for (see Sec. 2.1.2).

Training Areas

The same general areas, as reported in the 1978 assessment, are still used as training areas. Although tracked vehicles are still permitted in Areas D, E, F, and G, units have been directed to refrain from digging or excavating in these areas due to the possibility that unexploded ordnance (UXOs) may be present from past demolition operations.

RVAAP has recognized that Training Areas A, B, and C are almost entirely within the quantity distance safety limits for inhabited buildings established for Magazine Storage Area No. 7. Training Areas 7 and G are also partially within the quantity distance safety limits of Magazine Storage Areas B and C.

Radiological Materials

Reportedly, there are no radiological sources at RVAAP. Sealed sources reported in the 1978 assessment were two Cobalt-60 sources used with munition X-ray machines. These were shipped to the Atomic Energy Commission (AEC) in 1972; the destination of this shipment was unknown.

Storage of Toxic/Hazardous Materials

Strategic and critical materials are stored in warehouses, steel tanks, igloos, and in the open for the General Services Administration (GSA).

Asbestos is stored in warehouses within sealed plastic containers and in steel tanks. These areas are posted and restricted. Beryllium is also

stored in a warehouse within sealed fiber drums to contain any associated dust. An updated inventory of stored items is shown in Table 1.

There are a number of aboveground and underground fuel tanks on the installation. These are included in the current Installation Spill Contingency Plan (ISCP). Aboveground tanks are bermed and visually inspected monthly for leaks. Underground tanks are not leak tested (EPA, 1981).

Cooling oil in transformers at RVAAP has been analyzed for polychlorinated biphenyls (PCBs). In-service and unused transformers contain less than 500 parts per million (ppm) PCBs, and most contain less than 50 ppm.

Twenty-four out-of-service transformers (stored in Bldg. 854), which had contained oil with a PCB content range of 50 to 500 ppm, were drained and adequately rinsed with solvent. One transformer with a PCB content greater than 500 ppm was also drained and rinsed in the same manner. This operation was under a contract for disposal by Transformer Repair and Service Corp., Mentor, Ohio. The contractor repeated this procedure in Bldg. 813 on 13 die-cast machines that contained hydraulic oils with PCB ranges of 50 to 500 ppm. The contractor is storing the oil at his site, while awaiting approval of a disposal method by the Ohio Environmental Protection Agency (Ohio EPA). The installation is awaiting final documentation on the disposal.

Ammunition and explosives are still stored in 90 percent of the installation magazines.

Pesticides

Pesticide (insecticide, herbicide, rodenticide) mixing and storage operations are conducted in Bldg. T-4452, in accordance with current Army regulations (U.S. Army, 1978, 1981).

Table 1. Items Stored at RVAAP

Strategic and Critical Material Services Description	Type*	For General Administration Location†
Antimony	Tank	LL #3
Asbestos	Tank whse	Bldg. 841, LL #3, RT 80
Beryllium	Whse	GP 8
Bismuth	Whse	GP 8
Chrome, chemical	Unimproved	Ore piles
Chrome, metallurgical	Unimproved	Ore piles
Chrome, refractory	Unimproved	Ore piles
Cobalt	Igloo	Bldg. HE 339, HG 859, GP 7
Cobalt	Whse	GP 8
Ferrochrome	Improved	Ore piles
Ferrochrome, low carbon	Whse	GP 8
Ferrochrome, low carbon	Whse	GP 8
Ferrochrome, silicon	Whse	GP 8
Ferromanganese, medium carbon	Improved	Ore piles
Lead	Whse	GP 8
Manganese, battery grade	Unimproved	Ore piles
Manganese, metallurgical	Unimproved	Ore piles
Manganese, metallurgical	Unimproved	Ore piles
Nickel cathodes	Tank	RT 80
Rutile	Tank	RT 80
Talc	Tank	RT 80
Zirconium	Whse	GP 8
Hafnium	Whse	GP 8
Zircalloy	Whse	GP 8

* Type: Whse - warehouse.
Tank - steel tank.
Unimproved - on ground in open.
Improved - on concrete pad and/or covered.

† Location: GP - group.
LL - load line.
RT - route (highway).

The herbicide 2,4,5-T was used until 1979, and remaining stocks have been excessed to the Defense Property Disposal Office (DPDO), Columbus, Ohio, although the installation is storing this herbicide until the disposal action is accomplished by DPDO. App. B lists the current pesticide inventory.

2.1.2 DISPOSAL OPERATIONS

Waste Disposal

The Firestone Defense research and Products Division, at Load Line 6, continues to generate explosive waste, such as sweepings, scrap, paper wrappings, rags, and liquid wastes. This material is burned at the Winklepeck Burning Grounds once per month under an Ohio EPA permit, allowing 300 pounds (lbs) per month to be disposed of by open burning.

Liquid wastes contaminated with explosives are generated at Load Line 6 from washdown operations. These wastes are discharged to a water evaporation unit, similar to a greenhouse, which was constructed in 1980. There are no liquid wastes discharged from this facility. The residual solid material (explosives residue) is also disposed of at the burning ground with monthly burning of solid waste. Prior to construction of this facility, wastewater was filtered through sawdust for clarification and removal of residue explosive dusts. The filtered wastewater then flowed to open ditches.

In Bldg. 134, one wash rack discharges to the sanitary sewer after flowing through an oil/water separator.

The primary items destroyed at the Winklepeck Burning Grounds are waste explosives, although, in the past, laboratory chemicals and waste oils have also been disposed of in the burning grounds. Waste oils were dumped on the ground in the northeast corner of the burning ground until 1973. These waste oils included hydraulic oils from machines and lubrication oil from vehicles.

Additional information not reported in the Installation Assessment indicated that small amounts of laboratory chemicals were also disposed of routinely at the burning grounds during production periods. Table 2 lists items disposed of at the burning grounds in 1971, as listed on two separate turn-in documents (RAI, 1971).

RVAAP and the Firestone Defense Research and Products Division both have EPA hazardous waste permits. Both permits designate the facilities to treat, store, and dispose of hazardous wastes. The wastes specified on both permits are those associated with explosives manufacturing operations. The authorized disposal sites for most of the wastes are the Winklepeck Burning Grounds and the water evaporation unit, used for liquid wastes generated at Load Line 6. The hazardous waste quantities reported by RVAAP are estimates for mobilization. Hazardous waste permits and applications are included in App. C.

A plan to equip all load lines with charcoal filtering systems, which would eliminate pink water discharges during operations, has been submitted to the U.S. Army Armament Materiel Readiness Command (ARRCOM), although no action has been taken to date.

Landfills and Burial Sites

Subsequent to the 1978 assessment, additional landfills and burial sites were identified. An area within the Winklepeck Burning Grounds was used as a landfill for general refuse from 1941-1969. Most of these wastes were burned and covered with earth. From 1969-1978 burning operations were moved to an area just north of Winklepeck Burning Grounds, and Winklepeck Burning Grounds were used for landfilling refuse only. Since 1978, the Ramsdell Quarry has been used for landfilling operations. Spent rinse solutions and sludges from acid dip tanks were discarded by transporting to and dumping at the stone quarry in the early 1950s to 1960s (RAI, n.d.). Reportedly, this quarry was located in the Block C magazine area and was observed from aerial photographs as a dump site in the 1950s (Bionetics Corp., 1981).

The Ramsdell Quarry is still used to dispose of general refuse generated by the plant. It is estimated that 1 ton of waste is disposed of per week. The use of the area as a sanitary landfill has been approved by Ohio EPA through December 1981.

The suspected mustard burial site, described as a triangular area enclosed by a cyclone fence, was located in the old demolition grounds in March 1981 by RAI personnel. RVAAP personnel plan to repair the fence and post the area. Fig. 1 provides locations of the previously mentioned sites.

Holding/Settling Ponds

Unlined settling ponds at various load lines still hold water, and no analysis of these settling ponds or their bottom sediments has been performed.

2.1.3 WATER QUALITY

An additional water treatment plant (Waterworks 4) has been constructed near Load Line 4 and is currently on standby. This plant was constructed to treat water from Lake Kerwin, a reservoir to the south of RVAAP. Use of this water source was initially scheduled for 1979, but was not accomplished due to anticipated costs.

Two water treatment plants are currently used (Waterworks 2 and 3), and there are five active wells (Nos. 45, 60, 68, 28, and 29).

RVAAP had National Pollutant Discharge Elimination System (NPDES) Permit No. 0010936 renewed in 1979; the permit expires June 30, 1983. Four outfalls are included in the permit:

001	Depot Sewage Treatment Plant (STP)
002	George Road STP
003	Sand Creek STP
004	Sludge Lagoon Waterworks 3

1 QUARRY USED AS DUMP AND POSSIBLE ACID DISPOSAL (1950's)
2 LANDFILL - GENERAL REFUSE DISPOSAL (1941-69)
3 WASTE OIL DISPOSAL (UNTIL 1973)
4 DEMOLITION AREA (1949 TO PRESENT)
5 LANDFILL - GENERAL REFUSE (1969-78)
6 WINKLEPECK BURNING GROUNDS (1948 TO PRESENT)
7 OLD DEMOLITION AREA (1945-49)
8 SUSPECTED MUSTARD BURIAL SITE
9 RAMSDELL QUARRY - CURRENT LANDFILL
10 QUARRY USED AS LANDFILL FOR GENERAL REFUSE (1950's)
11 TRACK 49 BURNING GROUND (WW II)

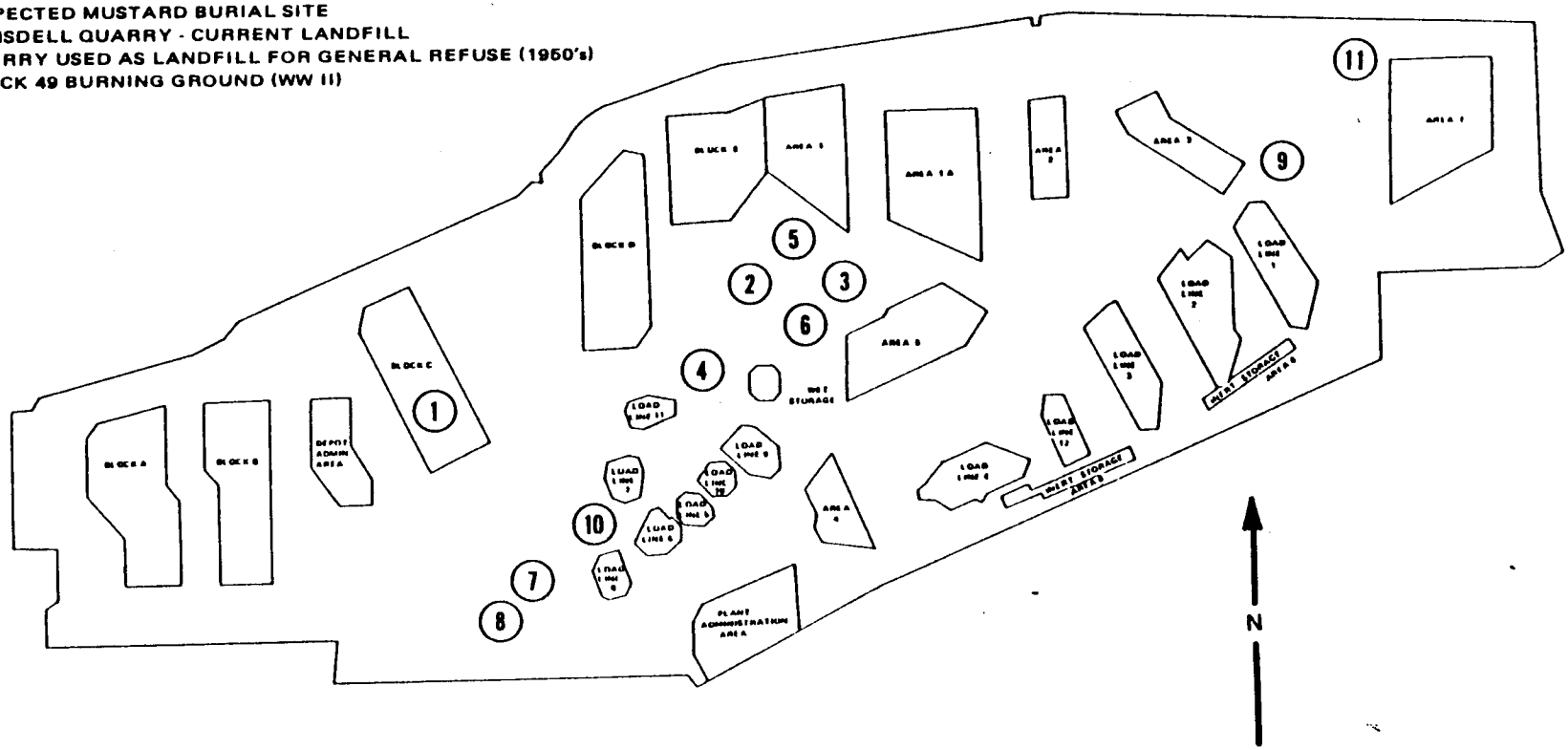

Fig. 1. Sites on RVAAP

Only Outfalls 001 and 002 are discharging. There has been one violation of parameter limits for each of the two active outfalls during 1981. Outfall 001 exceeded the 7-day average for chemical oxygen demand (COD), which is limited to 30 milligrams per liter (mg/l), by 2 mg/l. This excursion was attributed to a hydraulic overload at the plant, due to excessive rainfall and infiltration of ground water into the sewer lines.

The other parameter excursion was at Outfall 002, where the 7- and 30-day averages for COD were slightly exceeded once by 6.4 and 9.6 mg/l, respectively. The cause for this was determined to be low influent flow and extensive detention times within the plant.

Some changes were made in the current NPDES permit since the Installation Assessment:

1. There is now daily sampling of flow, temperature, residual chlorine, and dissolved oxygen (DO) in lieu of weekly.
2. Quantities are now reported as 7- and 30-day averages instead of daily averages.
3. A requirement to perform semiannual 24-hour composite monitoring for substances such as heavy metals, explosives, and PCBs has been added (App. D).

The discharge limits for biochemical oxygen demand (BOD), suspended solids (SS), temperature, fecal coliform, residual chlorine, oil and grease, DO, and ammonia remain unchanged, as reported in the 1978 assessment.

RVAAP has also requested a modification to the NPDES permit by the addition of an additional outfall at Waterworks 2. This outfall will be from the filter backwash lagoon at the plant, which has not yet discharged any effluent.

RVAAP personnel initiated a surface water and groundwater monitoring program in March 1980, although there was evidence (logbooks) which indicated that RVAAP conducted surface water monitoring on a small scale since the early 1960s.

The current surface water monitoring program requires analyses performed on incoming and outgoing water sources for standard parameters, including nitrate, nitrite, oil and grease, heavy metals, TNT, and RDX. App. D is a detailed history of additional parameters monitored as part of RVAAP's internal surveillance programs. The surface waters at RVAAP have shown no excessive levels for these sampled parameters, as compared with Ohio EPA limits.

The current groundwater monitoring program includes sampling four wells on RVAAP for the same parameters at a comparable frequency as in the surface water monitoring program. No contaminant levels in excess of those prescribed in the Safe Water Drinking Act have been observed.

USAEHA is planning to drill 19 monitor wells on the installation at various locations, including the current sanitary landfill at the Ramsdell Quarry, during the summer of 1981.

Continuous monitoring of drinking water required by Ohio EPA is accomplished by RVAAP personnel. Samples are regularly taken in the water treatment plants and throughout the distribution system. Within the past year, one parameter, iron, exceeded the limit of 300 micrograms per liter (ug/l) to a level of 360 ug/l. The distribution system was flushed, and the problem was corrected.

Additional information not reported in the 1978 assessment revealed that surface waters have been monitored periodically since 1952. Data from this period indicated an attempt to limit discharges of pink water into the creeks flowing offpost. Monitoring data from 1968 also indicated

that onpost and offpost streams were being monitored daily for pH and TNT. From 1972-1975, RVAAP had an active monitoring program on all incoming and outgoing streams at 81 different locations. Parameters monitored included pH, TNT, color, temperature, DO, phosphorus, nitrates, chlorine, and oil.

2.2 MIGRATION POTENTIAL

The surface soils of RVAAP and the surrounding area consist of boulder clay, sand, and gravel. Boulder clay is an unsorted, unstratified mixture of varying amounts of sand, silt, and clay, containing pebbles, cobbles, and boulders.

Data from monitoring wells indicate that the depth to ground water varies from 3 feet (ft) to 100 ft, with an average of 30 ft. The predominant soil texture is silty clay which inhibits infiltration; however, significant areas of sandy soil which underlie RVAAP may allow vertical migration. At the time of the reassessment, data did not indicate migration of contaminants in the ground water.

Due to the low permeability of the surface soils, surface drainage is the primary avenue for dissipation of rainfall events, yielding a high potential for surface migration of contaminants. However, there was no surface water quality information to indicate contamination migration via surface drainage.

Based on local geohydrologic conditions, there is a potential for migration at the Winklepeck Burning Grounds and old burial sites, although at the time of the reassessment, no data were available to indicate that contamination was occurring.

3.0 FINDINGS

1. Current industrial operations remain unchanged since 1978.

2. The demolition ground and three cubicles in Load Line 6 continue to be used by the Firestone Defense Research and Products Division.

3. Organizations using the RVAAP training areas in the old demolition ground have been restricted from digging or excavating in the area due to UXOs.

4. Five training areas are within quantity distance safety limits of magazines.

5. There are no radiological sources at RVAAP.

6. Asbestos and beryllium are stored safely in sealed containers.

7. Underground fuel tanks are not leak tested (EPA, 1981).

8. In-service transformers and die-cast machines at RVAAP contain PCBs.

9. Twenty-five out-of-service transformers and 13 die-cast machines have been drained of PCBs and adequately rinsed by a contractor.

10. Pesticide operations are within current Army regulations (U.S. Army, 1978, 1981).

11. Explosive wastes are burned in the Winklepeck Burning Grounds under an EPA permit.

12. Explosives-contaminated liquid wastes are no longer discharged to storm drainage.

13. Additional landfill areas were identified in the Winklepeck Burning Grounds, the Block C magazine area, and north of Load Line 8.

14. The reported mustard burial site has been located by Ravenna Arsenal, Inc. personnel.

15. No analysis of old settling pond waters or bottom sediments has been performed.

16. The water system was not connected to the Kerwin Reservoir as expected.

17. Wells are still the source of potable water, and no increase in contaminants has been detected since the 1978 assessment.

18. An active water-monitoring program has been initiated by RVAAP.

19. USAEHA plans to drill monitor wells at RVAAP to detect contaminant migration.

20. The installation STPs have experienced two NPDES permit parameter limit excursions in the past year. The causes of the excursions have been corrected.

4.0 1978 ASSESSMENT

The following conclusions and recommendations are from the initial assessment conducted in September 1978.

4.1 CONCLUSIONS

1. Areas of RVAAP, including the production areas, burning grounds, test areas, and demolition areas, are contaminated with explosive waste, including TNT, Composition B, lead azide, lead styphnate, and black powder.

2. Surface waters exiting the installation are not currently required to be monitored for nitrobodies and heavy metals.

3. The current analysis of the well water indicates potable quality.

4. UXOs are in the demolition area.

5. There is no environmental stress at RVAAP.

6. Chemical mustard agent may be buried within the old demolition grounds.

7. The Ramsdell Quarry site landfill, as it has been and is currently being used, could constitute a potential leaching problem.

8. Although the subsurface soil structure prevents any quick percolation, the finding of trace quantities of 2-, 4-, and 6-TNT in the wells indicates that some leaching has occurred.

9. A potential radiological problem (monazite ore) was removed, clearance of the area was obtained, and that portion of the Nuclear Regulatory Commission (NRC) license was properly handled.

4.2 RECOMMENDATIONS

It is recommended that:

1. No preliminary survey be conducted at the present time.

2. The installation augment its water quality program to monitor surface waters and subsurface well waters to include analysis for nitrobodies and heavy metals as well as normal parameters. Specifically, wells to the east of Ramsdell Quarry (Nos. 25, 27, 86, 87, and 88) should be monitored annually to determine if leachate (nitrobodies and heavy metals) is moving from the quarry.

3. Digging or excavating within the demolition area (located in Training Areas D and G) be prohibited by RVAAP until the area has been certified safe by an explosive ordnance disposal (EOD) team.

4. RVAAP investigate the area where mustard agent is suspected, to ensure a survey by an EOD team, and, if required, perform excavation, monitoring, and decontamination of the area.

5.0 1981 REASSESSMENT

5.1 CONCLUSIONS

1. Available geologic evidence and information on contaminant sources do not indicate the offpost migration of contaminants via surface or subsurface waters.

2. The following practices, although not leading to offpost migration, are not in compliance/conformance with designated regulations/guidelines:
   a. Winklepeck Burning Grounds and the old dump site in the Block C area may be sources of contamination.
   b. The reported mustard burial site in the old demolition ground is not secured and adequately posted.
   c. Settling ponds may contain hazardous materials (CSL, 1978).
   d. Underground POL storage tanks are not tested for leakage on a regular basis.
   e. Five training areas within the inhabited building quantity distance limits of the magazine and two training areas are located in areas which contain UXO (CSL, 1978).

5.2 RECOMMENDATIONS

1. That no survey be conducted by USATHAMA at this time.

2. That RVAAP perform the following:
   a. Coordinate with USAEHA to include the Winklepeck Burning Grounds, landfills, and the old dump site in the Block C magazine area in future water quality monitoring programs.

b. Continue to send USATHAMA water monitoring program data for RVAAP.

c. Fence and adequately post the suspected mustard burial site.

d. Take samples of the settling ponds to determine if explosives residues and associated compounds are present, and take appropriate action.

e. Test underground POL storage tanks for leakage on a regular basis.

f. Review current training agreements for U.S. Army Reserve and National Guard units utilizing areas at RVAAP to ensure compliance with quantity distance safety requirements.

BIBLIOGRAPHY

Bionetics Corp. 1981. Installation Assessment, Ravenna Army Ammunition Plant, Ohio. EPA Contract No. 68-03-2844, Warrenton, Va.

Chemical Systems Laboratory. 1978. Installation Assessment of Ravenna Army Ammunition Plant. Report No. 132, Aberdeen Proving Ground, Md.

Ravenna Arsenal, Inc. n.d. SOP for Preparing Chemical Clean Tanks. Ravenna, Ohio.

Ravenna Arsenal, Inc. 1971. Ravenna Arsenal Turn-In Forms RA-614 (To: Burning Grounds, From: Chemical Laboratory, June 1, 1971 and March 1, 1971). Ravenna, Ohio.

Ravenna Army Ammunition Plant. 1979. Environmental Impact Assessment, Installation-Wide Assessment for Peace Time Level of Activity up to Full Mobilization, RVAAP. (Aug. 18, 1978; revised June 11, 1979), Ravenna, Ohio.

U.S. Army. 1978. Environmental Quality: Environmental Protection and Enhancement. Army Regulation 200-1 and Supplement 1, Washington, D.C.

U.S. Army. 1981. Pest Management Program. Army Regulation 400-76. Washington, D.C.

U.S. Environmental Protection Agency. 1981. Oil Pollution Prevention. Code of Federal Regulations, Title 40, Part 122, pp. 17-29.

APPENDIX A

PERMITS, LICENSES, AND AGREEMENTS

INDEX NO.	PERMIT NO.	SCOPE
1.	DACA-31-4-74-256	To provide use of Drop Zone for training of A/F personnel by 911th TAG, Dept. of the Air Force, Greater Pittsburgh International Airport, PA. w/SA W24H0R-80266-001.
2.	DACA-31-4-75-49	To provide office space in Rooms ~~227 and 229~~ 146A in Bldg. 1030 to GSA, Quality Control Division, FSS. w/SA W24H0R-80273-001.
3.	DACA-31-4-75-200	To provide space for the storage of compatible ammo and/or HE in magazine JB-607 and JD-621 for Dept. of the Treasury, Bureau of Alcohol, Tobacco and Firearms, Cincinnati, OH. w/SA W24H0R-80273-003.
4.	DACA-31-4-76-368	To provide office space in Bldg. 1033 and storage space in Bldg. PE-23 for Northern Division/Naval Readiness Command, Fifth Region. w/SA W24H0R-76275-001.
5.	DACA-31-4-77=292	Provide space for storage of compatible ammo and/or HE in magazine JD-622 for the Dept. of Justice, FBI. w/SA W24H0R-80273-002.
6.	DACA-31-4-78-218	Provide space for storage of inert materials in Bldg. AP-15 by DLA, DCASMA, Cleveland. w/SA W24H0R-80275-003.
7.	DACA-31-4-78-279	Provide space in storage Bldg. 2B-14 for storage of ADPE paper supplies and other inert materials by Navy Finance Center, Cleveland. w/SA W24H0R-80263-001.
8.	DACA-31-4-78-315	Use of Bldg. DT-30 to store furniture and office equipment by US Dept. of Labor. w/SA W24H0R-80275-001.
9.	DACA-31-4-79-294	Use of magazine JA-625 to store training ammo by US Marine Corps, 3d BN, 25th Marines, 4th Marine Div., Cleveland, OH. w/SA W24H0R-80263-002.
10.	DACA-31-4-79-308	Use of magazine JB-604 to store blank ammo by US Marine Corps, Co. K, 3d BN, 25th Marines, 4th Marine Div., Akron, OH. w/SA W24H0R-80262-001.
11.	DACA-31-4-79-363	Provide use of Igloo 3-C-13 and Bldg. 840 for the storage of Zirconium and Hafnium by the Dept. of Energy. w/SA W24H0R-80275-002.
12.	DACA-31-4-80-494	Use of magazine JB-603 to store training ammo by US Marine Corps, 4th Marine Div., New Castle, PA. w/SA W24H0R-76001-001.
13.	DACA-31-4-80-495	Use of magazine JC-614 to store training ammo by US Marine Corps, 4th Marine Div., Pittsburgh, PA. w/SA W24H0R-80266-002.

RAVENNA ARMY AMMUNITION PLANT
Ravenna, Ohio 44266

BRIEF SYNOPSIS OF LICENSE AGREEMENTS

INDEX NO.	LICENSE NO.	SCOPE
1.	DACA-31-3-71-259	Use of Training Areas A (Containing 240 acres of land) and C (containing 500 acres of land), and concurrent use with Dept. of the Air Force of Area B (containing 180 acres of land) and Bldg. T-102 by the Ohio Army National Guard.
2.	DACA-31-3-73-270	See Support Agreement W24HOR-~~75032-001~~ 80263-003, Index No. 5, State of Ohio National Guard.
3.	DACA-31-3-78-113	State of Ohio National Guard, establish 14.5mm firing range in Training Areas D & G.
4.	--	Provide use of well house and well, Bldg. WH-26 for training of hydrogeology classes by Kent State Univ.
5.	DACA-31-3-79-433	Provide use of Bldgs. JC-612, JC-613 and JC-615 located in storage area 4 to store miscellaneous explosives by Ohio Army National Guard.
6.	--	Provide use of two areas for Biological studies by Kent State Univ.
7.	--	Provide use of installation for Biological studies by Dept. of Plant Pathology at Ohio State Univ.
8.	--	Provide two areas for Ecological studies by Kent State Univ.

RAVENNA ARMY AMMUNITION PLANT
Ravenna, Ohio 44266

BRIEF SYNOPSIS OF LEASES (AGREEMENTS)

INDEX NO.	LEASE NO.	SCOPE
1.	DACA-27-1-69-33	To provide installation use of earth-covered magazines No. 6-C-3, 6-C-4 and 6-C-5 by the Austin Powder Company, an Ohio corporation of Cleveland, Ohio, for the storage of dynamite, Flake TNT, and detonating cord. (Rental Cost: $3,720.00 per annum)
2.	~~DACA-31-1-71-387~~	~~To provide a tract of land approximately 200 ft. in width, a distance of 8,000 ft. within specific boundaries, to the Firestone Tire & Rubber Company Akron, OH; and use of Bundling Road adjoining North Line Road west to Bundling Bldg. 224, Bldg. F-1.~~ Terminated (Rental Cost: $3,300.00 per annum)
3.	~~DAGA-31-1-76-232~~	~~American Fireworks Co., Hudson, OH. To provide installation use of magazine JB-695 for storage of commercial fireworks.~~ Terminated
4.	DACA-31-1-78-309	To provide four areas, within installation, each containing 1/5 of an acre for apiary purposes to Dr. Samuel J. Mazzer.
5.	Pending	To provide storage space in magazine JC-611 for the storage of class B fireworks by Tri-State Manufacturing Company, Loveland, OH.

APPENDIX B

PESTICIDE INVENTORY

APR. 9, 1981

PESTICIDE INVENTORY, APR. 9, 1981

Product	Registration no.	Size & type container	Quantity
Insecticide, household spray, Propoxur 1%	USDA 400-74-C-2862	1-gal can	1.75 gal
Pyrethrum space spray Synergized pyrethrins	EPA 551-225	1-gal can	15 gal
Rodenticide, bait Anticoagulant, warfarin	EPA 12455-15AA	5-lb can	15 lbs
Sevin® 50W insecticide Carbaryl 50% by wt	USDA 1016-41	2-lb bag	23 lb
Diazinon AG500	USDA 100-461	1-gal can	1 pt
Malathion, 57%	EPA 6830-35	1-gal can 5-gal can	12 gal 8 gal
Chlordane liquid, 72%	USDA 6830-15	5-gal can	1 gal
Napthalene, technical	USDA 1813-4	1-lb box	6 lb
Insecticide roach bait 2% methy carbamate	USDA 3125-121	5-lb jar	18 lb
Diazinon 4E	EPA 6720-191	1-gal can	1 pt
Malathion, 57%	USDA 1386-124	1-gal jug	3 qts
Bromacil Hyvar X 80% herbicide wettable powder	EPA 352-287-AA	50-lb container	600 lb
Herbicide water soluble 21.9% Hyvar XL	EPA 352-346-Z-A	5-gal can	1 gal

Product	Registration no.	Size & type container	Quantity
3D Weedone, 2,4-D 2,4,5-T	EPA 264-237AA	5-gal can	20 gal
DED-Weed LV-9 2,4,5-T 83.5%	EPA 148-431	55-gal drum	95 gal
2,4,5-TP 10% 2,4,5-TP .4% 2, 4-D	Not known	55-gal drum	5 gal

APPENDIX C

HAZARDOUS WASTE PERMITS AND APPLICATIONS

Please print or type in the unshaded areas only (fill-in areas are spaced for elite type, i.e., 12 characters/inch).

NJ NO ASSIGNED 10/18/80

Form Approved OMB No. 158-R0175

FORM 1 GENERAL

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER: F OH4210090003

LABEL ITEMS

II. EPA I.D. NUMBER

III. FACILITY NAME

IV. FACILITY MAILING ADDRESS

V. FACILITY LOCATION

LOAD LINE #6
DEFENSE RESEARCH & PRODUCTS
DIVISION OF THE FIRESTONE TIRE &
RUBBER COMPANY
1600 FIRESTONE PARKWAY
PLEASE PLACE LABEL IN THIS SPACE
AKRON, OH 44301

STATE ROUTE #5
RAVENNA, OH 44266

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent *(the area to the left of the label space lists the information that should appear)*, please provide it in the proper fill-in area(s) below. If the label is complete and correct, you need not complete items I, III, V, and VI *(except VI-B which must be completed regardless)*. Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold-faced terms.

SPECIFIC QUESTIONS	MARK 'X' YES	NO	FORM ATTACHED	SPECIFIC QUESTIONS	MARK 'X' YES	NO	FORM ATTACHED
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)		X		B. Does or will this facility *(either existing or proposed)* include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)		X	
C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C)	X			D. Is this a proposed facility *(other than those described in A or B above)* which will result in a discharge to waters of the U.S.? (FORM 2D)		X	
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)	X		X	F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X		H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X		J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

III. NAME OF FACILITY

1 SKIP: LL6 DEF RES & PROD DIV FIRESTONE TIRE

IV. FACILITY CONTACT

A. NAME & TITLE (last, first, & title)	B. PHONE (area code & no.)
2 ERUS EDWARD SECTION MANAGER	216 379 6483

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX: 3 1600 FIRESTONE PARKWAY

B. CITY OR TOWN	C. STATE	D. ZIP CODE
4 AKRON	OH	44301

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER: 5 RAVENNA ARMY AMMUNITION PLANT

B. COUNTY NAME: PORTAGE

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE (if known)
6 RAVENNA	OH	44266	

EPA Form 3510-1 (6-80) US PRES PERMIT OHOO1 CONTINUE ON REVERSE

A. FIRST: 3 (specify) AMMUNITION - EXCEPT FOR SMALL ARMS

B. SECOND: C 7 (specify)

C. THIRD: (specify)

D. FOURTH: C 7 (specify)

OPERATOR INFORMATION

A. NAME: DEFENSE RESEARCH & PRODUCTS DIVISION, FIRESTONE TIRE & RUBBER CO.

B. Is the name listed in Item VIII-A also the owner? ☐ YES ☒ NO

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box; if "Other", specify.)
F = FEDERAL, S = STATE, P = PRIVATE, M = PUBLIC (other than federal or state), O = OTHER (specify)
P (specify)

D. PHONE (area code & no.): C A 216 379 7668

E. STREET OR P.O. BOX: 200 FIRESTONE PARKWAY

F. CITY OR TOWN: AKRON

G. STATE: OH

H. ZIP CODE: 44301

IX. INDIAN LAND
Is the facility located on Indian lands? ☐ YES ☒ NO

EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water): N OH0010936

D. PSD (Air Emissions from Proposed Sources): 9 P

B. UIC (Underground Injection of Fluids): U

E. OTHER (specify): 9 (specify)

C. RCRA (Hazardous Wastes): R

E. OTHER (specify): 9 (specify)

MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property bounderies. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

NATURE OF BUSINESS (provide a brief description)

LOADING TEST ROCKET WARHEADS
FIRE TEST ROCKET WARHEADS

CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print)
D. P. ZART, PRESIDENT
FIRESTONE STEEL PRODUCTS COMPANY

B. SIGNATURE: D P Zart

C. DATE SIGNED: 11-12-80

COMMENTS FOR OFFICIAL USE ONLY

EPA Form 3510-1 (6-80) REVERSE

n areas are spaced for elite type, i.e., 12 characters/inch)

Form Approved OMB No. 158-S80004

U.S. ENVIRONMENTAL PROTECTION AGENCY

HAZARDOUS WASTE PERMIT APPLICATION

Consolidated Permits Program

(This information is required under Section 3005 of RCRA.)

I. EPA I.D. NUMBER: T|O|H|4|2|1|0|9|9|0|0|0|3

FOR OFFICIAL USE ONLY

APPLICATION APPROVED	DATE RECEIVED (yr., mo., & day)	COMMENTS

FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below *(mark one box only)* to indicate whether this is the first application you are submitting for your facility or a revised application. If this is your first application and you already know your facility's EPA I.D. Number, or if this is a revised application, enter your facility's I.D. Number in Item I above.

FIRST APPLICATION *(place an "X" below and provide the appropriate date)*

X 1. EXISTING FACILITY *(See instructions for definition of "existing" facility. Complete item below.)*

FOR EXISTING FACILITIES, PROVIDE THE DATE (yr., mo., & day) OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED *(use the boxes to the left)*

YR.	MO.	DAY
4 0	0 8	2 6

☐ 2. NEW FACILITY *(Complete item below.)*

FOR NEW FACILITIES, PROVIDE THE DATE (yr., mo., & day) OPERATION BEGAN OR IS EXPECTED TO BEGIN

YR.	MO.	DAY

REVISED APPLICATION *(place an "X" below and complete Item I above)*

☐ 1. FACILITY HAS INTERIM STATUS

☐ 2. FACILITY HAS A RCRA PERMIT

PROCESSES – CODES AND DESIGN CAPACITIES

PROCESS CODE – Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the code(s) in the space provided. If a process will be used that is not included in the list of codes below, then describe the process *(including its design capacity)* in the space provided on the form *(Item III-C)*.

PROCESS DESIGN CAPACITY – For each code entered in column A enter the capacity of the process.

1. AMOUNT – Enter the amount.
2. UNIT OF MEASURE – For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER *(barrel, drum, etc.)*	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D79	GALLONS OR LITERS
LANDFILL	D80	ACRE-FEET *(the volume that would cover one acre to a depth of one foot)* OR HECTARE-METER
LAND APPLICATION	D81	ACRES OR HECTARES
OCEAN DISPOSAL	D82	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D83	GALLONS OR LITERS
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
OTHER *(Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided; Item III-C.)*	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G
LITERS	L
CUBIC YARDS	Y
CUBIC METERS	C
GALLONS PER DAY	U
LITERS PER DAY	V
TONS PER HOUR	D
METRIC TONS PER HOUR	W
GALLONS PER HOUR	E
LITERS PER HOUR	H
ACRE-FEET	A
HECTARE-METER	F
ACRES	B
HECTARES	Q

EXAMPLE FOR COMPLETING ITEM III *(shown in line numbers X-1 and X-2 below)*: A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

DUP | Y/A: | C: 1

LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify)	B. PROCESS DESIGN CAPACITY 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY
X-1	S02	600	G	
X-2	T03	20	E	
1	T02	30	U	
2	T04	0.2	U	
3				
4				
5				
6				
7				
8				
9				
10				

...inued from the front.

...PROCESSES (continued)

...PACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESSES (code "T04"). FOR EACH PROCESS ENTERED HERE ...NCLUDE DESIGN CAPACITY.

LINE 2 (T04) DISPOSAL BY OPEN BURNING ACCORDING TO OHIO - EPA CODE 3745-19 WITH PERMIT ISSUED FOR EACH BURNING INCIDENT.

...DESCRIPTION OF HAZARDOUS WASTES

...EPA HAZARDOUS WASTE NUMBER — Enter the four-digit number from 40 CFR, Subpart D for each listed hazardous waste you will handle. If you ...andle hazardous wastes which are not listed in 40 CFR, Subpart D, enter the four-digit number(s) from 40 CFR, Subpart C that describes the characteris...s and/or the toxic contaminants of those hazardous wastes.

...ESTIMATED ANNUAL QUANTITY — For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual ...asis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non-listed waste(s) that will be handled ...hich possess that characteristic or contaminant.

...UNIT OF MEASURE — For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate ...odes are:

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

...facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into ...ount the appropriate density or specific gravity of the waste.

...ROCESSES

PROCESS CODES:

For listed hazardous waste: For each listed hazardous waste entered in column A select the code(s) from the list of process codes contained in Item III to indicate how the waste will be stored, treated, and/or disposed of at the facility.

For non-listed hazardous wastes: For each characteristic or toxic contaminant entered in column A, select the code(s) from the list of process codes contained in Item III to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed hazardous wastes that possess that characteristic or toxic contaminant.

Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code(s).

PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

...TE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER — Hazardous wastes that can be described by ...than one EPA Hazardous Waste Number shall be described on the form as follows:

1. Select one of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete columns B,C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.
2. In column A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In column D(2) on that line enter "included with above" and make no other entries on that line.
3. Repeat step 2 for each other EPA Hazardous Waste Number that can be used to describe the hazardous waste.

...MPLE FOR COMPLETING ITEM IV (shown in line numbers X-1, X-2, X-3, and X-4 below) — A facility will treat and dispose of an estimated 900 pounds ...year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes ...orrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated ...ounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (If a code is not entered in D(1))
X-1	K 0 5 4	900	P	T 0 3 D 8 0	
X-2	D 0 0 2	400	P	T 0 3 D 8 0	
X-3	D 0 0 1	100	P	T 0 3 D 8 0	
X-4	D 0 0 2				included with above

...nued from page 2.

NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

Form Approved OMB No. 158-580004

EPA I.D. NUMBER (enter from page 1): 0 H 4 2 1 0 0 9 0 0 0 3

FOR OFFICIAL USE ONLY: W | DUP | 2 | DUP

IV. DESCRIPTION OF HAZARDOUS WASTES (continued)

LINE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (If a code is not entered in D(1))
1	K044	10	P	T04	OPEN BURN BY PERMIT
2	K045	80	P	T04	OPEN BURN BY PERMIT
3	K047	50	T	T02	
4	D003	0.5	T	T04	EMPTY EXPLOSIVE CONTAINE (MAY BE REACTIVE) OPEN BU
5					
6					
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26					

...nued from the front.

DESCRIPTION OF HAZARDOUS WASTES *(continued)*

USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM ITEM D(1) ON PAGE 3.

TO4 (BURNING) IS DONE AT A SPECIFIED BURNING SITE WITHIN RAVENNA US ARMY FACILITY.

EPA I.D. NO. *(enter from page 1)*

0	4	4	2	1	0	0	9	0	0	0	3	T/A	C
													6

FACILITY DRAWING

All existing facilities must include in the space provided on page 5 a scale drawing of the facility *(see instructions for more detail)*.

PHOTOGRAPHS

All existing facilities must include photographs *(aerial or ground—level)* that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas *(see instructions for more detail)*.

FACILITY GEOGRAPHIC LOCATION

LATITUDE *(degrees, minutes, & seconds)*						LONGITUDE *(degrees, minutes, & seconds)*					
4	1	1	0	3	8	8	1	0	6	1	2

II. FACILITY OWNER

A. If the facility owner is also the facility operator as listed in Section VIII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

B. If the facility owner is not the facility operator as listed in Section VIII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. *(area code & no.)*
U. S. ARMY	

3. STREET OR P.O. BOX	4. CITY OR TOWN		5. ST.	6. ZIP CODE
STATE ROUTE 5	G	RAVENNA	OH	44216

OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

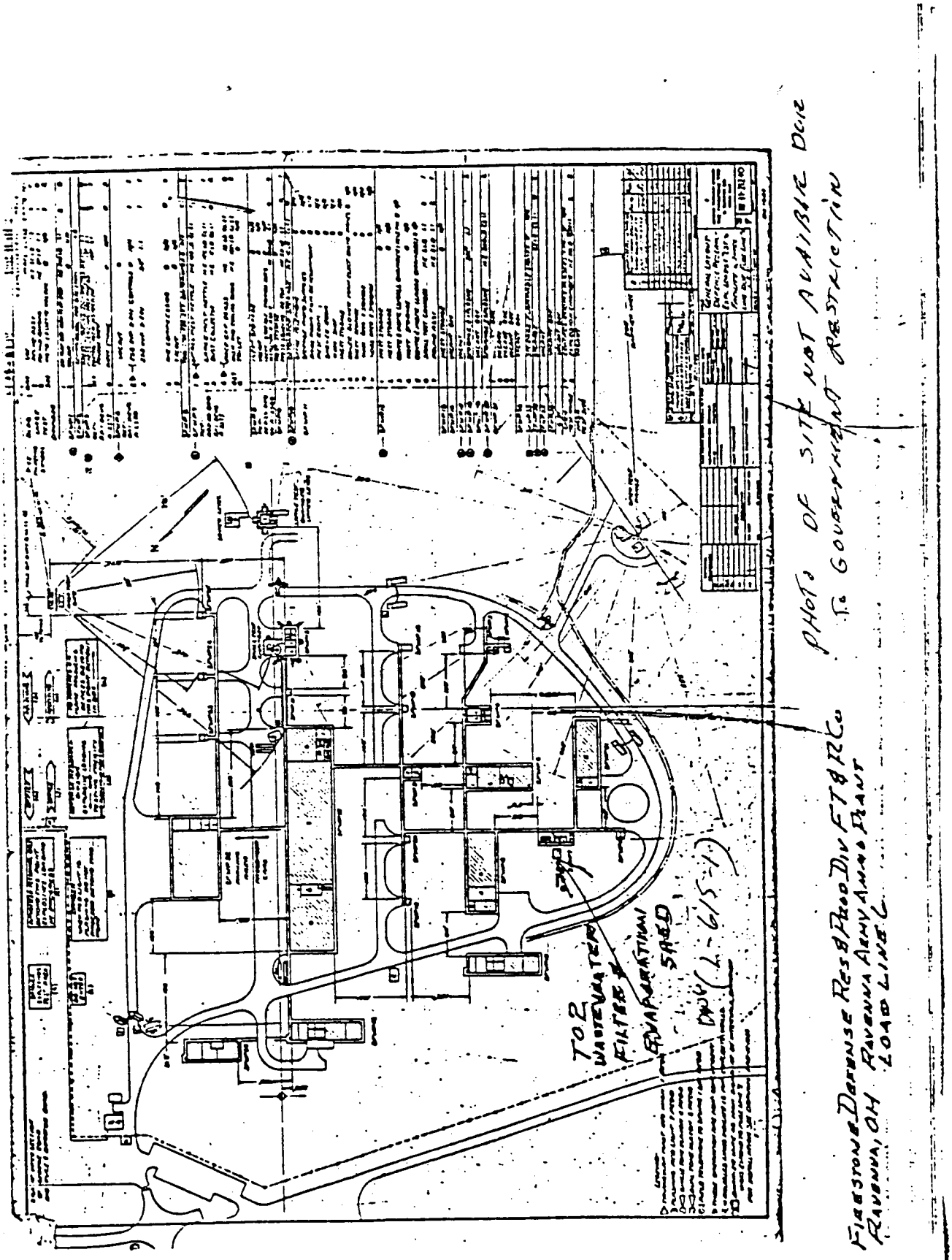
NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED
ALBERT C. CASPER, U.S.ARMY COMMANDER REPRESENTATIVE for	Allan L Lawson	11-12-80

OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED
F. ZART, PRESIDENT FIRESTONE STEEL PRODUCTS CO. FIRESTONE TIRE & RUBBER CO.	A F Zart	11-12-80

DRAWING (see page 4)



FORM 1 GENERAL

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

Form Approved OMB No. 158-R0175

I. EPA I.D. NUMBER

O H 1 3 8 2 0 7 3 6 D

I. EPA I.D. NUMBER

II. FACILITY NAME

V. FACILITY MAILING ADDRESS

VI. FACILITY LOCATION

PLEASE PLACE LABEL IN THIS SPACE

I.D. No. OH5210020736
(From REGION V EPA)

affix form- area in the appropriate fill-in area below. Also, if any of the preprinted data is absent (*the area to the left of the label space lists the information that should appear*), please provide it in the proper fill-in area(s) below. If the label is complete and correct, you need not complete Items I, III, V, and VI (*except VI-B which must be completed regardless*). Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold-faced terms.

SPECIFIC QUESTIONS	MARK "X" YES	MARK "X" NO	MARK "X" FORM ATTACHED
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)		X	
B. Does or will this facility (*either existing or proposed*) include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)		X	
C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C) See below	X		
D. Is this a proposed facility (*other than those described in A or B above*) which will result in a discharge to waters of the U.S.? (FORM 2D)		X	
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)	X		
F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X	
H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	
J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

III. NAME OF FACILITY

1 SKIP Ravenna Army Ammunition Plant

IV. FACILITY CONTACT

A. NAME & TITLE (last, first, & title)	B. PHONE (area code & no.)
2 Lawless David General Manager	216 358 7111

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

3 State Route 5

B. CITY OR TOWN	C. STATE	D. ZIP CODE
4 Ravenna	OH	44266

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

5 State Route

B. COUNTY NAME

Portage

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE (if known)
6 Ravenna C-8	OH	44266	

EPA Form 3510-1 (6-80)

SIC CODES (4-digit, in order of priority)

A. FIRST: (specify) 1482 Artillery Projectiles-Ordnance

B. SECOND: (specify)

C. THIRD: (specify)

D. FOURTH: (specify)

II. OPERATOR INFORMATION

A. NAME: Pavenna Arsenal Incorporated

B. Is the name listed in Item VIII-A also the owner? ☐ YES ☒ NO

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box; if "Other", specify.)
F = FEDERAL, S = STATE, P = PRIVATE, M = PUBLIC (other than federal or state), O = OTHER (specify)

P (specify)

D. PHONE (area code & no.): A 216 383 7111

E. STREET OR P.O. BOX: Star Route 5

F. CITY OR TOWN: Pavenna

G. STATE: OH

H. ZIP CODE: 44266

IX. INDIAN LAND

Is the facility located on Indian land? ☐ YES ☒ NO

III. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water): OH 0 0 1 0 9 3 C

D. PSD (Air Emissions from Proposed Sources):

B. UIC (Underground Injection of Fluids):

E. OTHER (specify): (specify) OHIO EPA Insurance Solid Waste-Contract Facility

C. RCRA (Hazardous Waste):

F. OTHER (specify): Gas Attached (specify)

Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

V. NATURE OF BUSINESS (provide a brief description)

MISSION PURPOSE

Load, Assemble and Pack military ammunition items (currently inactive).
Handle and store Strategic and Critical materials for other Government agencies.
Receive, store, maintain and ship or demilitarize military ammunition and explosive items.
Maintenance of active facilities and maintenance and/or layaway of inactive facilities including equipment in a condition to permit resumption of production within the prescribed time limitations.

VI. CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print): Robert J. Knepper, Commander's Representative

B. SIGNATURE:

C. DATE SIGNED: 10 Nov 80

COMMENTS FOR OFFICIAL USE ONLY

EPA Form 3510-1 (6-80) REVERSE

EPA I.D. Number
OH 213820736

I.D. No. OH5210020736
(From REGION V EPA)

Item X. EXISTING ENVIRONMENTAL PERMITS:

E. OTHER - (Specify)

1667060084B023	OHIO EPA Permit To Operate Air Contaminant Source
1667060084B024	

Item XI. MAP:

Attached is the Topographic Map for Ravenna Army Ammunition Plant and surrounding area, in parts as follows:

Part 1.	U.S.G.S.	Ravenna, Ohio	quadrangle	7.5 minute series
Part 2.	U.S.G.S.	Windham, Ohio	quadrangle	7.5 minute series
Part 3.	U.S.G.S.	Newton Falls, Ohio	quadrangle	7.5 minute series

FORM 3 RCRA

EPA HAZARDOUS WASTE PERMIT APPLICATION

Consolidated Permits Program

(Use information in the shaded areas only)

Form Approved. OMB No. [illegible]

I. EPA I.D. NUMBER: O H 5 2 1 0 0 2 0 7 3 6

I.D. No. OH5210020736 (From REGION V EPA)

FOR OFFICIAL USE ONLY

APPLICATION APPROVED	DATE RECEIVED (yr., mo., & day)	COMMENTS

II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below (mark one box only) to indicate whether this is the first application you are submitting for your facility or a revised application. If this is your first application and you already know your facility's EPA I.D. Number, or if this is a revised application, enter your facility's EPA I.D. Number in Item I above.

A. FIRST APPLICATION (place an "X" below and provide the appropriate date)

[X] 1. EXISTING FACILITY (See instructions for definition of "existing" facility. Complete item below.)

FOR EXISTING FACILITIES, PROVIDE THE DATE (yr., mo., & day) OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED (use the boxes to the left): 8 | 4 0 | 0 8 | 2 6

[ ] 2. NEW FACILITY (Complete item below.)

FOR NEW FACILITIES PROVIDE THE DATE (yr., mo., & day) OPERATION BEGAN OR IS EXPECTED TO BEGIN

B. REVISED APPLICATION (place an "X" below and complete item I above)

[ ] 1. FACILITY HAS INTERIM STATUS

[ ] 2. FACILITY HAS A RCRA PERMIT

III. PROCESSES – CODES AND DESIGN CAPACITIES

A. PROCESS CODE – Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the code(s) in the space provided. If a process will be used that is not included in the list of codes below, then describe the process (including its design capacity) in the space provided on the form (Item III C).

B. PROCESS DESIGN CAPACITY – For each code entered in column A enter the capacity of the process.

1. AMOUNT – Enter the amount.

2. UNIT OF MEASURE – For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER (barrel, drum, etc.)	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D79	GALLONS OR LITERS
LANDFILL	D80	ACRE-FEET (the volume that would cover one acre to a depth of one foot) OR HECTARE-METER
LAND APPLICATION	D81	ACRES OR HECTARES
OCEAN DISPOSAL	D82	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D83	GALLONS OR LITERS
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR OR GALLONS PER HOUR OR LITERS PER HOUR
OTHER (any physical, chemical, thermal or biological treatment process not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided; Item III-C)	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G
LITERS	L
CUBIC YARDS	Y
CUBIC METERS	C
GALLONS PER DAY	U
LITERS PER DAY	V
TONS PER HOUR	D
METRIC TONS PER HOUR	W
GALLONS PER HOUR	E
LITERS PER HOUR	H
ACRE-FEET	A
HECTARE-METER	F
ACRES	B
HECTARES	Q

EXAMPLE FOR COMPLETING ITEM III (shown in line numbers X-1 and X-2 below): A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

C. DUP

LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify)	B. PROCESS DESIGN CAPACITY 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY
X-1	S 0 2	600	G	
X-2	T 0 3	20	E	
1	S 0 2	250,000	G	
2	S 0 1	10,000	G	
3	T 0 1	60,000	U	
4	T 0 2	400,000	U	

LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT	B. PROCESS DESIGN CAPACITY 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY
5	T 0 3	1.0	D	
6	T 0 4	1.0	D	
7	D 8 0	180	A	
8	D 8 1	1,079	B	
9	D 8 3	60,000,000	G	
10				

III. PROCESSES (continued)

[illegible] SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESSES (see item III-C). FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

T04 Open burning and demolition on land surface of explosive waste and explosive contaminated materials (e.g. containers used in transporting explosive materials and non-essential explosive items classified as excess).

IV. DESCRIPTION OF HAZARDOUS WASTES

A. EPA HAZARDOUS WASTE NUMBER — Enter the four-digit number from 40 CFR, Subpart D for each listed hazardous waste you will handle. If you handle hazardous wastes which are not listed in 40 CFR, Subpart D, enter the four-digit number(s) from 40 CFR, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.

B. ESTIMATED ANNUAL QUANTITY — For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non-listed waste(s) that will be handled which possess that characteristic or contaminant.

C. UNIT OF MEASURE — For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

D. PROCESSES

1. PROCESS CODES:

For listed hazardous wastes: For each listed hazardous waste entered in column A select the code(s) from the list of process codes contained in item III to indicate how the waste will be stored, treated, and/or disposed of at the facility.

For non-listed hazardous wastes: For each characteristic or toxic contaminant entered in column A, select the code(s) from the list of process codes contained in item III to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed hazardous wastes that possess that characteristic or toxic contaminant.

Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of item IV-D(1); and (2) Enter in the space provided on page 4, the line number and the additional code(s).

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER — Hazardous wastes that can be described by more than one EPA Hazardous Waste Number shall be described on the form as follows:

1. Select one of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete columns B,C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.
2. In column A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In column D(2) on that line enter "included with above" and make no other entries on that line.
3. Repeat step 2 for each other EPA Hazardous Waste Number that can be used to describe the hazardous waste.

EXAMPLE FOR COMPLETING ITEM IV *(shown in line numbers X-1, X-2, X-3, and X-4 below)* — A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

LINE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (If a code is not entered in D(1))
X-1	K054	900	P	T03 D80	
X-2	D002	400	P	T03 D80	
X-3	D001	100	P	T03 D80	
X-4	D002				included with above

C-12

EPA Form 3510-3 (6-80)

CONTINUE ON PAGE 3

NOTE (From REGION V EPA)

EPA I.D. NUMBER (enter from page 1)

W	O	B		2	1	3	6	P	0	7			

FOR OFFICIAL USE ONLY

W	DUP	2	DUP

Form Approved. OMB No. 158-S80004

IV. DESCRIPTION OF HAZARDOUS WASTES (continued)

NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (If a code is not entered in D(1))
1	K044	120,000	P	T01 T03 T04 D83	
2	K045	500	T	T03 D81	
3	K046	6,000	P	S02 T04 T03 D83	
4	K047	606,000	T	T01 T02 T03	
5	U002	88,000	P	S01 T03 T04	
6	U013	10	T	S01	
7	P099	1	T	S01	
8	P015	1	T	S01	
9	D001	10	T	T04	
10	D002	10	T	T01	
11	D003	6,600	T	T03 T04	
12	D004	5	T	S01	
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

EPA Form 3510-3 (6-80)

CONTINUE ON REVERSE

D. DESCRIPTION OF HAZARDOUS WASTES (continued)

E. USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES (from page 3)

I.D. No. OH5210020736
(From REGION V EPA)

EPA I.D. NO. (enter from page 1)

O	H		2	1	3	8	2	0	7	3	6	

VI. FACILITY DRAWING

All existing facilities must include in the space provided on page 5 a scale drawing of the facility *(see instructions for more detail)*.

VII. PHOTOGRAPHS

All existing facilities must include photographs *(aerial or ground-level)* that clearly delineate all existing structures, existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas *(see instructions for more detail)*.

VIII. FACILITY GEOGRAPHIC LOCATION

LATITUDE (degrees, minutes, & seconds)								LONGITUDE (degrees, minutes, & seconds)							
4	1	1	1	4	5			8	1	0	5	0	0	0	

IX. FACILITY OWNER

A. If the facility owner is also the facility operator as listed in Section VIII on Form 1 (General Information), place an "X" in the box to the left and skip to Section IX below.

B. If the facility owner is not the facility operator as listed in Section VIII on Form 1, complete the following items.

1. NAME OF FACILITY'S LEGAL OWNER

United States Army

2. PHONE NO. (area code & no.)

2	1	6	-	3	5	8	-	7	1	1	1

3. STREET OR P.O. BOX

State Route #5

4. CITY OR TOWN

Ravenna

5. ST

O	H

6. ZIP CODE

4	4	2	6	6

X. OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME (print or type)	B. SIGNATURE	C. DATE SIGNED
Robert J. Knaper	Robert J. Knaper	10/16/80

XI. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME (print or type)	B. SIGNATURE	C. DATE SIGNED
L. E. May, President Ravenna Arsenal, Inc.	C-14	November 12, 1980

EPA Form 3510-3 (6-80)

CONTINUE ON PAGE 5

X. FACILITY DRAWING (See page 4)

Refer to enclosed General Area Map No. A-109 For Facility Drawing and Specific Facility Processes.

A total of thirty-four (34) photographs depicting the twenty-two (22) TSD sites at Ravenna Army Ammunition Plant are enclosed. The numbers on the back of the photos correspond with the identification numbers for the respective TSD sites shown on the attached General Area Map, A-109.

APPENDIX D

ADDITIONAL MONITORING REQUIREMENTS

PART I

FEB 22 1978

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on on the effective date of the permit and lasting until June 30, 1983, the permittee is authorized to discharge from outfalls serial number 001, 002, 003, and 004.

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS kg/day		DISCHARGE LIMITATIONS Other Units (mg/l)		MONITORING REQUIREMENTS Measurement Frequency	MONITORING REQUIREMENTS Sample Type
	Daily Avg.	Daily Max.	Daily Avg.	Daily Max.		
Ammonia	-	-	-	-	Semi-annual	24-Hr. Composite
Chloride	-	-	-	-	Semi-annual	24-H4. Composite
Fluoride	-	-	-	-	Semi-annual	24-Hr. Composite
Arsenic	-	-	-	-	Semi-annual	24-Hr. Composite
Barium	-	-	-	-	Semi-annual	24-Hr. Composite
Boron	-	-	-	-	Semi-annual	24-Hr. Composite
Cadmium	-	-	-	-	Semi-annual	24-Hr. Composite
Chromium	-	-	-	-	Semi-annual	24-Hr. Composite
Copper	-	-	-	-	Semi-annual	24-Hr. Composite
Dissolved Solids	-	-	-	-	Semi-annual	24-Hr. Composite
Iron	-	-	-	-	Semi-annual	24-Hr. Composite
Manganese	-	-	-	-	Semi-annual	24-Hr. Composite
Mercury	-	-	-	-	Semi-annual	24-Hr. Composite
Nitrate	-	-	-	-	Semi-annual	24-Hr. Composite
Silver	-	-	-	-	Semi-annual	24-Hr. Composite
Zinc	-	-	-	-	Semi-annual	24-Hr. Composite
Polychlorinated biphenols	-	-	-	-	Semi-annual	24-Hr. Composite
TNT	-	-	-	-	Semi-annual	24-Hr. Composite

If any of these parameters occur in significant concentrations, this permit may be modified to include effluent limits for the polluting parameter.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: At a point representative of the discharges but prior to entry into the receiving streams.

RAVENNA ARMY AMMUNITION PLANT

WATER QUALITY SURVEILLANCE PROGRAM

Ravenna Arsenal, Inc.

March 12, 1980

SAMPLING STATIONS

A.	EAGLE CREEK	Influent	(North of Area #1 & Block E)
	" "	Effluent	(North of Area #3)
B.	SAND CREEK	Influent	(1/2 Mi. West of Slagle Rd.)
	" "	Effluent	(Smalley Road Bridge)
C.	HINCKLEY CREEK	Influent	(500 Ft. West of Post #32 - Rte. 80)
	" "	Effluent	(East of Post #24 - Charleston Perimeter Rd.)
D.	PARSHALL FLUME (Area #8)	Effluent	(Between Wayland-Wilcox and Parris Windham Rds on South Perimeter Fence Line Rd.)
E.	PARSHALL FLUME (Area #6)	Effluent	(South of Kelly's Pond and East of Post #20 on South Perimeter Fence Line Rd.)
F.	PARSHALL FLUME	Effluent	(Rte. #534)

Nomenclature:		Sampling Station:
EC-1	Influent	Eagle Creek
EC-2	Effluent	Eagle Creek
SC-1	Influent	Sand Creek
SC-2	Effluent	Sand Creek
HC-1	Influent	Hinckley Creek
HC-2	Effluent	Hinckley Creek
PF #8	Effluent	Parshall Flume - Area #8
PF #6	Effluent	Parshall Flume - Area #6
PF #534	Effluent	Parshall Flume - Rte. #534.

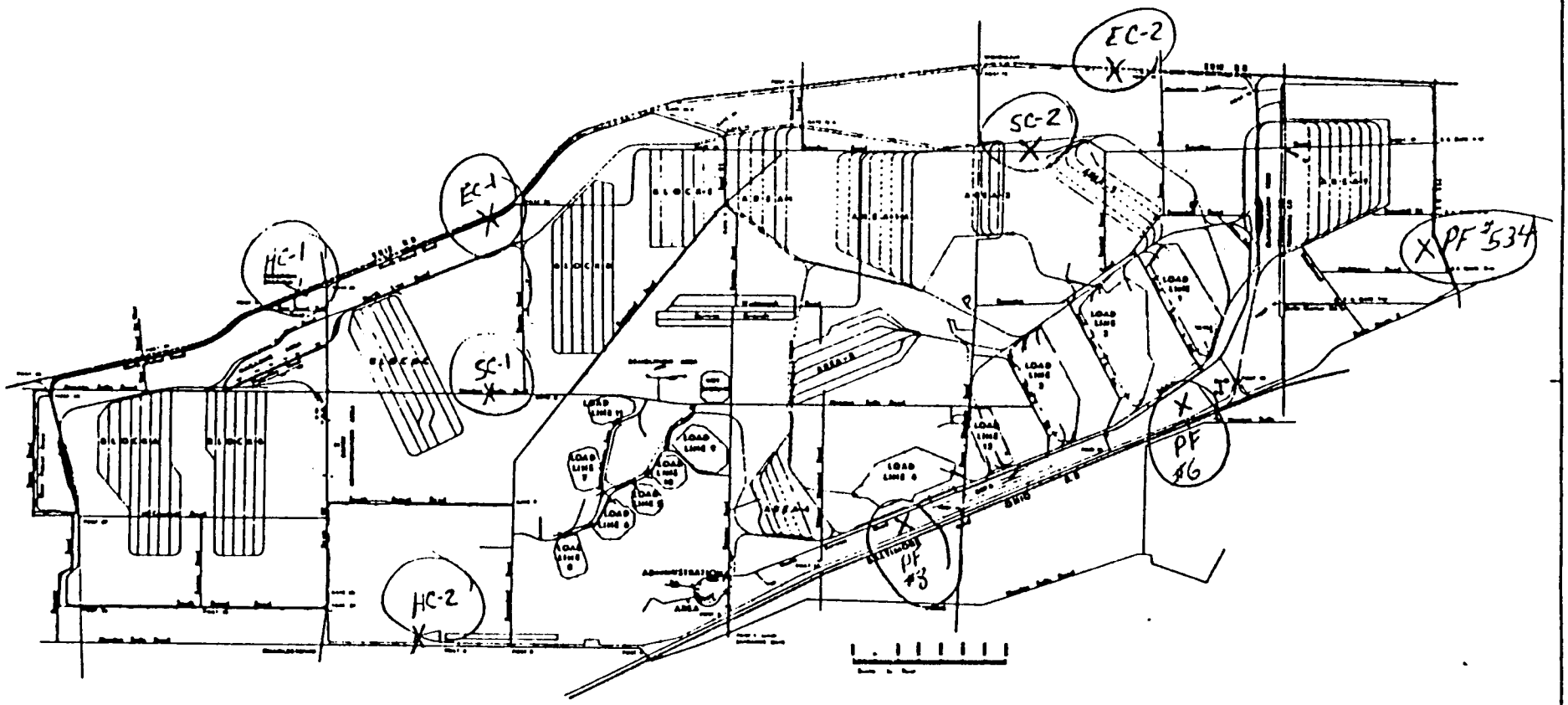
Re: Water Quality Surveillance Program

PARAMETER	SAMPLE STATION								
	EC-1	EC-2	SC-1	SC-2	HC-1	HC-2	PF #8	PF #6	PF #534
pH	Q	Q	Q	Q	Q	Q	Q	Q	Q
Temperature	Q	Q	Q	Q	Q	Q	Q	Q	Q
Specific Conductance	Q	Q	Q	Q	Q	Q	Q	Q	Q
Total Suspended Solids	Q	Q	Q	Q	Q	Q	Q	Q	Q
Biochemical Oxygen Demand -5 day	Q	Q	Q	Q	Q	Q	Q	Q	Q
Total Organic Carbon	S	S	S	S	S	S	S	S	S
Total Kjehldal Nitrogen	S	S	S	S	S	S	S	S	S
Nitrate	S	S	S	S	S	S	S	S	S
Nitrite	S	S	S	S	S	S	S	S	S
Phosphorous	S	S	S	S	S	S	S	S	S
Oil & Grease	Q	Q	Q	Q	Q	Q	Q	Q	Q
Dissolved Oxygen	Q	Q	Q	Q	Q	Q	Q	Q	Q
TNT		A		A		A	A	A	A
RDX		A		A		A	A	A	A
Copper	A	A	A	A	A	A	A	A	A
Chromium, Total (Hex & Tri)	A	A	A	A	A	A	A	A	A
Zinc	A	A	A	A	A	A	A	A	A
Lead	A	A	A	A	A	A	A	A	A
Fecal Coliform	Q	Q	Q	Q	Q	Q	Q	Q	Q

Q = Quarterly - 4/times a year (March, June, September & December)
S = Semi-Annually - 2 times a year (June (June & September
A = Annual - Once a year (September).

NOTE: (1) All samples will be taken as a grab sample unless otherwise notified at a future date.
(2) The Wastewater Treatment Plant Operator will be responsible for obtaining the Grab Samples.

Location of surface water sampling Points



RAVENNA ARMY AMMUNITION PLANT

GENERAL AREA MAP

A-109

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