19190

RCRA ORDER

CHEMICALS TABLE 1 - pA-3
HAZ WASTE TABLE 2 pA-4

SMALL QUANTITY GENERATOR
EXCEEDED STORAGE LIMITS

U.S. Environmental Protection Agency
RCRA §3008(h) CONSENT ORDER

for

Radio Materials Corporation
U.S. EPA I.D.# IND 005 477 021

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ATTACHMENTS

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FIGURES

ABBREVIATIONS AND ACRONYMS

AOC	Area of Concern
CAP	Corrective Action Plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CMI	Corrective Measure Implementation
CMS	Corrective Measure Study
DOCC	Description of Current Conditions
DQO	Data Quality Objective
EPA	United States Environmental Protection Agency
HWMU	Hazardous Waste Management Unit
IM	Interim Measures
MCL	Maximum Contaminant Level
mg/kg	milligram per kilogram
mg/l	milligram per liter
NPDES	National Pollution Discharge Elimination System
PA	Preliminary Assessment
ppm	parts per million
ppb	parts per billion
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
RA	Release Assessment
RCRA	Resource Conservation and Recovery Act

RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
SOW	Scope of Work
SWMU(s)	Solid Waste Management Unit(s)
µg/kg	micrograms per kilogram
µg/l	micrograms per liter
U.S.C.	United States Code
U.S. EPA	United States Environmental Protection Agency
VSI	Visual Site Inspection

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 5

IN THE MATTER OF: RADIO MATERIALS CORPORATION EAST PARK AVENUE ATTICA, INDIANA 47918 IND 005 477 021 RESPONDENT	ADMINISTRATIVE ORDER ON CONSENT U.S. EPA Docket No. R8H-5-99-005 Proceeding under Section 3008(h) of the Resource Conservation and Recovery Act, as amended, 42 U.S.C. §6928(h).

I. JURISDICTION

A. This ADMINISTRATIVE ORDER ON CONSENT (Order) is issued pursuant to the authority vested in the Administrator of the United States Environmental Protection Agency (U.S. EPA) by Section 3008(h) of the Solid Waste Disposal Act, commonly referred to as the Resource Conservation and Recovery Act of 1976 (RCRA), as amended by the Hazardous and Solid Waste Amendments of 1984, 42 U.S.C. §6928(h). The authority vested in the Administrator to issue this order has been delegated to the Chief of the Enforcement and Compliance Assurance Branch of the Waste, Pesticides and Toxics Division.

B. This Order is issued to Radio Materials Corporation (RMC, Respondent), the owner and operator of a facility located at East Park Avenue, Attica, Indiana 47918 (Facility).

C. Respondent consents to and agrees not to contest U.S. EPA's jurisdiction to issue this Order and to enforce its terms. Further, Respondent will not contest U.S. EPA's jurisdiction to:

1. Compel compliance with this Order in any subsequent enforcement proceedings, either administrative or judicial;

2. Require Respondent's full or interim compliance with the terms of this Order; or

3. To impose sanctions for violations of this Order.

II. DEFINITIONS

Unless otherwise expressly provided herein, terms used in this Order which are defined in RCRA or in regulations promulgated under RCRA shall have the definitions given to them in RCRA or in such regulations.

Acceptable, in the phrase "In a manner acceptable to U.S. EPA..." shall mean that submittals or completed work meet the terms and conditions of this Order, attachments, scopes of work, approved workplans and/or U.S. EPA's written comments and guidance documents.

Additional work shall mean any activity or requirement that is not expressly covered by this Order or its attachments but is determined by U.S. EPA to be necessary to fulfill the purposes of this Order as presented in Section III: Statement of Purpose.

Administrative Record shall mean the record compiled and maintained by U.S. EPA supporting this Order.

Area of Concern shall mean any area of the Facility under the control or ownership of the owner or operator where a release to the environment of hazardous waste(s) or hazardous constituents has occurred, is suspected to have occurred, or may occur, regardless of the frequency or duration of the release.

CERCLA shall mean the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. §§9601, et seq.

Comply or compliance may be used interchangeably and shall mean the performance of work required by this Order of a quality which is acceptable to and approvable by U.S. EPA and in the manner and time specified in this Order or any modification thereof, its attachments or any modification thereof, or written U.S. EPA directives. Respondent must meet both the quality and timeliness components of a particular requirement to be considered in compliance with the terms and conditions of this Order.

Contractor shall include any contractor, subcontractor, consultant or laboratory retained to conduct or monitor any portion of the work performed pursuant to this Order.

Corrective measures shall mean those measures or actions necessary to control, prevent, or mitigate the release or potential release of hazardous waste or hazardous constituents into the environment.

Corrective Measures Implementation or CMI shall mean those activities necessary to initiate, complete, monitor, and maintain the remedies U.S. EPA has selected or may select to protect human health and/or the environment from the release or potential release of hazardous wastes, or hazardous constituents, into the environment from the Facility. The CMI requirements are detailed in the CMI Scope of Work included as Attachment IV.

Corrective Measures Study or CMS shall mean the investigation and evaluation of potential remedies which will protect human health and/or the environment from the release or potential release of hazardous wastes, or hazardous constituents, into the environment from the Facility. The CMS requirements are detailed in the CMS Scope of Work included as Attachment III.

Data Quality Objectives shall mean the qualitative or quantitative statements derived from the Data Quality Objective

process that clarify study objectives, define the appropriate type of data, and specify tolerable levels of potential decision errors that will be used as the basis for establishing the quality and quantity of data needed to support decisions.

Day shall mean a calendar day unless expressly stated to be a business day. Business day shall mean a day other than a Saturday, Sunday, or Federal Holiday. In computing any period of time under this Order, where the last day would fall on a Saturday, Sunday, or Federal Holiday, the period shall run until the end of the next business day.

EPA or U.S. EPA shall mean the United States Environmental Protection Agency, and any successor Departments or Agencies of the United States.

Facility shall mean all contiguous property under the control of the owner and/or operator.

Hazardous Constituents shall mean those constituents listed in Appendix VIII to 40 CFR Part 261 or any constituent identified in Appendix IX to 40 CFR Part 264.

Hazardous Waste shall mean hazardous waste as defined in §1004(5) of RCRA or 40 CFR 260.10. This term includes hazardous constituents as defined above.

Hazardous Waste Management Unit or HWMU shall mean a contiguous area of land on or in which hazardous waste is placed, or the largest area in which there is significant likelihood of mixing hazardous waste constituents in the same area. Examples of hazardous waste management units include a surface impoundment, a waste pile, a land treatment area, a landfill cell, an incinerator, a tank and its associated piping and underlying containment system, and a container storage area. A container alone does not constitute a hazardous waste management unit; the unit includes containers and the land or pad upon which they are placed.

Innovative Treatment Technologies shall mean those technologies for treatment of soil, sediment, sludge, and debris other than incineration or solidification - stabilization and those technologies for treatment of groundwater contamination that are alternatives to pumping with conventional treatments like air stripping and ultraviolet light oxidation.

Interim Measures or IM shall mean those actions, which can be initiated in advance of implementation of the final corrective action for the Facility, to achieve the goal of stabilization. Interim Measures initiate cleanup at the Facility and control or eliminate the release or potential release of hazardous wastes at

or from the Facility. The IM requirements are detailed in the IM Scope of Work included as Attachment I.

RCRA Facility Investigation or RFI shall mean the investigation and characterization of the source(s) of contamination and the nature, extent, direction, rate, movement, and concentration of the source(s) of contamination and releases of hazardous waste, including hazardous constituents, that have been or are likely to be released into the environment from the Facility. The activities required for the RFI are detailed in the RFI Scope of Work included as Attachment II.

Receptors shall mean those humans, animals, or plants and their habitats which are or may be affected by releases of hazardous waste from or at the Facility.

Release shall mean any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing of hazardous wastes or hazardous constituents into the environment.

Scope of Work or SOW shall mean the outline of work Respondent must use to develop all workplans and reports required by this Order as set forth in this Order and the following Attachments: [I, Interim Measures Scope of Work; II, RCRA Facility Investigation Scope of Work; III, Corrective Measures Study Scope

of Work; and IV, Corrective Measures Implementation Scope of Work]. All SOW Attachments and modifications or amendments thereto, are incorporated into this Order and are an enforceable part of this Order.

Solid Waste Management Unit or SWMU shall mean any discernible unit at which solid wastes have been placed at any time irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a Facility where solid wastes have been routinely and systematically released.

Stabilization shall mean controlling or abating immediate threats to human health and/or the environment from releases and/or preventing or minimizing the spread of contaminants while long-term corrective measures alternatives are being evaluated or implemented.

Submittal shall include any workplan, report, progress report, or any other written document Respondent is required by this Order to send to U.S. EPA.

Violations of this Order shall mean those actions or omissions, failures or refusals to act by Respondent that result in a failure to meet the terms and conditions of this Order or its attachments.

Work or Obligation shall mean any activity Respondent must perform to comply with the requirements of this Order and its attachments.

Workplan shall mean the detailed plans prepared by Respondent to satisfy the requirements of the corresponding Scope of Work. The requirements for each workplan are presented in Section VIII: Work to be Performed and/or the Attachments I-IV.

III. STATEMENT OF PURPOSE

In entering into this Order, the mutual objectives of U.S. EPA and Respondent are:

A. To perform Interim Measures (IM) at the Facility to relieve threats to human health and/or the environment, if necessary;

B. To perform a RCRA Facility Investigation (RFI) to determine fully the nature and extent of any release of hazardous waste at or from the Facility;

C. To perform a Corrective Measures Study (CMS) to identify and evaluate alternatives for the corrective measures necessary to prevent, mitigate, and/or remediate any releases of hazardous wastes at or from the Facility;

D. To implement the corrective measure or measures selected by U.S. EPA at the Facility; and

E. To perform any other activities necessary to correct or evaluate actual or potential threats to human health and/or the environment resulting from the release or potential release of hazardous waste at or from the Facility.

IV. PARTIES BOUND

A. This Order shall apply to and be binding upon U.S. EPA, Respondent and its officers, directors, employees, agents, successors and assigns, heirs, trustees, receivers, and upon all persons, including but not limited to contractors, acting on behalf of Respondent.

B. No change in ownership or corporate or partnership status relating to the Facility will in any way alter Respondent's responsibility under this Order. Any conveyance of title, easement, or other interest in the Facility, or a portion of the Facility, shall not affect Respondent's obligations under this Order. Respondent will be responsible for and liable for any failure to carry out all activities required of Respondent by the terms and conditions of the Order, regardless of Respondent's use of employees, agents, or contractors to perform any such tasks.

C. Respondent shall provide a copy of this Order to all contractors and laboratories retained to conduct or monitor any portion of the work performed pursuant to this Order

within fourteen (14) days of the issuance of this Order or the retention of such person(s), whichever occurs later, and shall condition all such contracts on compliance with the terms of this Order.

D. Respondent shall give written notice of this Order to any successor in interest prior to transfer of ownership or operation of the Facility or a portion thereof and shall notify U.S. EPA in writing within thirty (30) days prior to such transfer.

E. Respondent agrees to undertake all actions required by the terms and conditions of this Order, including any portions of this Order incorporated by reference.

F. Respondent waives any rights to request a hearing on this matter pursuant to §3008(b) of RCRA and 40 CFR Part 24, and consents to the issuance of this Order without a hearing pursuant to §3008(b) of RCRA as a Consent Order issued pursuant to §3008(h) of RCRA.

V. FINDINGS OF FACT

A. Respondent is a company doing business in the State of Indiana and is a person as defined in Section 1004(15) of RCRA, 42 U.S.C. §6903(15) and 40 CFR 260.10.

B. Respondent is currently a small quantity generator of hazardous waste and an owner and/or operator of a hazardous waste management facility located at East Park Avenue, Attica, Indiana. Respondent was engaged in the treatment and storage of hazardous waste at the Facility subject to interim status requirements of 40 CFR Part 265. Specifically, Respondent treated hazardous waste in a centrifuge unit and stored hazardous waste in containers for greater than ninety (90) days in at least two units.

C. Respondent owned and/or operated the Facility as a hazardous waste management facility on or after November 19, 1980, the applicable date which renders facilities subject to interim status requirements or the requirement to have a permit under §§3004 and 3005 of RCRA.

D. Pursuant to §3010 of RCRA, Respondent notified U.S. EPA of its hazardous waste activity. In its notification dated August 14, 1980, Respondent identified itself as a generator of hazardous waste and an owner/operator of a treatment, storage, and/or disposal facility for hazardous waste. In a subsequent notification dated October 16, 1986, Respondent also identified itself as a transporter of hazardous waste.

E. In its initial Part A permit application dated November 14, 1980, Respondent identified itself as managing the following hazardous wastes at the Facility:

1. Hazardous wastes exhibiting the characteristic of EP toxicity (D005) identified at 40 CFR 261.20-261.24, to be stored in containers;

2. Hazardous wastes from non-specific sources including F001 and F003 identified at 40 CFR 261.31, to be stored in containers and treated in a centrifuge unit;

3. Hazardous wastes from specific sources including K046 identified at 40 CFR 261.32; and

4. Discarded commercial chemical products, manufacturing chemical intermediates, off-specification commercial chemical products, or manufacturing intermediates including U112, U122, and U188 identified at 40 CFR 261.33(e) and (f).

F. Respondent revised its Part A permit application several times to add hazardous wastes D001 and D002 (June 4, 1981), to increase drum storage capacity (June 26, 1986), and to add a new container storage area (June 27, 1988).

G. Respondent's facility location, description, history, and operation are described below:

1. The RMC facility is located in a residential area on East Park Avenue in Attica, Indiana. The site is located in Fountain County and occupies approximately 19.5 acres (see figure 1, page A-1). The facility is bordered on the northwest, north, and northeast by undeveloped land, to the south and southeast by residences, and to the south by Ravine Park.

2. The RMC facility consists of a main plant of 4 interconnected buildings on the south side of Summit Street and six buildings and a former drum storage area on the north side of Summit Street (see figure 2, page A-2). The main plant includes production areas, administrative offices, cafeteria, and storage areas for raw materials and finished products. The buildings on the north side of Summit are used for storage, warehousing, and maintenance activities.

3. RMC, a private corporation, was founded by Joseph F. Riley in 1947, in Chicago, Illinois, to manufacture television picture tubes and ceramic capacitors. The Attica facility began operations in 1948. The current owners of the company are Joseph F. Riley, Jr. and

Helen Riley. Between 1957-1978, the company was owned by Mallory Corporation, a publicly owned firm; however, the Riley family repurchased the corporation from Mallory and reprivitized it. Peak employment at the Attica facility was about 1,000 employees in 1958. By 1998, employment had dropped to 31 employees. The Chicago facility closed in 1984, transferring surplus, obsolete materials, and laboratory chemicals to the Attica facility.

4. The RMC facility manufactures ceramic capacitors as its primary source of business. Barium titanate based ceramic powders are mixed with small amounts of other compounds and milled. The milled mixture is then dried by spray drying, oven drying or with a filter press to form a dielectric (non-conducting) material. Some of this material is calcined, ground and packaged to customers who manufacture their own electrical components. The rest of the dielectric material is retained in-house for the production of disc capacitors.

5. Waste streams generated during the manufacturing process, amounts and methods of disposal or treatment are listed in Table 1 (see page A-3). Table 2 (see

page A-4) lists the current hazardous wastes generated by RMC.

H. Respondent's environmental setting is described below:

1. The climate in Attica falls within the humid continental range, with warm summers and rainfall occurring throughout the year. The average January and July temperatures are 30-50 degrees and 70-90 degrees, respectively. Attica receives a net precipitation of about 40 inches per year, most of which occurs between May 1st and October 31st.

2. The main plant is located on a relatively level ground at an elevation of 670 feet above sea level in an area that slopes gently toward the Wabash River. The facility is outside the 100-year flood boundary of the Wabash River. The nearest surface waterbody is Riley Lake, a manmade pond that is used as a source of water for fire fighting activities and recreation. It is located approximately 300 feet northwest of the main RMC plant. Other surface waterbodies in the area include an unnamed intermittent stream located 1000 feet south of the facility in Ravine Park; an unnamed intermittent stream located 3600 feet northeast of the plant; and the Wabash River, located 4400 feet

northwest of the plant. The closest sensitive environment is the freshwater wetland area of the Wabash River floodplain located 2400 feet northwest of the facility.

3. There are four major soil types underlying the RMC property. The soil beneath the main plant is part of the Miami Series, which is severely eroded occurring in limited areas of glacial till plains on ridgetops and knobs or in eroded areas of steeper soils. The Miami Series soils develop under hardwood forest. The soil type bounding both sides of Summit street is the Fincastle silt loam, which is found on upland areas of glacial till plains that are covered with windblown silt (loess). The soil type underlying the northern portion of the RMC warehouse and storage building area is the Fox silt loam, part of the Fox Series, which occurs at the head of drainageways and on the top and sides of knolls. The soils type underlying the southern portion of the RMC warehouse and storage building area is a Gravel Pit soil, also occurring in the Fox Series. The Gravel Pit soil is characteristically underlain by loose gravel and sand.

4. The local geology of the RMC facility consists of unconsolidated Pleistocene glacial deposits of till and glaciofluvial sands and gravels underlain by Paleozoic sedimentary rocks of Mississippian and Pennsylvanian age. Waterwell logs from within a 1/4 mile radius of the facility indicate that the glacial geology of the area consists of 20-35 feet of yellow and blue clay underlain by 15-45 feet of gravel. Underlying the glacial materials is bedrock composed of sandstones and shales of the Pennsylvanian Racoon Creek Group, which begins at 55-60 feet below grade.

5. In the Attica area, municipal and industrial water is supplied from the unconsolidated glacial deposits. Pre-glacial streams carved valleys into the bedrock which were filled and completely buried by glacial materials. Some of the present day river valleys partially follow these old valleys including the Wabash River. The base of the bedrock valley under the Wabash River in Attica is approximately 350-400 feet above sea level while the present surface elevation of the river is 500 feet above sea level indicating a buried valley approximately 150 feet deep.

6. Water yields from the Pleistocene glacial valley fill are large enough to supply Attica's municipal and industrial needs. Two 16-inch diameter municipal wells are located approximately 4600 feet northwest of the facility. The wells are 104 feet and 125 feet deep and the depth to the top of the water bearing zones are 49 and 68 feet, respectively. The direction of groundwater flow in the bedrock aquifer is west towards the Wabash River. Outside of the pre-glacial bedrock valley, groundwater is obtained from the Mississippian and Pennsylvanian shales and sandstones which are the source of water for domestic and agricultural use. The depth to the water table in the vicinity of the RMC facility ranges from 45-60 feet below grade. Three of the five water well logs obtained from the Indiana Department of Natural Resources show confined aquifer conditions in which water bearing sandstone or a fractured shale lies below an impermeable shale unit. The other two well show unconfined water table conditions. The direction of groundwater flow in the water table aquifer is generally west towards the Wabash River.

7. The nearest residential wells are located in the Elmdale subdivision east and adjacent to the main

plant. One well is also located in Ravine Park. In addition, RMC has two of its own wells. One is located in the northeast corner of the main plant. The well is approximately 300 feet deep with a water level of 165 feet. The other well is located in the northeast corner of the man-made lake located northwest of the main plant. This well is also approximately 300 feet deep with water encountered approximately 40 feet below the surface. These wells are the sole source of water for the entire plant.

I. A Preliminary Assessment/Visual Site Inspection (PA/VSI), performed in August of 1992, identified 9 Solid Waste Management Units (SWMUs) at the Facility. In the PA/VSI final report the SWMUs were identified as follows [see Table 3 for a summary of SWMUs (page A-5) and Figure 3 (page A-6) for their locations]:

1. <u>SWMU 1 - Outdoor Drum Storage Area</u> This former waste storage area was located 1500 feet north of the main plant and was 150 feet by 150 feet in area. Wastes managed at this location included halogenated and non-halogenated waste solvents, solder wastes containing lead, plating solutions, ferric chloride, barium titanate sludge, silver sludge, and phenolic resin.

This unit was in operation between 1981 and around 1988-1990 when closure took place. This unit did not contain any secondary containment or other release controls, but at the time of the PA/VSI no spills or stressed vegetation was observed.

2. SWMU 2 - Past Disposal Area "A" This unit was a dump site located adjacent and south of SWMU 1. It was approximately 100 feet by 40 feet in area. Wastes managed in this unit included waste ceramic, phenolic resin, acetone/alcohol, tetrachloroethylene and trichloroethylene. This unit was operational between the mid 1960's and 1979, when it was closed and covered. No release controls are known or documented at this unit. The area is not surrounded by a fence or any other means to restrict access.

3. SWMU 3 - Temporary Storage Area This unit, a temporary drum storage area, is located at the east end of warehouse building 6 and was 12 feet by 36 feet in area. Wastes stored at this unit included drums of ceramic waste, phenolic and epoxy resin, waste solvents, and oil/water wastes. This unit was operational as of 1992. No release controls are known

to exist at this unit, but no evidence of leaks or spills were identified during the PA/VSI.

4. SWMU 4 - Centrifuge Area This unit, the centrifuge was housed in Building 2 in a space approximately 3 feet by 3 feet in area. Wastes managed in this unit included a mixture of tetrachloroethylene, silver and ethyl acetate. This unit only operated for a period of several months in 1977, and was formally closed in 1988. No release controls were known to exist at this unit, however the unit was located on a concrete floor in a room with no floor drains. The centrifuge has been removed from this area.

5. SWMU 5 - Past Disposal Area "B" This unit, an unlined pit of unknown depth, was located approximately 200 feet southwest of the main plant and was approximately 20 feet in diameter. This unit is believed to have contained chlorinated solvents, acetone, alcohol, waxes, paints, phenolic resins, and ceramics. It was used for a period of time between approximately 1950 and 1958. No release controls are known to exist at this unit, and during the PA/VSI it was observed to be covered with grass. The unit was subsequently voluntarily remediated by RMC by the excavation and

removal of its contents. The excavation took place between November 1995 and February 1996. Approximately 7,000 cubic yards of contaminated soil were removed and disposed of during the project.

6. SWMU 6 - Eight 55-Gallon Drum Storage Area This unit is located by the east end of Building 2 in the main plant by the raw material storage area. This unit occupies an area of approximately 10 feet by 5 feet. Wastes stored at this area include drums of ceramic waste stored on wooded pallets. This unit was operational since 1992. No release controls are known to exist at this unit, although at the time of the PA/VSI no evidence of leaks or spills were observed.

7. SWMU 7 - Etching Room The etching room is located in Building 8 which also houses the mechanics garage and carpenter shop. This unit is approximately 10 feet by 25 feet in area. Wastes managed in this unit included ferric chloride sludge. This unit was operational for a period of time between 1967 and 1989 when operations were ceased. No release controls were known to exist at this unit.

8. SWMU 8 - Phenolic Dip Area This unit is a process area in the west central portion of Building 1, just

west of the Fluid Bed Epoxy Coating room. Disc capacitors are coated by dipping them in phenolic resin, which is the waste managed in this unit. This unit began operations in 1949, and is currently in use. No release controls are known to exist at this unit, which appeared to be contaminated by the routine and systematic dripping of resin. However, this unit is located on wood over a concrete floor.

9. SWMU 9 - Epoxy Coating Resin Room This unit is a process area in the south central portion of Building 1, just east of the Phenolic Dip area. This room is approximately 15 feet by 12 feet in area. Epoxy resin waste is managed at this unit, which is currently operational. No release controls are known to exist at this unit, which appeared to be contaminated by yellow powder at the time of the PA/VSI.

J. In the PA/VSI final report, two Areas of Concern (AOC) were identified as follows:

1. AOC 1 - Flux/Molten Solder Bath Area This area is located in the southeast portion of Building 1, and is currently part of the disc capacitor assembly area. Trays of discs are coated with flux and conveyed to a bath of molten solder. During the PA/VSI spillage of

flux/molten solder was observed on the concrete floor of this area.

2. AOC 2 - Underground Product Storage Tanks This area is located outside, between Buildings 1 and 2 on the east side of the buildings. This AOC consists of 3 underground storage tanks, each of which has a 6000 gallon capacity. The tanks were used to store heating oil, acetone/alcohol, and tetrachloroethylene, and were installed in 1965. Subsequently, the second and third tanks were cleaned in 1991 and converted to heating oil storage. It is unclear as to whether these tanks contain any leak detection system. In addition, one heating oil tank (1000 gallons) south of Building 1 was excavated and removed in 1992. As part of the tank removal, soils contaminated with heating oil were also removed. Also, a heating oil tank was removed north of Building 5 during 1992. The surrounding soils were not found to be contaminated, therefore no soil excavation was required.

K. The following paragraphs describe the incidents or scenarios where hazardous wastes or hazardous constituents have been or could be released from the facility into the environment:

1. In 1986, RMC documented the release of 2/3 of a drum of plating waste solution unto the ground at the former Outdoor Drum Storage area identified as SWMU 1. The remaining waste was transferred to another drum, and the contaminated soil, was manifested offsite. In addition, in 1989, as part of closure, soil sampling detected several areas where solder dross and oil had leaked onto the ground. Under Indiana Department of Environmental Management's (IDEM's) approval, 6 inches of topsoil was excavated and disposed of as a "special waste". These soils contained levels of barium as high as 350 mg/kg, lead as high as 30 mg/kg, and silver as high as 20 mg/kg. No groundwater monitoring wells are surrounding this area, however, the potential for contaminant migration to groundwater exists.

2. Past disposal areas "A" and "B" are historic dump site where ceramic waste containing barium titanate, paint waste, phenolic resins, acetone/alcohol, tetrachloroethylene, and trichloroethylene are known to have been disposed of. These units are apparently both unlined earthen structures with no containment structures in place which would prevent the migration of constituents to the groundwater. During the excavation of area "B" two groundwater monitoring wells

were installed north and northeast of the unit. One monitoring well was dry, and the other (identified as MW-7) was completed to a depth of 60 feet. Chemical analysis of groundwater from MW-7 indicated the presence of cis-1,2-dichloroethene at 220 ppb, trichloroethene at 1900 ppb, and tetrachloroethene at 96 ppb, documenting an observed release of these contaminants to the groundwater.

3. During the PA/VSI the routine and systematic dripping of phenolic resin was observed in the Phenolic Dip Area. There are no groundwater monitoring wells to assess if groundwater quality has been impacted in this area.

4. During the PA/VSI, Underground Product Storage tanks were identified at this facility. In the past, they had been used to store acetone and tetrachloroethylene, both highly mobile constituents. The tanks are over 30 years old and lack any leak detection devices or spill or overfill equipment. There are no groundwater monitoring wells in this area to assess if groundwater quality has been impacted in this area.

L. The hazardous wastes and/or constituents identified in paragraph K above include highly toxic compounds and

suspected carcinogens which may pose a potential threat to human health or the environment. The U.S. EPA Integrated Risk Information System (IRIS) identifies lead as a compound which causes damage to children's neurobehavioral development and as a probable human carcinogen. Acetone and and compounds of barium such as titanate, carbonate, and zirconate, when ingested orally, can cause damage to kidneys and liver. Tetrachloroethylene is also a compound which has been known to have an adverse effect on the liver when ingested orally.

M. Releases from the Facility may migrate toward present or future residential users of groundwater in the vicinity of the RMC property posing an unacceptable risk to public health.

VI. CONCLUSION OF LAW AND DETERMINATIONS

Based on the Findings of Fact set forth above and after consideration of the Administrative Record, the Chief of the Enforcement and Compliance Assurance Branch; Waste, Pesticides and Toxics Division; Region 5; U.S. EPA has made the following conclusions of law and determinations:

A. Respondent is a "person" within the meaning of Section §1004(15) of RCRA, 42 U.S.C. §6903(15);

B. Respondent is the owner or operator of a Facility that has operated under interim status subject to §3005(e) of RCRA, 42 U.S.C. §6925(e);

C. Certain wastes found at the Facility are hazardous wastes pursuant to §§1004(5) and 3001 of RCRA, 42 U.S.C. §§6903(5) and 6921, and 40 CFR Part 261;

D. There is or has been a release of hazardous waste(s) into the environment from the Facility; and

E. The actions required by this Order are necessary to protect human health and/or the environment.

VII. PROJECT COORDINATOR

A. Within fifteen (15) days of the effective date of this Order, U.S. EPA and Respondent shall each designate a Project Coordinator. Respondent shall notify U.S. EPA in writing of the Project Coordinator it has selected. Each Project Coordinator shall be responsible for overseeing the implementation of this Order and for designating a person to act in their absence. U.S. EPA's Project Coordinator will be U.S. EPA's designated representative for the Facility. To the maximum extent practicable, all communications between Respondent and U.S. EPA, and all documents, reports, approvals, and other correspondences concerning the

activities performed pursuant to this Order shall be directed through the Project Coordinators.

B. Respondent may change its Project Coordinator but agrees to provide at least fourteen (14) days written notice prior to changing a Project Coordinator. Respondent shall notify U.S. EPA within five (5) days of any unanticipated change in its Project Coordinator.

C. The absence of the U.S. EPA Project Coordinator from the Facility shall not be cause for the stoppage of work.

VIII. WORK TO BE PERFORMED

A. Pursuant to §3008(h) of RCRA, Respondent agrees to and is hereby ordered to perform the acts specified in this section, in the manner and by the dates specified herein. All work and/or submittals required by this Order are subject to U.S. EPA approval in accordance with Section IX: Agency Approvals/Proposed Contractor. All work undertaken pursuant to this Order shall be performed in a manner consistent with, at a minimum: the attached Scopes of Work; all U.S. EPA-approved workplans; RCRA and other applicable Federal laws and their implementing regulations; and applicable U.S. EPA guidance documents. Guidance may include, but is not limited to, documents listed in Attachment VI: References.

B. **Interim Measures**

1. Respondent shall evaluate currently available data and assess the need for interim measures (IM). IM shall be used whenever possible to achieve stabilization.

2. In the event Respondent identifies an immediate or potential threat to human health and/or the environment; discovers new releases of hazardous wastes; or discovers new SWMUs, HWMUs, or AOCs not previously identified; Respondent shall notify the U.S. EPA Project Coordinator orally within 48 hours of discovery, and notify U.S. EPA in writing within fourteen (14) days of such discovery summarizing the immediacy and magnitude of the potential threat(s) to human health and/or the environment.

3. If U.S. EPA identifies an immediate or potential threat to human health and/or the environment; discovers new releases of hazardous wastes; discovers new SWMUs, HWMUs, or AOCs not previously identified; or determines the need of IM as a result of Respondent's evaluation or Description of Current Conditions Report (DOCC); U.S. EPA will notify Respondent in writing.

4. Within thirty (30) days of receiving the U.S. EPA's written notification or request, Respondent shall

submit to the U.S. EPA an IM Workplan in accordance with the IM Scope of Work contained in Attachment I.

5. If U.S. EPA determines that immediate action is required, U.S. EPA's Project Coordinator may orally (confirmed in writing) require Respondent to act prior to:

   a. Respondent's receipt of U.S. EPA's written notification;

   b. U.S. EPA's receipt of the IM Workplan; or

   c. U.S. EPA's approval of the IM Workplan.

C. **RCRA Facility Investigation**

1. Respondent shall submit to U.S. EPA a DOCC Report within sixty (60) days of the effective date of this Order. The DOCC Report shall be developed in a manner consistent with the RCRA Facility Investigation Scope of Work contained in Attachment II. The DOCC Report is for U.S. EPA's review and comment and not subject to Section IX: Agency Approvals/Proposed Contractor.

2. Respondent shall submit to U.S. EPA a Workplan for a RCRA Facility Investigation (RFI) within ninety (90) days of the effective date of this Order. The RFI

Workplan shall be developed in a manner consistent with the RFI Scope of Work contained in Attachment II.

3. The RFI Workplan shall detail the methodology Respondent shall use to:

   a. Gather data needed to make decisions on stabilization during the early phase of the RFI;

   b. Identify and characterize all sources of contamination;

   c. Define the degree and extent of contamination;

   d. Characterize the potential pathways of contaminant migration;

   e. Identify actual or potential human and/or ecological receptors; and

   f. Support the development of alternatives from which a corrective measure will be selected by U.S. EPA.

4. Respondent shall include a specific schedule for implementation of all activities in the RFI Workplan.

5. Respondent shall submit a RFI Report to U.S. EPA in accordance with the U.S. EPA-approved RFI Workplan schedule.

D. **Corrective Measures Study**

1. Respondent shall submit to U.S. EPA a Corrective Measures Study (CMS) Report within ninety (90) days of U.S. EPA approval of the RFI Report. The CMS Report shall be developed in a manner consistent with the CMS Scope of Work contained in Attachment III.

2. The CMS Report shall detail the methodology for developing and evaluating potential corrective measures to remedy any contamination exceeding Media Cleanup Standards[1] at or from the Facility. The CMS shall identify the potential corrective measures, including any innovative technologies, that may be used for the containment, treatment and/or disposal of contamination.

3. U.S. EPA will provide the public with an opportunity to review and comment on the final draft of the Corrective Measures Study Report and a description of U.S. EPA's proposed corrective measure(s), including U.S. EPA's justification for proposing such corrective measure(s) (Statement of Basis) and an opportunity for a public

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[1]Media Cleanup Standards are described in Attachment II: RFI Scope of Work, and Attachment III: CMS Scope of Work.

meeting regarding U.S. EPA's proposed cleanup standards and remedy for the Facility.

4. Following the public comment period, U.S. EPA will issue its decision on corrective measure(s) for the protection of human health and/or the environment. U.S. EPA will also issue a Response to Comments received during the public comment period.

E. **Corrective Measures Implementation**

1. Respondent shall submit to U.S. EPA a Corrective Measures Implementation (CMI) Workplan within sixty (60) days of receipt of written notice of U.S. EPA's decision on the corrective measure(s).

2. The CMI Workplan shall be designed and implemented to facilitate the design, construction, operation, maintenance, and monitoring of corrective measures at the Facility in accordance with the CMI Scope of Work contained in Attachment IV.

3. Respondent shall implement the work and submit CMI reports to U.S. EPA in accordance with the U.S. EPA-approved CMI Workplan schedule.

F. **Additional Work**

1. U.S. EPA may determine or Respondent may propose that certain tasks, including investigatory work, engineering evaluation, or procedure/methodology modifications, are necessary in addition to or in lieu of the tasks included in any U.S. EPA-approved workplan, when such additional work is necessary to meet the purposes set forth in Section III: Statement of Purpose.

2. U.S. EPA will notify Respondent in writing and specify the basis for its determination that additional work is necessary. Within thirty (30) days after receipt of such determination, Respondent shall have the opportunity to meet or confer with U.S. EPA to discuss the additional work.

3. If required by U.S. EPA, Respondent shall submit for U.S. EPA approval a workplan for the additional work. U.S. EPA shall specify the contents of such workplan. Such workplan shall be submitted within sixty (60) days of receipt of U.S. EPA's determination that additional work is necessary, or according to an alternative schedule established by U.S. EPA.

4. Upon approval of a workplan by U.S. EPA, Respondent shall implement it in accordance with the schedule and provisions contained therein.

IX. AGENCY APPROVALS/PROPOSED CONTRACTOR

A. Agency Approvals

1. U.S. EPA will provide Respondent with its written approval, approval with conditions and/or modifications, disapproval, or disapproval with comments for any workplan, report (except progress reports), specification, or schedule submitted pursuant to or required by this Order. U.S. EPA will provide a statement of reasons for any approval with conditions and/or modifications, disapproval, or disapproval with comments.

2. Within forty-five (45) days of receipt of U.S. EPA's disapproval, or disapproval with comments, Respondent shall revise and submit an approvable workplan, report, specification, or schedule in accordance with U.S. EPA's written comments.

3. Any disapproval or disapproval with comments of a revised and resubmitted workplan, report, specification, or schedule shall be deemed a violation of this Order and subjects Respondent to the stipulated

penalties provision found at Section XV.A.2 unless waived by U.S. EPA.

4. Upon receipt of U.S. EPA's written approval or approval with conditions and/or modifications, Respondent shall commence work and implement any such workplan in accordance with the schedule and provisions contained therein and U.S EPA's written directions thereon.

5. Any U.S. EPA-approved report, workplan, specification, or schedule shall be deemed incorporated into this Order. Prior to U.S. EPA's written approval, no workplan, report, specification, or schedule shall be construed as approved and final. Oral advice, suggestions, or comments given by U.S. EPA representatives will not constitute an official approval, nor shall any oral approval or oral assurance of approval be considered as binding.

B. **Proposed Contractor**

1. All work performed pursuant to this Order shall be under the direction and supervision of a professional engineer, hydrologist, geologist, or environmental scientist with expertise in hazardous waste or contaminated soil and groundwater site cleanup. Respondent's contractor shall have the technical

expertise sufficient to adequately perform all aspects of the work for which it is responsible.

2. Respondent shall notify U.S. EPA in writing of the name, title, and qualifications of the principal engineer, hydrologist, geologist, or environmental scientist to be used in carrying out the terms of this Order within fourteen (14) days of the effective date of this Order.

3. Respondent shall identify whether any contractor is on the List of Parties Excluded for Federal Procurement or Non-Procurement Programs. U.S. EPA reserves the right to disapprove Respondent's contractor at any time during the period that the Order is effective.

4. If U.S. EPA disapproves a contractor, then Respondent must, within thirty (30) days of receipt from U.S. EPA of written notice of disapproval, notify U.S. EPA, in writing, of the name, title and qualifications of its replacement.

X. QUALITY ASSURANCE

A. Respondent shall follow U.S. EPA guidance for sampling and analysis. Workplans shall contain quality assurance/quality control (QA/QC) and chain of custody procedures for all

sampling, monitoring, and analytical activities. Any deviations from the QA/QC and chain of custody procedures in approved workplans must be approved by U.S. EPA prior to implementation; must be documented, including reasons for the deviations; and must be reported in the applicable report.

B. The name(s), addresses, and telephone numbers of the analytical laboratories Respondent proposes to use must be specified in the applicable workplan(s).

C. All workplans required under this Order shall include data quality objectives for each data collection activity to ensure that data of known and appropriate quality are obtained and that data are sufficient to support their intended use(s).

D. Respondent shall monitor their contractors and their work to ensure that high quality data are obtained. Respondent shall ensure that laboratories it uses perform analyses according to the latest approved edition of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846 Third Edition inclusive of Final updates I, II, IIa, IIb, III, and any subsequent updates), or other methods deemed satisfactory to U.S. EPA. If methods other than U.S.

EPA methods are to be used, Respondent shall specify all such protocols in the applicable workplan (e.g., RFI).

E. U.S. EPA may reject any data that does not meet the requirements of the approved workplan or U.S. EPA analytical methods and may require re-sampling and additional analyses.

F. Respondent shall ensure that laboratories it uses for analyses participate in a QA/QC program equivalent to that which is followed by U.S. EPA.

G. U.S. EPA may conduct a performance and QA/QC audit of the laboratories chosen by Respondent before, during, or after sample analyses. Upon request by U.S. EPA, Respondent shall have its laboratory perform analyses of samples provided by U.S. EPA to demonstrate laboratory performance. If the audit reveals deficiencies in a laboratory's performance or QA/QC, re-sampling and additional analyses may be required.

XI. SAMPLING AND DATA/DOCUMENT AVAILABILITY

A. Respondent shall submit to U.S. EPA, upon request, the results of all sampling and/or tests or other data generated Respondent or its agents or contractors pursuant to this Order.

B. Notwithstanding any other provisions of this Order, the United States retains all of its information gathering and inspection authorities, including the authority to bring enforcement actions related thereto, under RCRA, CERCLA, and any other applicable statutes or regulations.

C. Respondent shall notify U.S. EPA in writing at least fourteen (14) days prior to beginning each separate phase of field work approved under any workplan required by this Order.

D. If Respondent believes it must commence emergency field activities without delay, Respondent may seek emergency telephone authorization from the U.S. EPA Project Coordinator or, if the U.S. EPA Project Coordinator is unavailable, their Section Chief, to commence such activities immediately.

E. At the request of U.S. EPA, Respondent shall provide or allow U.S. EPA or its authorized representative to take split or duplicate samples of all samples collected by Respondent pursuant to this Order. Similarly, at the request of Respondent, U.S. EPA shall allow Respondent or its authorized representative(s) to take split or duplicate samples of all samples collected by U.S. EPA under this Order.

F. Respondent may assert a business confidentiality claim covering all or part of any information submitted to U.S. EPA pursuant to this Order, with the exception of physical or analytical data. Any assertion of confidentiality must be accompanied by information that satisfies the items listed in 40 CFR 2.204(e)(4) or such claim shall be deemed waived. Information determined by U.S. EPA to be confidential shall be disclosed only to the extent permitted by 40 CFR Part 2.

G. If no confidentiality claim accompanies the information when it is submitted to U.S. EPA, the information may be made available to the public by U.S. EPA without further notice to Respondent.

H. Respondent agrees not to assert any confidentiality claim with regard to any physical or analytical data.

XII. ACCESS

A. Upon properly identifying themselves, U.S. EPA, its contractors, employees, and/or any duly designated representatives are authorized to enter and freely move about the Facility pursuant to this Order for the purposes of, inter alia:

1. Interviewing Facility personnel and contractors;

2. Inspecting records, operating logs, and contracts related to the Facility;

3. Reviewing the progress of Respondent in carrying out the terms of this Order;

4. Conducting such tests, sampling, or monitoring as U.S. EPA deems necessary;

5. Using a camera, sound recording, or other documentary type equipment; and

6. Verifying the reports and data submitted to U.S. EPA by Respondent.

B. Respondent shall provide U.S. EPA and its representatives access at all reasonable times to the Facility and subject to paragraph C below, to any other property to which access is required for implementation of this Order. Respondent shall permit such persons to inspect and copy all records, files, photographs, documents, including all sampling and monitoring data, that pertain to work undertaken pursuant to this Order and that are within the possession or under the control of Respondent or its contractors. The Facility may appoint an escort to accompany U.S. EPA and its representatives. Such escort shall not unreasonably interfere with U.S. EPA and its representatives.

C. To the extent that work being performed pursuant to this Order must be done beyond the Facility property boundary, Respondent shall use its best efforts to obtain access agreements necessary to complete work required by this Order from the present owner(s) of such property within thirty (30) days of approval of any workplan for which access is required. Best efforts as used in this paragraph shall include, at a minimum, a certified letter from Respondent to the present owner(s) of such property requesting access agreement(s) to permit Respondent and its authorized representatives access to such property, and the offer of payment of reasonable compensation in consideration of granting access. Any such access agreement shall provide for access by U.S. EPA and its representatives. Respondent shall insure that U.S. EPA's Project Coordinator has a copy of any access agreement(s).

D. In the event that agreements for access are not obtained within thirty (30) days of approval of any workplan for which access is required, Respondent shall notify U.S. EPA in writing within fourteen (14) days thereafter of both the efforts undertaken to obtain access and the failure to obtain access agreements.

E. U.S. EPA may, in its discretion, assist Respondent in obtaining access. In the event U.S. EPA obtains access, Respondent shall undertake U.S. EPA-approved work on such property.

F. The Respondent agrees to indemnify the United States as provided in Section XXI: Indemnification of the United States Government, for any and all claims arising from activities on such property.

G. Nothing in this section limits or otherwise affects U.S. EPA's right of access and entry pursuant to applicable law, including RCRA and CERCLA.

H. Nothing in this section shall be construed to limit or otherwise affect Respondent's liability and obligation to perform corrective action, including corrective action beyond the Facility boundary, notwithstanding the lack of access.

XIII. RECORD PRESERVATION

A. Respondent shall retain, during the pendency of this Order and for a minimum of 6 years after its termination, all data, records, and documents now in its possession or control or which come into its possession or control which relate in any way to this Order. Respondent shall notify

U.S. EPA in writing ninety (90) days prior to the destruction of any such records, and shall provide U.S. EPA with the opportunity to take possession of any such records. Such written notification shall reference the effective date, caption, and docket number of this Order and shall be addressed to:

Project Coordinator for
Radio Materials Corporation
Enforcement and Compliance Assurance Branch
Waste, Pesticides and Toxics Division (DE-9J)
U.S. EPA, Region 5
77 West Jackson Blvd.
Chicago, IL 60604

B. Respondent shall within thirty (30) days of retaining or employing any agent, or contractor for the purpose of carrying out the terms of this Order, enter into an agreement with any such agent or contractor whereby such agent or contractor will be required to provide Respondent a copy of all documents produced pursuant to this Order.

C. All documents pertaining to this Order shall be stored by the Respondent in a centralized location at the Facility or other agreed upon repository to afford ease of access by U.S. EPA or its representatives.

XIV. REPORTING AND DOCUMENT CERTIFICATION

A. Beginning with the first full month following the effective date of this Order, and throughout the period that this Order is effective, Respondent shall provide U.S. EPA with monthly progress reports. Progress reports are due by the tenth day of each month and report the previous month's activities and progress. The progress reports shall conform to requirements in the relevant scope of work contained in the Attachments. U.S. EPA may adjust the frequency of progress reports to be consistent with site-specific activities.

B. Three (3) copies of all documents submitted pursuant to this Order shall be sent to the U.S. EPA project coordinator designated pursuant to Section VII of this Order. Respondent shall send these documents either by messenger service, certified mail, return receipt requested or by overnight mail. Other addresses and additional copies (e.g., state EPA) can also be designated by the U.S. EPA Project Coordinator. Whenever practicable, all documents submitted pursuant to this Order shall be printed on recycled paper and shall be copied double-sided.

C. Any report or other document submitted by Respondent pursuant to this Order which makes any representation

concerning Respondent's compliance or noncompliance with any requirement of this Order shall be certified by a responsible corporate officer of Respondent or a duly authorized representative. A responsible corporate officer means: a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation.

D. The certification required by paragraph C above, shall be in the following form:

"I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to evaluate the information submitted. I certify that the information contained in or accompanying this submittal is true, accurate, and complete. As to those identified portion(s) of this submittal for which I cannot personally verify the accuracy, I certify that this submittal and all attachments were prepared in accordance with procedures designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature: _____
Name: _____
Title: _____
Date: _____

XV. DELAY IN PERFORMANCE/STIPULATED PENALTIES

A. Unless there has been a written modification by U.S. EPA of a compliance date, an approved workplan condition, or excusable delay as defined in Section XVII: Force Majeure and Excusable Delay, if Respondent fails to comply with any term or condition set forth in this Order in the time or manner specified herein, Respondent shall pay stipulated penalties as set forth below upon written demand from U.S. EPA:

1. For failure to commence, perform, or complete any work required by an U.S. EPA-approved workplan in a manner acceptable to U.S. EPA or at the time required pursuant to this Order: $3,500 per day for the first seven days of such violation, $6,500 per day for the eighth through twenty-first day of such violation, and $10,000 per day for each day of such violation thereafter;

2. For failure to complete or submit any workplans or reports (other than progress reports) in a manner acceptable to U.S. EPA or at the time required pursuant to this Order, or for failure to notify U.S. EPA of immediate or potential threats to human health and/or the environment, new releases of hazardous waste and/or new solid waste management units not previously

identified, as required by this Order: $3,500 per day for the first seven days of such violation, $6,500 per day for the eighth through twenty-first day of such violation, and $10,000 per day for each day of such violation thereafter;

3. For failure to complete or submit other work not included in paragraph A.1 and A.2. of this section in a manner acceptable to U.S. EPA or at the time required pursuant to this Order: $1,750 per day for the first seven days of such violation, $3,000 per day for the eighth through twenty-first day of such violation, and $4,250 per day for each day of such violation thereafter;

4. For failure to comply with any other provisions of this Order in a manner acceptable to U.S. EPA: $1,750 per day for the first seven days of such violation, $3,000 per day for the eighth through twenty-first day of such violation, and $4,250 per day for each day of such violation thereafter.

B. Penalties shall begin to accrue on the day after the complete performance is due or the day a violation occurs, and shall continue to accrue through the day of correction of the violation. Nothing herein shall prevent the

simultaneous accrual of separate stipulated penalties for separate violations of this Order. Penalties shall continue to accrue regardless of whether U.S. EPA has notified the Respondent of a violation.

C. All penalties owed to the United States under this section shall be due and payable within thirty (30) days of the Respondent's receipt from U.S. EPA of a written demand for payment of the penalties. Such a written demand will describe the violation and will indicate the amount of penalties due.

D. Interest shall begin to accrue on any unpaid stipulated penalty balance beginning on the thirty-first (31) day after Respondent's receipt of U.S. EPA's demand letter. Interest shall accrue at the Current Value of Funds Rate established by the Secretary of the Treasury. Pursuant to 31 U.S.C. §3717, an additional penalty of 6% per annum on any unpaid principal shall be assessed for any stipulated penalty payment which is overdue for 90 or more days.

E. All penalties shall be made payable by certified or cashier's check to the United States of America and shall be remitted to:

U.S. Department of Treasury
Attention: U.S. EPA, Region 5,
Office of the Comptroller
P.O. Box 70753
Pittsburgh, PA 15251

F. All such checks shall reference the name of the Facility, the Respondent's name and address, and the U.S. EPA docket number of this action. Copies of all such checks and letters forwarding the checks shall be sent simultaneously to U.S. EPA's Project Coordinator and assigned attorney.

G. Respondent may dispute U.S. EPA's assessment of stipulated penalties by invoking the dispute resolution procedures under Section XVI: Dispute Resolution. The stipulated penalties arising from the violations in dispute shall continue to accrue, but need not be paid, during the dispute resolution period. Respondent shall pay stipulated penalties and interest, if any, in accordance with the dispute resolution decision and/or agreement. Respondent shall submit such payment to U.S. EPA within seven (7) days of receipt of such resolution in accordance with paragraph E of this section.

H. Neither the invocation of dispute resolution nor the payment of penalties shall alter in any way Respondent's obligation to comply with the terms and conditions of this Order.

I. The stipulated penalties set forth in this section do not preclude U.S. EPA from pursuing any other remedies or sanctions which may be available to U.S. EPA by reason of Respondent's failure to comply with any of the terms and conditions of this Order including, but not limited to, seeking statutory penalties for such violations.

J. No payments under this section shall be tax deductible for Federal tax purposes.

XVI. DISPUTE RESOLUTION

A. The parties shall use their best efforts to resolve informally and in good faith, all disputes or differences of opinion. The parties agree that the procedures contained in this section are the sole procedures for resolving disputes arising under this Order. If Respondent fails to follow any of the requirements contained in this section then it shall have waived its right to further consideration of the disputed issue.

B. If Respondent disagrees, in whole or in part, with any written decision (Initial Written Decision) by U.S. EPA pursuant to this Order, Respondent's Project Coordinator shall notify the U.S. EPA's Project Coordinator of the dispute. The Project Coordinators shall attempt to resolve the dispute informally.

C. If the Project Coordinators cannot resolve the dispute informally, Respondent may pursue the matter formally by placing its objections in writing. Respondent's written objections must be directed to the Supervisor of U.S. EPA's Project Coordinator and copied to U.S. EPA's Assistant Regional Counsel. This written notice must be mailed to such person(s) within fourteen (14) days of Respondent's receipt of the Initial Written Decision. Respondent's written objection must set forth the specific points of the dispute, the position Respondent claims should be adopted as consistent with the requirements of this Order, the basis for Respondent's position, and any matters which it considers necessary for U.S. EPA's determination.

D. U.S. EPA and Respondent shall have fourteen (14) days from U.S. EPA's receipt of Respondent's written objections to attempt to resolve the dispute through formal negotiations. This time period may be extended by U.S. EPA for good cause. During such time period, (Negotiation Period) Respondent may request a conference with Chief of the Enforcement Compliance Assurance Branch to discuss the dispute and Respondent's objections. U.S. EPA agrees to confer in person or by telephone to resolve any such disagreement with the Respondent as long as Respondent's request for a conference will not extend the Negotiation Period.

E. If the parties are unable to reach an agreement within the Negotiation Period, Respondent may submit any additional written arguments and evidence, not previously submitted, to the Director of the Waste, Pesticides and Toxics Division. Based on the record, U.S. EPA shall provide to Respondent its written decision on the dispute (U.S. EPA Dispute Decision) which shall include a response to Respondent's arguments and evidence. Such decision shall be incorporated into and become an enforceable element of this Order, but will not be considered final Agency action for purposes of judicial review.

F. Except as provided in Section XV: Delay in Performance/Stipulated Penalties, the existence of a dispute as defined in this section and U.S. EPA's consideration of matters placed into dispute shall not excuse, toll, or suspend any compliance obligation or deadline required pursuant to this Order during the pendency of the dispute resolution process.

G. Any agreement to resolve the dispute reached by the parties pursuant to this section shall be in writing and shall be signed by both parties. The written agreement shall be an enforceable element of this Order.

XVII. FORCE MAJEURE AND EXCUSABLE DELAY

A. Force majeure, for purposes of this Order, is defined as any event arising from causes not foreseen and beyond the control of Respondent or any person or entity controlled by Respondent, including but not limited to Respondent's contractors, that delays or prevents the timely performance of any obligation under this Order despite Respondent's best efforts to fulfill such obligation. The requirement that Respondent exercise "best efforts to fulfill such obligation" shall include, but not be limited to, best efforts to anticipate any potential force majeure event and address it before, during, and after its occurrence, such that any delay or prevention of performance is minimized to the greatest extent possible.

B. Force majeure does not include increased costs of work to be performed under this Order, financial inability to complete the work, plant shutdown, work stoppages or other labor disputes.

C. If any event occurs or has occurred that may delay the performance of an obligation under this Order, whether or not caused by a force majeure event, Respondent shall provide written notice to U.S. EPA's Project Coordinator, or in their absence, their supervisor, within 48 hours of when

Respondent first knew or reasonably should have known that the event might cause a delay. If Respondent wishes to claim a force majeure event, then within five (5) days of the event, Respondent shall provide to U.S. EPA in writing detailed information regarding:

1. The events or causes giving rise to the claim;

2. The work that is subject to the event and the anticipated duration of the delay;

3. All actions Respondent has taken and will take to prevent or minimize the delay;

4. All other obligations affected by the event, and what measures, if any, that Respondent has taken and will take to minimize the effect of the event on those obligations;

5. A schedule for implementation of all measures Respondent will take to prevent or mitigate the delay or the effect of the delay;

6. Respondent's rationale for attributing such delay to a force majeure event if it intends to assert such a claim;

7. A statement as to whether, in the opinion of Respondent, such event may cause or contribute to endangerment to public health or the environment; and

8. A description of its best efforts to fulfill its obligations under the Order and to minimize the duration of any delay.

D. Respondent shall include with any claim of force majeure all available documentation supporting its claim, if any, that the delay was attributable to a force majeure event. Failure to comply with the above requirements shall preclude Respondent from asserting any claim of force majeure for that event. Respondent shall be deemed to have notice of any circumstances of which its contractors had or reasonably should have had notice.

E. If U.S. EPA determines that the delay or anticipated delay is attributable to a force majeure event, the time for performance of such obligation under this Order that is affected by the force majeure event will be extended by U.S. EPA for such time as U.S. EPA determines is necessary to perform such obligation. U.S. EPA will notify Respondent in writing of the length of the extension, if any.

F. An extension of the time for performance of such obligation affected by the force majeure event shall not, of itself, extend the time for performance of any other obligation, unless Respondent can demonstrate that more than one obligation was affected by the force majeure event.

G. If U.S. EPA disagrees with Respondent's assertion of a force majeure event, U.S. EPA will notify Respondent in writing and Respondent may elect to invoke the dispute resolution provision, and shall follow the time frames set forth in Section XVI: Dispute Resolution. In any such proceeding, Respondent shall have the burden of demonstrating by a preponderance of the evidence that the delay or the anticipated delay has been or will be caused by a force majeure event, that the duration of the delay or the extension sought was or will be warranted under the circumstances, that best efforts were exercised to avoid and mitigate the effects of the delay, and that Respondent complied with the requirements of this section. If Respondent satisfies this burden, the time for performance of such obligation will be extended by U.S. EPA for such time as is necessary to complete such obligation.

XVIII. RESERVATION OF RIGHTS

A. U.S. EPA reserves all of its statutory and regulatory powers, authorities, rights, and remedies, both legal and equitable, which may pertain to this Facility, the work required by this Order, or Respondent's failure to comply with any of the requirements of this Order, including without limitation the assessment of penalties under §3008(h)(2) of RCRA, 42 U.S.C. §6928(h)(2). This Order shall not be construed as a covenant not to sue, release, waiver, or limitation of any rights, remedies, powers, and/or authorities, civil or criminal, which U.S. EPA has under RCRA, CERCLA, or any other statutory, regulatory, or common law authority of the United States.

B. U.S. EPA reserves the right to disapprove of work performed by Respondent pursuant to this Order and to order that Respondent perform the work required or additional tasks.

C. U.S. EPA reserves the right to perform any portion of the work consented to herein or any additional site characterization, feasibility study, and remedial work as it deems necessary to protect human health and/or the environment. U.S. EPA may exercise its authority under CERCLA to undertake response actions at any time. In any event, U.S. EPA reserves its right to seek reimbursement

from Respondent for costs incurred by the United States. Notwithstanding compliance with the terms of this Order, Respondent is not released from liability, if any, for the costs of any response actions taken or authorized by U.S. EPA.

D. If U.S. EPA determines that activities in compliance or noncompliance with this Order have caused or may cause a release of hazardous waste or hazardous constituent(s), or a threat to human health and/or the environment, or that Respondent is not capable of undertaking any of the work ordered, U.S. EPA may order Respondent to stop further implementation of this Order for such period of time as U.S. EPA determines may be needed to abate any such release or threat and/or to undertake any action which U.S. EPA determines is necessary to abate such release or threat.

E. This Order is not intended to be nor shall it be construed to be a permit. Further, the parties acknowledge and agree that U.S. EPA's approval of a scope of work or any final workplan does not constitute a warranty or representation that the scope of work or workplan will achieve the required cleanup or performance standards. Compliance by Respondent with the terms of this Order shall not relieve Respondent of

its obligations to comply with RCRA or any other applicable local, State, or Federal laws and regulations.

F. Notwithstanding any other provision of this Order, no action or decision by U.S. EPA pursuant to this Order, including without limitation, decisions of the Regional Administrator, the Director of the Waste, Pesticides and Toxics Division or any authorized representative of U.S. EPA, shall constitute final agency action giving rise to any right of judicial review prior to U.S. EPA's initiation of a judicial action to enforce this Order, including an action for penalties or an action to compel Respondent's compliance with the terms and conditions of this Order.

G. In any action brought by U.S. EPA for a violation of this Order, Respondent shall bear the burden of proving that U.S. EPA's actions were arbitrary and capricious and not in accordance with law.

H. In any subsequent administrative or judicial proceeding initiated by the United States for injunctive or other appropriate relief relating to the Facility, Respondent shall not assert, and may not maintain, any defense or claim based upon the principles of waiver, res judicata, collateral estoppel, issue preclusion, claim-splitting, or other defenses based upon any contention that the claims

raised by the United States in the subsequent proceeding were or should have been raised in the present matter.

XIX. OTHER CLAIMS

A. Nothing in this Order shall constitute or be construed as a release from any claim, cause of action, demand, or defense in law or equity, against any person, firm, partnership, or corporation for any liability it may have arising out of or relating in any way to the generation, storage, treatment, handling, transportation, release, or disposal of any hazardous constituents, hazardous substances, hazardous wastes, pollutants, or contaminants found at, taken to, or taken or migrating from the Facility.

B. The Respondent waives any claims or demands for compensation or payment under §§106(b), 111, and 112 of CERCLA; 42 U.S.C. §§9606(b), 9611, and 9612; against the United States or the Hazardous Substance Superfund established by 26 U.S.C. §9507 for, or arising out of, any activity performed or expense incurred pursuant to this Order. Additionally, this Order does not constitute any decision on preauthorization of funds under §111(a)(2) of CERCLA, 42 U.S.C. §9611(a)(2).

XX. OTHER APPLICABLE LAWS

All actions required to be taken pursuant to this Order shall be undertaken in accordance with the requirements of all applicable local, State, and Federal laws and regulations. Respondent shall obtain or cause its representatives to obtain all permits and approvals necessary under such laws and regulations.

XXI. INDEMNIFICATION OF THE UNITED STATES GOVERNMENT

A. Respondent agrees to indemnify and save and hold harmless the United States Government, its agencies, departments, agents, and employees, from any and all claims or causes of action arising from or on account of acts or omissions of Respondent or its officers, employees, agents, independent contractors, receivers, trustees, and assigns in carrying out activities required by this Order.

B. This indemnification shall not be construed in any way as affecting or limiting the rights or obligations of Respondent or the United States under their various contracts.

XXII. FINANCIAL RESPONSIBILITY

A. Respondent shall provide financial assurance for the implementation of corrective measure(s) within ninety (90) days of U.S. EPA's selection of the final corrective

measure(s). Respondent shall establish the financial assurance from among one or more of the following:

1. A trust fund;

2. A surety bond;

3. A letter of credit;

4. Insurance; or

5. A financial test and corporate guarantee.

B. The wording and terms of the financial assurance instrument(s) shall be subject to approval by the U.S. EPA.

XXIII. MODIFICATION

A. This Order may only be modified by mutual agreement of U.S. EPA and Respondent. Any agreed modification shall be in writing, be signed by both parties, shall have as its effective date, the date on which it is signed by U.S. EPA, and shall be incorporated into this Order.

B. Any reports, plans, specifications, schedules, and attachments required by this Order are, upon written approval by U.S. EPA, incorporated into this Order.

C. Unless there is an approved modification as provided in paragraph D of this section, any noncompliance with such

U.S. EPA-approved reports, plans, specifications, schedules, and attachments shall be considered a violation of this Order and shall subject Respondent to the penalty provisions of Section XV: Delay in Performance/Stipulated Penalties.

D. Any request by Respondent for a compliance date modification and/or revision of an approved workplan requirement must be made in writing and be received by U.S. EPA at least ten (10) days prior to an applicable deadline. Such requests must provide justification for any proposed compliance date modification or workplan revision. U.S. EPA has no obligation to approve such requests, but if it does so, such approval and the modification or revision must be in writing from U.S. EPA's Project Coordinator.

E. Any approved compliance date modification shall be incorporated by reference into the Order. Such a modification would not alter other due dates, unless so stated by U.S. EPA in its written approval, modification, or revision.

F. No informal advice, guidance, suggestions or comments by U.S. EPA regarding reports, plans, specifications, schedules or any other writing submitted by the Respondent will be construed as relieving Respondent of its obligation to obtain written approval, if and when required by this Order.

XXIV. SEVERABILITY

If any provision or authority of this Order or the application of this Order to any party or circumstances is held by any judicial or administrative authority to be invalid, the application of such provisions to other parties or circumstances and the remainder of the Order shall remain in force and shall not be affected thereby.

XXV. SURVIVABILITY/PERMIT INTEGRATION

A. Except as otherwise expressly provided in this section, this Order shall survive the issuance or denial of a RCRA permit for the Facility, and this Order shall continue in full force and effect after either the issuance or denial of such permit. Accordingly, Respondent shall continue to be liable for the performance of obligations under this Order notwithstanding the issuance or denial of such permit.

B. If the Respondent is issued a RCRA permit for this Facility that expressly incorporates all or part of the requirements of this Order, or expressly states that its requirements are intended to replace some or all of the requirements of this Order, Respondent may request a modification of this Order and shall, with written U.S. EPA approval, be relieved of liability under this Order for those specific obligations.

XXVI. SUBMITTAL SUMMARY

Table 4, as follows, is a summary of the major deadlines required by this Order. To the extent that this section is inconsistent with any other section of this Order, such other section rather than this summary shall prevail.

Table 4
Submittal Summary

SECTION	ACTION	DUE DATE
IV.D	Notify U.S. EPA of transfer of ownership	30 days prior to such scheduled transfer
VII.A	Designate a Project Coordinator and notify U.S. EPA in writing	Within 15 days of the effective date of the Order
VIII.B.4	Submit IM Workplan	Within 30 days of receipt of U.S. EPA's request/ determination or upon written request
VIII.C.1	Submit DOCC Report	Within 60 days of the effective date of this Order
VIII.C.2	Submit RFI Workplan	Within 90 days of the effective date of this Order
VIII.C.4	Submit RFI Report	As scheduled in approved RFI Workplan
VIII.D.1	Submit CMS Report	Within 90 days of receipt of U.S. EPA approval of RFI Report
VIII.E.1	Submit CMI Workplan	Within 60 days of notification of U.S. EPA's selection of corrective measure(s)

Table 4
Submittal Summary

SECTION	ACTION	DUE DATE
VIII.E.3	Submit CMI Report	As scheduled in approved CMI Workplan
VIII.F.4	Submit workplan for additional work	If necessary, within 30 days of receipt of U.S. EPA determination
IX.A.2	Revise and Submit document disapproved or disapproved with comments	Within 45 days of receipt of U.S. EPA's document disapproval or disapproval with comments
IX.B.2	Notify U.S. EPA in writing of proposed contractor(s)	Within 14 days of the effective date of the Order
XI.C	Notify U.S. EPA prior to beginning each separate phase of field work	14 days prior to beginning field activities
XII.C	Obtain access agreements	If necessary, within 30 days of approval of workplan where access is required
XIII.A	Notify U.S. EPA prior to destruction of documents or records that relate to this Order	90 days prior to destruction
XIV.A	Submit monthly progress reports	On the tenth day of each month

XXVII. TERMINATION AND SATISFACTION

A. The provisions of this Order shall be deemed satisfied upon Respondent's and U.S. EPA's execution of an "Acknowledgment of Termination and Agreement to Record Preservation and Reservation of Rights" (Acknowledgment). U.S. EPA will prepare the Acknowledgment for Respondent's signature. When U.S. EPA has determined that Respondent has demonstrated to the satisfaction of U.S. EPA that the terms of this Order, including any additional tasks determined by U.S. EPA to be required pursuant to this Order, have been satisfactorily completed and any penalties have been paid. Respondent's execution of the Acknowledgment will affirm Respondent's continuing obligation as identified by U.S. EPA. The obligations include:

1. Preserving all records as required in Section XIII: Record Preservation;

2. Recognizing U.S. EPA's reservation of rights as required in Section XVIII: Reservation of Rights, after all other requirements of the Order are satisfied; and

3. Maintaining long-term corrective measures until such time U.S. EPA terminates Respondent's duty for these activities.

B. The Acknowledgment required by this section shall be as in Attachment VII: Acknowledgment of Termination.

XXVIII. EFFECTIVE DATE

The effective date of this Order shall be the date on which it is signed by U.S. EPA. Because the Order was entered with the consent of both parties, Respondent waives its right to request a public hearing pursuant to Section 3008(b) of RCRA, 42 U.S.C. §6928(b).

IT IS SO AGREED:
For: Radio Materials Corporation

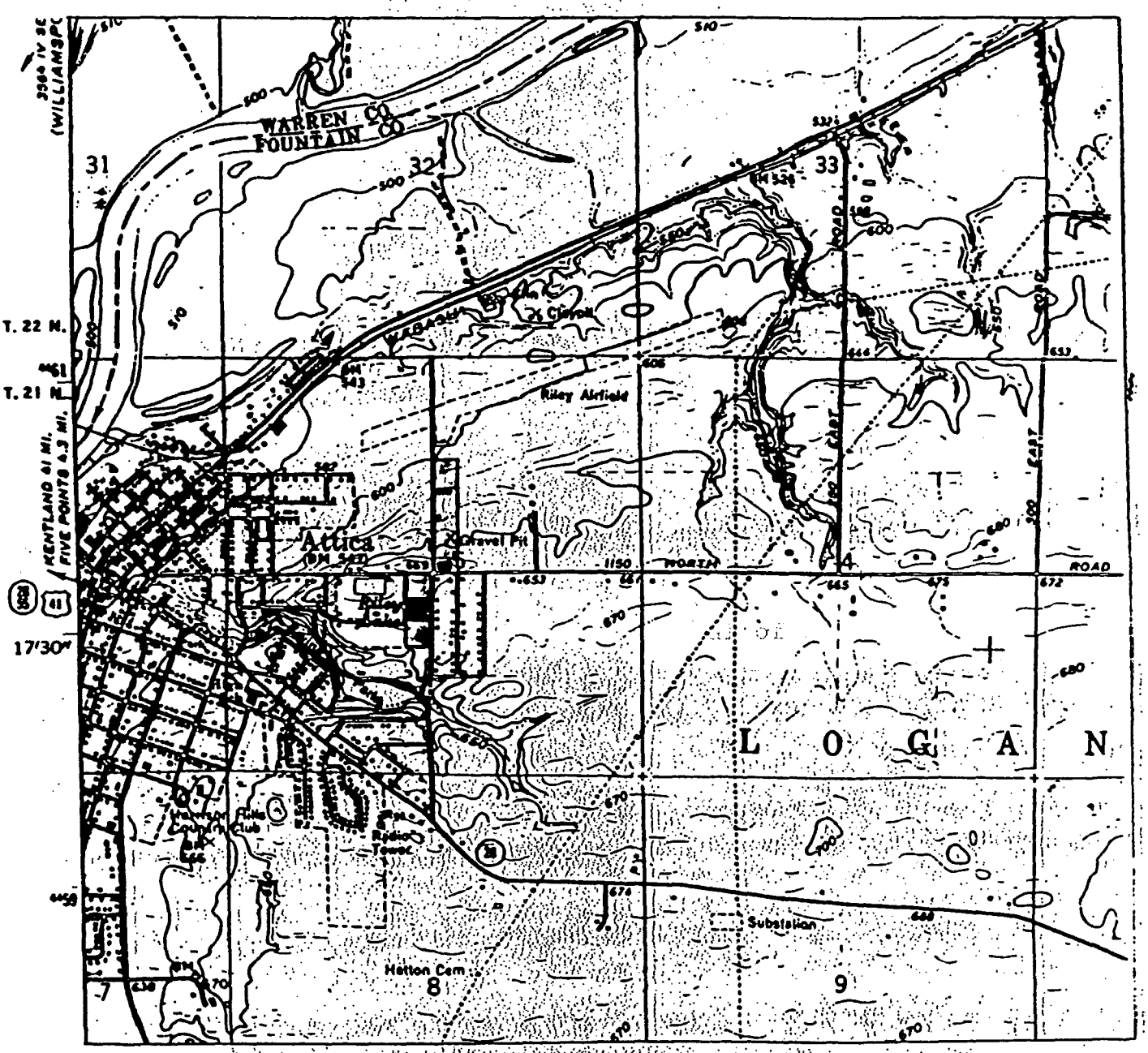
BY: _____ February 9, 1999
(Respondent) Joseph F. Riley, Jr. Date
President

IT BEING SO AGREED, IT IS HEREBY ORDERED THIS 1st DAY OF March, 1999

BY: _____
Joseph M. Boyle, Chief
Enforcement & Compliance Assurance Branch
Waste, Pesticides and Toxics Division
U.S. EPA, Region 5

U.S. EPA I.D.# IND 005 477 021

FIGURE 1
FACILITY LOCATION MAP

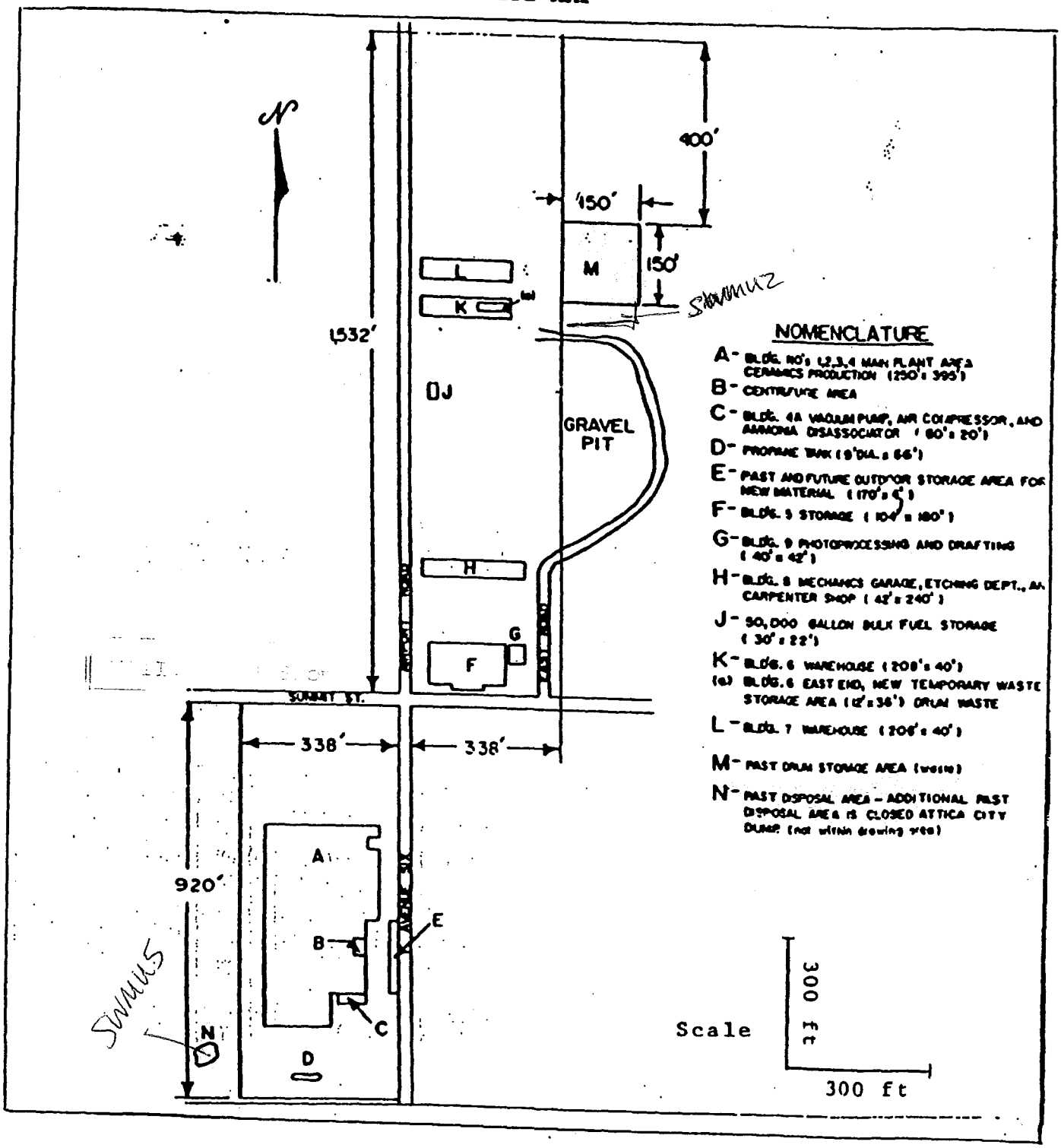


USGS 7.5 Minute Quadrangle, Attica, IN, 1962

Scale: 1 inch = 2000 ft

Metcalf & Eddy

FIGURE 2
SITE MAP



NOMENCLATURE

A- BLDG. NO's 1,2,3,4 MAIN PLANT AREA CERAMICS PRODUCTION (250' x 395')

B- CENTRIFUGE AREA

C- BLDG. 4A VACUUM PUMP, AIR COMPRESSOR, AND AMMONIA DISASSOCIATOR (80' x 20')

D- PROPANE TANK (9' DIA. x 66')

E- PAST AND FUTURE OUTDOOR STORAGE AREA FOR NEW MATERIAL (170' x 6')

F- BLDG. 5 STORAGE (104' x 180')

G- BLDG. 9 PHOTOPROCESSING AND DRAFTING (40' x 42')

H- BLDG. 8 MECHANICS GARAGE, ETCHING DEPT., AND CARPENTER SHOP (42' x 240')

J- 50,000 GALLON BULK FUEL STORAGE (30' x 22')

K- BLDG. 6 WAREHOUSE (208' x 40')

(a) BLDG. 6 EAST END, NEW TEMPORARY WASTE STORAGE AREA (12' x 36') DRUM WASTE

L- BLDG. 7 WAREHOUSE (208' x 40')

M- PAST DRUM STORAGE AREA (vacant)

N- PAST DISPOSAL AREA - ADDITIONAL PAST DISPOSAL AREA IS CLOSED ATTICA CITY DUMP (not within drawing area)

Metcalf & Eddy

TABLE 1
Waste Streams Generated at Radio Materials Corporation

WASTE STREAM	AMOUNT	DISPOSAL/TREATMENT
Ceramic Waste	6 drums/yr	Recycled
Fired ceramic discs	86 lbs/mo	Municipal landfill
Aluminum oxide refractory scrap	100 lbs/mo	Recycled/stored/land-filled
Waste epoxy and phenolic resin	75 lbs/mo	Stored on site
Aqueous flux in alcohol	23 gal/mo	Manifested off site
Ink-jet inks and solvents	<1 gal/mo	Manifested off site
Cleaning and rinse water	1700 gal/mo	City sewer
Tetrachloroethylene, Trichloroethylene, Acetone/alcohol, and Ethyl acetate	averages 23 gal/mo	Manifested off site
Oil/water waste	8-10 drums/yr	Oil recovery tank truck
Waste silver Waste copper wire Solder dross Product rejects	10 tr oz/mo 161 lbs/mo 20 lbs/mo 108 lbs/mo	Smelted and refined for recovery of metal content or stored on site when metal markets are low
Empty raw material bags that contained barium carbonate and titanium dioxide	100 bags/mo	Municipal landfill

TABLE 2
Current Radio Materials Corp Wastes, By Chemical Composition and Hazardous Waste Code

CHEMICAL	HAZARDOUS WASTE CODE
Trichloroethylene	Listed Waste F001
Tetrachloroethylene	Listed Waste F001
Acetone/alcohol	Listed Waste F003
Phenolic resin	Characteristic Waste D001
Solder dross (lead)	Characteristic Waste D008
Non-halogenated solvent	Listed Waste F005
Ethyl acetate	Listed Waste F003
Methyl ethyl ketone	Listed Waste F005
Waste ink (silver)	Characteristic Waste D011
Ceramic Scrap (barium)	Characteristic Waste D005

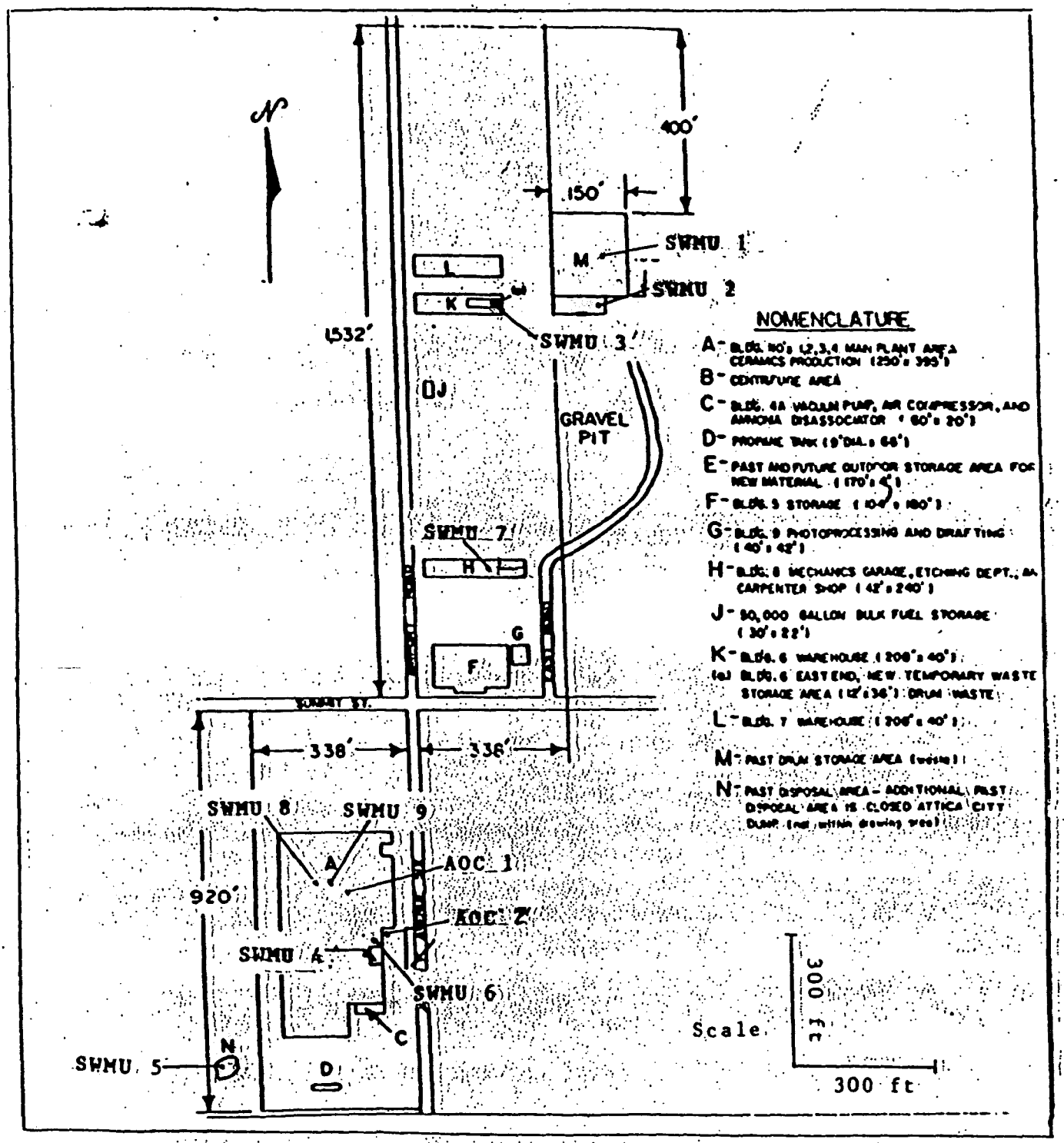
TABLE 3

Summary of Solid Waste Management Units at Radio Materials Corporation

SWMU Name	RCRA HWMU	Status
SWMU 1 - Outdoor Drum Area	Y - Storage	Closure Pending
SWMU 2 - Past Disposal Area "A"	N - Disposal	Inactive
SWMU 3 - Temporary Storage Area	Y - Storage	Closure Pending
SWMU 4 - Centrifuge Area	Y - Treatment	Closure Pending
SWMU 5 - Past Disposal Area "B"	N - Disposal	Inactive
SWMU 6 - Eight 55-Gallon Drum Storage Area	N - Storage	Active
SWMU 7 - Etching Room	N - Process Area	Inactive
SWMU 8 - Phenolic Dip Area	N - Process Area	Active
SWMU 9 - Epoxy Resin Coating Room	N - Process Area	Active

Y - Unit is currently or was a RCRA hazardous waste management unit.
N - Unit is not currently nor has been a RCRA hazardous waste management unit.

FIGURE 3
SWMU AND AOC LOCATIONS



Metcalf & Eddy

ATTACHMENT I
Interim Measures
Scope of Work

Purpose

If deemed necessary by Respondent and/or U.S. EPA, the purpose of Interim Measures (IM) are to control or abate immediate threats to human health and the environment and/or prevent or minimize the release or potential release of hazardous wastes or hazardous constituents at or from the Facility while long-term corrective measure alternatives are being evaluated. Respondent shall furnish all personnel, materials and services necessary for, or incidental to, performing the IMs.

Scope

Interim Measures are one possible step in the corrective action program. Interim Measures consist of the following components, which for clarity have been designated as sections.

Section I: Interim Measures Workplan

A. Interim Measures Objectives

B. Health and Safety Plan

C. Public Involvement Plan

D. Quality Assurance Project Plan

E. Data Management and Reporting Plan

Section II: Interim Measures Design Program

A. Design Plans and Specifications

B. Operations and Maintenance Plan

C. Project Schedule

D. Final Design Documents

Section III: Interim Measures Construction Quality Assurance Plan

A. Construction Quality Assurance Objectives

B. Inspection Activities

C. Documentation

Section IV: Reports

A. Progress

B. Interim Measures Workplan

C. Final Design Documents

D. Draft Interim Measures Report

E. Final Interim Measures Report

Section V: Proposed Schedule

Section I: Interim Measures Workplan

If interim measures are proposed by Respondent and/or determined to be necessary by U.S. EPA, Respondent shall prepare an Interim Measures Workplan. The Workplan shall include the development of several plans which shall be prepared concurrently.

A. Interim Measures Objectives

The Workplan shall specify the objectives of the interim measures, demonstrate how the interim measures will abate releases and threatened releases, and to the extent possible, be consistent and integrated with any long-term solution at the facility. The Interim Measures Workplan will include a discussion of the technical approach, engineering design, engineering plans, schedules, budget, and personnel. The Workplan will also include a description of qualifications of personnel performing or directing the interim measures, including contractor personnel. This plan shall also document the overall management approach to the interim measures and whether a Quality Assurance Project Plan and Data Management and Reporting Plan are required for the IM.

B. Health and Safety Plan

Respondent shall submit a Health and Safety Plan to U.S. EPA for review, although it does not require approval by U.S. EPA.

1. Major elements of the Health and Safety Plan may include:

- Facility description, including availability of resources such as roads, water supplies, electricity and telephone services;
- Description of the known hazards and evaluation of the risks associated with the incident and with each activity conducted;
- A list of key personnel and alternates responsible for site safety, response operations, and for protection of human health;
- Description of the levels of protection to be worn by personnel;

- Delineation of the work area;
- Procedures to control site access;
- Description of decontamination procedures for personnel and equipment;
- Site emergency procedures;
- Emergency medical care for injuries and toxicological problems;
- Description of requirements for an environmental surveillance program;
- Routine and special training required for response personnel; and
- Procedures for protecting workers from weather-related problems;

2. The Facility Health and Safety Plan shall be consistent with:

- NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);
- U.S. EPA Order 1440.1 - Respiratory Protection;
- U.S. EPA Order 1440.3 - Health and Safety Requirements for Employees engaged in Field Activities;
- Facility Contingency Plan;
- U.S. EPA Standard Operating Safety Guide (1984);
- OSHA regulations particularly in 29 CFR 1910 and 1926;
- State and local regulations; and
- Other U.S. EPA guidance as provided.

C. Public Involvement Plan

All Public Involvement Plans prepared by Respondent shall be submitted to U.S. EPA for comment and approval prior to use. Respondent must never appear to represent or speak for the U.S. EPA before the public, other government officials, or the media.

Public Involvement activities that may be required of Respondent include the following:

- Conducting an open house or informal meeting (i.e., availability session) in a public location where people can talk to Agency officials and Respondent on a one-to-one basis;
- Preparing fact sheets summarizing current or proposed corrective action activities (all fact sheets should be reviewed by the U.S. EPA prior to public distribution);
- Communicating effectively with people who have vested interest in the corrective action activities, (e.g., providing written or verbal information in the foreign language of a predominantly non-English-speaking community); and
- Maintaining an easily accessible repository (such as a town hall or public library or the Facility itself, in some limited circumstances) of information on the facility-specific corrective action program, including the order, approved workplans, and/or other reports.

A schedule for community relations activities shall be included in the Public Involvement Plan.

D. Quality Assurance Project Plan

Respondent shall prepare a plan to document all monitoring procedures, sampling, field measurements and sample analysis performed during interim measures so as to ensure that all information, data, and resulting decisions are technically sound, statistically valid, and properly documented. The QAPP shall be prepared in accordance with Attachment V. A pre-QAPP meeting shall be held prior to preparation of the QAPP. Participants shall include, but are not limited to Respondent, their QAPP preparer, laboratory representatives, U.S. EPA Project Coordinator, and U.S. EPA Quality Assurance representatives.

A performance audit may be conducted by U.S. EPA on the laboratory selected by Respondent.

E. Data Management and Reporting Plan

Respondent shall develop and initiate a Data Management and Reporting Plan to document and track interim measures data and results. This plan shall identify and set up data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and conclusions of the interim measures.

All groundwater data shall be submitted in a computer accessible format, i.e., diskette. The format used shall be compatible with the U.S. EPA, Region 5 groundwater database known as the Ground Water Information Tracking System (GRITS), Version 4.0.

Section II: Interim Measures Design Program

A. Design Plans and Specifications

Respondent shall develop clear and comprehensive design plans and specifications which include but are not limited to the following:

1. Discussion of the design strategy and the design basis, including:

- Compliance with all applicable or relevant environmental and public health standards; and
- Minimization of environmental and public impacts.

2. Discussion of the technical factors of importance including:

- Use of currently accepted environmental control measures and technology;
- The constructibility of the design; and
- Use of currently acceptable construction practices and techniques.

3. Description of assumptions made and detailed justification of these assumptions.

4. Discussion of the possible sources of error and references to possible operation and maintenance problems.

5. Detailed drawings of the proposed design including:

- Qualitative flow sheets;
- Quantitative flow sheets;
- Facility layout; and
- Utility locations.

6. Tables listing materials, equipment and specifications.

7. Tables giving material balances.

8. Appendices including:

- Sample calculations (one example presented and explained clearly for significant or unique design calculations);
- Derivation of equations essential to understanding the report; and
- Results of laboratory or field tests.

General correlations between drawings and technical specifications is a basic requirement of any set of working construction plans and specifications. Before submitting the project specifications, Respondent shall coordinate and cross-check the specifications and drawings and complete the proofing of the edited specifications and required cross-checking of all drawings and specifications.

B. Operation and Maintenance Plan

Respondent shall prepare an Operation and Maintenance Plan to cover both implementation and long-term maintenance of the interim measure. The plan shall be composed of the following elements as appropriate to the specific interim measure:

1. Equipment start-up and operator training

Respondent shall prepare, and include in the technical specifications governing treatment systems, contractor requirements for providing appropriate service visits by experienced personnel to supervise the installation, adjustment, start-up and operation of the treatment systems and training covering appropriate operational procedures once the start-up has been successfully accomplished.

2. Description of normal operation and maintenance (O&M), including:

- Description of tasks for operation;
- Description of tasks for maintenance;
- Description of prescribed treatment or operation conditions;
- Schedule showing frequency of each O&M task; and
- Common and/or anticipated remedies.

3. Description of routine monitoring and laboratory testing, including:

- Description of monitoring tasks;
- Description of required laboratory tests and their interpretation;
- Required QA/QC; and
- Schedule of monitoring frequency and date, if appropriate, when monitoring may cease.

4. Description of equipment, including:

- Equipment identification;
- Installation of monitoring components;
- Maintenance of site equipment; and

- Replacement schedule for equipment and installed components.

5. Records and reporting mechanisms required, including:

   - Daily operating logs;
   - Laboratory records;
   - Mechanism for reporting emergencies;
   - Personnel and maintenance records; and
   - Monthly/annual reports to Federal/State agencies.

The Operation and Maintenance Plan shall be submitted with the Final Design Documents or as approved in the Interim Measures Workplan.

C. Project Schedule

Respondent shall develop a detailed Project Schedule for construction and implementation of the interim measure(s) which identifies timing for initiation and completion of all critical path tasks. Respondent shall specifically identify dates for completion of the project and major interim milestones which are enforceable terms of this Order. A Project Schedule shall be submitted simultaneously with the Final Design Documents.

D. Final Design Documents

The Final Design Documents shall consist of the Final Design Plans and Specification (100%) complete, the final Draft Operation and Maintenance Plan, and Project Schedule. Respondent shall submit the final documents 100% complete with reproducible drawings and specifications. The quality of the design documents should be such that Respondent would be able to include them in a bid package and invite contractors to submit bids for the construction project.

Section III: Interim Measure Construction Quality Assurance Plan

A. Construction Quality Assurance Objectives

In the CQA plan, Respondent shall identify and document the objectives and framework for the development of a construction quality assurance program including, but not limited to the following: responsibility and authority; personnel qualifications; inspection activities; sampling requirements; and documentation. The responsibility and authority of all organizations (i.e., technical consultants, construction firms, etc.) and key personnel involved in the construction of the interim measure should be described fully in the CQA plan. Respondent must identify a CQA officer and the necessary supporting inspection staff.

B. Inspection Activities

The observations and tests that will be used to monitor the construction and/or installation of the components of the interim measure(s) shall be summarized in the CQA plan. The plan shall include the scope and frequency of each type of inspection. Inspections shall verify compliance with all environmental requirements and include, but not be limited to, air quality and emissions monitoring records, waste disposal records (e.g., RCRA transportation manifests), etc. The inspection should also ensure compliance with all health and safety procedures. In addition to oversight inspections, Respondent shall conduct the following activities:

1. Preconstruction inspection and meeting

Respondent shall conduct a preconstruction inspection and meeting to:

- Review methods for documenting and reporting inspection data;
- Review methods for distributing and storing documents and reports;
- Review work area security and protocol;
- Discuss any appropriate modifications of the construction quality assurance plan to ensure that site-specific considerations are addressed; and
- Conduct a site walk-around to verify that the design criteria, plans, and specifications are

understood and to review material and equipment storage locations.

The preconstruction inspection and meeting shall be documented by a designated person and minutes should be transmitted to all parties.

2. Prefinal inspection

Upon preliminary project completion, Respondent shall notify U.S. EPA for the purposes of conducting a prefinal inspection. The prefinal inspection will consist of a walk-through inspection of the entire project site. The inspection is to determine whether the project is complete and consistent with the contract documents and the U.S. EPA approved interim measure. Any outstanding construction items discovered during the inspection will be identified and noted. Additionally, treatment equipment will be operationally tested by Respondent will certify that the equipment has performed to meet the purpose and intent of the specifications. Retesting will be completed where deficiencies are revealed. The prefinal inspection report should outline the outstanding construction items, actions required to resolve items, completion date for these items, and date for final inspection.

3. Final Inspection

Upon completion of any outstanding construction items, Respondent shall notify U.S. EPA for the purpose of conducting a final inspection. The final inspection will consist of a walk-through inspection of the project site. The prefinal inspection will be used as a checklist with the final inspection focusing on the outstanding items that have been resolved.

4. Sampling and Testing Requirements

The sampling and testing activities, sample size, sample and test locations, frequency of testing, acceptance and rejection criteria, and plans for correcting problems should be presented in the CQA.

C. Documentation

Reporting requirements for CQA activities shall be described in detail the CQA plan. This shall include such items as daily summary reports, inspection data sheets, problem identification and interim measures reports, design acceptance reports and final documentation. Provisions for the final storage of all records shall be presented in the CQA plan.

Section IV: Reports

A. Progress

Respondent shall at a minimum provide the U.S. EPA with signed, monthly progress reports containing:

1. A description and estimate of the percentage of the interim measures completed;

2. Summaries of *all* findings;

3. Summaries of *all* changes made in the interim measures during the reporting period;

4. Summaries of *all* contacts with representatives of the local community, public interest groups, or State government during the reporting period;

5. Summaries of *all* problems of potential problems encountered during the reporting period;

6. Actions being taken to rectify problems;

7. Changes in personnel during the reporting period;

8. Projected work for the next reporting period; and

9. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

B. Interim Measures Workplan

Respondent shall submit an Interim Measures Workplan as described in Sections I, II and III.

C. Final Design Documents

Respondent shall submit the Final Design Documents as described in Section II.

D. Draft Interim Measures Report

At the "completion" of the construction of the project (except for long-term operations, maintenance and monitoring), Respondent shall submit an Interim Measures and Implementation Report to U.S. EPA. The Report shall document that the project is consistent with the design specifications, and that the interim measures are performing adequately. The Report shall include, but not be limited to, the following elements:

1. Synopsis of the interim measures and certification of the design and construction;

2. Explanation of any modifications to the plan and why these were necessary for the project;

3. Listing of criteria, established before the interim measures were initiated, for judging the functioning of the interim measures and also explaining any modification to these criteria;

4. Results of facility monitoring, indicating that interim measures will meet or exceed the performance criteria; and

5. Explanation of the operation and maintenance (including monitoring) to be undertaken at the facility.

This report shall include the inspection summary reports, inspection data sheets, problem identification and corrective measure reports, block evaluation reports, photographic reporting data sheets, design engineers' acceptance reports, deviations from design and material specifications (with justifying documentation) and as-built drawings.

E. Final Interim Measures Report

Respondent shall finalize the Interim Measures Work Plan and the Interim Measures Implementation Report incorporating comments received on draft submissions.

Section V: Proposed Schedule

Respondent will provide U.S. EPA with IM submittals according to the following schedule:

Facility Submission	Due Date
Interim Measures Workplan -Interim Measures Objectives -Health and Safety Plan -Public Involvement Plan -Quality Assurance Project Plan -Data Management and Reporting Plan -Construction QA Plan	Within 30 days of U.S. EPA request/determination or upon written request
Final Design Documents -Design Plans and Specs -O&M Plan -Project Schedule	As outlined in the approved IM workplan
Draft Interim Measures Report	In accordance with the project schedule approved in the IM Workplan
Final Interim Measures Report	45 days after receipt of U.S. EPA comments on Draft IM Report
Progress Reports	Monthly

ATTACHMENT II

RCRA Facility Investigation
Scope of Work

ATTACHMENT II
RCRA Facility Investigation
Scope of Work

Purpose

The purpose of the RCRA Facility Investigation (RFI) is to determine the nature and extent of releases of hazardous waste or constituents from regulated units, solid waste management units, areas of concern, and other source areas at and from the Facility and to gather all necessary data to support a Corrective Measures Study. Respondent shall furnish all personnel, materials, and services necessary for, or incidental to, performing the RFI.

Scope

The RCRA Facility Investigation is one step in the corrective action program. The RFI consists of the following components, which for clarity have been designated as sections.

Section I: Description of Current Conditions

A. Facility Background

B. Preliminary Assessment of Nature and Extent of Contamination

C. Implementation of Interim/Stabilization Measures

Section II: RFI Workplan

A. Purpose/Objectives

B. Project Management Plan

C. Quality Assurance Project Plan

D. Data Management and Reporting Plan

E. Health and Safety Plan

F. Public Involvement Plan

G. Schedule for Facility Investigation

Section III: Facility Investigation

A. Purpose/Objectives

B. Environmental Setting

C. Source Characterization

D. Contamination Characterization

E. Potential Receptor Identification

Section IV: Investigation Results and Analysis

A. Data Analysis

B. Media Cleanup Standards

C. Analysis of Risk

Section V: Progress Reports

Section VI: Proposed Schedule

Section I: Description of Current Conditions

Respondent shall submit to U.S. EPA for review and comment, a report (as set forth below) providing the background information on the Facility, contamination, and interim measures. Respondent shall indicate in the applicable section if some of this information is not available. This report shall contain information that is consistent with the data gathered during the RCRA Facility Assessment. The current condition report shall be submitted prior to the submission of the RFI to allow the U.S. EPA to review it.

A. Facility Background

Respondent's report shall summarize the regional location, pertinent boundary features, general facility physiography, hydrogeology, and historical use of the facility for the treatment, storage, or disposal of solid and hazardous waste. Respondent's report shall include:

1. *Maps*. All maps shall be of sufficient detail and accuracy to locate and report all current and future work performed at the site. Aerial photographs may be used with solid waste management units, areas of concern, and other source areas superimposed on them. Maps shall depict the following:

- General geographic location;
- Property lines, with the owners of all adjacent property clearly indicated;
- Topography and surface drainage depicting all waterways, wetlands, flood plains, water features, drainage patterns, and surface-water containment areas;
- All tanks, buildings, utilities, paved areas, easements, rights-of-way, and other features;
- All solid or hazardous waste treatment, storage, or disposal areas active after November 19, 1980;
- All known past solid or hazardous waste treatment, storage or disposal areas regardless of whether they were active on or after November 19, 1980;

- All known past and present product and waste underground tanks or piping;
- Surrounding land uses (residential, commercial, industrial, agricultural, recreational);
- The location of all municipal, public, private and industrial wells, along with all monitoring wells, at the Facility and within a 1-mile radius of the Facility. These wells shall be clearly labeled and ground and top of casing elevations and construction details included, if available (these elevations and details may be included as an attachment); and
- Wind rose and meteorology.

2. A history and description of ownership and operation, solid and hazardous waste generation, treatment, storage and disposal activities at the facility.

3. Approximate dates or periods of past product and waste spills, identification of the materials spilled, the amount spilled, the location where spilled, and a description of the response actions conducted (local, State, or Federal response units or private parties), including any inspection reports or technical reports generated as a result of the response.

4. A summary of past permits applied for and/or received, any enforcement actions and their subsequent responses and a list of documents and studies prepared for the facility. This may include information from previous and/or present owner/operators, if available.

5. A general description of major habitat types (e.g., grasslands, forests, lakes, streams, wetlands) located in and adjacent to the facility. In delineating wetlands, the U.S. Fish and Wildlife Service's National Wetland Inventory maps should be consulted. The U.S. Army Corps of Engineers should be consulted and wetlands should be delineated using the Federal Manual for Identifying and Delineating Jurisdictional Wetlands.

6. A general description of plants and animals at and adjacent to the facility, including the following:

qualitative observations of resident plants and animals (birds, mammals, fish, stream benthos, etc.); and classification of vegetation community types. Threatened and endangered species possibly on or near the facility should be identified as early as possible.

B. Preliminary Assessment of Nature and Extent of Contamination

Respondent shall prepare and submit for U.S. EPA review, a preliminary report describing the existing information on the nature and extent of contamination.

1. Respondent's report shall summarize all possible source areas of contamination. This, at a minimum, shall include all RCRA-regulated units, solid waste management units, areas of concern, spill areas, and other suspected source areas of contamination. For each area, Respondent shall identify the following:

- Location of unit/area (to be depicted on facility map provided in Section I.A.1);
- Quantities of solid and hazardous wastes (both managed and spilled or released);
- Type of hazardous waste or constituents (both causing or potentially causing contamination), to the extent known;
- Identification of areas where additional information is necessary; and
- The results of previous investigations.

2. Respondent shall prepare a preliminary assessment and description of the existing degree and extent of contamination. This shall include:

- For each medium where the Order identifies a release (e.g., soil, groundwater, surface water, sediments, etc.), a description of the existing extent of contamination. This description must include all available monitoring data and qualitative information on the locations and levels of contamination at the facility (both on-site and off-site). Include biodata (e.g.,

fishkills, distressed vegetation, abnormal individuals of a species, carcasses, tissue studies, etc.). Include a general assessment of the data quality, a map showing the location of all existing sampling points and potential source areas and contour maps showing any existing ground water plumes at the facility. Highlight potential ongoing release areas that would warrant use of interim measures (see Section I.C. Implementation of Interim/Stabilization Measures); and

- A list and brief description of all previous investigations that have occurred at the facility, who they were conducted for (i.e., agency) and agency contacts.

3. Respondent shall submit a report that identifies the potential impact(s) on human health and the environment, including potential exposure pathways, migration routes, and potential receptors for all relevant land use scenarios related to the sources of contamination identified as relevant in paragraph 1 above. A site-conceptual model should be created to illustrate these pathways, routes, and receptors. The report shall include, at a minimum:

- All potential migration pathways, including information on geology, pedology, hydrogeology, physiography, hydrology, water quality, foodwebs, meteorology, air quality, chemistry, fate and transport characteristics associated with affected media, and natural attenuation, as appropriate;

- Physical properties of known contaminants;

- An assessment of whether off-site migration of contaminants has occurred or is likely to occur;

- An assessment of media-specific potential human exposure pathways (e.g., ingestion, inhalation, dermal contact), including groundwater and surface water use;

- Identification of current and future land use;

- Identification of current or potential receptors at risk including demography and identification of

possible sensitive subpopulations (e.g., schools, homes for the elderly, hospitals, and ecosystems).

C. Implementation of Interim/Stabilization Measures

Respondent's report shall document past, present, or proposed interim/stabilization measures at the facility. This shall include:

- Objectives of the interim/stabilization measures: how the measure is mitigating a potential threat to human health and the environment and/or is consistent with and integrated into any long-term solution at the facility;
- Design, construction, operation, and maintenance requirements;
- Schedules for design, construction and monitoring;
- Schedule for progress reports; and
- Data in support of the potential need for future interim measures or related to any assessment undertaken to determine the need for future interim/stabilization measures.

Section II: RFI Workplan

A. Purpose/Objectives

Respondent shall prepare an RFI Workplan. The purpose of the RFI Workplan is to present to U.S. EPA the specific plans to characterize the nature and extent of contamination. The RFI Workplan shall include the development of several plans, which will be prepared concurrently. During the RCRA Facility Investigation, it may be necessary to revise the RFI Workplan to increase or decrease the detail of information collected to accommodate facility-specific situations.

B. Project Management Plan

Respondent shall prepare a Project Management Plan (PMP) which will include a discussion of the technical approach, schedules, and personnel. The PMP will also include a description of

qualifications of personnel performing or directing the RFI, including contractor personnel. This plan shall also document the overall management approach to the RFI.

C. Quality Assurance Project Plan

Respondent shall prepare a plan to document all monitoring procedures, sampling, field measurements and sample analysis performed during the investigations so as to ensure that all information, data, and resulting decisions are technically sound, statistically valid, and properly documented. The QAPP shall be prepared in accordance with Attachment V. A pre-QAPP meeting shall be held prior to preparation of the QAPP. Participants shall include, but are not limited to Respondent, their QAPP preparer, laboratory representatives, U.S. EPA Project Coordinator, and U.S. EPA Quality Assurance representatives.

A performance audit may be conducted by U.S. EPA on the laboratories selected by Respondent. This audit will be completed and laboratories approved for use on the project prior to the start of field work for the RFI.

D. Data Management and Reporting Plan

Respondent shall develop and initiate a Data Management and Reporting Plan to document and track investigation data and results. This plan shall identify and set up data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and conclusions of the interim measures.

All groundwater data shall be submitted in a computer accessible format, i.e., diskette. The format used shall be compatible with the U.S. EPA, Region 5 groundwater database known as the Ground Water Information Tracking System (GRITS), Version 4.0.

E. Health and Safety Plan

Respondent shall submit a Health and Safety Plan to U.S. EPA for review, although it does not require approval by U.S. EPA.

1. Major elements of the Health and Safety Plan may include:

- Facility description, including availability of resources such as roads, water supplies, electricity and telephone services;
- Description of the known hazards and evaluation of the risks associated with the incident and with each activity conducted;
- A list of key personnel and alternates responsible for site safety, response operations, and for protection of human health;
- Description of the levels of protection to be worn by personnel;
- Delineation of the work area;
- Procedures to control site access;
- Description of decontamination procedures for personnel and equipment;
- Site emergency procedures;
- Emergency medical care for injuries and toxicological problems;
- Description of requirements for an environmental surveillance program;
- Routine and special training required for response personnel; and
- Procedures for protecting workers from weather-related problems;

2. The Facility Health and Safety Plan shall be consistent with:

- NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);
- U.S. EPA Order 1440.1 - Respiratory Protection;

- U.S. EPA Order 1440.3 - Health and Safety Requirements for Employees engaged in Field Activities;
- Facility Contingency Plan;
- U.S. EPA Standard Operating Safety Guide (1984);
- OSHA regulations particularly in 29 CFR 1910 and 1926;
- State and local regulations; and
- Other U.S. EPA guidance as provided.

F. Public Involvement Plan

The Public Involvement Plan (PIP) prepared by Respondent shall be submitted to U.S. EPA for comment and approval prior to use. Respondent must never appear to represent or speak for the U.S. EPA before the public, other government officials, or the media.

Public involvement activities that may be required of Respondent include the following:

- Conducting an open house or informal meeting (i.e., availability session) in a public location where people can talk to Agency officials and Respondent on a one-to-one basis;
- Preparing fact sheets summarizing current or proposed corrective action activities (all fact sheets should be reviewed by the U.S. EPA prior to public distribution);
- Communicating effectively with people who have vested interest in the corrective action activities, (e.g., providing written or verbal information in the foreign language of a predominantly non-English-speaking community); and
- Maintaining an easily accessible repository (such as a town hall or public library or the Facility itself, in some limited circumstances) of information on the facility-specific corrective action program, including the order, approved workplans, and/or other reports.

A schedule for community relations activities shall be included in the PIP.

G. Schedule for Facility Investigation

1. Sampling

2. Analysis

3. Reports

4. Public Involvement Activities

5. Laboratory or Bench-Scale Studies

Section III: Facility Investigation

A. Purpose/Objectives

The Facility Investigation phase of the RFI is the first step of the implementation process. Prior to this implementation phase, all documentation and reports for the Description of Current Conditions and RFI Workplan are drafted and submitted to U.S. EPA for review. Respondent must have approval prior to implementing the procedures outlined in the RFI Workplan. Throughout the RFI implementation phase, it is critical that Respondent comply with report submission requirements. Respondent shall submit both progress reports and a draft RFI Report to U.S. EPA for review. At the direction of U.S. EPA, Respondent shall develop in final format the RFI Report, which will incorporate any comments received on the draft report.

Respondent shall conduct those additional investigations (including sampling) as approved in the RFI Workplan to: characterize the facility (Environmental Setting); define the source (Source Characterization); define the degree and three dimensional extent of contamination (Contamination Characterization); and identify actual or potential receptors (Potential Receptors Identification).

The investigations shall result in data of adequate technical quality to support the development and evaluation of the corrective measure alternative(s) during the CMS and/or IMs.

B. Environmental Setting

Respondent shall collect information to supplement and verify existing information on the environmental setting at the facility (when information already submitted to U.S. EPA is not sufficient). The U.S. EPA may request additional information not included on the following lists. Respondent shall characterize the following areas:

1. Hydrogeology

Respondent shall conduct a program to evaluate hydrogeologic conditions at the facility. This program shall provide the following information:

- A description of the regional and facility-specific geologic and hydrogeologic characteristics affecting groundwater flow beneath the facility, including:
  - Regional and facility-specific stratigraphy including: description of strata including strike and dip, and identification of stratigraphic contacts;
  - Structural geology including: description of local and regional structural features (e.g., folding, faulting, tilting, jointing, etc.);
  - Depositional history;
  - Areas and amounts of recharge and discharge;
  - Influence of tidal actions on groundwater flow regimes near large rivers;
  - Regional and facility-specific groundwater flow patterns; and
  - Seasonal variations in the groundwater flow regime.
- An analysis of any topographic features that might influence the groundwater flow system. (Note: Stereographic analysis of aerial photographs may aid in this analysis.)

- A representative and accurate classification and description of the hydrogeologic units based on field data, tests, and cores that may be part of the migration pathways at the facility (i.e., the aquifers and any intervening saturated and unsaturated zones), including, but not limited to:

  - Hydraulic conductivity, intrinsic permeability [particularly when non-aqueous phase liquids (NAPLs) are present], and porosity (total and effective);

  - Lithology, grain size, sorting, degree of cementation;

  - An interpretation of hydraulic interconnections between saturated zones; and

  - The attenuation capacity and mechanisms of the natural earth materials (e.g., ion exchange capacity, organic carbon content, mineral content, etc.).

- Based on field studies and cores, structural geology and hydrogeologic cross sections showing the extent (depth, thickness, lateral extent) of hydrogeologic units that may be part of the migration pathways identifying:

  - Sand and gravel in unconsolidated deposits;

  - Zones of fracturing or channeling in consolidated and unconsolidated deposits;

  - Zones of higher permeability or low permeability that might direct and restrict the flow of contaminants;

  - The uppermost aquifer: geologic formation, group of formations, or part of a formation capable of yielding a significant amount of groundwater to wells or springs;

  - Water-bearing zones above the first confining layer that may serve as a pathway for

contaminant migration, including perched zones of saturation; and

- All other geologic formations, or parts thereof, yielding a significant amount of groundwater.

• Based on data obtained from groundwater monitoring wells and piezometers installed upgradient and downgradient of the potential contaminant source, a representative description of water level or fluid pressure monitoring including:

  - Water level contour and/or potentiometric maps;

  - Hydrologic cross sections showing vertical flow gradients;

  - The flow system, including the vertical and horizontal components of flow; and

  - Any temporal changes in hydraulic gradients, (due to tidal or seasonal influences, etc.)

• A description of man-made influences that may affect the hydrogeology of the site, identifying:

  - Active and inactive local water-supply and production wells with an approximate schedule of pumping; and

  - Man-made hydraulic structures (sewers, pipelines, french drains, ditches, unlined ponds, septic tanks, NPDES outfalls, retention areas, etc.).

2. Soils

Respondent shall conduct a program to characterize the soil and rock units potentially affected by contaminant release(s). Such characterization shall include, but not be limited to, the following information:

- Where remediation by removal of soils is the only corrective measure option, provide map(s) and perpendicular cross sections showing:

  - The extent of contamination;

  - Depth of groundwater; and

  - The consistency and distribution of soils [using the Unified Soil Classification System (ASTM D 2487)];

- Where remediation by removal is the likely option, and it is necessary to determine the extent of migration (e.g., to assess the mobility of wastes from an unlined surface impoundment or landfill), provide the following in addition to the requirements immediately above:

  - Depth to bedrock and the characteristics of the bedrock including discontinuities such as faults, fissures, joints, fractures, sinkholes, etc.;

  - A detailed soil survey conducted according to USDA Soil Conservation Service (SCS) procedures including:

    -- USDA Textural Soil Classification and soil profiles showing stratifications or zones which may affect or direct the subsurface flow;

    -- Hydraulic conductivity and the SCS hydrologic group classification of A, B, C or D;

    -- Relative permeability (only if the waste may have changed the soil's hydraulic conductivity, such as concentrated organics);

    -- Storage capacity (if excavated soil will be stored);

-- Shrink-swell potential (where extreme dry weather could lead to the formation of cracks);

-- Potential for contaminant transport via erosion, using the Universal Soil Loss Equation;

-- Soil sorptive capacity;

-- Cation exchange capacity;

-- Soil organic content; and

-- Soil pH.

- The following contaminant characteristics must be included:

-- Physical state;

-- Viscosity;

-- pH;

-- pKa;

-- Density;

-- Water solubility;

-- Henry's Law Constant;

-- K_{ow};

-- Biodegradability; and

-- Rates of hydrolysis, photolysis and oxidation.

• Where in-situ soil treatment will likely be the remediation, the above information and the following additional information must be provided:

- Bulk density;

- Porosity;
- Grain size distribution;
- Mineral content;
- Soil moisture profile;
- Unsaturated hydraulic conductivity;
- Effect of stratification on unsaturated flow; and
- Infiltration and evapotranspiration.

3. Surface Water and Sediment

Respondent shall conduct a program to characterize the surface water bodies likely to be affected by releases from the facility. Such characterization shall include the following activities and information:

- Description of the temporal and permanent surface water bodies including:
  - For lakes: location, elevation, surface area, inflow, outflow, depth, temperature stratification, and volume;
  - For impoundments: location, elevation, surface area, depth, volume, freeboard, and purpose of impoundment;
  - For rivers, streams, ditches, drains, swamps and channels: location, elevation, flow, velocity, depth, width, seasonal fluctuations, and flooding tendencies (i.e., 100-year event);
  - For wetlands obtain any available delineation;
  - Containment measures in place (e.g., levees, concrete lining, etc.)
  - Drainage patterns; and
  - Evapotranspiration rates.

- Description of the chemistry of the natural surface water and sediments. This includes determining:
  - pH;
  - total dissolved solids;
  - total suspended solids;
  - biological oxygen demand;
  - alkalinity;
  - conductivity;
  - dissolved oxygen profiles;
  - nutrients (NH_3, NO_3 /NO_2, PO_4^{-3});
  - chemical oxygen demand;
  - total organic carbon; and
  - concentrations of the site-specific contaminants of concern.
- Description of sediment characteristics including:
  - Deposition area;
  - Thickness profile; and
  - Physical parameters (e.g., grain size, density, ion exchange capacity, etc.).

4. Air

Respondent shall provide information characterizing the climate in the vicinity of the facility. Such information shall include:

- A description of the following parameters:
  - Annual and monthly rainfall averages;
  - Monthly temperature averages and extremes;

- Wind speed and direction;
- Relative humidity/dew point;
- Atmospheric pressure;
- Evaporation data;
- Development of inversions; and
- Climate extremes that have been known to occur in the vicinity of the facility, including frequency of occurrence.

• A description of topographic and man-made features that affect air flow and emission patterns, including:

- Ridges, hills, or mountain areas;
- Canyons or valleys;
- Surface water bodies (e.g., rivers, lakes, etc.);
- Wind breaks and forests; and
- Buildings.

C. Source Characterization

Respondent shall collect analytical data to characterize the wastes and the areas where wastes have been placed, collected or removed including: type; quantity; physical form; disposition (containment or nature of disposal); and any facility characteristics that may affect or have affected a release (e.g., facility security, engineered barriers). This shall include quantification of the following specific characteristics, at each source area:

1. Unit/Disposal Area/Area of Concern Characteristics:

• Location of unit/disposal area;
• Type of unit/disposal area;
• Design features;

- Operating practices (past and present) including the history of releases;
- Period of operation;
- Age of unit/disposal area;
- General physical conditions; and
- Method used to close or remediate the unit/disposal area.

2. Waste Characteristics:

- Type of waste placed in the unit;
  - Hazardous classification (e.g., flammable, reactive, corrosive, oxidizing or reducing agent);
  - Quantity; and
  - Chemical composition.
- Physical and chemical characteristics;
  - Physical form (solid, liquid, gas);
  - Physical description (e.g., powder, oily sludge);
  - Temperature;
  - pH;
  - General chemical class (e.g., acid, base, solvent);
  - Molecular weight;
  - Density;
  - Boiling point;
  - Viscosity;

- Solubility in water;
- Cohesiveness of the waste;
- Vapor pressure; and
- Flash point.

• Migration and dispersal characteristics of the waste;

- Sorption;
- Biodegradability, bioconcentration, biotransformation;
- Photodegradation rates;
- Hydrolysis rates; and
- Expected chemical transformations.

Respondent shall document the procedures used in making the above determinations.

D. Contamination Characterization

Respondent shall collect analytical data on environmental media, including ground water, soils, surface water, sediment, and air likely to be affected by releases from the facility. This data shall be sufficient to define the extent, origin, direction, and rate of movement of contaminant plumes. Data shall include:

- time and location of sampling;
- media sampled;
- concentrations found;
- conditions during sampling; and
- the identity of the individuals performing the sampling and analysis.

Respondent shall address the following types of contamination at the facility:

1. Groundwater Contamination

Respondent shall conduct a groundwater investigation to characterize any plumes of contamination at the facility. This investigation shall, provide the following information:

- A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the facility;
- The horizontal and vertical direction of contaminant movement;
- The velocity of contaminant movement;
- The horizontal and vertical concentration profiles of 40 C.F.R. Part 264 Appendix IX constituents in the plume(s);
- An evaluation of factors influencing the plume movement; and
- An extrapolation of future contaminant movement.

Respondent shall document the procedures used in making the above determinations (e.g., well design, well construction, geophysics, modeling, etc.).

2. Soil Contamination

Respondent shall conduct an investigation to characterize the contamination of the soil and rock units above the water table in the vicinity of the contaminant release. The investigation shall include the following information:

- A description of the vertical and horizontal extent of contamination;
- A description of contaminant and soil chemical properties within the contaminant source area and plume. This includes contaminant solubility, speciation, adsorption, leachability, exchange capacity, biodegradability, hydrolysis, photolysis, oxidation and other factors that might affect contaminant migration and transformation;

- Site-specific contaminant concentrations;
- Velocity and direction of contaminant movement; and
- An extrapolation of future contaminant movement.

Respondent shall document the procedures used in making the above determinations.

3. Surface Water and Sediment Contamination

Respondent shall conduct a surface water and sediment investigation to characterize contamination in surface water bodies resulting from contaminant releases at the facility. Respondent is also required to characterize contamination from storm water runoff. The investigation shall include the following information:

- A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the facility, and the extent of contamination in underlying sediments;
- The horizontal and vertical direction of contaminant movement;
- The contaminant velocity;
- An evaluation of the physical, biological, and chemical factors influencing contaminant movement;
- An extrapolation of future contaminant movement; and
- A description of the chemical and physical properties of the contaminated surface waters and sediments. This includes determining the pH, total dissolved solids, specific contaminant concentrations, etc.

Respondent shall document the procedures used in making the above determinations.

4. Air Contamination

Respondent shall conduct an investigation to characterize the particulate and gaseous contaminants released into the atmosphere. This investigation shall provide the following information:

- A description of the horizontal and vertical direction and velocity of contaminant movement;
- The rate and amount of the release; and
- The chemical and physical composition of the contaminants(s) released, including horizontal and vertical concentration profiles.

Respondent shall document the procedures used in making the above determinations.

E. Potential Receptor Identification

Respondent shall collect data describing the human populations and environmental systems that currently or potentially are at risk of contaminant exposure from the facility. Chemical analysis of biological samples may be needed. Data on observable effects in ecosystems may also be required by U.S. EPA. The following characteristics shall be identified:

1. Local uses and possible future uses of groundwater:

- Type of use (e.g., drinking water source: municipal or residential, agricultural, domestic/non-potable, public and industrial) and
- Location of groundwater users including wells and discharge areas.

2. Local uses and possible future uses of surface waters characterized in the "Environmental Setting" or "Contamination Characterization" Sections above:

- Domestic and municipal (e.g., potable and lawn/gardening watering);
- Recreational (e.g., swimming, fishing);
- Agricultural;

- Industrial; and
- Environmental (e.g., fish and wildlife propagation).

3. Authorized or unauthorized human use of or access to the facility and adjacent lands, including but not limited to:

- Recreation;
- Hunting;
- Residential;
- Commercial;
- Zoning; and
- Relationship between population locations and prevailing wind direction.

4. A demographic profile of the people who use or have access (authorized or unauthorized) to the facility and adjacent land, including, but not limited to: age; sex; sensitive subgroups; and environmental justice concerns.

5. A description of the ecological characteristics of the facility and adjacent areas, including habitat and species present and expected to be present. Data required for this may include the following:

- Chemical sampling in potentially exposed habitats and reference sites.
- Toxicity testing.
- Tissue analyses.
- Biological community assessment.
- Habitat assessment of aquatic and terrestrial habitats on or potentially affected by the facility.
- Revised assessment of ecological impacts on receptors. Impacts should include those occurring

at individual level (e.g., mortality, growth and reproductive impairments) and those occurring at higher levels of biological organization (i.e., at population, community, and ecosystem levels).

6. A description of the biota in surface water bodies on, adjacent to, or affected by the facility.

7. A description of any State and Federal endangered or threatened species (both proposed and listed) near the Facility.

Section IV: Investigation Results and Analysis

Respondent shall prepare an analysis and summary of all facility investigations and their results. The investigation data should be sufficient in quality (e.g., quality assurance procedures have been followed) and quantity to describe the nature and extent of contamination, potential threat to human health and/or the environment, and to support the Corrective Measures Study and/or IMs.

A. Data Analysis

Respondent shall analyze all facility investigation data outlined in Section III and prepare a report on the type and extent of contamination at the facility which has not been eliminated from further investigation by the screening methods used, including sources and migration pathways. The report shall describe the extent of contamination (qualitative/quantitative) in relation to background levels indicative for the area as well as in relation to applicable screening levels.

B. Media Cleanup Standards

Respondent shall provide information as required to support U.S. EPA's selection/development for media cleanup standards (MCSs) of any releases that may have adverse effects on human health and the environment due to migration of waste constituents. MCSs are to contain such terms and provisions as necessary to protect human health and the environment, including, the provisions stated below.

1. Groundwater Cleanup Standards

Respondent shall provide information to support U.S. EPA's selection/development of groundwater cleanup standards for all of the 40 C.F.R. Part 264 Appendix IX constituents found in the groundwater during the Facility Investigation (Section III). The groundwater cleanup standards shall consist of:

- For any constituents for which an MCL has been promulgated under the Safe Drinking Water Act, the MCL value;
- Background concentration of the constituent in the ground water; or
- An alternate standard [e.g., an alternate concentration limit (ACL) for a regulated unit] to be approved by U.S. EPA.

2. Soil Cleanup Standards

Respondent shall provide information to support U.S. EPA's selection/development of soil cleanup standards. U.S. EPA may require the following information:

- The volume and physical and chemical characteristics of the wastes in the unit;
- The effectiveness and reliability of containing, confining, and collecting systems and structures in preventing contaminant migration;
- The hydrologic characteristics of the unit and the surrounding area, including the topography of the land around the unit;
- The patterns of precipitation in the region;
- The existing quality of surface soils, including other sources of contamination and their cumulative impacts on surface soils;
- The potential for contaminant migration and impact to the underlying groundwater;
- The patterns of land use in the region;

- The potential for health risks caused by human exposure to waste constituents; and

- The potential for damage to domestic animals, wildlife, food chains, crops, vegetation, and physical structures caused by exposure to waste constituents.

3. Surface Water and Sediment Cleanup Standards

Respondent shall provide information to support U.S. EPA's selection/development of surface water and sediment cleanup standards. U.S. EPA may require the following information:

- The volume and physical and chemical characteristics of the wastes in the unit;

- The effectiveness and reliability of containing, confining, and collecting systems and structures in preventing contaminant migration;

- The hydrologic characteristics of the unit and the surrounding area, including the topography of the land around the unit;

- The patterns of precipitation in the region;

- The quantity, quality, and direction of groundwater flow;

- The proximity of the unit to surface waters;

- The current and potential uses of nearby surface waters and any water quality standards established for those surface waters;

- The existing quality of surface waters, including other sources of contamination and their cumulative impacts on surface waters;

- The potential for damage to domestic animals, wildlife, food chains, crops, vegetation and physical structures caused by exposure to waste constituents;

- The patterns of land use in the region; and
- The potential for health risks caused by human exposure to waste constituents.

4. Air Cleanup Standards

Respondent shall provide information to support U.S. EPA's selection/development of air cleanup standards. U.S. EPA may require the following information:

- The volume and physical and chemical characteristics of the wastes in the unit, including its potential for the emission and dispersal of gases, aerosols and particulates;
- The effectiveness and reliability of systems and structures to reduce or prevent emissions of hazardous constituents to the air;
- The operating characteristics of the unit:
- The atmospheric, meteorological, and topographic characteristics of the unit and the surrounding area;
- The existing quality of the air, including other sources of contamination and their cumulative impact on the air;
- The potential for health risks caused by human exposure to waste constituents; and
- The potential for damage to domestic animals, wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents.

5. Other Relevant Cleanup Standards

Respondent shall identify all relevant and applicable standards for the protection of human health and the environment (e.g., National Ambient Air Quality Standards, Ohio Water Quality Standards, water quality criteria, health advisories, proposed MCL's, etc.).

C. Analysis of Risk

Respondent may determine as necessary an analysis of risk at the facility. This analysis would include ecological as well as human health risk and shall be consistent with applicable guidance provided in **References**. Risk may be evaluated at several milestones within the process, as developed in the U.S. EPA-approved RFI Workplan.

All activities in conducting corrective action pursuant to this Order will allow for risk screening steps to be conducted with the data available at the risk assessment phase as well as within the RFI and CMS as appropriate. Generally, a screening risk assessment would be conducted during the RFI with additional, more detailed analysis, including appropriate cumulative risk, occurring as more data becomes available. The highest level of risk analysis may occur later in the CMS stage.

Section V: Progress Reports

Respondent will, at a minimum, provide the U.S. EPA with signed monthly progress reports. These reports are required to contain the following information, but U.S. EPA requirements are not limited to this list:

1. A description and estimate of the percentage of the RFI completed;

2. Summaries of *all* findings in the reporting period, including results of any sampling and analysis;

3. Summaries of *all* changes made in the RFI during the reporting period;

4. Summaries of *all* contacts with representatives of the local community, public interest groups or State government during the reporting period;

5. Summaries of *all* contacts made regarding access to off-site property;

6. Summaries of *all* problems encountered during the reporting period;

7. Actions being taken to rectify problems;

8. Changes in relevant personnel during the reporting period;

9. Projected work for the next reporting period; and

10. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

Section VI: Proposed Schedule

Respondent will provide U.S. EPA with RFI submittals according to the following schedule:

Facility Submission	Due Date
Description of Current Conditions (Section I)	60 days after the effective date of the Order
RFI Workplan (Section II)	90 days after the effective date of the Order
Draft RFI Report (Sections III and IV)	As scheduled in the approved RFI Workplan
Final RFI Report	45 days after receipt of comments on the Draft RFI Report
Progress Reports on Sections I through IV	Monthly

ATTACHMENT III

Corrective Measures Study
Scope of Work

ATTACHMENT III
Corrective Measures Study
Scope of Work

Purpose

The purpose of the Corrective Measures Study (CMS) portion of the RCRA corrective action process is to identify and evaluate potential remedial alternatives for the releases that have been identified at and/or from the Facility.

Scope

A Corrective Measures Study Report is, unless otherwise specified by U.S. EPA, a required element of the CMS. The CMS consists of the following components:

Section I: Corrective Measures Study Report

A. Introduction/Purpose

B. Description of Current Conditions

C. Media Cleanup Standards

D. Identification, Screening and Development of Corrective Measure Alternatives

E. Evaluation of A Final Corrective Measure Alternative

F. Recommendation by Respondent for a Final Corrective Measure Alternative

G. Public Involvement Plan

Section II: Progress Reports

Section III: Proposed Schedule

Section I: Corrective Measures Study Report

The CMS Report shall include the following elements:

A. Introduction/Purpose

Respondent shall describe the purpose of the document and provide a summary description of the project.

B. Description of Current Conditions

Respondent shall include a brief summary/discussion of any new information that has been discovered since the RFI current conditions report was provided. This discussion should concentrate on those issues which could significantly affect the evaluation and selection of the corrective measures alternative(s).

C. Media Cleanup Standards

Respondent may propose media cleanup standards. The standards must be based on promulgated Federal and State standards, risk derived standards, all data and information gathered during the corrective action process (e.g., from interim measures, RCRA Facility Investigation, etc.), and/or other applicable guidance documents. If no other guidance exists for a given contaminant and media, Respondent shall propose and justify a media cleanup standard.

D. Identification, Screening, and Development of Corrective Measure Alternatives

1. Identification: List and briefly describe potentially applicable technologies for each affected media that may be used to achieve the corrective action objectives. Respondent should consider including a table that summarizes the available technologies. Depending on the site-specific situation, U.S. EPA may require Respondent to consider additional technologies.

Respondent should consider innovative treatment technologies, especially in situations where there are a limited number of applicable corrective measure technologies. Innovative technologies are defined as those technologies utilized for remediation other than incineration, solidification/stabilization, and pumping with

conventional treatment for contaminated groundwater. Innovative treatment technologies may require extra effort to gather information, to analyze options, and to adapt the technology to the site-specific situation. Treatability studies and on-site pilot scale studies may be necessary for evaluating innovative treatment technologies.

2. Screening: When Respondent is required to, or chooses to, evaluate a number of corrective measures technologies, Respondent will evaluate the technology limitations to show why certain corrective measures technologies may prove unfeasible to implement given existing waste and site-specific conditions.

Likewise, if only one corrective measure alternative is being analyzed, Respondent must indicate any technological limitations given waste and site-specific conditions at the facility for which it is being considered. Respondent should consider including a table that summarizes these findings.

3. Corrective Measure Development: As required by U.S. EPA, Respondent shall assemble the technologies that pass the screening step into specific alternatives that have potential to meet the corrective action objectives for each media. Options for addressing less complex sites could be relatively straight-forward and may only require evaluation of a single or limited number of alternatives.

Each alternative may consist of an individual technology or a combination of technologies used in sequence (i.e., treatment train). Depending on the site-specific situation, different alternatives may be considered for separate areas of the facility. List and briefly describe each corrective measure alternative.

E. Evaluation of a Final Corrective Measure Alternative

For each remedy which warrants a more detailed evaluation, including those situations when only one remedy is being proposed, Respondent shall provide detailed documentation of how the potential remedy will comply with each of the standards listed below. These standards reflect the major technical components of remedies including cleanup of releases, source control and management of wastes that are generated by remedial activities. The specific standards are provided below.

1. Protect human health and the environment.

2. Attain media cleanup standards set by the U.S. EPA.

3. Control the source of releases so as to reduce or eliminate, to the extent practicable, further releases that may pose a threat to human health and the environment.

4. Comply with any applicable standards for management of wastes.

5. Other Factors.

In evaluating the selected alternative or alternatives Respondent shall prepare and submit information that documents that the specific remedy will meet the standards listed above. The following guidance should be used in completing this evaluation. This guidance provides examples of the types of information that would be supportive; U.S. EPA may require additional information.

1. Protect Human Health and the Environment

Corrective action remedies must be protective of human health and the environment. Remedies may include those measures that are needed to be protective, but are not directly related to media cleanup, source control, or management of wastes. An example would be a requirement to provide alternative drinking water supplies in order to prevent exposures to releases from an aquifer used for drinking water purposes. Another example would be a requirement for the construction of barriers or for other controls to prevent harm arising from direct contact with waste management units. Therefore, Respondent shall include a discussion on what types of short term remedies are appropriate for the particular facility in order to meet this standard. This information should be provided in addition to a discussion of how the other corrective measure alternatives meet this standard.

2. Attain Media Cleanup Standards Set by U.S. EPA

Remedies will be required to attain media cleanup standards set by U.S. EPA which may be derived from existing State or Federal regulations (e.g. groundwater standards) or other standards. The media cleanup

standards for a remedy will often play a large role in determining the extent of and technical approaches to the remedy. In some cases, certain technical aspects of the remedy, such as the practical capabilities of remedial technologies, may influence to some degree the media cleanup standards that are established.

As part of the necessary information for satisfying this requirement, Respondent shall address whether the potential remedy will achieve the preliminary remediation objective as identified by U.S. EPA as well as other, alternative remediation objectives that may be proposed by Respondent. Respondent shall also include an estimate of the time frame necessary for each alternative to meet these standards.

3. Control the Sources of Releases

A critical objective of any remedy must be to stop further environmental degradation by controlling or eliminating further releases that may pose a threat to human health and the environment. Unless source control measures are taken, efforts to clean up releases may be ineffective or, at best, will essentially involve a perpetual cleanup. Therefore, an effective source control program is essential to ensure the long-term effectiveness and protectiveness of the corrective action program.

The source control standard is not intended to mandate a specific remedy or class of remedies. Instead, Respondent is encouraged to examine a wide range of options. This standard should not be interpreted to preclude the equal consideration of using other protective remedies to control the source, such as partial waste removal, capping, slurry walls, in-situ treatment/stabilization and consolidation.

As part of the CMS Report, Respondent shall address the issue of whether source control measures are necessary, and if so, the type of actions that would be appropriate. Any source control measure proposed should include a discussion on how well the method is anticipated to work given the particular situation at the facility and the known track record of the specific technology.

4. Comply With Any Applicable Standards for Management of Wastes.

Respondent shall include a discussion of how the specific waste management activities will be conducted in compliance with all applicable State or Federal regulations (e.g., closure requirements, land disposal restrictions).

5. Other Factors

There are five general factors that will be considered as appropriate by U.S. EPA in selecting/approving a remedy that meets the four standards listed above. These factors represent a combination of technical measures and management controls for addressing the environmental problems at the facility. The five general decision factors include:

a. Long-term reliability and effectiveness;

b. Reduction in the toxicity, mobility or volume of wastes;

c. Short-term effectiveness;

d. Implementability; and

e. Cost.

U.S. EPA may request Respondent to provide additional information to support the use of these factors in the evaluation of viable remedial alternatives. Examples of the types of information that may be requested are provided below:

a. Long-term Reliability and Effectiveness

Demonstrated and expected reliability is a way of assessing the risk and effect of failure. Respondent may consider whether the technology or a combination of technologies have been used effectively under analogous site conditions, whether failure of any one technology in the alternative would have an immediate impact on receptors, and whether the alternative would have

the flexibility to deal with uncontrollable changes at the site (e.g., heavy rain storms, flooding, earthquakes, etc.).

Most corrective measure technologies, with the exception of destruction, deteriorate with time. Often, deterioration can be slowed through proper system operation and maintenance, but the technology eventually may require replacement. Each corrective measure alternative should be evaluated in terms of the projected useful life of the overall alternative and of its component technologies. Useful life is defined as the length of time the level of effectiveness can be maintained.

b. Reduction in the Toxicity, Mobility or Volume of Wastes

As a general goal, remedies will be preferred that employ techniques, such as treatment technologies, that are capable of eliminating or substantially reducing the inherent potential for the wastes in SWMUs (and/or contaminated media at the facility) to cause future environmental releases or other risks to human health and the environment. There may be some situations where achieving substantial reductions in toxicity, mobility or volume may not be practical or even desirable. Examples might include large, municipal-type landfills, or wastes such as unexploded munitions that would be extremely dangerous to handle, and for which the short-term risks of treatment outweigh potential long-term benefits.

Estimates of how much the corrective measures alternatives will reduce the waste toxicity, volume, and/or mobility may be helpful in applying this factor. This may be done through a comparison of initial site conditions to expected post-corrective measure conditions.

c. Short-term Effectiveness

Short-term effectiveness may be particularly relevant when remedial activities will be

conducted in densely populated areas, or where waste characteristics are such that risks to workers or to the environment are high and special protective measures are needed. Possible factors to consider include fire, explosion, exposure to hazardous substances and potential threats associated with treatment, excavation, transportation, and re-disposal or containment of waste material.

d. Implementability

Implementability will often be a determining variable in shaping remedies. Some technologies will require State or local approvals prior to construction, which may increase the time necessary to implement the remedy. In some cases, State or local restrictions or concerns may necessitate eliminating or deferring certain technologies or remedial approaches from consideration in remedy selection. Information to consider when assessing implementability may include:

1. The administrative activities needed to implement the corrective measure alternative (e.g., permits, rights of way, off-site approvals, etc.) and the length of time these activities will take;

2. The constructibility, time for implementation, and time for beneficial results;

3. The availability of adequate off-site treatment, storage capacity, disposal services, needed technical services and materials; and

4. The availability of prospective technologies for each corrective measure alternative.

e. Cost

The relative cost of a remedy may be an appropriate consideration, especially in those situations where several different technical alternatives to remediation will offer equivalent

protection of human health and the environment, but may vary widely in cost. However, in those situations where only one remedy is being proposed, the issue of cost would not need to be considered. Cost estimates could include costs for: engineering, site preparation, construction, materials, labor, sampling/analysis, waste management/disposal, permitting, health and safety measures, training, operation and maintenance, etc.

F. Recommendation by Respondent for a Final Corrective Measure Alternative

In the CMS Report, Respondent may recommend a preferred remedial alternative for consideration by U.S. EPA. Such a recommendation should include a description and supporting rationale for the proposed remedy, consistent with the remedial standards and the decision factors discussed above. Such a recommendation is not required and the U.S. EPA still retains the role of remedy selection.

G. Public Involvement Plan

After the CMS has been performed by Respondent and the U.S. EPA has selected a preferred alternative for proposal in the Statement of Basis, it is the agency's policy to request public comment on the Administrative Record and the proposed corrective measure(s). Changes to the proposed corrective measure(s) may be made after consideration of public comment. U.S. EPA may also require that Respondent perform additional corrective measures studies. If the public is interested, a public meeting may be held. After consideration of the public's comments on the proposed corrective measure, the agency develops the Final Decision and Response to Comments to document the selected corrective measure, the agency's justification for such selection, and the response to the public's comment. Additional public involvement activities may be necessary, based on site-specific circumstances.

Section II: Progress Reports

Respondent will, at a minimum, provide U.S. EPA with signed monthly progress reports. These reports are required to contain

the following information, but U.S. EPA requirements are not limited to this list:

1. A description and estimate of the percentage of the CMS completed;

2. Summaries of *all* findings in the reporting period, including results of any pilot studies;

3. Summaries of *all* changes made in the CMS during the reporting period;

4. Summaries of *all* contacts with representative of the local community, public interest groups or State government during the reporting period;

5. Summaries of *all* contacts made regarding access to off-site property;

6. Summaries of *all* problems encountered during the reporting period;

7. Actions being taken to rectify problems;

8. Changes in relevant personnel during the reporting period;

9. Projected work for the next reporting period; and

10. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

Section III: Proposed Schedule

Respondent will provide the U.S. EPA with CMS submittals according to the following schedule:

Facility Submission	Due Date
Draft CMS Report (Section I)	Within 90 days of U.S. EPA approval of the RFI Report
Final CMS Report (Section I)	45 days after Public and U.S. EPA Comments on the Draft Final CMS
Progress Reports on Sections I	Monthly

ATTACHMENT IV

Corrective Measures Implementation
Scope of Work

ATTACHMENT IV
Corrective Measures Implementation
Scope of Work

PURPOSE

The purpose of the Corrective Measures Implementation (CMI) program is to design, construct, operate, maintain and monitor the performance of the Corrective Measures selected by U.S. EPA and other measures/additional work determined necessary by U.S. EPA pursuant to this Order such that the performance standards are achieved and maintained. Respondent shall furnish all personnel, materials and services necessary for the implementation of the Corrective Measures.

SCOPE

The CMI program shall consist of four tasks:

Section I: Corrective Measures Implementation Workplan

A. Program Management Plan
B. Public Involvement Plan
C. Health and Safety Plan
D. Quality Assurance Project Plan
E. Sampling and Analysis Plan
F. Surveys

Section II: Corrective Measures Design

A. Preliminary Design
B. Prefinal and Final Designs
C. Operation and Maintenance Plan
D. Cost Estimate
E. Project Schedule
F. Construction Quality Assurance Objectives

Section III: Corrective Measures Construction

A. Responsibility and Authority
B. Construction Quality Assurance Personnel Qualifications
C. Inspection Activities
D. Sampling Requirements
E. Documentation

Section IV: Other Reports and Submissions

A. Progress
B. Construction Completion Report
C. Attainment of Groundwater Performance Standards Report
D. Completion of Work Report
E. Institutional Controls
F. Submittal Summary

Section I: Corrective Measures Implementation (CMI) Workplan

Respondent shall prepare and submit a CMI Workplan which includes the development and implementation of several plans, which shall be prepared concurrently. Respondent shall submit a draft CMI Workplan within 60 days of U.S. EPA's decision on the corrective measure(s) and submit a final CMI Workplan that incorporates U.S. EPA comments on the draft CMI Workplan according to the schedule identified in the Submittal Summary, Section IV. The CMI Workplan includes the following:

A. Program Management Plan

Respondent shall prepare and submit a Program Management Plan (PMP) which includes a discussion of the technical approach, engineering designs and plans, schedules, and personnel needed for performing the design, construction, operation, maintenance and monitoring of Corrective Measures for U.S. EPA review and approval. The PMP shall document the responsibility and authority of all organizations and key personnel involved with the implementation. The PMP shall also include a description of qualifications of key personnel directing the Corrective Measure Design and Implementation, including contractor personnel.

B. Public Involvement Plan

The existing Public Involvement Plan (PIP) shall be revised to describe the community relations program to be implemented by Respondent during the design and construction subject to the approval of U.S. EPA. Specific activities which must be conducted include the revision of the PIP to reflect knowledge of community concerns and involvement during design and construction and the preparation of a fact sheet at the completion of the engineering design. At the request of U.S. EPA, Respondent shall participate in the preparation of information disseminated to the public and in providing information for public meetings that may be held or sponsored by the U.S. EPA.

C. Health and Safety Plan

Respondent shall submit a Health and Safety Plan (HSP) to U.S. EPA for review although it does not require approval by U.S. EPA. The HSP shall be designed to protect on-site personnel and area residents from physical, chemical and other hazards posed by the Corrective Measures, including pre-design studies.

1. Major elements of the HSP shall include:

   - Facility description including availability of resources such as roads, water supply, electricity, and telephone service;
   - Description of the known hazards and evaluation of the risks associated with each activity conducted;
   - A list of key personnel and alternates responsible for site safety, response operations, and protection of human health;
   - Delineation of work area;
   - Description of protective clothing or other protective items to be worn by personnel in work area;
   - Procedures to control site access;
   - Description of decontamination procedures for personnel and equipment;
   - Site emergency procedures;
   - Emergency medical care needed for injuries and toxicological problems;
   - Description of requirements for an environmental surveillance program;
   - Routine and special training required for response personnel; and
   - Procedures for protecting workers from weather-related problems.

2. The Facility HSP shall be consistent with:

   - NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);
   - EPA Order 1440.1 - Respiratory Protection;

- EPA Order 1440.3 - Health and Safety Requirements for Employees engaged in Field Activities;
- Facility Contingency Plan;
- EPA Standard Operating Safety Guide (1984);
- OSHA regulations particularly in 29 CFR 1910 and 1926;
- State and local regulations; and
- Other applicable EPA guidance as provided.

D. Quality Assurance Project Plan

Respondent shall prepare and submit a Quality Assurance Project Plan (QAPP) to document all monitoring procedures, sampling, field measurements, and sample analyses to be performed during the Corrective Measures, so as to ensure that all information, data and resulting decisions are technically sound, statistically valid and properly documented. The QAPP shall be prepared in accordance with Attachment V. At the request of U.S. EPA, Respondent shall participate in a pre-QAPP meeting with the U.S. EPA prior to preparation of any QAPP.

A performance audit may be conducted by U.S. EPA on the laboratories selected by Respondent.

E. Sampling and Analysis Plan

Respondent shall develop a Sampling and Analysis Plan (SAP) for the predesign field activities and any monitoring programs required by this Order. Respondent shall submit the SAP addressing predesign field activities with the draft CMI Work Plan and shall propose a schedule for the submittal of any additional sampling plans. The SAP shall include, at a minimum:

1. A description of the proposed field activities;

2. The proposed locations of soil borings, ground water monitoring wells and surface water monitoring points;

3. A description of how the SAP is expected to meet the requirements of the final remedy;

4. A description of the planned operation and maintenance (O&M) activities, including the anticipated frequency of each O&M task;

5. A flow chart and schedule of work to be performed during the CMI.

F. Surveys

Respondent shall submit surveys to delineate current Facility boundaries and to update water well use adjacent to the Facility.

Section II: Corrective Measures Design

Respondent shall prepare final construction plans and specifications to implement the Corrective Measures at the facility which have been selected by U.S. EPA. The final product of the Corrective Measures Design shall be a technical package (or packages) that contain and address all elements necessary to accomplish the Corrective Measures. This includes all design support activities, initial permitting and access requirements, operation and maintenance, and institutional controls, as well as technical elements.

A. Preliminary Design

Respondent shall submit for U.S. EPA review and approval a Preliminary Design when the design effort is approximately 50% complete. The Preliminary Design submittal shall include or discuss, at a minimum, the following:

1. Design strategy and basis, including compliance with all applicable or relevant environmental and public health standards and minimization of environmental and public impacts;

2. Technical factors of importance, including use of currently accepted environmental control measures and technology, design constructability, and use of currently acceptable construction practices techniques;

3. A summary of activities performed and data generated during Corrective Measures Design or Predesign, including results and interpretations of data and studies;

4. Design assumptions and parameters, including design restrictions and process performance criteria;

5. Real estate, easement and permit requirements;

6. Preliminary construction schedule, including contracting strategy;

7. Discussion of the possible sources of error and references to possible operation and maintenance problems;

8. Detailed drawings of the proposed designs, including qualitative and quantitative flow sheets;

9. Tables listing equipment and specifications;

10. Tables giving material and energy balances; and

11. Sample calculations and derivation of equations essential to understanding the report.

B. Prefinal and Final Designs

Respondent shall submit for U.S. EPA review and approval the Prefinal Design when the design effort is 95% complete and shall submit the Final Design when the design effort is 100% complete. The Prefinal Design shall fully address all U.S. EPA's comments on the Preliminary Design. After receipt of U.S. EPA comments on the Prefinal Design, Respondent shall execute the required revisions and submit the Final Design with reproducible drawings and specifications suitable for bid advertisement. The Final Design consists of the Final Design Plans and Specifications (100% complete), Final Construction Cost Estimate, Final Operation and Maintenance Plan, Construction Quality Assurance Objectives, Final Project Schedule and Final Health and Safety Plan specifications.

The U.S. EPA may require additional work, including but not limited to studies, to supplement the available technical data. Respondent shall furnish all equipment and personnel necessary to complete any additional work needed. Draft and final reports shall be prepared and present all data obtained during the additional studies, a summary of the results, and conclusions.

C. Operation and Maintenance Plan

Respondent shall prepare an Operation and Maintenance (O&M) Plan to cover both implementation and long term maintenance of the Corrective Measures. A draft O&M Plan shall be submitted for U.S. EPA review and comment concurrently with the Prefinal Design and the final O&M Plan shall be submitted for U.S. EPA review and approval with the Final Design. The plan shall include the following elements:

1. Description of normal O&M:

    a. Description of tasks for operation;

    b. Description of tasks for maintenance;

    c. Description of prescribed treatment or operation conditions; and

    d. Schedule showing frequency of each O&M task.

2. Description of potential operating problems:

    a. Description and analysis of potential operation problems;

    b. Sources of information regarding problems; and

    c. Common and/or anticipated remedies.

3. Description of routine monitoring and laboratory testing:

    a. Description of monitoring tasks;

    b. Description of required laboratory tasks and their interpretation;

    c. Required data collection, Quality Assurance Project Plan (QAPP);

    d. Schedule of monitoring frequency; and

    e. Description of triggering mechanisms for ground water/surface water monitoring results.

4. Description of alternate O&M:

a. Should system fail, alternate procedures to prevent release or threatened releases of hazardous substances, pollutants or contaminants which may endanger public health and the environment or exceed cleanup standards; and

b. Analysis of vulnerability and additional resource requirements should a failure occur.

5. Corrective steps:

a. Description of corrective steps to be implemented in the event that cleanup or performance standards are not met; and

b. Schedule for implementing these corrective steps.

6. Safety plan:

a. Description of precautions, of necessary equipment, etc., for site personnel; and

b. Safety tasks required in event of systems failure.

7. Description of equipment:

a. Equipment identification;

b. Installation of monitoring components;

c. Maintenance of site equipment; and

d. Replacement schedule for equipment and installed components.

8. Records and reporting mechanisms required:

a. Daily operating logs;

b. Laboratory records;

c. Records for operating costs;

d. Mechanism for reporting emergencies;

e. Personnel and maintenance records; and

f. Monthly/annual reports to State agencies.

D. Cost Estimate

Respondent shall refine the cost estimate developed in the CMS to reflect the more detailed/accurate design plans and specifications being developed. The cost estimate shall include both capital and O&M costs. An Initial Cost Estimate shall be submitted simultaneously with the Prefinal Design and the Final Cost Estimate with the Final Design.

E. Project Schedule

Respondent shall develop a project schedule for construction and implementation of the Corrective Measures which identifies timing for initiation and completion of all critical path tasks. The schedule to be submitted to U.S. EPA for review and approval shall provide for the completion of the Corrective Measures in a reasonable period of time. Respondent shall specifically identify dates for completion of the project and major interim milestones. An initial project schedule shall be submitted simultaneously with the Prefinal Design and a final project schedule with the Final Design.

F. Construction Quality Assurance Objectives

Respondent shall identify and document the objectives and framework for the development of a construction quality assurance program including, but not limited to the following: responsibility and authority; personnel qualifications; inspection activities; sampling requirements and documentation. Draft Construction Quality Assurance Objectives, Prefinal Design, and the Final Construction Quality Assurance Plan shall be submitted for U.S. EPA review and approval within 45 days after U.S. EPA's approval of the Final Design.

Section III: CORRECTIVE MEASURES CONSTRUCTION

Respondent shall finalize the Construction Quality Assurance Plan incorporating comments received on the draft Construction Quality Assurance Plan submitted with the Prefinal Design. Within 45 days of U.S. EPA's approval of the Final Design, Respondent shall implement a construction quality assurance (CQA) program and submit the Final CQA Plan to ensure, with a reasonable degree of

certainty, that a completed Corrective Measure will meet or exceed all design criteria, plans and specifications. The CQA Plan is a facility specific document which must be approved by U.S. EPA prior to the start of the construction. At a minimum, the CQA Plan should include the elements which are summarized below. Within 120 days of U.S. EPA's approval of the CQA Plan, Respondent shall construct and implement the Corrective Measures in accordance with the approved design, schedule and CQA Plan. Respondent shall also implement the elements of the approved O&M Plan.

A. Responsibility and Authority

Respondent shall describe fully in the CQA Plan the responsibility and authority of all organizations (i.e., technical consultants, construction firms, etc.) and key personnel involved in the construction of the corrective measures. Respondent shall also identify a CQA officer and the necessary supporting inspection staff.

B. Construction Quality Assurance Personnel Qualifications

Respondent shall set forth the qualifications of the CQA Officer and supporting inspection personnel shall be presented in the CQA plan to demonstrate that they possess the training and experience necessary to fulfill their identified responsibilities.

C. Inspection Activities

Respondent shall summarize in the CQA plan the observations and tests that will be used to monitor the construction and/or installation of the components of the Corrective Measures. The plan shall include the scope and frequency of each type of inspection. Inspections shall verify compliance with environmental requirements and include, but not be limited to air quality and emissions monitoring records, waste disposal records (e.g., RCRA transportation manifests), etc. The inspection shall also ensure compliance with all health and safety procedures. In addition to the oversight inspections, Respondent shall conduct construction inspections.

Within 30 days after Respondent makes a preliminary determination that construction is complete, Respondent shall notify U.S. EPA for the purposes of conducting an inspection. The inspection shall consist of a walk-through inspection of the entire project site. The inspection is to determine whether the project is

complete and consistent with the contract documents and the U.S. EPA-approved Corrective Measures. Any outstanding construction items discovered during the inspection shall be identified and noted. Additionally, treatment equipment, if installed, shall be operationally tested by Respondent. Respondent shall certify that the equipment has performed to meet the purpose and intent of the specifications. Retesting will be completed where deficiencies are revealed. Respondent shall outline in the inspection report the outstanding construction items, actions required to resolve items, completion date for these items and date for final inspection.

Upon completion of any outstanding construction items, Respondent shall notify U.S. EPA for the purposes of conducting a final inspection. The final inspection shall consist of a walk-through inspection of the project site. Confirmation shall be made that outstanding items have been resolved subject to EPA's approval.

D. Sampling Requirements

Respondent shall present in the CQA Plan the sampling activities, sample size, sample locations, frequency of testing, criteria for acceptance and rejection and plans for correcting problems as addressed in the project specifications.

E. Documentation

Respondent shall describe in detail in the CQA plan the reporting requirements for CQA activities. This shall include such items as daily summary reports, inspection data sheets, problem identification and corrective measures reports, design acceptance reports and final documentation. Provisions for the final storage of all records shall be presented in the CQA Plan.

Section IV: Other Reports and Submissions

Respondent shall prepare plans, specifications and reports as set forth in Sections I through III to document the design, construction, operation, maintenance and monitoring of the Corrective Measure. Other documentation shall include, but not be limited to the following:

A. Progress

Respondent shall at a minimum provide the U.S. EPA with signed monthly progress reports during the design and construction phases and semi-annual progress reports for operation and maintenance activities containing:

1. A description and estimate of the percentage of the CMI completed;

2. Summaries of all findings;

3. Summaries of all changes made in the CMI during the reporting period;

4. Summaries of all contacts with representatives of the local community, public interest groups or State government during the reporting period;

5. Summaries of all problems or potential problems encountered during the reporting period;

6. Actions being taken to rectify problems;

7. Changes in personnel during the reporting period;

8. Projected work for the next reporting period; and

9. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

B. Construction Completion Report

Within 30 days of a successful final inspection, as determined by U.S. EPA, Respondent shall submit a Construction Completion Report. In the report, a registered professional engineer and Respondent's Project Coordinator shall state that the Corrective Measures have been constructed in accordance with the design and specifications, to the best of their knowledge, and the performance standards have been attained. The written report shall include as-built drawings signed and stamped by a registered professional engineer. The report shall be certified by a Responsible Official pursuant to Section XIV of the Order. The Final O&M Plan shall be submitted concurrently with the Construction Completion Report.

C. Attainment of Ground Water Performance Standards Report

Within 30 days after Respondent concludes that the ground water performance standards have been attained, Respondent shall submit a written report and certification to U.S. EPA for review and approval. In the report, a registered professional engineer and Respondent's Project Coordinator shall state that the ground water performance standards have been attained in full satisfaction of the requirements of this Order. The report shall be certified by a Responsible Official pursuant to Section XIV of the Order.

D. Completion of Work Report

This report shall be submitted by Respondent when construction is complete, performance standards have been attained and O&M is complete. Within 30 days after Respondent concludes that all phases of the work (including O&M and monitoring) have been completed, Respondent shall schedule and conduct a precertification inspection to be attended by representatives of Respondent and U.S. EPA. After the precertification inspection and any prefinal or subsequent final inspections required by U.S. EPA, Respondent shall submit within 30 days of a successful final inspection, a written Completion of Work Report to U.S. EPA for approval. In the report, a registered professional engineer and Respondent's Project Coordinator shall state that the Corrective Measures have been completed in full satisfaction of the requirements of this Order. The written report shall include as-built drawings stamped by a registered professional engineer. The report shall be certified by a Responsible Official pursuant to Section XIV of the Order.

F. Submittal Summary

A summary of the information reporting requirements contained in the CMI Scope of Work is presented below.

SUBMITTAL	DUE DATE
Draft CMI Workplan -Project Management Plan -Public Involvement Plan -Health and Safety Plan -Pre-Design QAPP -Pre-Design SAP -Surveys Final CMI Workplan -Revisions to Draft	Within 60 days of U.S. EPA's decision on corrective measure(s) 30 days after receipt of U.S. EPA's comments on Draft CMI Workplan
Preliminary Design (50%) -Design Criteria -Pre-Design Results -Design Assumptions/ Parameters -Preliminary Plans -Outline of Required Specifications -Preliminary Construction Schedule Prefinal Design (95%) -Revisions to Preliminary Design -Final QAPP -Final SAP -Final HSP -Final Construction Schedule -Cost Estimates -Draft O&M Plan -CQA Objectives Final Design (100%) -Revisions to Prefinal Design	In accordance with the project schedule approved in the CMI Workplan 30 days after receipt of U.S. EPA's comments on Preliminary Design 30 days after receipt of U.S. EPA's comments on Prefinal Design
Construction Quality Assurance Plan (CQAP)	45 days after U.S. EPA's approval of Final Design
Construct and implement corrective measure(s)	120 days after U.S. EPA's approval of CQAP

SUBMITTAL	DUE DATE
Final O&M Plan	30 days after final Construction Inspection
Construction Inspection	30 days after Construction Completion
Construction Completion Report	30 days after final Construction Inspection
O&M Progress Report	No later than one year after U.S. EPA's approval of Construction Completion Report, semi-annually thereafter
Attainment of GW Performance Standards Report	30 days after determination that GW performance standards have been attained
Completion of Work Inspection	30 days after completion of all work, including O&M
Completion of Work Report	30 days after Completion of Work Inspection

ATTACHMENT V

Quality Assurance Project Plan
Region 5 RCRA Model

Diskette enclosed contains U.S. EPA Region 5's Model Quality Assurance Project Plan (QAPP) which can be read and printed in Adobe Acrobat. It is also available on Region 5's web page at www.epa.gov/Region5.

ATTACHMENT VI

References

ATTACHMENT VI
References
A. REFERENCES

The following list comprises additional guidance documents and other information which may be useful in implementing a RCRA §3008(h) Order. This list does not include every guidance document pertaining to work performed under a §3008(h) Order. Documents are organized according to the relevant section of the Order. Contacts for additional information are included at the end of this list.

"*Health and Safety Requirements of Employees Employed in Field Activities,*" EPA Order 1440.2, July 12, 1981.

"*Corrective Measures for Releases to Ground Water from SWMUs,*" Draft Final, EPA/530-SW-88-020, March 1985.

"*Corrective Measures for Releases to Soil from SWMUs,*" Draft Final EPA/530-SW-88-022, March 1985.

"*Technical Guidance for Corrective Measures -- Subsurface Gas,*" EPA/530-SW-88-023, March 1985.

"*Technical Guidance for Corrective Measures--Determining Appropriate Technology and Response for Air Releases,*" Draft Final, EPA/530-SW-88-021, March 1985.

"*RCRA Ground-Water Monitoring Technical Enforcement Guidance Document (TEGD),*" OSWER Directive 9950.1, September 1986.

"*Technical Guidance Document: Construction Quality Assurance for Hazardous Waste Land Disposal Facilities,*" EPA 530/SW-86/031, OSWER Directive 9472.003, October 1986.

"*RCRA Facility Assessment (RFA) Guidance,*" EPA/530/SW-86/053, October 1986.

"*Data Quality Objectives for Remedial Response Activities,*" EPA/540/G-87/003 & 004, OSWER Directive 9335.0-7B, March 1987.

"*Alternate Concentration Limit Guidance, Part 1: ACL Policy and Information Requirements,*" Interim Final, OSWER Directive 9481.00-6C, July 1987.

"*A Compendium of Superfund Field Operations Methods,*" Two Volumes, EPA/540/P-87/001a&b, OSWER Directive 9355.0-14, August 1987.

"*Technology Screening Guide for Treatment of CERCLA Soils and Sludges,*" EPA/540/2-88/004, September 1988.

"*Ground-Water Modeling: An Overview and Status Report,*" EPA/600/2-89/028, December 1988.

"*Risk Assessment Guidance for Superfund, Volume II: Environmental Evaluation Manual,*" Interim Final, EPA/540/1-89/001, March 1989.

"*Ecological Assessment of Hazardous Waste Sites: A Field and Laboratory Reference Document,*" EPA 600/3-89/013, March 1989.

"*Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,*" Interim Final, EPA/530/SW-89/026, April 1989.

"*Handbook of Suggested Practices for the Design and Installation of Ground-Water Monitoring Wells,*" EPA/600/4-89/034, April 1989.

"*Stabilization/Solidification for CERCLA and RCRA Wastes,*" EPA/625/6-89/022, May 1989.

"*Interim Final RCRA Facility Investigation (RFI) Guidance,*" Volumes I-IV, EPA/530/SW-89-031, May 1989.

"*Technical Guidance Document: Final Covers on Hazardous Waste Landfills and Surface Impoundments,*" EPA/530/SW-89/047, July 1989.

"*Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part A),*" Interim Final, EPA/540/1-89/002, December 1989

"*Air/Superfund National Technical Guidance Study Series,*" Volumes I-IV, EPA 450/1-89-001,002,003,004 (1989 and 1990).

"*Handbook on In-Situ Treatment of Hazardous Waste-Contaminated Soils,*" EPA/540/2-90/002, 1990.

"*Basics of Pump-and-Treat Groundwater Remediation Technology,*" EPA/600/8-90/003, March 1990.

"*Framework for Ecological Risk Assessment,*" EPA/630/R-92/001, February 1991.

"*Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors,*" OSWER Directive 9285.6-03, March 25, 1991.

"*Synopses of Federal Demonstrations of Innovative Site Remediation Technologies,*" EPA/540/8-91/009, May 1991.

"*Bibliography of Federal Reports and Publications Describing Alternative and Innovative Treatment Technologies for Corrective Action and Site Remediation,*" EPA/540/8-91/007, May 1991.

"*Handbook: Ground Water,*" Volumes I and II, EPA/625/6-90/016 (a&b), September 1990 and July 1991.

"Guide for Conducting Treatability Studies under CERCLA: Aerobic Biodegradation Remedy Screening", EPA/540/2-91/013B, July 1991.

"*Handbook: Stabilization Technologies for RCRA Corrective Actions,*" EPA/625/6-91/026, August 1991.

"*Guide for Conducting Treatability Studies under CERCLA: Soil Vapor Extraction*", EPA/540/2-91/019B, September 1991.

"*Guide for Conducting Treatability Studies under CERCLA: Soil Washing,*" EPA/540/2-91/020B, September 1991.

"*Selected Alternative and Innovative Treatment Technologies for Corrective Action and Site Remediation,*" EPA/540/8-91/092, 1991.

"*Characterizing Heterogeneous Wastes: Methods and Recommendations,*" EPA/600/R-92/033, Feb. 1992.

"*Final Guidance for Data Useability in Risk Assessment,*" (Parts A & B), OSWER Directive 9285.7-09A, April 1992.

"*Literature Survey of Innovative Technologies for Hazardous Waste Site Remediation: 1987 - 1991,*" EPA/542/B-92/004, July 1992.

"*Handbook of RCRA Ground-Water Monitoring Constituents: Chemical and Physical Properties,*" EPA/530/R-92/022, September 1992.

"*Ground-Water Monitoring: Draft Technical Guidance,*" EPA/530-R-93-001, November 1992.

"*Statistical Training Course for Ground-Water Monitoring Data Analysis,*" EPA/530/R-93/003, 1992.

"*Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration,*" OSWER Directive 9234.2-25, September 1993.

"*RCRA Corrective Action Plan,*" OSWER Directive 9902.3-2A, May 1994.

"*Ecological Risk Assessment Guidance for RCRA Corrective Action,*" U.S. EPA, Region 5, Interim Draft, October 1994.

"*Land Use in the CERCLA Remedy Selection Process,*" OSWER Directive 9355.7-04, May 25, 1995.

"*Standard Guide for Risk Based Corrective Action Applied to Petroleum Release Sites,*" ASTM E-1739-95, November 1995. (As approved by Region 5 guidance policy)

"*Conducting Risk-Based Corrective Action for Federally-Regulated UST Petroleum Releases,*" U.S. EPA, Region 5, December 7, 1995.

"*Sitting at the RCRA Data Quality Level Table, Update 1,*" U.S. EPA, Region 5, Memorandum, December 14, 1995.

"*Soil Screening Guidance: Users Guide,*" OSWER Publication 9355.4-23, April 1996.

"*Soil Screening Guidance: Technical Background Document,*" EPA/540/R-95/128, May 1996.

"*Corrective Action for Releases From Solid Waste Management Units at Hazardous Waste Management Facilities,*" Advanced Notice of Proposed Rulemaking, 61 Fed. Reg. 19432, May 1, 1996.

"*Region 9 Preliminary Remediation Goals (PRGs) 1996,*" U.S. EPA, Region 9, Annual Update, August 1, 1996.

"*Region 5 Ecological Data Quality Levels,*" Final Report, August 26, 1996.

"*EPA's Proposed Guidelines for Ecological Risk Assessment,*" 61 Fed. Reg. 47552, September 9, 1996. (Note: Final document to be released in early-1998.)

"*Corrective Action Principles,*" U.S. EPA, Region 5, Memorandum, November 19, 1996.

"*Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments,*" Interim Final, EPA/540/R-97/006, June 5, 1997.

"*Ecological Data Quality Levels, RCRA Appendix IX Hazardous Constituents,*" U.S. EPA, Region 5, Draft Report, August 18, 1997.

GENERAL INFORMATION:

"OSWER Directives - System Catalog," OSWER Directive 9013.15-3D, March 1992. (Provides a list of OSWER Directives published through March 1991.)

"Technical Support Services for Superfund Site Remediation and RCRA Corrective Action" (third edition), EPA/540/8-91/091, March 1992.

"Accessing Federal Data Bases for Contaminated Site Clean-Up Technologies," EPA/540/8-91/008, May 1991.

"Memorandum on the Use of Supplemental Environmental Projects, Amendment to GM 22," James M. Strock, February 12, 1991.

USEFUL TELEPHONE NUMBERS:

RCRA/CERCLA/UST Hotline (800) 424-9346

EPA's Office of Research and Development publishes occasional ground water and engineering issue papers. For information contact:

ORD Publications Office, Center for Environmental Research Information (CERI), (513) 569-7562

National Technical Information Services (NTIS) (703) 487-4650
(800) 553-6847

ATTACHMENT VII

Acknowledgment of Termination

ATTACHMENT VII
Acknowledgment of Termination

ACKNOWLEDGMENT OF TERMINATION and
AGREEMENT TO RECORD PRESERVATION AND RESERVATION OF RIGHTS

1. The United States Environmental Protection Agency (U.S. EPA) agrees and acknowledges that the terms of Order RCRA- - - issued by U.S. EPA on , 19 (Order), including any additional tasks determined by U.S. EPA to have been required pursuant to the Order, but excluding Section XIII: Record Preservation, have been satisfactorily completed based upon the information presently available to U.S. EPA.

2. Respondent agrees and acknowledges that the terms of Section XIII: Record Preservation remain in effect until , 20 (date 6 years after termination of the Order).

3. Respondent agrees and acknowledges that Respondent's completion of the terms of the Order does not limit or otherwise preclude U.S. EPA from taking additional enforcement action pursuant to Section 3008(h) of the Solid Waste Disposal Act, commonly referred to as the Resource Conservation and Recovery Act of 1976 (RCRA), as amended by the Hazardous and Solid Waste Amendments of 1984, 42 U.S.C. §6928(h), or other available legal authorities, should U.S. EPA determine that such actions are warranted.

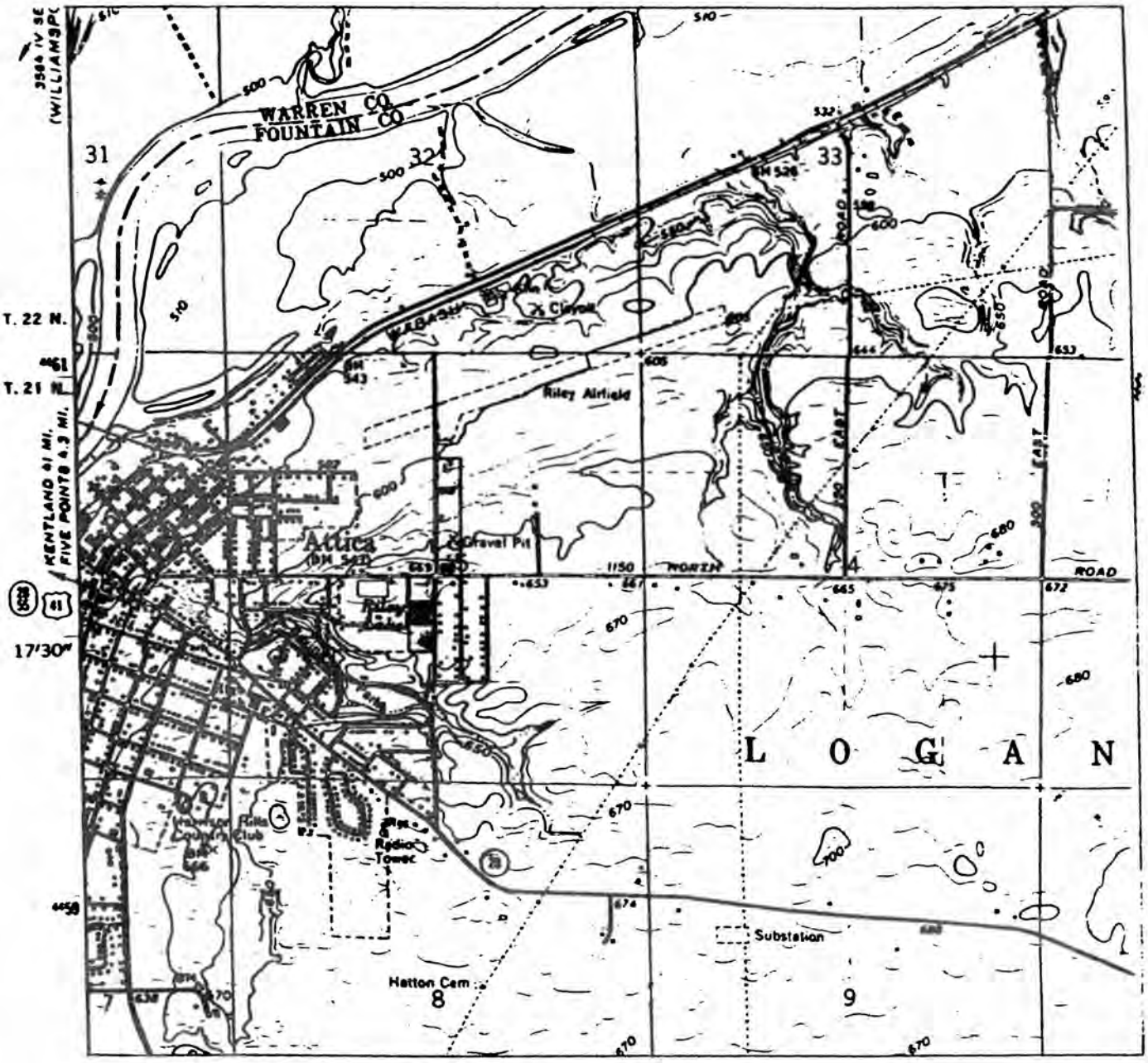
4. Respondent agrees and acknowledges that Respondent's completion of the terms of the Order does not relieve Respondent of its obligations to comply with RCRA or any other applicable local, State, or Federal laws and regulations.

IT IS SO AGREED AND ACKNOWLEDGED:

Date:_____ By: _____
(Name), (Title)
(RESPONDENT)

Date:_____ By: _____
(Name), (Title)
UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 5
(Petitioner)

FIGURE 1
FACILITY LOCATION MAP

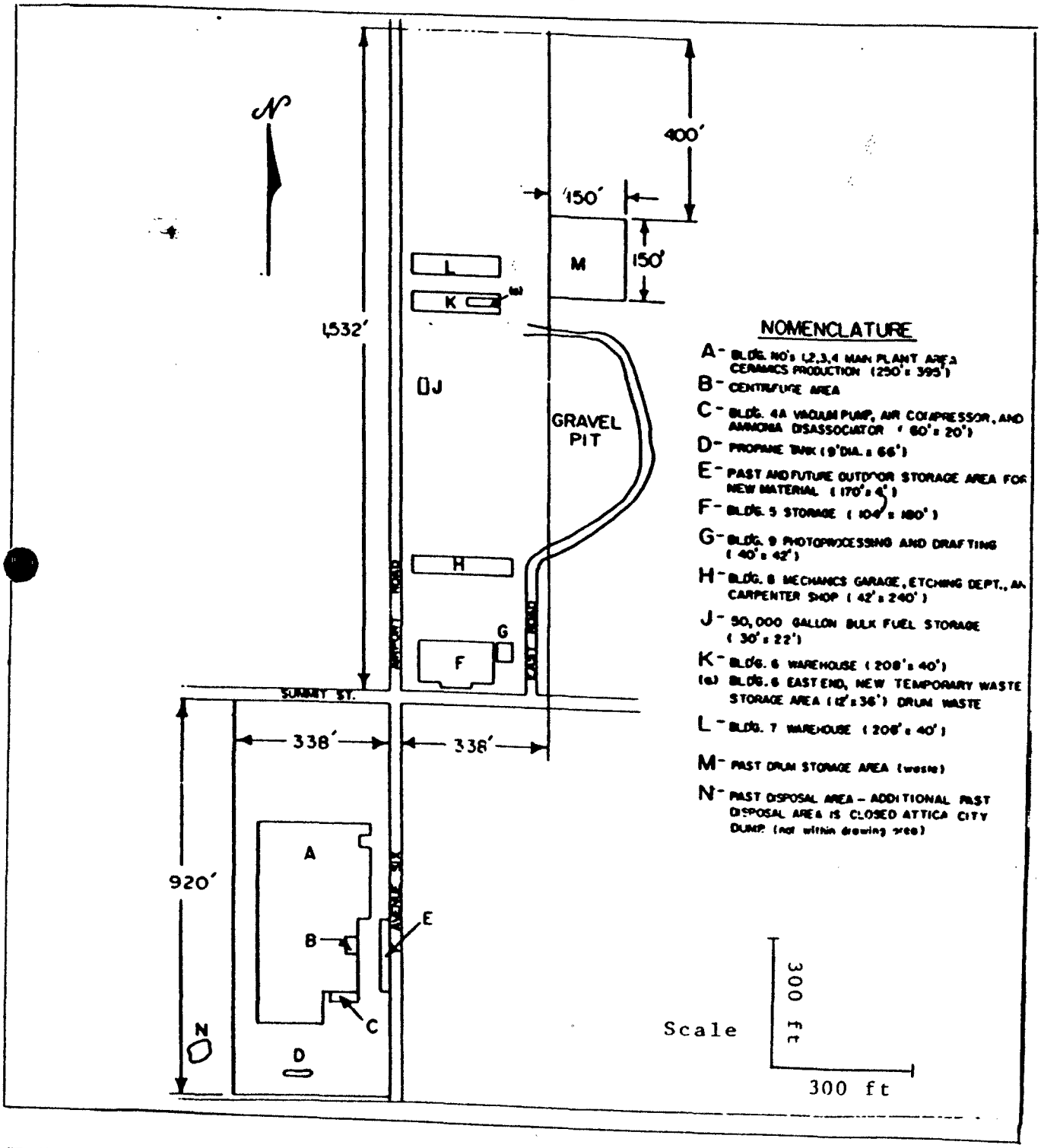


USGS 7.5 Minute Quadrangle, Attica, IN, 1962

Scale: 1 inch = 2000ft

Metcalf & Eddy

FIGURE 2
SITE MAP



Metcalf & Eddy

TABLE 1
Waste Streams Generated at Radio Materials Corporation

WASTE STREAM	AMOUNT	DISPOSAL/TREATMENT
Ceramic Waste	6 drums/yr	Recycled
Fired ceramic discs	86 lbs/mo	Municipal landfill
Aluminum oxide refractory scrap	100 lbs/mo	Recycled/stored/land-filled
Waste epoxy and phenolic resin	75 lbs/mo	Stored on site
Aqueous flux in alcohol	23 gal/mo	Manifested off site
Ink-jet inks and solvents	<1 gal/mo	Manifested off site
Cleaning and rinse water	1700 gal/mo	City sewer
Tetrachloroethylene, Trichloroethylene, Acetone/alcohol, and Ethyl acetate	averages 23 gal/mo	Manifested off site
Oil/water waste	8-10 drums/yr	Oil recovery tank truck
Waste silver Waste copper wire Solder dross Product rejects	10 tr oz/mo 161 lbs/mo 20 lbs/mo 108 lbs/mo	Smelted and refined for recovery of metal content or stored on site when metal markets are low
Empty raw material bags that contained barium carbonate and titanium dioxide	100 bags/mo	Municipal landfill

TABLE 2
Current Radio Materials Corp Wastes, By Chemical Composition and Hazardous Waste Code

CHEMICAL	HAZARDOUS WASTE CODE
Trichloroethylene	Listed Waste F001
Tetrachloroethylene	Listed Waste F001
Acetone/alcohol	Listed Waste F003
Phenolic resin	Characteristic Waste D001
Solder dross (lead)	Characteristic Waste D008
Non-halogenated solvent	Listed Waste F005
Ethyl acetate	Listed Waste F003
Methyl ethyl ketone	Listed Waste F005
Waste ink (silver)	Characteristic Waste D011
Ceramic Scrap (barium)	Characteristic Waste D005

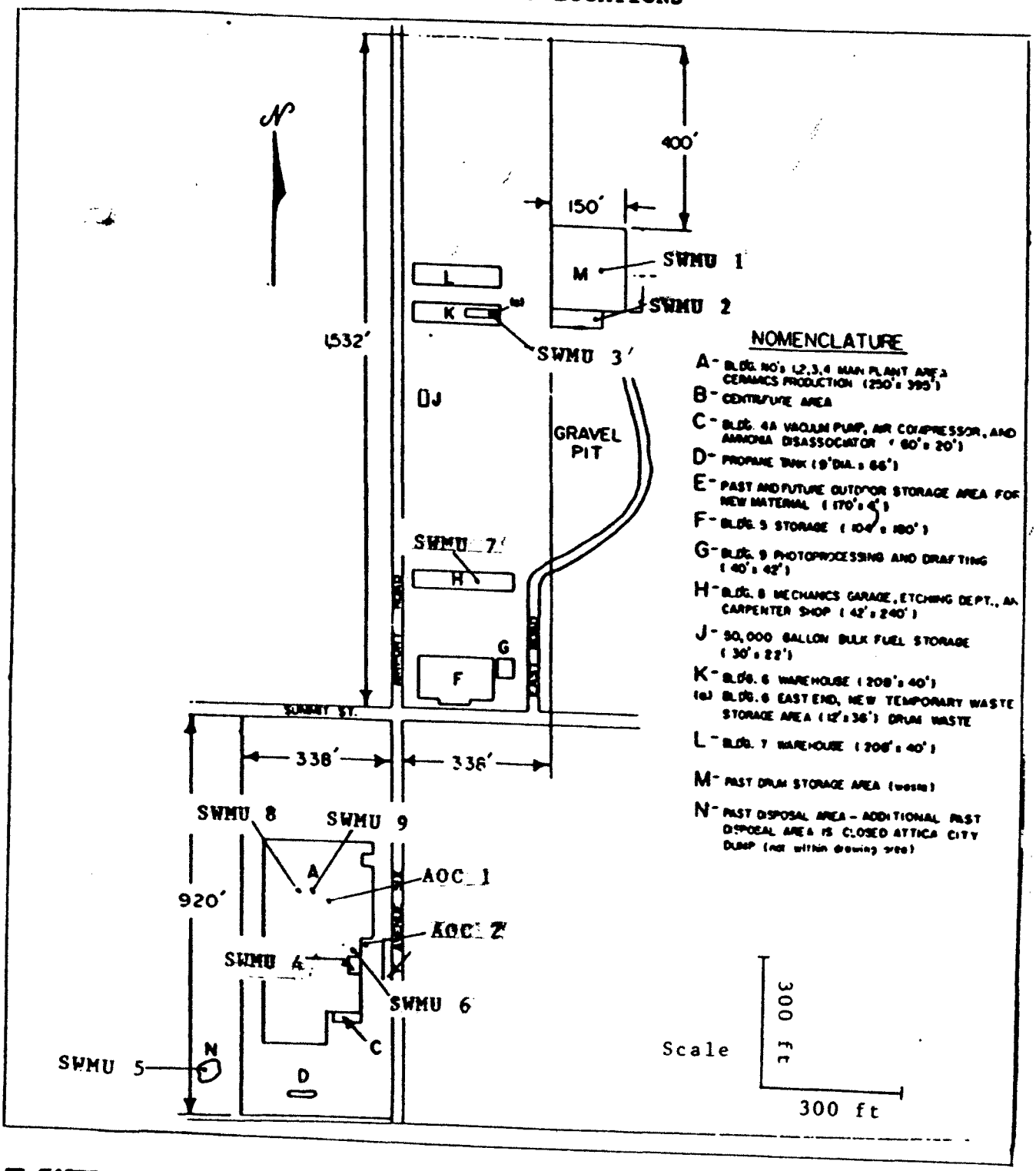
TABLE 3

Summary of Solid Waste Management Units at Radio Materials Corporation

SWMU Name	RCRA HWMU	Status
SWMU 1 - Outdoor Drum Area	Y - Storage	Closure Pending
SWMU 2 - Past Disposal Area "A"	N - Disposal	Inactive
SWMU 3 - Temporary Storage Area	Y - Storage	Closure Pending
SWMU 4 - Centrifuge Area	Y - Treatment	Closure Pending
SWMU 5 - Past Disposal Area "B"	N - Disposal	Inactive
SWMU 6 - Eight 55-Gallon Drum Storage Area	N - Storage	Active
SWMU 7 - Etching Room	N - Process Area	Inactive
SWMU 8 - Phenolic Dip Area	N - Process Area	Active
SWMU 9 - Epoxy Resin Coating Room	N - Process Area	Active

Y - Unit is currently or was a RCRA hazardous waste management unit.
N - Unit is not currently nor has been a RCRA hazardous waste management unit.

FIGURE 3
SWMU AND AOC LOCATIONS



Metcalf & Eddy