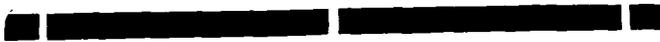


2494


— G-000-102.63 —

**EXPOSURE INFORMATION REPORT (VOLUME 1
OF 2) OCTOBER 31, 1991**

10/31/91

~~50-84~~
REPORT



United States
Department of Energy

Fernald Environmental Management Project



EXPOSURE INFORMATION REPORT

(Volume 1 of 2)

October 31, 1991

U.S. EPA Identification No. OH6890008976
Ohio EPA Permit No. 05-31-0681

EXPOSURE INFORMATION REPORT (EIR)

TABLE OF CONTENTS

1.0	INTRODUCTION	1
2.0	ADDITIONAL INFORMATION REQUIREMENTS - OPERABLE UNIT 1	5
2.1	Additional General Information	5
2.1.1	Existing risk assessment reports and information, including liability insurance analysis, claims and settlements (A-2a)	5
2.1.2	Land use and zoning map(s) for an area of four miles around the unit (A-2b)	5
2.1.3	Existing aerial photographs of the facility (A-2c)	6
2.1.4	Identify and summarize any waste analysis data already submitted; provide additional data (A-2d)	6
2.1.5	Current estimate of annual amount of waste received and description of any pretreatment process used (A-2e)	6
2.1.6	Identification of any Federal, State, or local inspection or compliance records related to environmental and health programs; include description of any major violations (A-2f)	7
2.2	Additional Groundwater Pathway Information (B-2)	8
2.2.1	Existing map showing location of all known wells within three miles; number and location of drinking water wells (B-2a)	8
2.2.2	Discussion of groundwater uses within three miles of unit (B-2b)	8
2.2.3	Regional map showing areas of groundwater recharge and discharge (B-2c)	9
2.2.4	Net precipitation using net seasonal rainfall or other available data (B-2d)	9
2.2.5	Unless otherwise reported to the EPA, available well data (B-2e)	9

2.2.6	Any known food chain contamination due to prior release from the unit to groundwater (B-2f)	10
2.3	Additional Surface Water Pathway Information (C-2)	12
2.3.1	Discussion of surface water uses within three miles of the unit, including a map showing the location of all surface water bodies and downstream drinking water intakes (C-2a)	12
2.3.2	Velocities of streams and rivers passing through and adjacent to the property (C-2b)	13
2.3.3	Description of any system used to monitor surface water quality, and a summary of the data (C-2c)	13
2.3.4	Description of known releases to surface water; the extent of contamination; remedial action, if any; and if known, severity of impact (C-2d)	15
2.3.5	Any known food chain contamination resulting from prior release from the unit to surface water (C-2e)	15
2.4	Additional Air Pathways Information (D-2)	16
2.4.1	Summary of air monitoring data and a description of current monitoring systems, if any (D-2a)	16
2.4.2	Population within a four mile radius of the unit (D-2b)	17
2.4.3	Describe any known releases to air; the extent of contamination; remedial action taken, if any; and severity of impact, if known (D-2c)	17
2.5	Additional Subsurface Gas Pathway Information (E-2)	18
2.5.1	Any past disposal of municipal-type wastes in the unit; approximate quantities and dates of disposal, if known (E-2a)	18
2.5.2	Map location of any underground conduits within the site and known underground conduits within 1000 feet of property boundary (E-2b)	18
2.5.3	Descriptions of any monitoring or control mechanisms for subsurface gas release; summarize resulting data (E-2c)	18

2.5.4	Description of any known releases, extent of contamination; remedial action, if any; and the severity of impact, if known (E-2d)	18
2.6	Contaminated Soil Pathway (F)	19
2.6.1	If soil sampling has been done, a map showing areas of soil contamination, and a summary of analytical result (F-2a)	19
2.6.2	Description of the major types of releases that resulted in soil contamination, and any cleanup action (F-2b)	19
2.6.3	Any known food-chain contamination resulting from the use of contaminated soils for raising crops (F-2c)	19
2.7	Additional Transportation Information (G-2)	20
2.7.1	Description of the types and capacities of vehicles used to transport waste (G-2a)	20
2.7.2	Identification of normal transport routes for hazardous wastes into the site and within one mile of the facility entries (G-2b)	22
2.7.3	Description of procedures for clean-up of transportation-related spills or leaks (G-2c)	22
2.7.4	Description of any transportation accidents releasing hazardous wastes on-site, or in the immediate vicinity (G-2d)	22
2.8	Additional Management Practices Information (H-2)	23
2.8.1	Summary of existing records on worker illness or injury, related to the operation of the unit, include summaries of Workmen's Compensation claims, or hospital records	23
3.0	ADDITIONAL INFORMATION REQUIREMENTS - OPERABLE UNIT 2	24
3.1	Additional General Information	24
3.1.1	Existing risk assessment reports and information, including liability insurance analysis, claims and settlements (A-2a)	24

3.1.2	Land use and zoning map(s) for an area of four miles around the unit (A-2b)	24
3.1.3	Existing aerial photographs of the facility (A-2c)	25
3.1.4	Identify and summarize any waste analysis data already submitted; provide additional data (A-2d)	25
3.1.5	Current estimate of annual amount of waste received and description of any pretreatment process used (A-2e)	25
3.1.6	Identification of any Federal, State, or local inspection or compliance records related to environmental and health programs; include description of any major violations (A-2f) . . .	25
3.2	Groundwater Pathway (B-2)	25
3.2.1	Existing map showing location of all known wells within three miles; number and location of drinking water wells (B-2a)	25
3.2.2	Discussion of groundwater uses within three miles of unit (B-2b)	26
3.2.3	Regional map showing areas of groundwater recharge and discharge (B-2c)	26
3.2.4	Net precipitation using net seasonal rainfall or other available data (B-2d)	26
3.2.5	Unless otherwise reported to the EPA, available well data (B-2e)	26
3.2.6	Any known food chain contamination due to prior release from the unit to groundwater (B-2f) . . .	26
3.3	Surface Water Pathway	27
3.3.1	Discussion of surface water uses within three miles of the unit, including a map showing the location of all surface water bodies and downstream drinking water intakes (C-2a)	27
3.3.2	Velocities of streams and rivers passing through and adjacent to the property (C-2b)	27

3.3.3	Description of any system used to monitor surface water quality, and a summary of the data	27
3.3.4	Description of known releases to surface water; the extent of contamination; remedial action, if any; and if known, severity of impact (C-2d) . .	27
3.3.5	Any known food chain contamination resulting from prior release from the unit to surface water (C-2e)	27
3.4	Air Pathways (D)	28
3.4.1	Summary of air monitoring data and a description of current monitoring systems, if any (D-2a) . .	28
3.4.2	Population within a four mile radius of the unit (D-2b)	28
3.4.3	Describe any known releases to air; the extent of contamination; remedial action taken, if any; and severity of impact, if known (D-2c)	28
3.5	Subsurface Gas Pathway	28
3.5.1	Any past disposal of municipal-type wastes in the unit; approximate quantities and dates of disposal, if known (E-2a)	28
3.5.2	Map location of any underground conduits within the site and known underground conduits within a 1000 feet of property boundary (E-2b)	29
3.5.3	Descriptions of any monitoring or control mechanisms for subsurface gas release; summarize resulting data (E-2c)	29
3.5.4	Description of any known releases, extent of contamination; remedial action, if any; and the severity of impact, if known (E-2d)	29
3.6	Contaminated Soil Pathway (F)	29
3.6.1	If soil sampling has been done, a map showing areas of soil contamination, and a summary of analytical results (F-2a)	29

3.6.2	Description of the major types of releases that resulted in soil contamination, and any cleanup action (F-2b)	30
3.6.3	Any known food-chain contamination resulting from the use of contaminated soils for raising crops (F-2c)	30
3.7	Transportation Information (G)	30
3.7.1	Description of the types and capacities of vehicles used to transport waste (G-2a)	30
3.7.2	Identification of normal transport routes for hazardous wastes into the site and within one mile of the facility entries (G-2b)	30
3.7.3	Description of procedures for clean-up of transportation-related spills or leaks (G-2c)	30
3.7.4	Description of any transportation accidents releasing hazardous wastes on-site, or in the immediate vicinity (G-2d)	31
3.8	Management Practices Information (H-2)	31
3.8.1	Summary of existing records on worker illness or injury, related to the operation of the unit, include summaries of Workmen's Compensation claims, or hospital records	31
4.0	ADDITIONAL INFORMATION REQUIREMENTS - OPERABLE UNIT 3	32
4.1	Additional Information (A-2)	32
4.1.1	Existing risk assessment reports and information, including liability insurance analysis, claims and settlements (A-2a)	32
4.1.2	Land use and zoning map(s) for an area of four miles around the unit (A-2b)	32
4.1.3	Existing aerial photographs of the facility (A-2c)	33
4.1.4	Identify and summarize any waste analysis data already submitted; provide additional data (A-2d)	33

4.1.5	Current estimate of annual amount of waste received and description of any pretreatment process used (A-2e)	33
4.1.6	Identification of any Federal, State, or local inspection or compliance records related to environmental and health programs; include description of any major violations (A-2f) . . .	33
4.2	Groundwater Pathway (B-2)	34
4.2.1	Existing map showing location of all known wells within three miles; number and location of drinking water wells (B-2a)	34
4.2.2	Discussion of groundwater uses within three miles of unit (B-2b)	34
4.2.3	Regional map showing areas of groundwater recharge and discharge (B-2c)	34
4.2.4	Net precipitation using net seasonal rainfall or other available data (B-2d)	34
4.2.5	Unless otherwise reported to the EPA, available well data (B-2e)	35
4.2.6	Any known food chain contamination due to prior release from the unit to groundwater (B-2f)	35
4.3	Surface Water Pathway	35
4.3.1	Discussion of surface water uses within three miles of the unit, including a map showing the location of all surface water bodies and downstream drinking water intakes (C-2a)	35
4.3.2	Velocities of streams and rivers passing through and adjacent to the property (C-2b)	35
4.3.3	Description of any system used to monitor surface water quality, and a summary of the data	36
4.3.4	Description of known releases to surface water; the extent of contamination; remedial action, if any; and if known, severity of impact (C-2d) . .	36

4.3.5	Any known food chain contamination resulting from prior release from the unit to surface water (C-2e)	36
4.4	Air Pathways (D)	36
4.4.1	Summary of air monitoring data and a description of current monitoring systems, if any (D-2a)	36
4.4.2	Population within a four mile radius of the unit (D-2b)	36
4.4.3	Describe any known releases to air; the extent of contamination; remedial action taken, if any; and severity of impact, if known (D-2c)	37
4.5	Subsurface Gas Pathway	37
4.5.1	Any past disposal of municipal-type wastes in the unit; approximate quantities and dates of disposal, if known (E-2a)	37
4.5.2	Map location of any underground conduits within the site and known underground conduits within a 1000 feet of property boundary (E-2b)	37
4.5.3	Descriptions of any monitoring or control mechanisms for subsurface gas release; summarize resulting data (E-2c)	37
4.5.4	Description of any known releases, extent of contamination; remedial action, if any; and the severity of impact, if known (E-2d)	37
4.6	Contaminated Soil Pathway (F)	38
4.6.1	If soil sampling has been done, a map showing areas of soil contamination, and a summary of analytical results (F-2a)	38
4.6.2	Description of the major types of releases that resulted in soil contamination, and any cleanup action (F-2b)	38
4.6.3	Any known food-chain contamination resulting from the use of contaminated soils for raising crops (F-2c)	38

4.7	Transportation Information (G)	38
4.7.1	Description of the types and capacities of vehicles used to transport waste (G-2a)	38
4.7.2	Identification of normal transport routes for hazardous wastes into the site and within one mile of the facility entries (G-2b)	39
4.7.3	Description of procedures for clean-up of transportation-related spills or leaks (G-2c)	39
4.7.4	Description of any transportation accidents releasing hazardous wastes on-site, or in the immediate vicinity (G-2d).	39
4.8	Management Practices Information (H-2)	39
4.8.1	Summary of existing records on worker illness or injury, related to the operation of the unit, include summaries of Workmen's Compensation claims, or hospital records	39
5.0	EXPOSURE POTENTIAL OF THE UNIT	41
5.1	Potential for Human Exposure Via the Groundwater Pathway	41
5.2	Potential for Human Exposure Via the Surface Water Pathway	43
5.3	Potential for Human Exposure Via the Air Pathway	44
5.4	Potential for Human Exposure From Subsurface Gas Releases	45
5.5	Potential for Human Exposure From Releases to Soil	45
5.6	Potential for Human Exposure From Transportation Related Releases	45
5.7	Potential for Human Exposure From Worker-Management Practices	46

LIST OF TABLES

Table 1	Closure Plan Submission Dates for Eight HWMUs
Table 2	Summary of Monthly NPDES Monitoring - Clearwell
Table 3	Summary of Monthly NPDES Non-Compliances - Clearwell

Table 4	Summary of Alleged Violations for Waste Pit Number 4 (August 1986 - February 1990)
Table 5	Summary of Monthly NPDES Monitoring Results - Biodenitrification (August 1986 - July 1991)
Table 6	Summary of Monthly NPDES Monitoring Results - Biodenitrification (March 1990 - June 1991)
Table 7	Summary of Monthly NPDES Non-Compliances - Biodenitrification

LIST OF FIGURES

Figure 1	Location of EIR Units and Typical Transportation Routes
Figure 2	Off-Site Public Wells Within Three Miles of FEMP
Figure 3	On-Site Monitoring Wells - FEMP
Figure 4	USGS Map Showing Surfacewater Bodies Within Three Miles of FEMP

LIST OF ATTACHMENTS

Attachment 1	Exposure Information Report Checklist
Attachment 2	Zoning Maps for Morgan, Crosby, Ross, and Colerain Townships
Attachment 3	Groundwater Recharge Map for Butler and Hamilton Counties
Attachment 4	Location of Underground Conduits

EXPOSURE INFORMATION REPORT (EIR)Fernald Environmental Management Project
Fernald, Ohio1.0 INTRODUCTION

This Exposure Information Report is submitted as required by Ohio Administrative Code (OAC) 3745-50-40(G), and Title 40 of the Code of Federal Regulations (CFR) 270.10(j). These rules both state that "... any Part B Permit Application submitted by an owner or operator of a facility that stores, treats, or disposes of hazardous waste in a surface impoundment or a landfill must be accompanied by information, reasonably ascertainable by the owner or operator, on the potential for the public to be exposed to hazardous wastes or hazardous constituents through releases related to the unit."

The Exposure Information Report addresses the exposure potential of nine units identified at the Fernald Environmental Management Project (FEMP) that meet the definition of a surface impoundment or landfill. These units were all listed as Hazardous Waste Management Units (HWMUs) in the RCRA Part A Permit Application submitted June 30, 1991. The FEMP is not seeking a permit to operate any of these units. The nine units include:

- Waste Pit No. 4
- Waste Pit No. 5
- Clearwell
- Bio-Surge Lagoon
- Lime Sludge Ponds
- Tank Farm Sump
- Coal Pile Run-off Basin
- Fire Training Facility
- Sludge Drying Beds

Figure 1 shows the location of these nine units.

The FEMP is a Department of Energy facility that formerly produced uranium metal. On November 28, 1989, the FEMP was included on the National Priorities List (NPL) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The FEMP is subject to a Federal Facilities Compliance Agreement (FFCA) (1986) which was amended by Consent Agreement in 1990 and 1991 (CERCLA Consent Agreement). The FFCA and CERCLA Consent Agreement require the FEMP to conduct a Remedial Investigation/Feasibility Study (RI/FS) with remedial action to study and clean up releases at and from the FEMP. The CERCLA Consent Agreement further provides the schedules for completion of the RI/FS for each Operable Unit at the FEMP.

The HWMUs in this Exposure Information Report are discussed according to their Operable Unit. An Operable Unit is defined as "... a discrete action that comprises an incremental step toward comprehensively addressing site problems" (40 CFR 300.5). A facility can be divided into any number of operable units determined by geographical location, or specific site problems. The Remedial Investigation (RI) will determine the nature and extent of the threat of public health or welfare or the environment caused by the release and threatened release of hazardous substances, pollutants, contaminants, or hazardous constituents at the FEMP, and include a baseline risk assessment for each Operable Unit. As of the submission of this report, the Operable Unit applicable to each individual unit discussed in this Exposure Information Report is listed below:

- Operable Unit 1 includes Waste Pit No. 4, Waste Pit No. 5, and the Clearwell;
- Operable Unit 2 includes the Lime Sludge Ponds;
- Operable Unit 3 includes the Fire Training Facility, Sludge Drying Beds, Tank Farm Sump, Bio-Surge Lagoon, and the Coal Pile Run-off Basin.

The two previous Exposure Information Reports submitted for the FEMP (dated 1985 and 1989) both presented information on only one unit, Waste

Pit No. 4. Waste Pit No. 4 was the only surface impoundment or landfill containing hazardous waste identified at the FEMP at that time. This Exposure Information Report addresses the exposure potential of nine HWMUs. Specific information pertaining to these units is limited, since eight of these units were not classified as HWMUs until the RCRA Part A Permit Application submittal on June 30, 1991. Any available information for individual units is supplied in this report. Applicable information that is not currently available will be provided to the OEPA and U.S. EPA as part of the RI/FS for each Operable Unit and/or the closure plan information for the HWMU.

Waste Pit No. 4 has undergone interim closure, with final closure deferred to the CERCLA program. The remaining eight units are scheduled for closure according to schedules submitted to OEPA. The closure plan submission dates for the remaining eight units are listed in Table 1.

This Exposure Information Report was prepared following guidelines provided in U.S. EPA document PB87-193694 "Permit Applicants' Guidance Manual for Exposure Information Requirements under RCRA Section 3019". Appendix A of that Guidance Manual is a checklist for applicants to cross-reference the location of information already included in their RCRA Part B Permit Application that is required in the Exposure Information Report. Information provided in the RCRA Part B Permit Application need not be resubmitted in the Exposure Information Report. Attachment 1 of this report is the Guidance Manual Information Requirements Checklist which cross-references information provided in the RCRA Part B Permit Application, and also lists the location of Additional Information Requirements for the Exposure Information Report.

Section 1 of the Exposure Information Report provides introductory information. Section 2 through Section 4 provide additional exposure-related information as outlined in the EPA Guidance Manual referenced above, and are organized by operable unit. Section 5 provides a narrative discussion based on the information provided in Section 2 through Section 4 on the potential for the public to be exposed to hazardous wastes or hazardous constituents through releases related to the units of concern.

The notation at the end of each subsection heading cross-references the information requirements in the guidance manual checklist (Attachment 1). All figures and tables referenced in this report are included at the end of the report.

It is Westinghouse Environmental Management Company of Ohio's (WEMCO) position that the following surface impoundments listed in this document did not manage a listed hazardous waste because of the application of the wastewater mixture rule exemption, and, as such, are exempt from Hazardous Waste Management Unit requirements: Waste Pit No. 5, the Clearwell, the Bio-surge Lagoon, the Sludge Drying Beds, the Lime Sludge Ponds, and the Coal Pile Runoff Basin. WEMCO is executing this document as co-operator in the spirit of cooperation with DOE which has overall responsibility for the FEMP. But in doing so, WEMCO does not agree that the listed surface impoundments are hazardous waste management units or that they and the listed wastewater streams are subject to hazardous waste statutes or regulations and WEMCO, in executing the document expressly reserves all rights with respect thereto.

2.0 ADDITIONAL INFORMATION REQUIREMENTS - OPERABLE UNIT 1

Additional Information Requirements of the Exposure Information Report are addressed in the following subsections in the same order as referenced in the Requirements Checklist provided in Attachment 1. This section presents specific information, when available, on Waste Pit No. 4, Waste Pit No. 5, and the Clearwell, as well as general information on Operable Unit 1.

2.1 Additional General Information

2.1.1 Existing risk assessment reports and information, including liability insurance analysis, claims and settlements (A-2a)

The Federal government is exempt from financial requirements according to OAC 3745-55-40, and 40 CFR 264.140(c), including liability insurance. Therefore, no health or risk assessment information has been prepared by insurance underwriters.

A baseline risk assessment for Operable Unit 1 is being conducted as part of the Remedial Investigation/Feasibility Study (RI/FS). This document is still in the draft stage, and will be submitted to the OEPA and U.S. EPA in accordance with the schedules in the CERCLA Consent Agreement.

2.1.2 Land use and zoning map(s) for an area of four miles around the unit (A-2b)

Zoning maps for an area four miles around the facility are provided in Attachment 2. The best available maps from Colerain, Morgan, Ross, and Crosby Townships are provided.

The primary land use within four miles of the FEMP is agricultural. Residential zones within four miles of the

facility are within the following municipalities: Fernald, Shandon, Ross, New Baltimore, New Haven, and Dunlap. There are 100 year flood plain zones along Paddy's Run and the Great Miami River, but none of the units of concern within Operable Unit 1 are in these zones. Numerous Neighborhood, Community, and General Business zones, and Light Industry zoned areas are within four miles of the facility.

2.1.3 Existing aerial photographs of the facility (A-2c)

Photographs of the facility are in the FEMP RCRA Part A Permit Application.

2.1.4 Identify and summarize any waste analysis data already submitted; provide additional data (A-2d)

The 1985 and 1989 RCRA Part B Permit Applications stated that approximately 23,500 pounds of waste containing barium chloride salt was placed in Waste Pit No. 4 between 1981 and 1983.

A summary of monthly monitoring reports submitted for the Clearwell as required by NPDES Permit No. 11000004605 is provided in Table 2.

Waste Pit No. 5 and the Clearwell were only recently identified as containing hazardous waste. No data, other than the NPDES monthly reports, have previously been submitted for the units. Waste analysis data will be collected as part of the remediation/closure activities for the two units.

2.1.5 Current estimate of annual amount of waste received and description of any pretreatment process used (A-2e)

None of the individual units discussed within the Exposure

Information Report for Operable Unit 1 are expected to receive hazardous waste.

2.1.6 Identification of any Federal, State, or local inspection or compliance records related to environmental and health programs; include description of any major violations (A-2f)

Inspections at the FEMP, including surface impoundments and landfills, are conducted by the U.S. EPA Region V and the OEPA. Complete copies of these inspections are located at the FEMP in the U.S. Department of Energy Central File Room. These reports are also kept on file at the respective agencies.

Inspections of this facility are also conducted by other Federal, State, and local agencies, but are not applicable directly to surface impoundments and landfills. The FEMP has more than 260 air permits, none of which are applicable to the units of concern in this Exposure Information Report. The only permit directly associated with the units of concern in Operable Unit 1 is a NPDES permit (Permit No. 11000004605) for the FEMP Wastewater Treatment System. Effluent from the Clearwell was monitored under the facility's NPDES permit. A summary of monthly non-compliance values for the Clearwell is provided in Table 3. This unit is no longer required to submit analytical data because discharge from the Clearwell is currently pumped to the Bio-Surge Lagoon.

Inspections conducted by the U.S. EPA and the OEPA have resulted in various Notice Of Violations (NOV). The only NOVs applicable to the units of concern within Operable Unit 1 were for Waste Pit No. 4. A summary of alleged violations for this unit is provided in Table 4.

2.2 Additional Groundwater Pathway Information (B-2)

2.2.1 Existing map showing location of all known wells within three miles; number and location of drinking water wells (B-2a)

A map showing the approximate locations of known off-site private wells within three miles of the facility is provided in Figure 2. The number of known drinking water wells within three miles of the facility exceeds 200, based on a survey funded by the Department of Energy. A map showing the on-site groundwater wells is provided as Figure 3. Section XV of the FEMP RCRA Part A Permit Application provides a map depicting known drinking water wells within 1/4 mile of the FEMP.

2.2.2 Discussion of groundwater uses within three miles of unit (B-2b)

The FEMP operates three on-site production wells which pumped at an average rate of 270,000 gallons per day in 1990. This water was primarily used for waste management operations, fire protection, and as a sanitary and potable water supply.

Private wells within a three mile radius of the site are primarily used for drinking water. Since land use in the area is primarily agricultural, some wells may also be used for irrigation purposes and as a water supply for domestic animals.

The Southwestern Ohio Water Company operates three collection wells on the banks of the Great Miami River upstream of the FEMP. The Southwestern Ohio Water Company pumped an average of 17.12 million gallons of water per day in 1990. This source is primarily used as a potable water supply.

2.2.3 Regional map showing areas of groundwater recharge and discharge (B-2c)

Regional maps showing areas of groundwater recharge and discharge for Butler and Hamilton Counties are provided in Attachment 3.

2.2.4 Net precipitation using net seasonal rainfall or other available data (B-2d)

The net annual precipitation for this region is estimated at 5.2 inches. This value was calculated by subtracting the mean annual evaporation for the region from the average annual precipitation. The annual precipitation average for the Hamilton-Fairfield NOAA station from 1951 through 1980 was 38.2 inches. The mean annual Free Water Surface evaporation for this region from 1956 through 1970 was 33 inches. Free Water Surface is defined as evaporation from a thin film of water having no appreciable heat storage. Free Water Surface evaporation closely represents the potential evaporation from adequately watered natural surfaces such as vegetation and soil. The actual evaporation is potentially less from a natural surface, therefore, the estimated evaporation value provided may be higher than actual evaporation.

2.2.5 Unless otherwise reported to the EPA, available well data (B-2e)

A RCRA Groundwater Detection Monitoring Program for Waste Pit No. 4 was initiated in 1985, as required by OAC 3745-65-90 and 40 CFR 265.90. Groundwater sampling of 41 wells in the vicinity of Waste Pit No. 4 showed that this unit could be affecting groundwater quality. A RCRA Groundwater Quality Assessment Program Plan (GQAPP) was subsequently submitted to the OEPA and U.S. EPA in November 1987. Since then, two

revisions have been prepared with the latest version submitted in April 1991.

Sampling results from the Groundwater Monitoring Program have detected volatile organic constituents (1,1-dichloroethane, 1,1-dichloroethene, 1,2-dichloroethene, 1,1,1-trichloroethane, trichloroethene, and tetrachloroethene) listed in 40 CFR Appendix IX from two wells in the waste pit area. The report also states that groundwater quality in the glacial overburden and the sand and gravel aquifer has been affected by several inorganic constituents. Initial evaluation indicated that the source is the waste pit area, however, the specific source has not been determined.

The 1990 FEMP RCRA Annual Groundwater Report, which was submitted to the OEPA and U.S. EPA, provides an update on assessment activities for Waste Pit No. 4, and reports data collected during 1990. The 1990 report was part of a program designed to determine the rate and extent of contamination in the vicinity of Waste Pit No. 4, as required by OAC 3745-65-93 through 3745-65-94 and 40 CFR 265.9 through 265.94.

Additional monitoring plans have been submitted to the OEPA and U.S. EPA. With the addition of eight land based HWMUs, a revised Groundwater Monitoring Plan (GMP) is being prepared for submission to the OEPA and U.S. EPA in December 1991. The revised plan will include groundwater monitoring for the entire waste pit area.

2.2.6 Any known food chain contamination due to prior release from the unit to groundwater (B-2f)

Based on a review of available documents and interviews with operating personnel, there are no documented instances of food

chain contamination due to prior releases of hazardous waste or hazardous constituents to groundwater from the units of concern within Operable Unit 1.

The FEMP 1989 Annual Environmental Report provides information on the impact of facility operations to off-site soil, grass, produce, milk, and fish.

The total uranium concentration in off-site soil samples ranged from 2.4 to 15 picocuries per gram (pCi/g) dry weight. For comparative purposes, naturally-occurring uranium-238 concentrations in Ohio range from approximately 0.6 to 2.2 pCi/g. Total uranium activity is approximately twice this amount under natural soil conditions.

The total uranium concentration in off-site grass samples ranged from 0.01 to 0.08 pCi/g dry weight. Standards have not been established for uranium in grass.

The results of the produce sampling program indicate that the uranium concentration in produce grown near the FEMP does not differ from the uranium concentration in produce grown on farms more than 16 kilometers from the FEMP. The highest uranium concentration, 0.29 pCi/g dry weight, was found in apples grown in Kentucky, 18 kilometers from the FEMP.

The FEMP has been reporting the results of milk sampling since 1983. Of the samples collected from 1983 through 1989, only three samples were above the analytical detection limit (<0.7 pCi/g) for uranium. Those results were 1.35 pCi/g in 1983, 1.0 pCi/g in 1988, and 12.8 pCi/g in the October 1989 sample. The October 1989 milk sample contained extraneous uranium from the sample container, or uranium introduced during transportation or analysis.

In 1989, the FEMP and a team from the University of Cincinnati collected more than 300 fish from three locations on the Great Miami River. The University of Cincinnati team came to the following conclusions:

- The diversity and abundance of fish populations has not changed appreciably since 1984;
- The habitats at the three sampling locations have not changed since 1985 except Location 3, which was affected by nearby gravel quarrying and the removal of part of a dam, and;
- The populations of fish throughout the river remained healthy in 1989.

2.3 Additional Surface Water Pathway Information (C-2)

2.3.1 Discussion of surface water uses within three miles of the unit, including a map showing the location of all surface water bodies and downstream drinking water intakes (C-2a)

Surface water bodies within a three mile radius of the facility include the Great Miami River and Paddy's Run. The Great Miami River is east of the facility; Paddy's Run is along the western boundary of the FEMP. Paddy's Run is a small, intermittent flow stream which joins the Great Miami River about 1.5 miles south of the site. Both of these surface water bodies are classified as warm water habitats, with primary contact to humans from wading. The Great Miami River is primarily used as an industrial and agricultural water supply source, but may also be used for recreational activities such as fishing or swimming.

Substantial amounts of industrial and municipal waste water from the upstream communities of Dayton, Middletown, Hamilton,

and Fairfield, Ohio, are discharged into the Great Miami River. Downstream areas of the river are sparsely settled and industries are small and scattered. There are no known downstream drinking water intakes within three miles of the FEMP. A map showing the surface water bodies within three miles of the facility is provided as Figure 4.

2.3.2 Velocities of streams and rivers passing through and adjacent to the property (C-2b)

Stream flow measurements for the Great Miami River were obtained from the Miami Conservancy District, Dayton, Ohio. Values recorded for the Hamilton gauge were adjusted to compensate for diversions and contributions to the river. The estimates for the mean annual flow at Ross and New Baltimore were 6072 and 6094 cubic feet per second, respectively. The estimated flow for Paddy's Run ranges between 0.2 and 4.0 cubic feet per second. There are times when Paddy's Run has no flow.

2.3.3 Description of any system used to monitor surface water quality, and a summary of the data (C-2c)

No surface water monitoring system is specifically designated for the units of concern within Operable Unit 1. However, a facility Surface Water Sampling Program measures the effect of effluent discharged into the Great Miami River and the effects of uncontrolled stormwater runoff into Paddy's Run. During 1989, surface water was sampled for radioactive and nonradioactive parameters at three locations along the Great Miami River, and six locations along Paddy's Run.

Radionuclide concentrations found in surface water samples collected in 1989 indicate that the average uranium concentration in the Great Miami River was slightly higher

downstream of the FEMP outfall than upstream. The estimated increase from upstream to downstream was 0.18 pCi/l, which is an approximate 13 percent increase from the 1.4 pCi/l background concentration detected at the upstream sampling location.

Radionuclide concentrations found in surface water samples collected in 1989 indicate that the average uranium concentration at all downstream sampling locations from Paddy's Run outfall was higher than upstream concentrations. The average uranium concentration at all Paddy's Run monitoring locations was, however, below the Department of Energy guideline value of 550 pCi/l, with a highest average value of 70 pCi/l.

In 1989, the FEMP also analyzed surface water samples from the Great Miami River and Paddy's Run for fluoride, nitrate-nitrogen, chloride, and pH. The fluoride concentrations from all sampling locations ranged from 0.1 mg/l to 1.3 mg/l, which is below the maximum contaminant level (MCL) of 1.8 mg/l as established by OAC 3745-1-07. The nitrate-nitrogen concentrations from all sampling ranged from <0.1 mg/l to 11 mg/l. The MCL for nitrate-nitrogen is 10 mg/l as established by OAC 3745-1-07. This standard was exceeded at three of the sampling locations in the Great Miami River, including the upstream location. The elevated concentrations of this parameter were apparently not caused by the FEMP operations.

The chloride concentrations from all sampling locations ranged from 4 mg/l to 92 mg/l. The MCL for chloride of 250 mg/l, as established by OAC 3745-1-07, was not exceeded. All pH values were within the 6.5 to 9.0 acceptable range, as defined in OAC 3745-1-31.

Discharges from the FEMP to the Great Miami River and Paddy's

Run are regulated by National Pollutant Discharge Elimination System (NPDES) permit. The Clearwell is the only unit of concern within Operable Unit 1 that was regulated by NPDES permit. In September 1990, the Wastewater Treatment System at the FEMP was changed to eliminate direct discharge from the Clearwell. The Clearwell effluent now mixes with other effluent at the Bio-Surge Lagoon, and is eventually monitored for NPDES parameters at the Bionitrification facility. Monthly summaries of NPDES parameters for the Clearwell and the Bionitrification facility are provided in Tables 2, 5, and 6.

2.3.4 Description of known releases to surface water; the extent of contamination; remedial action, if any; and if known, severity of impact (C-2d)

Based on a review of available documents and interviews with operating personnel, there have been no documented instances of known releases of hazardous waste or hazardous constituents to surface water from the units of concern within Operable Unit 1.

2.3.5 Any known food chain contamination resulting from prior release from the unit to surface water (C-2e)

Based on a review of available documents, there is no verified food chain contamination due to the prior release of hazardous waste or hazardous constituents to surface water from the units of concern within Operable Unit 1. See Section 2.2.6 for additional information.

2.4 Additional Air Pathways Information (D-2)

2.4.1 Summary of air monitoring data and a description of current monitoring systems, if any (D-2a)

The U.S. Department of Energy reported, for the calendar year 1990, that an estimated 0.053 kg/yr of total uranium were emitted from Waste Pit No. 5. This estimate was provided to the U.S. EPA Region V to meet the requirements of National Emission Standards for Hazardous Air Pollutants (NESHAPS) in 40 CFR 61, Subpart H.

No air monitoring systems are currently in place specifically for the units of concern within Operable Unit 1. There are, however, 16 continuous, high-volume Air Monitoring Stations on-site and off-site from the FEMP. Air at each Air Monitoring Station is drawn through a 20 centimeter by 25 centimeter filter at a rate of approximately one cubic meter per second. The filters are collected and analyzed at weekly intervals for uranium, particulate concentrations and gross beta activity. The FEMP also analyses for non-radiological pollutants including sulfur dioxide, nitrogen oxides, and airborne dust (total suspended particulates).

During 1989, the average concentration of uranium at each of the FEMP Air Monitoring Stations was less than two percent of the U.S. Department of Energy guideline of 100×10^{-15} microcuries per millimeter. The gross beta concentration, $100,000 \times 10^{-15}$ microcuries per milliliter stated in 10 CFR Part 20, Appendix B guideline, was not exceeded at any of the Air Monitoring Stations during 1989. One Air Monitoring Station near Fernald, Ohio, had an average particulate concentration of 51.1 micrograms per cubic meter during 1989.

Sulfur dioxide, nitrogen oxides, and airborne dust emissions

are monitored at the FEMP coal-fired boilers. These parameters are therefore not applicable to the units of concern within Operable Unit 1.

Radon concentrations are monitored both on-site and off-site. The FEMP has 21 radon monitoring locations along the facility fenceline and 16 on-site locations immediately adjacent to the K-65 Silos west of the production area. Four additional locations are at various distances from the silos, and nine monitoring locations are off-site. The monitoring system also includes continuous radon monitors at five locations along the K-65 exclusion-zone fence. The average net radon concentration of 0.24 ± 0.15 picocuries per liter indicates that the concentrations measured at the facility fenceline were within Department of Energy guidelines. These guidelines specify that the average concentration of radon emissions to uncontrolled areas must be less than 3.0 picocuries per liter above background concentrations.

2.4.2 Population within a four mile radius of the unit (D-2b)

There are an estimated 8,667 people within a four mile radius of the FEMP. This value is based on an extrapolation from 1980 census data by Geographic Data Systems Section, Computing and Telecommunications Division, Oak Ridge National Laboratory.

2.4.3 Describe any known releases to air; the extent of contamination; remedial action taken, if any; and severity of impact, if known (D-2c)

The total estimated emissions of uranium from the waste pit area including the Clearwell, Waste Pit No. 4, and Waste Pit No. 5 were 1512 kilograms, from 1951 through 1987. An estimated 0.438, 0.664, and 0.053 kilograms of uranium per

year were released, in 1988, 1989, and 1990, respectively.

2.5 Additional Subsurface Gas Pathway Information (E-2)

2.5.1 Any past disposal of municipal-type wastes in the unit; approximate quantities and dates of disposal, if known (E-2a)

There are no known records of municipal-type wastes being disposed of in Waste Pit No. 4, Waste Pit No. 5 or the Clearwell.

2.5.2 Map location of any underground conduits within the site and known underground conduits within 1000 feet of property boundary (E-2b)

A map showing the location of underground conduits is included as Attachment 4.

2.5.3 Descriptions of any monitoring or control mechanisms for subsurface gas release; summarize resulting data (E-2c)

There are currently no monitoring or control mechanisms for subsurface gas release applicable to the units of concern within Operable Unit 1. Section 2.4.1 contains information concerning radon monitoring.

2.5.4 Description of any known releases, extent of contamination; remedial action, if any; and the severity of impact, if known (E-2d)

Based on a review of available documents and interviews with operating personnel, there are no known releases of subsurface gas from the units of concern within Operable Unit 1.

2.6 Contaminated Soil Pathway (F)

2.6.1 If soil sampling has been done, a map showing areas of soil contamination, and a summary of analytical result (F-2a)

Sampling to detect soil contamination is being conducted under the RI/FS. Soil sampling results will be provided to the OEPA and U.S. EPA according to the schedules in the CERCLA Consent Agreement.

2.6.2 Description of the major types of releases that resulted in soil contamination, and any cleanup action (F-2b)

Based on a review of available documents and interviews with operating personnel, there are no known major types of releases that resulted in soil contamination from operations at the units of concern within Operable Unit 1.

2.6.3 Any known food-chain contamination resulting from the use of contaminated soils for raising crops (F-2c)

Based on a review of available documents, there is no known food chain contamination resulting from the use of contaminated soils for raising crops from the units of concern within Operable Unit 1. See Section 2.2.6 for additional information.

2.7 Additional Transportation Information (G-2)

2.7.1 Description of the types and capacities of vehicles used to transport waste (G-2a)

None of the units in Operable Unit 1 currently receive hazardous waste, therefore no vehicles are presently used to transport hazardous waste to any of the units of concern within Operable Unit 1. In the past, transportation of solid wastes to the waste pits was dependent upon the type of wastes generated and the types of storage containers. Drummed wastes were transported on semi-flatbed trailers; metal dumpsters were carried by dumpster vehicles; bulk wastes were transported by dump trucks and dump trailers; and drummed pyrophoric metal was conveyed on four-wheeled flatbed trailers pulled by tow tractors.

Liquid wastes were transported between the General Sump and the waste pit area via two 6 inch diameter pipes. The General Sump is a collection of aboveground tanks in the production area of the FEMP. These pipes exit the production area on the west side of the FEMP enclosed in a concrete trench that was covered with concrete slabs. The trench extends to the fence of the K-65 tanks, then the pipes bend north and are buried underground. The two pipes then branched with one branch extending north between Waste Pits No. 2, 3, and 4 to Waste Pit 5, while the other extends west to the Clearwell.

The pipe from the General Sump is connected to three berm valves on the southern dike of Waste Pit No. 5. With these valves, the liquid waste can be directed from the General Sump to Waste Pits No. 4 or 5, from either of the two pits to each other, or from either pit back to the General Sump.

An additional pipe originated in the tower at the west end of Waste Pit No. 5 and extended to the Clearwell. This pipe transported supernatant from Waste Pit No. 5 to the Clearwell. The other 6 inch pipe, connecting the Clearwell and the General Sump, was used to transport Clearwell effluent back to the General Sump.

On-site vehicles capable of transporting waste material include two pickup trucks, one with a 500 pound capacity and one with a 1,500 pound capacity. There are, in addition, a flatbed trailer with a 1,200 pound capacity, an enclosed trailer with a 13,000 pound capacity, a flatbed truck with a 10,100 pound capacity, a plane loader fork truck with a 20,000 pound capacity, and a flat fork truck with a 6,000 pound capacity.

The FEMP uses commercial waste carriers for off-site transportation that use primarily standard semi-tractor trailer type vehicles. These carriers are all licensed hazardous waste transporters registered with the U.S. Department of Transportation and U.S. EPA. Carriers are also licensed by the U.S. Nuclear Regulatory Commission for the shipment of low-level radioactive waste.

2.7.2 Identification of normal transport routes for hazardous wastes into the site and within one mile of the facility entries (G-2b)

Typical transportation routes within the FEMP are shown on Figure 1. There are only two major roads within one mile of the facility that would be used for transportation of hazardous wastes. These roads are Ohio State Routes 126 and 128. Most off-site transportation routes are from the FEMP south on Willey Road, east to Ohio State Route 128, and south to I-275.

2.7.3 Description of procedures for clean-up of transportation-related spills or leaks (G-2c)

A description of procedures for cleanup of spills or leaks is provided in Section G, Contingency Plan of the RCRA Part B Permit Application.

2.7.4 Description of any transportation accidents releasing hazardous wastes on-site, or in the immediate vicinity (G-2d)

Based on a review of available documents and interviews with operating personnel, there have been no transportation accidents involving the release of hazardous wastes on-site, or in the immediate vicinity of the FEMP.

2.8 Additional Management Practices Information (H-2)

2.8.1 Summary of existing records on worker illness or injury, related to the operation of the unit, include summaries of Workmen's Compensation claims, or hospital records (H-2a)

A review of existing worker illness and injury records, relating to the operation of the applicable units within Operable Unit 1 was conducted. The review involved all Workmen's Compensation claims filed by National Lead of Ohio and Westinghouse Environmental Management Company of Ohio employees from the origin of this site in approximately 1952 to the present. No claims relating to the operation of applicable units within Operable Unit 1 were found.

3.0 ADDITIONAL INFORMATION REQUIREMENTS - OPERABLE UNIT 2

Additional Information Requirements of the Exposure Information Report are addressed in the following subsections in the same order as referenced in the Requirements Checklist provided in Attachment 1. This section presents specific information, when available, on the Lime Sludge Ponds.

3.1 Additional General Information

3.1.1 Existing risk assessment reports and information, including liability insurance analysis, claims and settlements (A-2a)

The Federal government is exempt from financial requirements including liability insurance, according to OAC 3745-55-40, and 40 CFR 264.140(c). Therefore, no health or risk assessment information has been prepared by insurance underwriters.

A baseline risk assessment for Operable Unit 2 is being conducted as part of the Remedial Investigation/Feasibility Study (RI/FS). This document is still in the draft stage, and will be submitted to the OEPA and U.S. EPA in accordance with the schedules in the CERCLA Consent Agreement.

3.1.2 Land use and zoning map(s) for an area of four miles around the unit (A-2b)

Zoning maps are in Attachment 2. See Section 2.1.2 for additional information.

3.1.3 Existing aerial photographs of the facility (A-2c)

Photographs of the facility are in the RCRA Part A Permit Application.

3.1.4 Identify and summarize any waste analysis data already submitted; provide additional data (A-2d)

The RI/FS presently in progress for Operable Unit 2 will provide additional waste analysis data. The Lime Sludge Ponds were only recently identified as storing hazardous waste, therefore, no data had previously been submitted. Additional waste analysis data for this unit will be collected during remedial/closure activities at the FEMP.

3.1.5 Current estimate of annual amount of waste received and description of any pretreatment process used (A-2e)

The Lime Sludge Ponds are not expected to receive hazardous waste.

3.1.6 Identification of any Federal, State, or local inspection or compliance records related to environmental and health programs; include description of any major violations (A-2f)

See Section 2.1.6 for additional information. No NOVs have been noted for the Lime Sludge Ponds.

3.2 Groundwater Pathway (B-2)

3.2.1 Existing map showing location of all known wells within three miles; number and location of drinking water wells (B-2a)

See Section 2.2.1 and Figures 2 and 3.

3.2.2 Discussion of groundwater uses within three miles of unit (B-2b)

See Section 2.2.2

3.2.3 Regional map showing areas of groundwater recharge and discharge (B-2c)

See Attachment 3.

3.2.4 Net precipitation using net seasonal rainfall or other available data (B-2d)

See Section 2.2.4

3.2.5 Unless otherwise reported to the EPA, available well data (B-2e)

No well data is available specifically for the Lime Sludge Ponds. The RCRA Groundwater Monitoring Program (GMP) will provide groundwater monitoring for this unit. A proposal for a draft GMP including maps showing the location of monitoring wells, a sampling and analysis plan, and an implementation schedule for this unit is being prepared for submission to the OEPA and U.S. EPA in December 1991.

3.2.6 Any known food chain contamination due to prior release from the unit to groundwater (B-2f)

Based on a review of available documents, there are no known instances of food chain contamination due to the prior release of hazardous waste or hazardous constituents to groundwater from the Lime Sludge Ponds. See Section 2.2.6 for additional information.

3.3 Surface Water Pathway

3.3.1 Discussion of surface water uses within three miles of the unit, including a map showing the location of all surface water bodies and downstream drinking water intakes (C-2a)

See Section 2.3.1 and Figure 4.

3.3.2 Velocities of streams and rivers passing through and adjacent to the property (C-2b)

See Section 2.3.2

3.3.3 Description of any system used to monitor surface water quality, and a summary of the data (C-2c)

No system is currently used to monitor surface water quality applicable to the Lime Sludge Ponds.

3.3.4 Description of known releases to surface water; the extent of contamination; remedial action, if any; and if known, severity of impact (C-2d)

Based on a review of available documents and interviews with operating personnel, there have been no known releases of hazardous waste or hazardous constituents to surface water from the Lime Sludge Ponds.

3.3.5 Any known food chain contamination resulting from prior release from the unit to surface water (C-2e)

Based on a review of available documents, there is no known food chain contamination from prior releases of hazardous waste or hazardous constituents from the Lime Sludge Ponds to

surface water. See Section 2.2.6 for additional information.

3.4 Air Pathways (D)

3.4.1 Summary of air monitoring data and a description of current monitoring systems, if any (D-2a)

See Section 2.4.1

3.4.2 Population within a four mile radius of the unit (D-2b)

See Section 2.4.2

3.4.3 Describe any known releases to air; the extent of contamination; remedial action taken, if any; and severity of impact, if known (D-2c)

Based on a review of available documents and interviews with operating personnel, there are no known releases of hazardous waste or hazardous constituents to the air from the Lime Sludge Ponds.

3.5 Subsurface Gas Pathway

3.5.1 Any past disposal of municipal-type wastes in the unit; approximate quantities and dates of disposal, if known (E-2a)

There has been no documented disposal of municipal-type wastes in the Lime Sludge Ponds.

3.5.2 Map location of any underground conduits within the site and known underground conduits within a 1000 feet of property boundary (E-2b)

See Attachment 4.

3.5.3 Descriptions of any monitoring or control mechanisms for subsurface gas release; summarize resulting data (E-2c)

There are currently no monitoring or control mechanisms for subsurface gas release applicable to the units of concern within Operable Unit 2. Section 2.4.1 contains information concerning radon monitoring.

3.5.4 Description of any known releases, extent of contamination; remedial action, if any; and the severity of impact, if known (E-2d)

Based on a review of available documents and interviews with operating personnel, there are no known releases of subsurface gas from the Lime Sludge Ponds.

3.6 Contaminated Soil Pathway (F)

3.6.1 If soil sampling has been done, a map showing areas of soil contamination, and a summary of analytical results (F-2a)

Sampling to detect soil contamination will be conducted under the RI/FS. Soil sampling results will be provided to the OEPA and U.S. EPA according to the schedules in the CERCLA Consent Agreement.

3.6.2 Description of the major types of releases that resulted in soil contamination, and any cleanup action (F-2b)

Based on a review of available documents and interviews with operating personnel, there have been no known major types of releases that resulted in soil contamination from operations at the Lime Sludge Ponds.

3.6.3 Any known food-chain contamination resulting from the use of contaminated soils for raising crops (F-2c)

Based on a review of available documents, there are no known instances of food chain contamination resulting from the use of contaminated soils from the Lime Sludge Ponds for raising crops. See Section 2.2.6 for additional information.

3.7 Transportation Information (G)

3.7.1 Description of the types and capacities of vehicles used to transport waste (G-2a)

See Section 2.7.1

3.7.2 Identification of normal transport routes for hazardous wastes into the site and within one mile of the facility entries (G-2b)

See Section 2.7.2 and Figure 1.

3.7.3 Description of procedures for clean-up of transportation-related spills or leaks (G-2c)

See Section 2.7.3

3.7.4 Description of any transportation accidents releasing hazardous wastes on-site, or in the immediate vicinity (G-2d)

Based on a review of available documents and interviews with operating personnel, there have been no transportation accidents involving the release of hazardous wastes on-site, or in the immediate vicinity of the FEMP.

3.8 Management Practices Information (H-2)

3.8.1 Summary of existing records on worker illness or injury, related to the operation of the unit, include summaries of Workmen's Compensation claims, or hospital records (H-2a)

A review of existing worker illness and injury records, relating to the operation of the Lime Sludge Ponds was conducted. The review involved all Workmen's Compensation claims filed by National Lead of Ohio (NLO) and Westinghouse Environmental Management Company of Ohio (WEMCO) employees from the origin of this site in approximately 1952 to the present. No claims were found related to the operation of the Lime Sludge Ponds.

4.0 ADDITIONAL INFORMATION REQUIREMENTS - OPERABLE UNIT 3

Additional Information Requirements of the Exposure Information Report are addressed in the following subsections in the same order as referenced in the Requirements Checklist provided in Attachment 1. This section presents specific information, when available, on the Tank Farm Sump, Fire Training Facility, Bio-Surge Lagoon, Sludge Drying Beds, and the Coal Pile Run-off Basin.

4.1 Additional Information (A-2)

4.1.1 Existing risk assessment reports and information, including liability insurance analysis, claims and settlements (A-2a)

The Federal government is exempt from financial requirements according to OAC 3745-55-40, and 40 CFR 264.140(c), including liability insurance. Therefore, no health or risk assessment information has been prepared by insurance underwriters.

A baseline risk assessment for Operable Unit 3 is being conducted as part of the Remedial Investigation/Feasibility Study (RI/FS). This document is still in the draft stage, and will be submitted to the OEPA and U.S. EPA in accordance with the schedules in the CERCLA Consent Agreement.

4.1.2 Land use and zoning map(s) for an area of four miles around the unit (A-2b)

Zoning maps are in Attachment 2. See Section 2.1.2 for additional information.

4.1.3 Existing aerial photographs of the facility (A-2c)

Photographs of the facility are in the RCRA Part A Permit Application.

4.1.4 Identify and summarize any waste analysis data already submitted; provide additional data (A-2d)

A summary of monthly monitoring reports for the Bio-Surge Lagoon is provided in Tables 5 and 6. This sampling point monitors discharge from the Bio-Surge Lagoon after it passes through the Bionitrification Effluent Treatment System.

The RI/FS presently in progress for Operable Unit 3 will provide additional waste analysis data. No additional data had previously been submitted, since the units of concern within Operable Unit 3 were only recently identified as having treated or stored hazardous waste. Waste analysis data will be collected as part of the remedial/closure activities for these units.

4.1.5 Current estimate of annual amount of waste received and description of any pretreatment process used (A-2e)

None of the individual units discussed within the Exposure Information Report for Operable Unit 3 are expected to receive hazardous waste.

4.1.6 Identification of any Federal, State, or local inspection or compliance records related to environmental and health programs; include description of any major violations (A-2f)

The only permit directly associated to the units of concern within Operable Unit 3 is a NPDES permit for the FEMP

Wastewater Treatment System (NPDES permit 1I000004605). Effluent from the Bio-Surge Lagoon is monitored under this permit. The sampling point monitors discharge from the Bio-Surge Lagoon after it passes through the Bionitrification Effluent Treatment System. A summary of past noncompliance for the Bionitrification System NPDES monitoring point is provided in Table 7. See Section 2.1.6 for additional information.

4.2 Groundwater Pathway (B-2)

4.2.1 Existing map showing location of all known wells within three miles; number and location of drinking water wells (B-2a)

See Section 2.2.1 and Figures 2 and 3.

4.2.2 Discussion of groundwater uses within three miles of unit (B-2b)

See Section 2.2.2

4.2.3 Regional map showing areas of groundwater recharge and discharge (B-2c)

See Attachment 3.

4.2.4 Net precipitation using net seasonal rainfall or other available data (B-2d)

See Section 2.2.4

4.2.5 Unless otherwise reported to the EPA, available well data (B-2e)

The units of concern within Operable Unit 3 must meet the requirements of the FEMP RCRA Groundwater Monitoring Program. A draft Groundwater Monitoring Program including maps showing the location of monitoring wells, a sampling and analysis plan, and an implementation schedule for these units is being prepared for submission to the OEPA and U.S. EPA in December 1991.

4.2.6 Any known food chain contamination due to prior release from the unit to groundwater (B-2f)

Based on a review of available documents, there are no documented instances of food chain contamination due to prior releases to groundwater from the units of concern within Operable Unit 3.

4.3 Surface Water Pathway

4.3.1 Discussion of surface water uses within three miles of the unit, including a map showing the location of all surface water bodies and downstream drinking water intakes (C-2a)

See Section 2.3.1 and Figure 4.

4.3.2 Velocities of streams and rivers passing through and adjacent to the property (C-2b)

See Section 2.3.2

4.3.3 Description of any system used to monitor surface water quality, and a summary of the data (C-2c)

There is currently no system used to monitor surface water quality applicable to the units of concern within Operable Unit 3.

4.3.4 Description of known releases to surface water; the extent of contamination; remedial action, if any; and if known, severity of impact (C-2d)

Based on a review of available documents and interviews with operating personnel, there have been no known releases of hazardous waste or hazardous constituents to surface water from the units of concern within Operable Unit 3.

4.3.5 Any known food chain contamination resulting from prior release from the unit to surface water (C-2e)

Based on a review of available documents, there is no known food chain contamination due to prior releases of hazardous waste or hazardous constituents to surface water from the unit of concern within Operable Unit 3.

4.4 Air Pathways (D)

4.4.1 Summary of air monitoring data and a description of current monitoring systems, if any (D-2a)

See Section 2.4.1

4.4.2 Population within a four mile radius of the unit (D-2b)

See Section 2.4.2

4.4.3 Describe any known releases to air; the extent of contamination; remedial action taken, if any; and severity of impact, if known (D-2c)

Based on a review of available documents and interviews with operating personnel, there are no known releases of hazardous waste or hazardous constituents to the air from the units of concern within Operable Unit 3.

4.5 Subsurface Gas Pathway

4.5.1 Any past disposal of municipal-type wastes in the unit; approximate quantities and dates of disposal, if known (E-2a)

There has been no documented disposal of municipal-type wastes to the units of concern within Operable Unit 3.

4.5.2 Map location of any underground conduits within the site and known underground conduits within a 1000 feet of property boundary (E-2b)

See Attachment 4.

4.5.3 Descriptions of any monitoring or control mechanisms for subsurface gas release; summarize resulting data (E-2c)

See Section 2.5.3

4.5.4 Description of any known releases, extent of contamination; remedial action, if any; and the severity of impact, if known (E-2d)

There are no known releases of subsurface gas from the units of concern within Operable Unit 3.

4.6 Contaminated Soil Pathway (F)

4.6.1 If soil sampling has been done, a map showing areas of soil contamination, and a summary of analytical results (F-2a)

Sampling to detect soil contamination is being conducted under the RI/FS. Soil sampling results will be provided to the OEPA and U.S. EPA according to the schedules in the CERCLA Consent Agreement.

4.6.2 Description of the major types of releases that resulted in soil contamination, and any cleanup action (F-2b)

There are no known major types of releases that resulted in soil contamination from operations at the units of concern within Operable Unit 3.

4.6.3 Any known food-chain contamination resulting from the use of contaminated soils for raising crops (F-2c)

Based on a review of available documents, there is no known food chain contamination resulting from the use of contaminated soils for raising crops from the units of concern within Operable Unit 3.

4.7 Transportation Information (G)

4.7.1 Description of the types and capacities of vehicles used to transport waste (G-2a)

See Section 2.7.1

4.7.2 Identification of normal transport routes for hazardous wastes into the site and within one mile of the facility entries (G-2b)

See Section 2.7.2 and Figure 1.

4.7.3 Description of procedures for clean-up of transportation-related spills or leaks (G-2c)

See Section 2.7.3

4.7.4 Description of any transportation accidents releasing hazardous wastes on-site, or in the immediate vicinity (G-2d)

There have been no transportation accidents involving the release of hazardous wastes on-site or in the immediate vicinity of the FEMP.

4.8 Management Practices Information (H-2)

4.8.1 Summary of existing records on worker illness or injury, related to the operation of the unit, include summaries of Workmen's Compensation claims, or hospital records (H-2a)

A review of existing worker illness and injury records, relating to the operation of the units of concern within Operable Unit 3 was conducted. The review involved all Workmen's Compensation claims filed by National Lead of Ohio (NLO) and Westinghouse Environmental Management Company of Ohio (WEMCO) employees from the origin of this site in approximately 1952 to the present. One Workmen's Compensation claim was reported.

An employee twisted a knee at the Tank Farm Sump, on July 17, 1986, by stepping on a rock. This injury was not considered to be caused by the operation of this unit. Operations at the Tank Farm area have been greatly reduced since the time of the injury, thus reducing the potential for future accidents of this nature in the Tank Farm area.

5.0 EXPOSURE POTENTIAL OF THE UNIT

The following subsections summarize the potential for the public to be exposed to hazardous wastes or hazardous constituents through releases related to the units of concern at the FEMP by various pathways. These subsections discuss the exposure potential of the entire site because of the large number of units of concern at the FEMP. A risk assessment is mandated under the CERCLA Consent Agreement and will be addressed in further detail in the final RI/FS applicable to each Operable Unit.

5.1 Potential for Human Exposure Via the Groundwater Pathway

The groundwater of concern at the FEMP is the Great Miami Aquifer. This aquifer is used by industrial, municipal, and private sources. The aquifer is considered the primary pathway by which contaminants released from the units of concern discussed in this report may be transported to a receptor.

The Great Miami Aquifer has high rates of groundwater flow with the hydraulic conductivity for this aquifer estimated at 400-600 feet/day. The depth to the Great Miami Aquifer varies, but is approximately 50 feet. The net precipitation for this region is estimated at 5.2 inches annually. The soils within the regional aquifer have an average porosity of 25 percent. There are at least 200 private wells within three miles of the facility. The wells are primarily used for drinking water, but also may be used for irrigation purposes or as a water supply for grazing animals.

Waste Pit No. 4, Waste Pit No. 5, the Tank Farm Sump, the Clearwell, the Bio-Surge Lagoon, the Lime Sludge Ponds, and the Coal Pile Run-off Basin all contain liquids and solids. The Sludge Drying Beds, Fire Training Facility, Waste Pit No. 4, Clearwell, and the Lime Sludge Ponds have no manmade liner. Waste Pit No. 4, and the Clearwell are lined with a clay layer on the sides and bottom. The Tank Farm Sump is partially lined with clay and was constructed in a limestone ditch. The Coal Pile Run-off Basin excavation was lined with crushed limestone.

Waste Pit No. 4 has had a cover installed. The cover consists of fill material overlaid with two feet of clay compacted to 1×10^{-7} centimeters per second permeability and covered with a 45 mil (45/1000th of an inch) reinforced chlorosulphonated polyethylene cover.

Waste Pit No. 5 was constructed by the cut and fill method wherein excavated material was used to build a dike and pit walls. The pit was then lined with a 60 mil elastomeric membrane liner. The Bio-Surge Lagoon is a double-lined unit. It was constructed from a clay-bentonite mixture with four 6 inch valve underdrains with a 40 mil, high density polyethylene liner covering the clay-bentonite mixture. A 12 inch sand layer covers the liner and includes a drainage system with a second final layer covering the sand.

A Groundwater Detection Monitoring Program, in accordance with U.S. EPA and Ohio EPA requirements, has been initiated for Waste Pit No. 4. The Detection Monitoring Program involved the sampling of 41 groundwater monitoring wells on and off-site. Sampling results verified the presence of organic and inorganic constituents listed in 40 CFR Appendix IX, but the primary source for these constituents has not been determined. Currently, no monitoring well program is in place for the other units of concern. A Ground Water Quality Assessment Program Plan for the remaining units will eventually lead to the installation of correctly placed and screened monitoring wells that can detect releases from these units and enable the FEMP to take corrective action before human exposure occurs.

5.2 Potential for Human Exposure Via the Surface Water Pathway

Several of the units of concern are in close proximity to Paddy's Run, a small intermittent flow surface water source along the western property boundary. The FEMP discharges wastewater to the Great Miami River and Paddy's Run under Ohio NPDES permit (Permit No. 1I000004605). Eight monitoring points are regulated under this permit. Two of these monitoring locations are discharge points and six are internal monitoring locations. These monitoring points are sampled on a varying basis from continuous monitoring to weekly monitoring.

The average discharge to the Great Miami River for 1989 was 0.68 million gallons per day. Discharge to Paddy's Run occurred only twice in 1989, once on March 31 and once on April 4. Paddy's Run has no known drinking water intakes. The Great Miami River has no downstream drinking water intakes within three miles of the FEMP.

The FEMP has begun developing a runoff control project for the waste pit area. The project will focus on approximately 25 acres in the waste pit area plus the perimeter around the pits. Presently, stormwater that accumulates in Waste Pit No. 5 and a majority of runoff from Waste Pits Nos. 1, 2, and 3 collects in the Clearwell before being pumped to the Bio-Surge Lagoon. The project alternative under consideration consists of a collect and treat system that will separate drainage areas within the waste pit area. This project will greatly reduce stormwater runoff from the waste pit area that enters Paddy's Run, therefore reducing the potential for human exposure from surface water runoff.

None of the units of concern at this facility are within the 100 year flood plain, therefore, flooding is not considered a potential threat to this area. Severe storm events that cause, or have the potential to cause, an emergency involving hazardous waste would trigger procedures contained in Section G, Contingency Plan, of the RCRA Part B Permit Application.

5.3 Potential for Human Exposure Via the Air Pathway

The waste placed in the units of concern at the FEMP have not been sufficiently characterized to address the potential for releases to air of the wastes or waste constituents. Additional waste characterization of these units will be included in the RI/FS presently being conducted.

5.4 Potential for Human Exposure From Subsurface Gas Releases

The location of the units of concern reduces the potential for human exposure from subsurface gas release. These units are not near buildings or other structures that could trap potential gases. The design of these units is described in Section 5.1, including liners and caps. The absence of municipal type waste in the units of concern at the FEMP reduces the potential for releases of subsurface gas. The surface impoundments at this facility have relatively large exposed surface areas which further reduce the potential for release. No gas control measures or recovery systems exist at any of the units of concern.

5.5 Potential for Human Exposure From Releases to Soil

Runoff from the waste pit area is being addressed by the ongoing runoff control project as discussed in Section 5.2. Reduction of the potential for wind dispersal and runoff of contaminated soils is being addressed for the remaining applicable units. Direct exposure to contaminated soil on-site is minimized by established spill prevention and clean-up procedures, as well as strict security procedures used to limit public access to the facility. Food crops are not grown on facility property. The majority of agricultural usage on adjacent properties is limited to grazing for domestic animals.

5.6 Potential for Human Exposure From Transportation Related Releases

The shipment of low-level radioactive wastes off-site for disposal has been previously evaluated by several National Environmental Policy Act (NEPA) documents prepared by the Department of Energy. Based on these documents, it was determined that the shipment of wastes did not represent a significant impact to workers, drivers, or the population due to radiological exposure from shipping and

accident scenarios. A new analysis, presently in draft form, supplements the NEPA documents with the inclusion of hazardous wastes for disposal off-site. Based on the previous NEPA documents associated with the FEMP and the transportation of waste off-site, the proposed shipments of mixed wastes to off-site treatment/disposal facilities does not constitute significant impacts to the environment nor do they represent significant health risks to workers, truck drivers, or the general population.

The FEMP plans to continue using commercial carriers for waste shipment to disposal facilities. The waste will be containerized in 55-gallon drums, and typically over-packed in 85-gallon drums. The transportation routes are selected on the basis of utilizing primarily interstate highways, and avoiding metropolitan areas. The truck drivers are trained in response techniques for hazardous waste spills. The possibility of a release is minimized by the double-packing system used to containerize the waste, the use of truck drivers trained in response techniques, the use of rural routes and interstate highways, and the existence of hazardous materials response personnel. These combined factors reduce the potential magnitude of human exposure from transportation-related activities.

5.7 Potential for Human Exposure From Worker-Management Practices

According to FEMP records, there has been only one worker's compensation claim related to the operation of the units of concern discussed in this Exposure Information Report. That accident, at the Tank Farm Sump, involved a twisted knee, and was not considered to result from operation of the unit. Operations at the Tank Farm Area have been greatly reduced, further reducing the possibility of a similar accident.

Procedures for responding to accidental releases are discussed in Section G, Contingency Plan, of the RCRA Part B Permit Application. This plan calls for immediate action when necessary and provides for investigation into releases and the initiation of corrective actions. All employees at the FEMP involved in the operation of hazardous waste management units receive training on the Contingency Plan and the management of hazardous wastes. This program is outlined in Section H, Personnel Training, of the RCRA Part B Permit Application. The potential magnitude for human exposure is greatly reduced with the extremely low rate of accidents at these units, and the contingency and training programs established at the FEMP.

EXPOSURE INFORMATION REPORT (EIR)

Table 1

Closure Plan Submission Dates for Eight HWMUs

Unit	Submit* Closure Plan
Waste Pit No. 5	30 - Sep - 90
Clearwell	19 - Jul - 95
Bio-Surge Lagoon	20 - Dec - 95
Lime Sludge Ponds	20 - Oct - 94
Tank Farm Sump	29 - Jul - 93
Coal Pile Run-off Basin	07 - Mar - 96
Fire Training Facility	19 - May - 93
Sludge Drying Beds	16 - Nov - 94

* These dates are tentative pending approval from the OEPA

EXPOSURE INFORMATION REPORT

TABLE 2

NPDES MONTHLY SUMMARIES - CLEARWELL

January 1985 - February 1990

4603	Table 1	RESIDU		CHROM		CHROM		COPPER		IRON		NICKEL		CONDUIT	
		T. NFL	MG/L	HEX-VA	UG/L	CR,TOT	UG/L	CU,TOT	UG/L	FE,TOT	UG/L	NI,TOT	UG/L	FLOW	MGD
DATE															
JAN 1985	AVERAGE	8	10	28	31	300	101								0.134
	MAXIMUM	15	13	36	41	580	180								0.216
	MINIMUM	5	2	16	24	110	55								0.087
FEB 1985	AVERAGE	<3	12	29	36	135	82								0.16
	MAXIMUM	5	14	40	50	236	120								0.276
	MINIMUM	<2	9	18	27	70	48								0
MAR 1985	AVERAGE	14	2	25	24	364	55								0.207
	MAXIMUM	30	3	42	31	507	140								0.62
	MINIMUM	6	2	18	12	160	14								0.131
APR 1985	AVERAGE	7	3	13	23	214	34								0.215
	MAXIMUM	13	7	18	31	440	51								0.744
	MINIMUM	2	1	7	14	120	22								0
MAY 1985	AVERAGE	8	9	14	24	159	51								0.14
	MAXIMUM	11	14	18	26	208	58								0.308
	MINIMUM	<2	6	11	22	136	39								0.059
JUN 1985	AVERAGE	5	9	24	29	96	61								0.117
	MAXIMUM	8	12	31	32	150	65								0.227
	MINIMUM	2	7	18	23	52	52								0.059
JUL 1985	AVERAGE	12	9	14	25	77	46								0.12
	MAXIMUM	15	14	21	35	82	59								0.245
	MINIMUM	10	5	10	21	63	28								0.073
AUG 1985	AVERAGE	9	6	7	14	23	16								0.138
	MAXIMUM	12	14	15	26	29	23								0.458
	MINIMUM	6	2	2	9	18	9								0.062

EXPOSURE INFORMATION REPORT

TABLE 2

NPDES MONTHLY SUMMARIES - CLEARWELL
January 1985 - February 1990

4603	Table 1	RESIDU		CHROM		CHROM		COPPER		IRON		NICKEL		CONDUI	
		T. NFL	MG/L	HEX-VA	UG/L	CR,TOT	UG/L	CU,TOT	UG/L	FE,TOT	UG/L	NI,TOT	UG/L	FLOW	MGD
DATE															
SEP 1985	AVERAGE	8		12		24		27		53		59		0.085	
	MAXIMUM	14		13		35		36		102		131		0.172	
	MINIMUM	4		12		18		23		26		37		0.061	
OCT 1985	AVERAGE	6		12		17		24		539		34		0.125	
	MAXIMUM	7		14		23		32		1305		41		0.749	
	MINIMUM	5		10		10		15		49		25		0	
NOV 1985	AVERAGE	10		11		12		18		158		27		0.31	
	MAXIMUM	31		14		16		24		398		30		0.954	
	MINIMUM	3		5		8		11		36		23		0.061	
DEC 1985	AVERAGE	<4		5		9		12		382		23		0.145	
	MAXIMUM	5		7		13		13		568		28		0.537	
	MINIMUM	<2		2		6		11		226		16		0	
JAN 1986	AVERAGE	8		9		15		23		112		18		0.07	
	MAXIMUM	17		11		20		34		304		28		0.214	
	MINIMUM	4		8		8		18		37		10		0	
FEB 1986	AVERAGE	7		12		16		35		216		26		0.074	
	MAXIMUM	13		16		25		43		364		38		0.188	
	MINIMUM	3		7		9		30		22		18		0.034	
MAR 1986	AVERAGE	6		14		20		22		296		28		0.132	
	MAXIMUM	8		17		23		28		513		40		0.376	
	MINIMUM	2		11		16		14		41		17		0.05	
APR 1986	AVERAGE	4		11		14		18		99		21		0.067	
	MAXIMUM	6		14		17		23		133		29		0.231	
	MINIMUM	2		2		12		14		77		17		0	

2494

EXPOSURE INFORMATION REPORT

TABLE 2

NPDES MONTHLY SUMMARIES - CLEARWELL
January 1985 - February 1990

4603	Table 1	RESIDU		CHROM		CHROM		COPPER		IRON		NICKEL		CONDUIT	
		T. NFL	MG/L	HEX-VA	UG/L	CR, TOT	UG/L	CU, TOT	UG/L	FE, TOT	UG/L	NI, TOT	UG/L	FLOW	MGD
DATE															
MAY 1986	AVERAGE	8	12	13	15	52	18	0.051							
	MAXIMUM	12	12	16	17	81	23	0.074							
	MINIMUM	6	10	10	11	37	13	0.027							
JUN 1986	AVERAGE	8	8	11	16	51	24	0.072							
	MAXIMUM	11	9	14	19	82	50	0.16							
	MINIMUM	4	7	8	12	31	11	0							
JUL 1986	AVERAGE	14	5	7	16	86	20	0.048							
	MAXIMUM	18	7	9	21	136	27	0.094							
	MINIMUM	8	<1	4	14	48	15	0							
AUG 1986	AVERAGE	6	<1	<1	11	91	17	0.029							
	MAXIMUM	6	<1	<1	11	91	17	0.035							
	MINIMUM	6	<1	<1	11	91	17	0.023							
SEP 1986	AVERAGE	12	2	4	13	143	15	0.08							
	MAXIMUM	14	4	5	15	265	17	0.221							
	MINIMUM	9	1	2	11	58	11	0							
OCT 1986	AVERAGE	6	3	6	14	57	28	0.067							
	MAXIMUM	7	5	8	15	78	30	0.217							
	MINIMUM	5	1	3	13	35	26	0							
NOV 1986	AVERAGE	4	2	7	19	58	32	0.106							
	MAXIMUM	8	6	10	20	106	36	0.438							
	MINIMUM	2	1	6	17	38	30	0							
DEC 1986	AVERAGE	4	6	10	13	294	20	0.099							
	MAXIMUM	5	7	13	18	664	28	0.312							
	MINIMUM	3	5	7	11	63	14	0							

EXPOSURE INFORMATION REPORT

TABLE 2

NPDES MONTHLY SUMMARIES - CLEARWELL

January 1985 - February 1990

4603	Table 1	RESIDU		CHROM		CHROM		COPPER		IRON		NICKEL		CONDUIT	
		T. NFL	MG/L	HEX-VA	UG/L	CR, TOT	UG/L	CU, TOT	UG/L	FE, TOT	UG/L	NI, TOT	UG/L	FLOW	MGD
DATE															
JAN 1987	AVERAGE	9	7	10	12	56	23								0.042
	MAXIMUM	13	8	11	16	79	27								0.065
	MINIMUM	6	6	9	9	37	20								0.025
FEB 1987	AVERAGE	11	7	12	17	28	27								0.042
	MAXIMUM	12	9	14	18	37	32								0.081
	MINIMUM	11	6	10	16	23	25								0
MAR 1987		*													
APR 1987		*													
MAY 1987		**													
JUN 1987	AVERAGE	4	<1	1	12	317	12								0.091
	MAXIMUM	4	<1	1	12	317	12								0.109
	MINIMUM	4	<1	1	12	317	12								0.058
JUL 1987	AVERAGE	23	1	4	9	858	10								0.291
	MAXIMUM	23	1	4	9	858	10								0.357
	MINIMUM	23	1	4	9	855	10								0
AUG 1987		**													
SEP 1987		**													
OCT 1987		**													
NOV 1987		**													
DEC 1987		**													
JAN 1988		**													
FEB 1988	AVERAGE	17	2	4	8	296.5	10								0.09
	MAXIMUM	19	3	4	10	502	12								0.261
	MINIMUM	16	2	4	7	91	9								0.026

2494

EXPOSURE INFORMATION REPORT

TABLE 2

NPDES MONTHLY SUMMARIES - CLEARWELL

January 1985 - February 1990

4603	Table 1	RESIDU T. NFL MG/L	CHROM HEX-VA UG/L	CHROM CR,TOT UG/L	COPPER CU,TOT UG/L	IRON FE,TOT UG/L	NICKEL NI,TOT UG/L	CONDUI FLOW MGD
	AVERAGE	15	1	5	4	806	6	0.105
	MAXIMUM	15	1	5	4	806	6	0.137
	MINIMUM	15	1	5	4	806	6	0.052
APR 1988	***							
MAY 1988	**							
JUN 1988	**							
JUL 1988	**							
AUG 1988	**							
SEP 1988	**							
SEP 1988	**							
OCT 1988	**							
NOV 1988	**							
DEC 1988	**							
JAN 1989	**							
FEB 1989	**							
MAR 1989	***							
APR 1989	AVERAGE	19	1	2	11	1261		0.192
	MAXIMUM	24	1	3	13	1840		0.409
	MINIMUM	15	1	2	10	682		0.078
MAY 1989	***							
JUN 1989	**							
JUL 1989	**							
AUG 1989	**							
SEP 1989	**							
OCT 1989	**							
NOV 1989	**							

EXPOSURE INFORMATION REPORT

TABLE 2

NPDES MONTHLY SUMMARIES - CLEARWELL

January 1985 - February 1990

4603	Table 1		RESIDU	CHROM	CHROM	CHROM	COPPER	IRON	NICKEL	CONDUI
	T. NFL	MG/L								
DATE	-----		UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	MGD
DEC 1989	--		**							
JAN 1990	--		**							
FEB 1990	--		****							

* = Effluent pumped to Biodenitrification Surge Lagoon, no discharge statistics required
 ** = No water was pumped from the Clearwell this month
 *** = No sample was taken
 **** = Discharge data no longer required, change in NPDES Permit Requirements

EXPOSURE INFORMATION REPORT (EIR)

TABLE 3

SUMMARY OF MONTHLY NPDES MONITORING REPORT
NONCOMPLIANCE - CLEARWELL (April 1984 - April 1989)

SAMPLE DATE	PARAMETER	PERMIT VALUE	ACTUAL VALUE	UNIT
April 84	Iron	0.410	0.530	Kilograms/day
April 84	Copper	0.250	0.370	Kilograms/day
April 84	Cr+6	0.008	0.010	Kilograms/day
April 84	Cr+6	0.008	0.011	Kilograms/day
May 84	Cr+6	0.004	0.008	Kilograms/day
May 84	Cu	0.025	0.030	Kilograms/day
June 84	Cr+6	0.008	0.009	Kilograms/day
June 84	Cr+6	0.004	0.005	Kilograms/day
July 84	Cr+6	0.008	0.013	Kilograms/day
July 84	Cu	0.051	0.052	Kilograms/day
July 84	Cr+6	0.008	0.010	Kilograms/day
July 84	Susp. Solids	6.200	7.600	Kilograms/day
July 84	Cr+6	0.004	0.008	Kilograms/day
July 84	Cu	0.025	0.029	Kilograms/day
October 84	Cr+6	0.004	0.006	Kilograms/day
November 84	Susp. Solids	6.200	6.900	Kilograms/day
November 84	Cu	0.025	0.026	Kilograms/day
November 84	Cu	0.051	0.079	Kilograms/day
December 84	Cr+6	0.008	0.009	Kilograms/day
December 84	Oil & Grease	15.000	17.000	milligrams/liter
December 84	Cr+6	0.004	0.008	Kilograms/day
December 84	Cu	0.025	0.031	Kilograms/day
January 85	BDD	10.000	20.300	Kilograms/day
January 85	BOD	5.000	7.800	Kilograms/day
January 85	Cr+6	0.004	0.005	Kilograms/day
February 85	Oil & Grease	15.000	19.000	milligrams/day
February 85	Cr+6	0.004	0.007	Kilograms/day
March 85	TSS/Max	2.300	26.300	Kilograms/day
March 85	TSS/mg	6.200	12.100	Kilograms/day
July 85	Cr+6	0.008	0.011	Kilograms/day
July 85	Cr+6	0.004	0.005	Kilograms/day
July 85	ss/avg	6.700	6.500	Kilograms/day
August 85	Cr+6	0.008	0.014	Kilograms/day

EXPOSURE INFORMATION REPORT (EIR)

TABLE 3

SUMMARY OF MONTHLY NPDES MONITORING REPORT
NONCOMPLIANCE - CLEARWELL (April 1984 - April 1989)

SAMPLE DATE	PARAMETER	PERMIT VALUE	ACTUAL VALUE	UNIT
August 85	Cr+6	0.604	0.007	Kilograms/day
October 85	Cr+6	0.008	0.009	Kilograms/day
October 85	Fe	0.850	1.160	Kilograms/day
October 85	Cr+6/Avg	0.004	0.006	Kilograms/day
October 85	Fe/Avg	0.410	0.420	Kilograms/day
November 85	Cu/max	0.051	0.008	Kilograms/day
November 85	Cr+6/max	0.008	0.051	Kilograms/day
November 85	TSS/Max	12.800	112.400	Kilograms/day
November 85	Cr+6	0.008	0.010	Kilograms/day
November 85	Cr+6/Avg	0.004	0.015	Kilograms/day
November 85	Cu/Avg	0.025	0.027	Kilograms/day
December 85	Fe/Max	0.250	1.020	Kilograms/day
December 85	Fe/Avg	0.410	0.440	Kilograms/day
November 85	Tss/Avg	12.800	26.400	Kilograms/day
March 86	Cr+6	0.008	0.010	Kilograms/day
March 86	Cr+6/Max	0.008	0.009	Kilograms/day
March 86	Cr+6/Avg	0.004	0.007	Kilograms/day
June 87	TSS/Max	12.800	21.500	Kilograms/day
June 87	TSS/Max	12.800	19.300	Kilograms/day
February 88	TSS/Max	12.800	19.300	Kilograms/day
April 89	TSS/Avg	6.200	17.300	Kilograms/day
April 89	Fe/Max	0.850	1.750	Kilograms/day
April 89	Fe/Avg	0.41	1.15	Kilograms/day

EXPOSURE INFORMATION REPORT**TABLE 4****SUMMARY OF ALLEGED VIOLATIONS - WASTE PIT NO. 4**

DATE OF NOV: July 3, 1986

DATE OF INSPECTION: May 12-13, 1986

ALLEGATIONS: Failure to include a map showing the location and quantity of each hazardous waste disposed in the landfill, as required by 40 CFR 265.73(b)(2) and OAC 3745-65-73(B)(2);

Failure to prepare and maintain on-site a closure plan for the landfill, as required by 40 CFR 265.112 and OAC 3745-66-12;

Failure to maintain at the facility a written post-closure plan for the landfill, as required by 40 CFR 265.118 and OAC 3745-56-18; and

Failure to construct, operate, and maintain a run-off management system from the active portions of the landfill, as required by 40 CFR 265.302(b) and OAC 3745-67-02(B).

DATE OF NOV: September 2, 1987

DATE OF INSPECTION: Not Applicable - Groundwater Monitoring Report

ALLEGATIONS: Failure to implement a groundwater monitoring program capable of determining the facility's impact on the quality of groundwater in the uppermost aquifer underlying the facility, as required by 40 CFR 265.90(a) and OAC 3745-65-90(A);

Failure to install an adequate upgradient well(s), as required by 40 CFR 265.91(a)(1) and OAC 3745-65-91(A)(1); and

Failure to install at least three downgradient wells at the limit of the waste management area in a manner that ensures immediate detection of statistically significant amounts of hazardous waste or hazardous waste constituents that migrate from the waste management area to the uppermost aquifer, as required by 40 CFR 265.93(a)(2) and OAC 3745-65-93(A)(2).

EXPOSURE INFORMATION REPORT**TABLE 4****SUMMARY OF ALLEGED OF VIOLATIONS - WASTE PIT NO. 4**

DATE OF NOV: December 5-8, 1988

DATE OF INSPECTION: December 5-8, 1988

ALLEGATIONS: Failure to develop and maintain on-site a post-closure plan for "Pit 4" landfill, as required by 40 CFR 265.118(a) and OAC 3745-66-18(A).

DATE OF NOV: Not Applicable - Groundwater Monitoring Report

DATE OF INSPECTION: Not Applicable - Groundwater Monitoring Report

ALLEGATIONS: The Results and Conclusions section of May 1987 RCRA Groundwater Monitoring Report - Round 4 concluded that the distribution of radiological and non-radiological constituents appear to be localized around Waste Pit #4. No confirmatory sampling was performed, as required by 40 CFR 265.93(c)(2) and OAC 3745-65-93(C)(2);

Failure to develop and follow an adequate groundwater sampling and analysis plan, as required by 40 CFR 265.92(a) and OAC 3745-65-92(A); and

Failure to install a groundwater monitoring system capable of yielding groundwater samples for analysis, as required by 40 CFR 265.91(a) and OAC 3745-65-91(A).

DATE OF NOV: February 1989

DATE OF INSPECTION: Not Applicable - Groundwater Quality Assessment Program Plan

ALLEGATIONS: Using either flow direction, east or northeast, indicates that the landfill (Waste Pit #4) is not monitored by the required three downgradient wells, as required by 40 CFR 265.91(a)(2) and OAC 3745-65-91(A)(2).

EXPOSURE INFORMATION REPORT**TABLE 4****SUMMARY OF ALLEGED OF VIOLATIONS - WASTE PIT NO. 4**

DATE OF NOV: October 1989

DATE OF INSPECTION: Not Applicable - Groundwater Monitoring Evaluation Inspection

ALLEGATIONS: The assessment monitoring wells to monitor the till aquifer are located at the perimeter of the waste pit area, but not adjacent to Waste Pit #4. These perimeter wells are not sufficient to determine the concentration of hazardous constituents in the groundwater, in violation of OAC 3745-65-93(D)(4)(b), or characterize the contaminant plume, in violation of OAC 3745-70-14(C)(4).

EXPOSURE INFORMATION REPORT (EIR)

TABLE 5

2494

NPDES MONTHLY SUMMARIES - BIODENITRIFICATION
 August 1986 - July 1991

NPDES 4605	Table 2	AMMONIA NH3-N MG/L	NITRATE NO3-N MG/L	CONDUIT FLOW MGD
DATE				
AUG 1986	AVERAGE	1	45.7	0.031
	MAXIMUM	1.9	353	0.059
	MINIMUM	0.5	1.3	0
SEP 1986	AVERAGE	0.84	2.4	0.036
	MAXIMUM	1	6	0.059
	MINIMUM	0.52	1	0.012
OCT 1986		*		
NOV 1986		*		
DEC 1986		*		
JAN 1987		**		
FEB 1987		*		
MAR 1987		*		
APR 1987		*		
MAY 1987		*		
JUN 1987	AVERAGE	<7.8	92	0.067
	MAXIMUM	<10	153	0.119
	MINIMUM	0.90	47	0.015
JUL 1987	AVERAGE	<0.28	0.4	0.169
	MAXIMUM	0.45	0.5	0.24
	MINIMUM	<0.10	0.2	0.086
AUG 1987	AVERAGE	0.66	37.9	0.172
	MAXIMUM	1.77	101	0.23
	MINIMUM	0.12	0.6	0
SEP 1987	AVERAGE	3.22	125.2	0.1148
	MAXIMUM	4.34	292	0.168
	MINIMUM	1.82	0.8	0.03
OCT 1987	AVERAGE	1.2	63.8	0.089

- * = Bio Surge Lagoon unit out of service entire month, no discharge
- ** = No sample was taken

EXPOSURE INFORMATION REPORT (EIR)

2494

TABLE 5

NPDES MONTHLY SUMMARIES - BIODENITRIFICATION
 August 1986 - July 1991

NPDES 4605	Table 2	AMMONIA NH3-N MG/L	NITRATE NO3-N MG/L	CONDUIT FLOW MGD
DATE				
	MAXIMUM	4.07	252	0.179
	MINIMUM	0.11	0.2	0.05
NOV 1987	AVERAGE	1.48	21.6	0.104
	MAXIMUM	5.53	66	0.124
	MINIMUM	0.04	0.4	0.065
DEC 1987	AVERAGE	0.88	257.3	0.106
	MAXIMUM	1.85	803	0.144
	MINIMUM	0.26	4.7	0.024
JAN 1988	AVERAGE	1.01	348.7	0.113
	MAXIMUM	1.85	1141	0.173
	MINIMUM	0.19	35	0.029
FEB 1988	AVERAGE	0.74	143.3	0.19
	MAXIMUM	1	328	0.216
	MINIMUM	0.46	0.2	0.102
MAR 1988	AVERAGE	0.55	56.6	0.206
	MAXIMUM	1.6	281	0.219
	MINIMUM	0.11	0.2	0.166
APR 1988	AVERAGE	3.68	1	0.132
	MAXIMUM	10.2	3.3	0.216
	MINIMUM	1.33	0.1	0.06
MAY 1988	AVERAGE	7.18	134.5	0.099
	MAXIMUM	15.3	356	0.158
	MINIMUM	0.2	19	0.03
JUN 1988	AVERAGE	0.91	249.7	0.116
	MAXIMUM	1.39	620	0.13
	MINIMUM	0.11	28	0.101

* = Bio Surge Lagoon unit out of service
 entire month, no discharge

** = No sample was taken

EXPOSURE INFORMATION REPORT (EIR)

TABLE 5

NPDES MONTHLY SUMMARIES - BIODENITRIFICATION
August 1986 - July 1991

NPDES 4605	Table 2	AMMONIA NH ₃ -N MG/L	NITRATE NO ₃ -N MG/L	CONDUIT FLOW MGD
DATE				
JUL 1988	AVERAGE	0.68	851.2	0.121
	MAXIMUM	1.57	1365	0.187
	MINIMUM	0.18	148	0.058
AUG 1988	AVERAGE	1.35	132.3	0.113
	MAXIMUM	1.62	507	0.158
	MINIMUM	0.94	11.5	0.086
SEP 1988	AVERAGE	1.64	38.4	0.125
	MAXIMUM	3.54	99	0.151
	MINIMUM	0.68	0.2	0.086
OCT 1988	AVERAGE	2.47	2.3	0.098
	MAXIMUM	4.72	7.4	0.115
	MINIMUM	0.36	0.1	0.058
NOV 1988	AVERAGE	0.68	0.1	0.107
	MAXIMUM	0.78	0.2	0.13
	MINIMUM	0.62	0.1	0.1
DEC 1988	AVERAGE	1.23	0.5	0.065
	MAXIMUM	2.92	1.6	0.144
	MINIMUM	0.24	0.1	0.025
JAN 1989	AVERAGE	1.42	50	0.123
	MAXIMUM	4.69	182	0.144
	MINIMUM	0.06	18	0.028
FEB 1989	AVERAGE	0.38	39.5	0.147
	MAXIMUM	0.58	106	0.173
	MINIMUM	0.15	48	0.029
MAR 1989	AVERAGE	1.28	11.9	0.138

* = Bio Surge Lagoon unit out of service
entire month, no discharge

** = No sample was taken

EXPOSURE INFORMATION REPORT (EIR)

2494

TABLE 5

NPDES MONTHLY SUMMARIES - BIODENITRIFICATION
 August 1986 - July 1991

NPDES 4605	Table 2	AMMONIA NH3-N MG/L	NITRATE NO3-N MG/L	CONDUIT FLOW MGD
DATE				
	MAXIMUM	3.05	41	0.173
	MINIMUM	0.58	0.1	0.014
APR 1989	AVERAGE	0.52	5.8	0.157
	MAXIMUM	0.94	23	0.18
	MINIMUM	0.14	0.1	0.093
MAY 1989	AVERAGE	0.93	2	0.154
	MAXIMUM	2.71	8.4	0.187
	MINIMUM	0.25	0.1	0.115
JUN 1989	AVERAGE	0.49	0.1	0.097
	MAXIMUM	0.58	0.2	0.122
	MINIMUM	0.42	0.1	0.048
JUL 1989	AVERAGE	0.67	0.1	0.057
	MAXIMUM	0.86	0.3	0.058
	MINIMUM	0.48	0.1	0.035
AUG 1989	AVERAGE	0.35	0.4	0.071
	MAXIMUM	0.64	1.5	0.072
	MINIMUM	0.18	0.1	0.058
SEP 1989	AVERAGE	0.29	0.7	0.096
	MAXIMUM	0.42	2.3	0.101
	MINIMUM	0.09	0.1	0.042
OCT 1989	AVERAGE	0.78	0.2	0.08
	MAXIMUM	0.83	0.2	0.101
	MINIMUM	0.65	0.2	0.034
NOV 1989	AVERAGE	0.54	0.2	0.087
	MAXIMUM	0.84	0.3	0.101
	MINIMUM	0.33	0.1	0.072

* = Bio Surge Lagoon unit out of service
 entire month, no discharge
 ** = No sample was taken

EXPOSURE INFORMATION REPORT (EIR)

2494

TABLE 5

NPDES MONTHLY SUMMARIES - BIODENITRIFICATION
August 1986 - July 1991

NPDES 4605	Table 2	AMMONIA NH3-N MG/L	NITRATE NO3-N MG/L	CONDUIT FLOW MGD
DATE				
DEC 1989	AVERAGE	0.31	8	0.101
	MAXIMUM	0.41	31	0.12
	MINIMUM	0.23	0.2	0.094
JAN 1990	AVERAGE	0.3	0.2	0.077
	MAXIMUM	0.37	0.3	0.101
	MINIMUM	0.21	0.1	0
FEB 1990	AVERAGE	0.53	0.3	0.126
	MAXIMUM	0.7	0.3	0.159
	MINIMUM	0.42	0.2	0.049

- * = Bio Surge Lagoon unit out of service
entire month, no discharge
- ** = No sample was taken

EXPOSURE INFORMATION REPORT

TABLE 6

NPDES MONTHLY SUMMARIES - BIOSURGE LAGOON

March 1990 - June 1991

NPDES 4605	PH	CONDUIT FLOW	BOD 5 DAY	RESIDUE T. NFL	AMMONIA NH3-N	NITRATE NO3-N	FLOURIDE F, TOTAL	CHROMIUM CR, TOTAL	COPPER U, TOTAL	NICKEL NI, TOTAL	CHROMIUM HEX-DS
DATE	S.U.	MGD	MG/L	MG/L	MG/L	MG/L	MG/L	UG/L	UG/L	UG/L	UG/L
MAR 1990 AVERAGE	N/A	0.148	*	17	0.5	0.3	2.9	3.9	11.8		4.5
MAXIMUM	8.5	0.173	*	18	0.62	0.3	2.9	5.9	16.4		5
MINIMUM	7.1	0.073	*	14	0.36	0.2	2.8	2	9		4.1
APR 1990	**										
MAY 1990	**										
JUN 1990	**										
JUL 1990	**										
AUG 1990	**										
SEP 1990 AVERAGE	N/A	0.076	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MAXIMUM	7.8	0.115	5.23	12	1.83	13	3.4	*	23.3	20	*
MINIMUM	7.4	0.012	2.23	12	1.83	13	3.4	*	23.3	20	*
OCT 1990 AVERAGE	N/A	0.106	16.59	21	0.1	6.3	4.1	6.6	15.4	33.1	6.2
MAXIMUM	7.6	0.151	31.1	88	0.12	14	8.3	14	24.1	42.6	9
MINIMUM	7	0.035	3.93	13	0.1	0.1	3.5	6	14	24	6
NOV 1990 AVERAGE	N/A	0.071	28.78	5	0.21	2.1	4.2	6.3	17.3	28	*
MAXIMUM	8.4	0.112	74.7	10	0.61	6.7	4.6	7	30	36	*
MINIMUM	7.2	0.03	11.3	2	0.1	0.1	3.8	6	14	24	*

* = Sample collected but not analyzed

** = Facility taken out of service on 4/4/90 due to constructive activities

N/A = Not Applicable

EXPOSURE INFORMATION REPORT

TABLE 6

NPDES MONTHLY SUMMARIES - BIOSURGE LAGOON
March 1990 - June 1991

NPDES 4605	DATE	pH S.U.	CONDUT FLOW MGD	BOD 5 DAY MG/L	RESIDUE T. NFL MG/L	AMMONIA NH3-N MG/L	NITRATE NO3-N MG/L	FLOURIDE F, TOTAL MG/L	CHROMIUM CR, TOTAL UG/L	COPPER U, TOTAL UG/L	NICKEL NI, TOTAL UG/L	CHROMIUM HEX-DS UG/L
DEC 1990	AVERAGE	N/A	0.098	5.61	5	0.1	1	3.5	8.1	*	26.5	7.5
	MAXIMUM	8.4	0.148	14.73	8	0.1	1.2	3.7	11.4	*	34.5	9.6
	MINIMUM	7.5	0.021	1.43	2	0.1	0.8	3.2	6	*	19.9	6
JAN 1991	AVERAGE	N/A	0.195	8.74	4	0.12	1.2	3.4	10.6	*	16.4	7.6
	MAXIMUM	8.3	0.22	17.3	7	0.16	1.8	3.6	13.7	*	20.1	10.6
	MINIMUM	6.6	0.073	3.27	2	0.1	0.8	3.3	6	*	12.8	6
FEB 1991	AVERAGE	N/A	0.201	10.44	7	0.11	2.1	3.6	6.4	*	15.7	*
	MAXIMUM	8.4	0.238	17.2	16	0.12	3.4	3.8	6.9	*	17.2	*
	MINIMUM	7.4	0.115	2.27	2	0.1	0.6	3.4	6	*	14.7	*
MAR 1991	AVERAGE	N/A	0.086	10.45	9	0.11	0.9	5.1	8.7	*	19.1	*
	MAXIMUM	8.2	0.116	16.7	12	0.14	2.2	6.8	13.6	*	24.1	*
	MINIMUM	6.6	0.038	4.81	6	0.1	0.1	3.6	6	*	13.9	*
APR 1991	AVERAGE	N/A	0.131	34	5	0.18	1.1	3.4	8	*	21.6	*
	MAXIMUM	8.2	0.176	44.4	6	0.22	3.1	3.8	11.8	*	26.7	*
	MINIMUM	6.6	0.054	5.5	3	0.1	0.6	2.7	6	*	18.6	*

* = Sample collected but not analyzed
 ** = Facility taken out of service on 4/4/90 due to constructive activities
 N/A = Not Applicable

EXPOSURE INFORMATION REPORT

TABLE 6

NPDES MONTHLY SUMMARIES - BIOSURGE LAGOON
March 1990 - June 1991

NPDES 4605	PH	CONDUIT FLOW	BOD 5 DAY	RESIDUE T. NFL	AMMONIA NH3-N	NITRATE NO3-N	FLOURIDE F, TOTAL	CHROMIUM CR, TOTAL	COPPER U, TOTAL	NICKEL NI, TOTAL	CHROMIUM HEX-DS
DATE	S.U.	MGD	MG/L	MG/L	MG/L	MG/L	MG/L	UG/L	UG/L	UG/L	UG/L
MAY 1991 AVERAGE	N/A	0.109	8.2	6	0.12	1.2	3.2	6.8	14.3	19.4	*
MAXIMUM	8.2	0.147	9.09	12	0.16	2.5	3.4	7.7	14.9	22.6	*
MINIMUM	7.6	0.004	7.5	2	0.1	0.6	2.8	6	14	17.7	*
JUN 1991 AVERAGE	N/A	0.088	7.86	3	*	0.7	3.6	6	*	16	*
MAXIMUM	8.5	0.127	20.5	5	*	1.3	3.7	6	*	21.4	*
MINIMUM	7.5	0.011	4.07	2	*	0.6	3.5	6	*	11.1	*

* = Sample collected but not analyzed
** = Facility taken out of service on 4/4/90 due to constructive activities
N/A = Not Applicable

EXPOSURE INFORMATION REPORT (EIR)

2494

TABLE 7

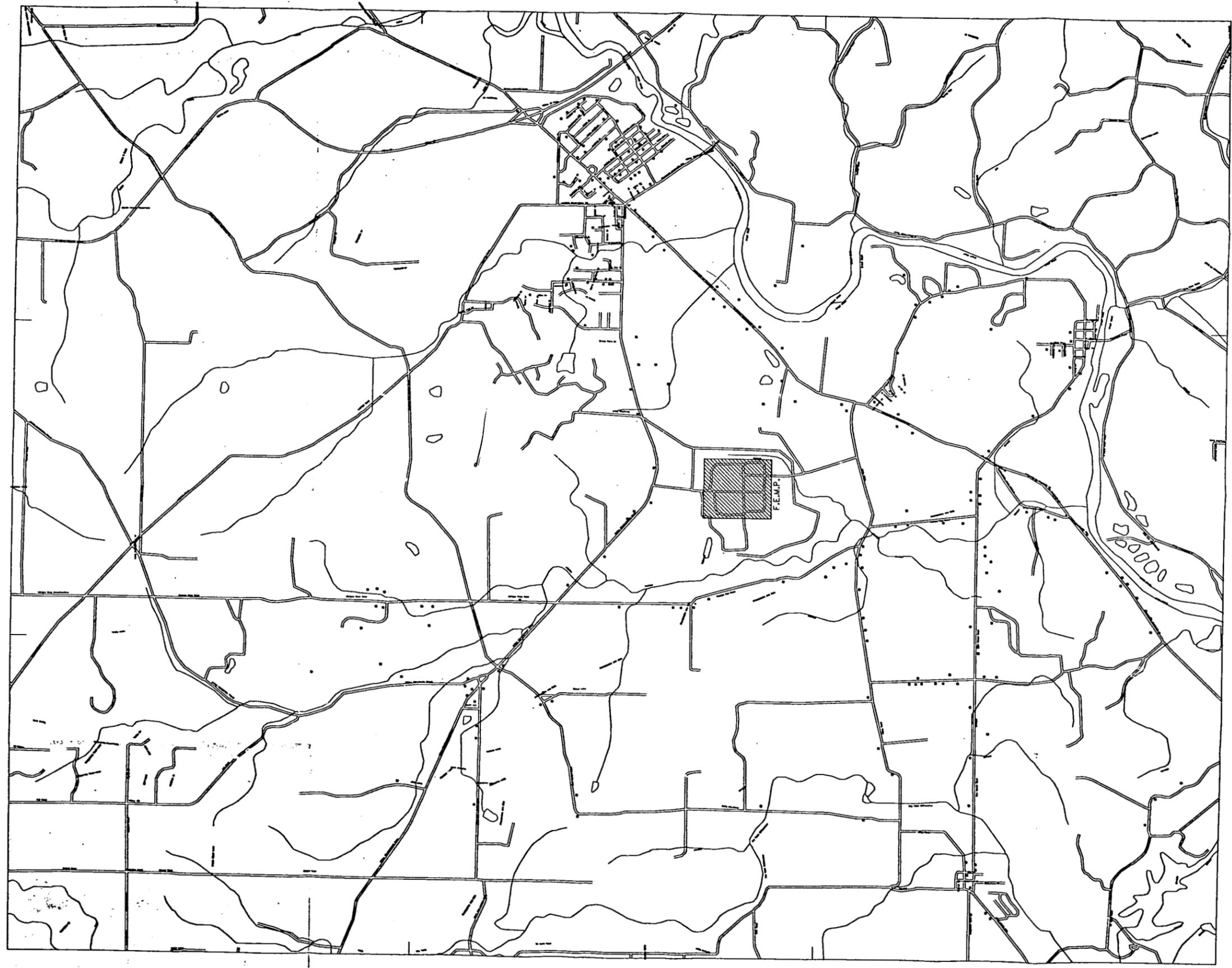
SUMMARY OF MONTHLY NPDES MONITORING REPORT
NONCOMPLIANCE BIODENITRIFICATION SYSTEM

SAMPLE DATE	PARAMETER	PERMIT VALUE	ACTUAL VALUE	UNIT
September 87	NO3/Avg	124.00	143.70	Kilograms/day
December 87	NO3/Avg	124.00	261.40	Kilograms/day
December 87	NO3/Avg	62.00	91.80	Kilograms/day
January 88	NO3/Avg	124.00	242.00	Kilograms/day
January 88	NO3/Avg	62.00	90.20	Kilograms/day
February 88	NO3/Max	124.00	127.00	Kilograms/day
February 88	NO3/Avg	62.00	79.80	Kilograms/day
March 88	N-NO3	124.00	230.00	Kilograms/day
June 88	N-NO3/Max	124.00	286.00	Kilograms/day
June 88	N-NO3/Avg	62.00	108.00	Kilograms/day
July 88	N-NO3/Max	128.00	292.00	Kilograms/day
July 88	N-NO3/Max	124.00	300.00	Kilograms/day
July 88	N-NO3/Max	124.00	277.00	Kilograms/day
July 88	N-NO3/Avg	62.00	244.00	Kilograms/day
August 88	N-NO3/Max	124.00	165.00	Kilograms/day
March 90	F/Avg	1.30	2.90	Miligrams/liter
October 90	TSS/Max	4.50	88.00	Miligrams/liter
October 90	F/Max	4.50	8.30	Miligrams/liter
October 90	F/Avg	1.30	4.10	Miligrams/liter
October 90	F/Avg	1.12	1.55	Kilograms/day
October 90	Ni:Max	42.00	42.60	Micrograms/day
October 90	Ni:Avg	29.00	33.10	Micrograms/day
November 90	BoD5	45.00	74.70	Miligrams/day
November 90	F/Max	4.50	4.60	Miligrams/day
November 90	F/Avg	1.30	4.20	Miligrams/day
November 90	F/Avg	1.12	1.27	Kilograms/day
December 90	F/Avg	1.30	3.50	Miligrams/liter
December 90	F/Avg	1.12	1.31	Kilograms/day
January 91	F/Avg	1.30	3.40	Miligrams/liter
January 91	F/Avg	1.12	2.21	Kilograms/day
February 91	F/Avg	1.30	3.61	Miligrams/liter
February 91	F/Avg	1.12	2.71	Kilograms/day
March 91	F/Max	4.50	6.80	Miligrams/liter
March 91	F/Max	4.50	5.20	Miligrams/liter
March 91	F/Max	1.30	5.09	Miligrams/liter
March 91	F/Max	1.12	1.55	Miligrams/liter

TABLE 7

**SUMMARY OF MONTHLY NPDES MONITORING REPORT
NONCOMPLIANCE BIODENITRIFICATION SYSTEM**

SAMPLE DATE	PARAMETER	PERMIT VALUE	ACTUAL VALUE	UNIT
April 91	BOD5	30.00	34.04	Miligrams/liter
April 91	F/Avg	1.30	3.43	Miligrams/liter
April 91	F/Avg	1.12	1.58	Kilograms/day
May 91	F/Avg	1.30	3.20	Miligrams/liter
June 91	F/Avg	1.30	3.60	Miligrams/liter
June 91	F/Avg	1.12	1.26	Kilograms/day

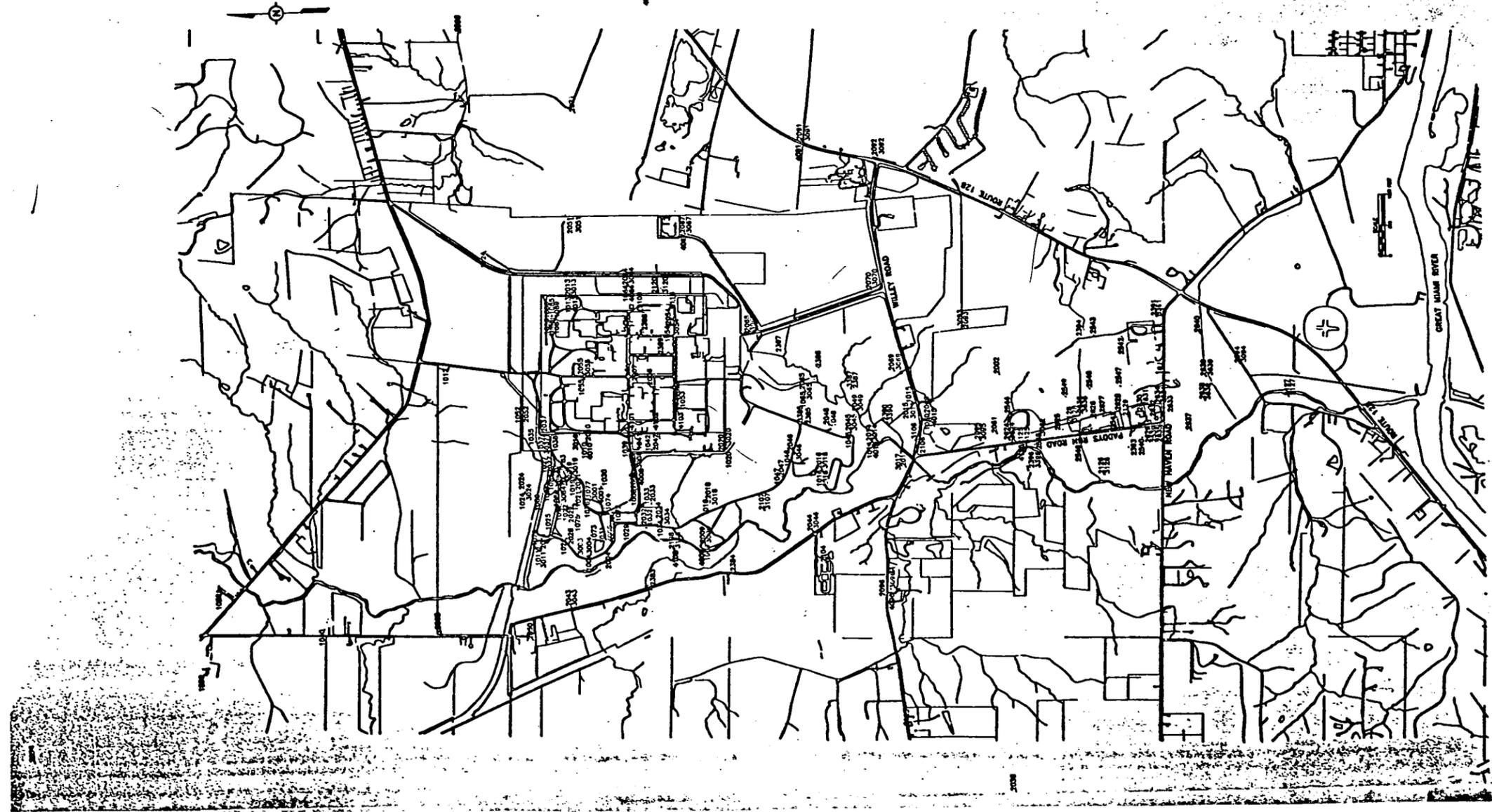


2494

82

NO.		DATE		REVISED		DATE		BY		REF. DTC. NO.	
NOTE: BEING C.A.D. DRAWING NOT TO BE REVISED MANUALLY											
CHECKED BY DATE			U.S. & H. MAINTENANCE DATE			APPROVALS U.S. & H. MAINTENANCE DATE			U.S. DEPARTMENT OF ENERGY FIGURE 2 FERNALD, OHIO		
CHECKED BY DATE			U.S. & H. MAINTENANCE DATE			APPROVALS U.S. & H. MAINTENANCE DATE			U.S. DEPARTMENT OF ENERGY FIGURE 2 FERNALD, OHIO		

FILE NAME: ZFAH200.PETER.DGN



2494

U.S. DEPARTMENT OF ENERGY
 FIGURE 3
 FERNALD, OHIO

SITE PLAN
 EXPOSURE INFORMATION REPORT
 FEMP
 MONITORING WELLS



DATE: 02-18-88
 DRAWN: S. J. WOOD

FILE NAME: ZFAH0004JBECAFIG3.DGN



Approved, authorized, and prepared by the Geological Survey, in cooperation with the State of Ohio, under the authority of the Act of October 3, 1890, and the Act of October 3, 1917, and the Act of October 3, 1933, and the Act of October 3, 1935, and the Act of October 3, 1937, and the Act of October 3, 1939, and the Act of October 3, 1941, and the Act of October 3, 1943, and the Act of October 3, 1945, and the Act of October 3, 1947, and the Act of October 3, 1949, and the Act of October 3, 1951, and the Act of October 3, 1953, and the Act of October 3, 1955, and the Act of October 3, 1957, and the Act of October 3, 1959, and the Act of October 3, 1961, and the Act of October 3, 1963, and the Act of October 3, 1965, and the Act of October 3, 1967, and the Act of October 3, 1969, and the Act of October 3, 1971, and the Act of October 3, 1973, and the Act of October 3, 1975, and the Act of October 3, 1977, and the Act of October 3, 1979, and the Act of October 3, 1981, and the Act of October 3, 1983, and the Act of October 3, 1985, and the Act of October 3, 1987, and the Act of October 3, 1989, and the Act of October 3, 1991, and the Act of October 3, 1993, and the Act of October 3, 1995, and the Act of October 3, 1997, and the Act of October 3, 1999, and the Act of October 3, 2001, and the Act of October 3, 2003, and the Act of October 3, 2005, and the Act of October 3, 2007, and the Act of October 3, 2009, and the Act of October 3, 2011, and the Act of October 3, 2013, and the Act of October 3, 2015, and the Act of October 3, 2017, and the Act of October 3, 2019, and the Act of October 3, 2021, and the Act of October 3, 2023, and the Act of October 3, 2025.



SCALE 1:25,000
 CONTAINING 12 SQUARES, 11 FEET
 ORIGINAL MEASUREMENTS OF 1900



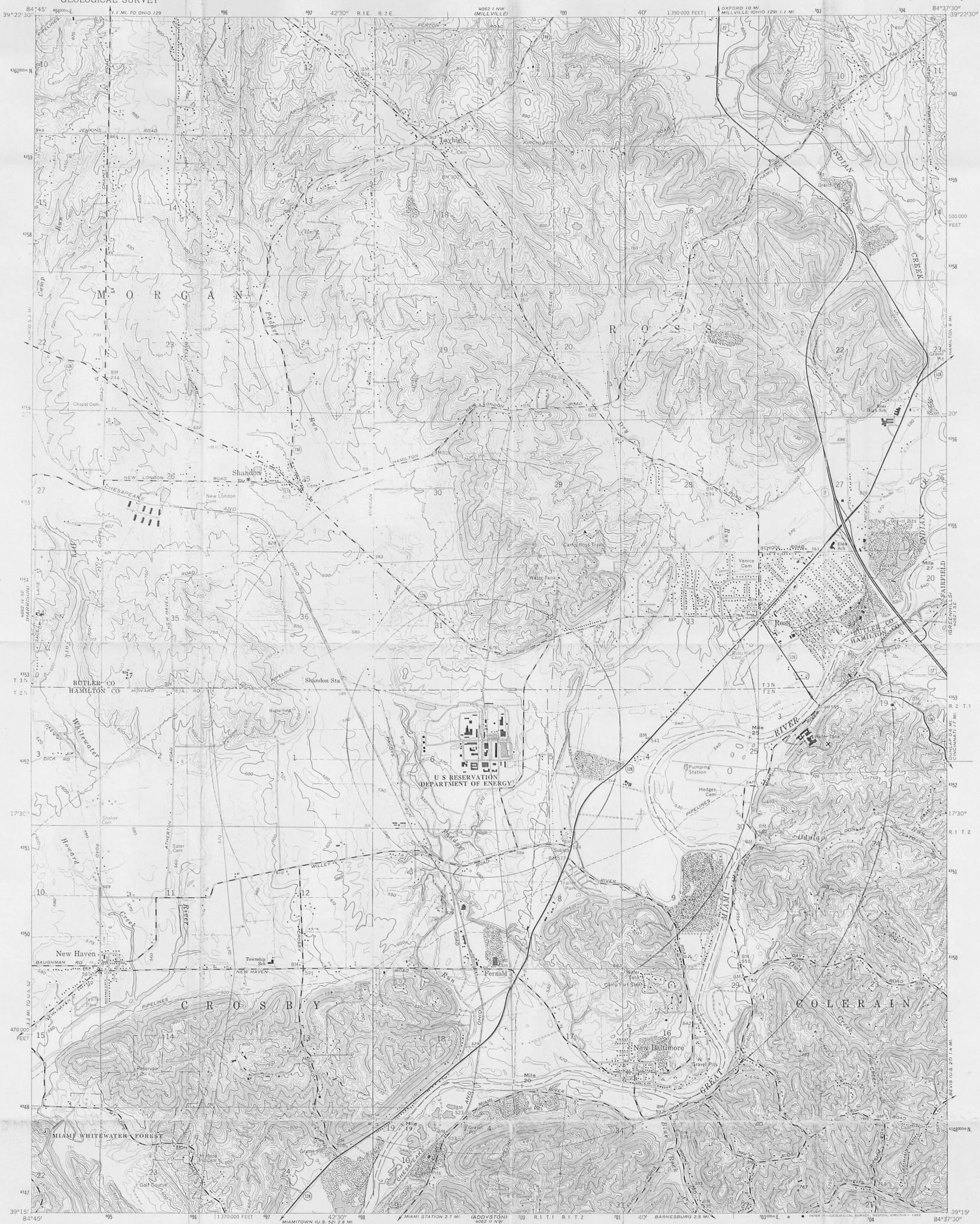
ROAD CLASSIFICATION
 Primary — Light Gray
 Secondary — Medium Gray
 Tertiary — Dark Gray
 U.S. Road — Circle with 'U.S.'
 State Road — Circle with 'OH'

SHANDON, OHIO
 1953
 PHOTOGRAPHED 1951
 MAP MADE BY GEORGE HARRIS

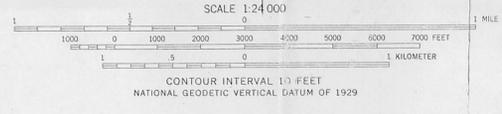
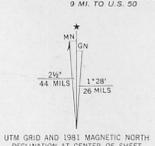
2494

84

84



Mapped, edited, and published by the Geological Survey in cooperation with the Defense Mapping Agency. Revised in cooperation with State of Ohio agencies. Control by USGS, NODNOAA, and City of Cincinnati. Topography by photogrammetric methods from aerial photographs taken 1954. Field checked 1955. Revised 1965. Polyconic projection. 10,000-foot grid ticks based on Ohio coordinate system, south zone. 1,000-meter Universal Transverse Mercator grid ticks, zone 16, shown in blue. 1927 North American Datum. To place on the predicted North American Datum, 1983 move the projection lines 3 meters south and 5 meters west as shown by dashed corner ticks. Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is unchecked. Area west of the Great Miami River lies within the Miami River Survey Area east of the Great Miami River lies within the Between the Miamis. Land lines based on the great Miami River Base. Dotted land lines established by private subdivision of the Symmes Purchase. There may be private inholdings within the boundaries of the National or State reservations shown on this map.



ROAD CLASSIFICATION

Heavy-duty	Light-duty
Medium-duty	Unimproved dirt
U.S. Route	State Route

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS FOR SALE BY U.S. GEOLOGICAL SURVEY, RESTON, VIRGINIA 22092. A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST.

Revisions shown in purple and woodland compiled in cooperation with State of Ohio agencies from aerial photographs taken 1979 and other sources. This information not field checked. Map edited 1981.

SHANDON, OHIO
N3915-W8437.5/7.5
1965
PHOTO-REVISED 1981
DMA 4082 1 SW-SERIES V852