**ENVIRONMENTAL ASSESSMENT
FOR THE CONSTRUCTION AND OPERATION OF
WASTE STORAGE FACILITIES
AT THE PADUCAH GASEOUS DIFFUSION PLANT
PADUCAH, KENTUCKY**

**U.S. DEPARTMENT OF ENERGY
PADUCAH GASEOUS DIFFUSION PLANT**

Paducah, Kentucky

June 1994

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TABLE OF CONTENTS

LIST OF FIGURES	iii
LIST OF TABLES	iv
ACRONYMS AND ABBREVIATIONS	v
SUMMARY	1
1.0 INTRODUCTION	4
1.1 PROPOSED ACTION	4
1.2 BACKGROUND	4
1.3 PURPOSE AND NEED	5
1.4 LOCATION	7
1.5 SCOPE	7
1.6 RELATIONSHIP TO OTHER ACTIONS	9
2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES	10
2.1 ALTERNATIVE 1: NO ACTION	10
2.2 ALTERNATIVE 2: PROPOSED ACTION - CONSTRUCT AND OPERATE NEW WSFs	11
2.2.1 Location, Site Preparation, and Construction of the PGDP WSFs ..	11
2.2.2 Operation of the PGDP WSFs	15
2.3 ALTERNATIVE 3: ALTERNATE LOCATIONS	18
2.4 ALTERNATIVE 4: ALTERNATIVES CONSIDERED AND DISMISSED	20
2.4.1 Upgrade Existing Facilities	20
2.4.2 Off-Site Shipment of Waste	20
3.0 DESCRIPTION OF THE EXISTING ENVIRONMENT	21
3.1 GEOLOGY	21
3.2 HYDROLOGY	22
3.2.1 Surface Water	22
3.2.2 Groundwater	25
3.2.3 Floodplains	26
3.2.4 Wetlands	26
3.3 SOILS	30
3.4 CLIMATE, AIR QUALITY, AND NOISE	32
3.4.1 Climate	32
3.4.2 Air Quality	33
3.4.3 Noise	33
3.5 BIOLOGICAL RESOURCES	33

TABLE OF CONTENTS (Continued)

3.5.1	Vegetation	33
3.5.2	Wildlife	34
3.5.3	Threatened and Endangered Species	36
3.6	LAND USE	40
3.7	CULTURAL RESOURCES	41
3.8	SOCIAL AND ECONOMIC CONDITIONS	43
3.8.1	Demography	43
3.8.2	Economic Activities	43
3.9	TRANSPORTATION	44
4.0	ENVIRONMENTAL IMPACTS	45
4.1	IMPACTS FROM THE PROPOSED ACTION: CONSTRUCT AND OPERATE NEW PGDP WSFs	45
4.1.1	Geology	45
4.1.2	Hydrology	45
4.1.3	Soils	47
4.1.4	Air Quality and Noise	47
4.1.5	Biological Resources	48
4.1.6	Land Use	49
4.1.7	Cultural Resources	49
4.1.8	Social and Economic Conditions	49
4.1.9	Transportation	49
4.1.10	Health and Safety	50
4.1.11	Cumulative Impacts	54
4.2	IMPACTS FROM NO ACTION ALTERNATIVE	57
4.2.1	Geology and Soils	57
4.2.2	Hydrology	57
4.2.3	Air Quality and Noise	57
4.2.4	Biological Resources	57
4.2.5	Land Use and Cultural Resources	57
4.2.6	Social and Economic Conditions	57
4.2.7	Human Health and Safety	57
4.3	ALTERNATE LOCATIONS	58
5.0	PERMITS AND REGULATORY REQUIREMENTS	59
6.0	AGENCIES AND PERSONS CONTACTED	63
7.0	LIST OF PREPARERS	64
	REFERENCES	65

LIST OF FIGURES

<u>Figure No.</u>	<u>Page</u>
1-1 Location Map, PGDP, Paducah, Kentucky	6
1-2 Location Plan for the WSFs, PGDP, Paducah, Kentucky	8
2-1 Alternate Locations for the PGDP WSFs	19
3-1 Regional Surface Water Features in the Vicinity of PGDP	23
3-2 Local Surface Water Features in the Vicinity of PGDP	24
3-3 MWSF Proposed Location Major Topographical Features, PGDP	27
3-4 On-site Well Locations, PGDP	28
3-5 Off-site Well Locations, PGDP	29
3-6 Soils Map, PGDP	31
3-7 Current Land Ownership Map for PGDP	42
4-1 Location Plan for Proposed Actions at PGDP	55

LIST OF TABLES

<u>Table No.</u>	<u>Page</u>
1-1 Available Waste Storage Space	5
2-1 Estimated Annual PGDP Waste Generation	12
2-2 MWSF Characterized Waste Hazard Level	17
3-1 Commonwealth of Kentucky, Threatened, Endangered, and "Special Concern" Animal Species Known from McCracken County, Kentucky	38
3-2 Commonwealth of Kentucky, Threatened, Endangered, and "Special Concern" Plant Species Known from McCracken County, Kentucky	39
4-1 Accepted Waste Types	50
4-2 Summary of Annual Dose from Radiological Contaminants	53

ACRONYMS AND ABBREVIATIONS

1		
2		
3		
4	AEA	Atomic Energy Act
5	AEC	U.S. Atomic Energy Commission
6	ANSI	American National Standards Institute
7	ASCE	American Society of Civil Engineers
8	ASTM	American Society for Testing and Materials
9	BMP	Best Management Practice
10	CAA	Clean Air Act
11	CDM Federal	CDM Federal Programs Corporation
12	CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
13	CFR	Code of Federal Regulations
14	CWA	Clean Water Act
15	DOD	U.S. Department of Defense
16	DOE	U.S. Department of Energy
17	DOT	U.S. Department of Transportation
18	EA	environmental assessment
19	EPA	Environmental Protection Agency
20	ER	Environmental Restoration
21	FONSI	Finding of No Significant Impact
22	FPPA	Farmland Protection Policy Act
23	FY	fiscal year
24	HEPA	high-efficiency particulate air
25	HVAC	heating ventilating and air conditioning
26	KAR	Kentucky Administrative Regulations
27	KDEP	Kentucky Department for Environmental Protection
28	KDFWR	Kentucky Department of Fish and Wildlife Resources
29	KOW	Kentucky Ordnance Works
30	KPDES	Kentucky Pollutant Discharge Elimination System
31	KSNPC	Kentucky State Nature Preservation Commission
32	LCD	Lower Continental Deposits
33	LLW	low-level radioactive waste
34	Energy Systems	Martin Marietta Energy Systems, Inc.
35	MSL	mean sea level
36	MWSF	mixed waste storage facility
37	NEPA	National Environmental Policy Act
38	NFPA	National Fire Protection Association
39	NRHP	National Registry of Historic Places
40	OSHA	Occupational Safety and Health Administration
41	PCB	polychlorinated biphenyl
42	PGDP	Paducah Gaseous Diffusion Plant
43	RCRA	Resource Conservation and Recovery Act
44	RGA	Regional Gravel Aquifer

1	SAIC	Science Applications International Corporation
2	SCS	U.S. Soil Conservation Service
3	SHPO	State Historic Preservation Officer
4	SOP	Standard Operating Procedure
5	SWL	solid waste landfill
6	TSCA	Toxic Substances Control Act
7	TSD	treatment, storage, and disposal
8	TVA	Tennessee Valley Authority
9	UCD	Upper Continental Deposits
10	UCRL	University of California Radiation Laboratory
11	UCRS	Upper Continental Recharge System
12	UE	uranium enrichment
13	UF ₆	uranium hexafluoride
14	USC	United States Code
15	USEC	U.S. Enrichment Corporation
16	USFWS	U.S. Fish and Wildlife Service
17	WKWMA	West Kentucky Wildlife Management Area
18	WSF	waste storage facility

SUMMARY

The Paducah Gaseous Diffusion Plant (PGDP) was constructed by the U.S. Atomic Energy Commission (AEC) in the early 1950s and has operated continuously since 1952. The plant enriches uranium for use in commercial nuclear power reactors in the United States and abroad. The plant is currently operated by Martin Marietta Energy Systems, Inc. (Energy Systems) for the United States Enrichment Corporation (USEC). USEC, a government corporation, leased the United States Department of Energy (DOE) Gaseous Diffusion Plant facility on July 1, 1993. DOE continues to own the facilities and is responsible for the decontamination and decommissioning, response actions, and/or corrective actions for conditions existing before the transition date. Under the lease agreement, DOE is temporarily responsible for the construction and operation of facilities which handle waste resulting from USEC uranium enrichment (UE) operations.

The operation of the Paducah facility results in the generation of considerable quantities of UE process-derived waste which must be properly managed per federal and state regulations and DOE Orders. PGDP operations require approximately 6746 ft²/year for storage of Toxic Substances Control Act (TSCA) waste and 2972 ft²/year for storage of Resource Conservation and Recovery Act (RCRA) waste (Beach 1992). Approximations based on the current TSCA waste generation rate suggest that PGDP will be out of TSCA waste storage space in August 1994. Projections indicate approximately 4354 ft² of TSCA waste storage space is currently available. A projection of available RCRA waste storage space shows 9100 ft² remaining. Based on this projection, RCRA waste storage space will not be available after Fiscal Year (FY) 1996. Estimates based on projected generation rates indicate that, beginning in FY 1995, an additional 200,000 ft² of waste storage space that meets TSCA and RCRA regulatory requirements will be necessary to provide storage capacity until the year 2000. Failure to provide adequate permitted waste storage space could require PGDP to either cease the generation of waste or be in violation of federal and state waste management regulations and agreements.

To meet this need, DOE is proposing to construct and operate two RCRA/TSCA waste storage facilities (WSFs) and one mixed waste storage facility (MWSF) at PGDP for the storage of waste generated through future environmental restoration (ER) activities. ER and operation wastes would be clearly marked and stored in separate areas. The facilities (buildings) would meet applicable regulatory requirements of either TSCA or RCRA, or the more stringent of these regulations, dependent on the wastes to be stored within the facilities. The construction and operation of these waste storage buildings would provide adequate regulatory waste storage space until the year 2000, based on current projections.

The proposed action consists of the following: constructing and operating two identical, approximately 42,000-ft² WSFs within the existing PGDP security fence, and one 200,000-ft² MWSF on a site adjacent to the existing security area near the northwest corner of the PGDP facility. Alternatives considered included: (1) no action; and (2) alternate locations.

1 Analysis conducted during the preparation of the environmental assessment (EA) resulted in
2 the following findings for the WSFs and the MWSF:
3

4 **Air Quality:** Short-term, minor air quality degradation in the immediate area of
5 construction activities would be expected. These activities would result in slightly
6 increased ambient concentrations of airborne particulates (fugitive dust) from
7 construction activities and sulfur dioxide, nitrogen oxides, and hydrocarbons from
8 construction vehicle exhaust. Dilution and dispersion of the pollutants in the
9 atmosphere would reduce ambient concentrations to immeasurable levels outside the
10 immediate area of activity. No permanent air emission sources would be created by
11 the proposed facilities.
12

13 **Cultural Resources:** Cultural resources or areas of archaeological significance do
14 not exist in the areas proposed for construction.
15

16 **Geology and Soils:** The geology of the area would not be affected by construction
17 of the proposed facilities. All areas have been previously disturbed and no soils that
18 are considered to be prime farmland would be disturbed.
19

20 **Land Use:** The areas proposed for construction are owned by DOE and are not
21 readily available for public access or recreational activities. Development of these
22 areas as industrial sites is consistent with adjacent site development, operations,
23 management practices, and agreements.
24

25 **Socioeconomics:** Construction of the proposed facilities is not expected to affect the
26 local economy on a long-term basis. The facilities would be operated by existing
27 PGDP personnel and only short-term construction employment would be created.
28 Transportation requirements would not change since all facilities would ultimately be
29 located within the PGDP security fence.
30

31 **Water Resources:** Big Bayou Creek may be affected by a temporary increase in
32 siltation due to construction activities and the proximity of the construction site to
33 Kentucky Pollutant Discharge Elimination System (KPDES) outfalls 001 and 015.
34 Siltation would not be expected to affect local biota and would be controlled by
35 standard construction management practices such as silt fences or hay bales. During
36 operation, engineering controls would minimize the potential for spills of hazardous
37 substances from the waste storage facilities to enter the outfalls, and ultimately, Big
38 Bayou Creek.
39

40 **Floodplains:** The 100-year flood elevation for Big Bayou Creek nearest the
41 proposed location ranges from about 365 to 366 feet above mean sea level (MSL).
42 The 500-year flood elevation ranges from about 366 to 367 feet above MSL (Cross
43 1993). The WSFs would be built at base elevations of at least 370 feet above MSL,
44 out of the 100- and 500-year floodplains.

1 **Wetlands:** Two approximately wetlands (less than 0.5 acre combined) that meet
2 federal jurisdictional requirements would be filled by construction activities. These
3 wetlands are considered to be isolated, non-headwaters wetlands, and a U.S. Army
4 Corps of Engineers Nationwide Permit has been received. A notice of wetlands
5 involvement was published on October 5, 1993 in the *Federal Register* per DOE
6 regulations (10 Code of Federal Regulations [CFR] 1022). The wetlands assessment
7 concluded that none of the potentially affected wetlands is of high ecological value
8 in a regional context (Appendix A).
9

10 **Threatened and Endangered Species:** Two acres of the 20-acre site for the PGDP
11 MWSF are considered potential summer habitat for the Indiana bat (*Myotis sodalis*),
12 a federally listed endangered species, due to the presence of shagbark hickory
13 (*Carya ovata*). The shagbark hickory (or other trees with loose bark) may provide
14 habitat for this bat during summer reproductive activities. A Biological Assessment
15 was conducted according to Section 7 of the Endangered Species Act and submitted
16 to the U.S. Fish and Wildlife Service (USFWS) for a biological opinion. The
17 USFWS concurs that the removal of approximately 2 acres of potential habitat
18 would not affect the status of the Indiana bat. Additionally, to ensure that no
19 individuals of the species are affected, construction activities would be initiated
20 outside of the known maternity season.
21

22 **Cumulative Impacts:** Cumulative impacts associated with other proposed actions
23 potentially coinciding with the proposed action would be minimal. These activities
24 include construction of a proposed 40 acre solid waste landfill, and an expansion of
25 the uranium hexafluoride (UF₆) tails cylinder storage yards. The potential cumulative
26 impacts associated with the proposed actions are discussed in Section 4.1.11.
27

28 This EA was prepared pursuant to the National Environmental Policy Act (NEPA) of 1969,
29 the Council on Environmental Quality regulations for the implementation of NEPA (Title
30 40 CFR Parts 1500-1508) and DOE's NEPA regulations 10 CFR Part 1021 [57 *Federal*
31 *Register* 15122 (April 24, 1992)], DOE Order 5440.1E, and *Recommendations for the*
32 *Preparation of Environmental Assessments and Environmental Impact Statements*, by the
33 Office of NEPA Oversight, U.S. Department of Energy, May 1993.
34

35 This EA describes the need for agency action, the existing environment at the proposed site,
36 the proposed action, and the potential impacts of the proposed action. Based on the
37 potential for impacts described herein, DOE will either publish a Finding of No Significant
38 Impact (FONSI) or prepare an Environmental Impact Statement.
39
40
41

1.0 INTRODUCTION

1.1 PROPOSED ACTION

DOE is proposing to construct and operate three Waste Storage Facilities (WSFs) at PGDP for the storage of process-derived waste, including waste generated from associated PGDP activities (e.g., routine maintenance, housekeeping, health and safety activities, project wastes). These wastes are regulated under RCRA, TSCA, Atomic Energy Act (AEA), and DOE Order 5820.2A. The proposed action would result in the construction and operation of two approximately 42,000 ft² WSFs (primarily for RCRA/TSCA wastes) and one 200,000 ft² MWSF (primarily for RCRA and mixed waste). All of the PGDP WSFs would be designed to TSCA specifications for containment, which are more stringent than RCRA specifications. The PGDP MWSF would be RCRA permitted. The proposed WSFs represent the first facilities to be constructed at the plant for the sole purpose of storing waste.

1.2 BACKGROUND

PGDP was built by the AEC in the early 1950s on the former site of the Kentucky Ordnance Works (KOW) and has operated continuously since then. The plant enriches uranium for use in commercial nuclear power reactors in the United States and abroad. The plant is operated by Energy Systems for the USEC, a government corporation established July 1, 1993, which leases the gaseous diffusion plant from DOE. PGDP occupies 748 acres of a 3423 acre DOE reservation 10 miles west of Paducah, Kentucky (Figure 1-1). Operation of this facility results in the generation of considerable quantities of RCRA- and TSCA-regulated wastes. With the addition of wastes generated as a result of the ER Program, available storage space is quickly being exhausted. DOE has established, as part of its operating mission, the objective of managing its waste in a safe manner and within regulatory requirements. The goals of the waste management program are to handle wastes in a manner that will protect the health and safety of on-site personnel and the public, and protect the environment. To meet this goal, the potential for releases of waste to the environment must be minimized.

DOE policy requires all its operations to be conducted in compliance with all federal, state, and local laws and regulations in addition to DOE Orders. The PGDP Program is driven by several different laws and regulations. These include the National Environmental Policy Act (NEPA), DOE's NEPA Regulations 10 CFR 1021 [57 *Federal Register* 15122 (April 24, 1992)], RCRA, TSCA, Clean Water Act (CWA), Clean Air Act (CAA), DOE Order 5440.1E, DOE Order 5820.2A, DOE Order 5480.3, and the Occupational Safety and Health Act (OSHA). The specific regulatory citations are discussed further in Section 5.0 of this document.

1.3 PURPOSE AND NEED

The purpose of this action is to provide additional storage capacity for wastes that are classified as toxic substances under TSCA, and hazardous and mixed waste under RCRA. The need for this action is driven by the shortage of waste storage space. PGDP operations require approximately 6746 ft²/year for storage of Toxic Substances Control Act (TSCA) waste and 2972 ft²/year for storage of Resource Conservation and Recovery Act (RCRA) waste (Beach 1992). Based on the TSCA waste generation rate, PGDP will be out of TSCA waste storage space around August 1994, as projections indicate that only approximately 4354 ft² of TSCA waste storage space is currently available. A projection of available RCRA waste storage space shows that only 9100 ft² currently remain. Based on this projection, RCRA waste storage space will not be available after FY 1996. A breakdown of available storage space is provided in Table 1-1.

TABLE 1-1: AVAILABLE WASTE STORAGE SPACE

WASTE TYPE	BUILDING	TOTAL STORAGE CAPACITY (FT ²)	OCCUPIED CAPACITY (FT ²) (as of 1/1/93)	AVAILABLE CAPACITY (FT ²) (as of 1/1/93)
TSCA	C-764-B	15,588	14,404	1184
	C-337	12,797	9627	3170
	TOTAL	28,385	24,031	4354
RCRA	C-733	1520	1156	364
	C-746-R	400	372	28
	C-746-Q	8974	7987	987
	C-746-A	14,880	7118	7762
	TOTAL	25,774	16,633	9141

SOURCE: Comprehensive Waste Storage Plan Revision 1, April 1992

LOCATION MAP PADUCAH GASEOUS DIFFUSION PLANT PADUCAH, KENTUCKY

FIGURE No. 1-1

1.4 LOCATION

Two identical, approximately 42,000 ft² buildings (WSFs) would be built on a 3-acre site inside the PGDP security fence on previously disturbed land that is mowed and maintained by PGDP personnel (Figure 1-2). These facilities would be used to store RCRA/TSCA and RCRA/TSCA-mixed waste (i.e., RCRA or TSCA waste which may also contain radioactive waste). Two buildings, rather than one large building, are being constructed because the time required to build a single large building would prevent it from being constructed before present waste storage is exhausted. The first PGDP WSF would be constructed and brought on-line followed by the second PGDP WSF. For the purposes of this EA, the two PGDP WSFs will be addressed as a single unit or operation, since the facilities represent adjacent buildings and it would be redundant to identify potential impacts associated with an individual building given the similarities in structure, purpose, and location.

The third facility would be a 200,000 ft² building (MWSF) that would be used to store hazardous and mixed waste as defined by RCRA. The MWSF would be constructed on a 20-acre site, 50% wooded and 50% grassy fields, adjacent to the PGDP security area at the northwest corner of the plant (Figure 1-2). Although planned facilities would not occupy the entire 20-acre site, the entire area will be cleared and fenced for security purposes and to allow for the construction of future waste storage facilities, as needed. For the purposes of this EA, it will be assumed that construction of the MWSF would disturb approximately 10 acres of the 20 acre site. The combined impacts of all storage facilities within the 20-acre site will be addressed under the cumulative impacts section (Section 4.1.11) of this report.

1.5 SCOPE

This EA evaluates the potential impacts of the construction and operation of two PGDP WSFs and a MWSF on wetlands, threatened and endangered species, water resources, and worker health and safety. Areas presented in this document but discussed in less detail due to the minimal potential for impacts to occur to these resources are: socioeconomics, noise, historic preservation and cultural resources, floodplains, geology, and topography.

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LOCATION PLAN FOR THE
PROPOSED MWSF AND WSFs
PADUCAH GASEOUS DIFFUSION PLANT
PADUCAH, KENTUCKY

FIGURE No. 1-2

1.6 RELATIONSHIP TO OTHER ACTIONS

Other proposed actions related by location (all are on the PGDP reservation), time (all could occur within similar time frames), and purpose (all are necessary to support continued uranium enrichment operations at PGDP) are discussed in the cumulative impacts section. These activities include the construction of a solid waste landfill proposed for a 40 acre area north of the plant site and a 13 acre expansion to the existing UF₆ tails cylinder storage yards in the south-east corner of the plant site. Each of these proposed activities are also addressed in separate EAs.

This EA was prepared pursuant to the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality regulations for the implementation of NEPA (Title 40 CFR Parts 1500-1508) and DOE's NEPA Implementing Regulations 10 CFR Part 1021 [57 *Federal Register* 15122 (April 24, 1992)], DOE Order 5440.1E, and *Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements*, by the Office of NEPA Oversight, U.S. Department of Energy, May 1993. Based on the potential for impacts described herein, DOE will either publish a FONSI and proceed with the proposed action or prepare an Environmental Impact Statement.

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 ALTERNATIVE 1: NO ACTION

The no-action alternative is considered in accordance with NEPA regulations and provides a baseline for comparison with the proposed action and alternatives. By definition, the no-action alternative would consist of DOE taking no action to construct new PGDP WSFs, but continuing to manage and store RCRA- and TSCA-regulated wastes at existing on-site waste storage facilities. The no-action alternative would also include continued implementation of waste minimization practices in accordance with site and program waste minimization plans, which include segregation and recycling where possible. All PGDP-generated waste would be stored on-site until storage capacity is reached and would need to cease generating waste or be in violation of federal and state waste management regulations and agreements. Previously generated waste would remain in existing on-site storage facilities until alternative waste disposal or treatment options became available.

Included in the no action alternative would be continued shipment of some wastes to an off-site facility. DOE Order 5820.2A specifies a preference for radioactive waste generated at a DOE facility to also be managed at a DOE facility, although not necessarily the same one at which the waste was generated.

On May 17, 1991, DOE imposed a moratorium on off-site shipments of RCRA- and TSCA-regulated wastes to commercial treatment, storage, and disposal (TSD) facilities (U.S. House of Representatives 1992). This moratorium was imposed to prevent the inadvertent transfer of radioactive waste to a facility not specifically authorized to manage the wastes. The policy does make a provision for lifting the moratorium on a site-specific basis if the site procedures for defining, classifying, and characterizing the waste are approved by DOE. Although this approval has not yet been obtained by PGDP, it is anticipated that at some time in the future, shipments to commercial TSD facilities could be resumed. Under the no action alternative, shipments of specified wastes to DOE's Hanford, Washington Facility and the K-25 TSCA Incinerator facility in Oak Ridge, Tennessee would continue under existing agreements.

The majority of the waste generated at PGDP is solid TSCA mixed waste and, to date, no off-site facilities have been identified to accept these wastes. Liquid TSCA mixed waste may be disposed of at the DOE TSCA incinerator in Oak Ridge, Tennessee, but solid TSCA waste is not currently accepted. Wastes capable of being shipped to the DOE TSCA incinerator represent only 6.3% of the total TSCA waste stream. Shipping liquid waste to the TSCA incinerator would solve a small part of the storage space problem at PGDP, but additional storage facilities would still be necessary.

2.2 ALTERNATIVE 2: PROPOSED ACTION - CONSTRUCT AND OPERATE NEW WSFs

The proposed WSFs consist of three buildings to be located and constructed at PGDP. The two PGDP WSFs would contain approximately 42,000 ft² of waste storage space each and would be identical in design. The third WSF, the MWSF, would contain 200,000 ft² of waste storage space. These WSFs would be designed to contain PGDP-generated wastes. The types of waste generated through PGDP activities include: hazardous waste regulated under RCRA; toxic waste regulated under TSCA; radioactive waste regulated under AEA; and mixed waste, defined as TSCA and/or RCRA waste contaminated with radioactive waste. Table 2-1 depicts the waste types, the RCRA/TSCA constituents in the waste, and the estimated annual quantity of waste generated [in drums and required storage space (ft²)]. These values reflect continued implementation of waste minimization practices in accordance with site and program waste minimization plans.

These facilities would be designed to survive until plant closure and would support future facility decontamination and decommissioning activities. Closure of the PGDP WSFs would be conducted according to future site decommissioning plans.

2.2.1 Location, Site Preparation, and Construction of the PGDP WSFs

The PGDP WSFs would be located and constructed in phases. Each WSF is discussed separately.

2.2.1.1 WSFs

The two WSFs would be located on a 3-acre site inside the PGDP security fence, in a previously disturbed, mowed, grassy area south of Building C-746-B, west of railroad track #6, and east of C-745-C Cylinder Yard (Figure 1-2). Soil surveys have been performed at the site, and the soil within the construction area is free of contaminants that would require any remedial action. Only minor grading and excavation in the area would be required to support construction of the facilities. Utilities for sanitary/fire water and electrical supply would be extended to the site from existing distribution systems. Paved or concrete surface areas and roof drainage would be routed to existing ditches via underground storm drains and by positive surface drainage from the buildings.

One PGDP WSF would be constructed in FY 1994 and the other in FY 1995. Each approximately 42,000-ft² WSF would provide space equivalent to approximately 18,000 ft² of useable waste storage space, based on three tier stacking (three drums high) of U.S. Department of Transportation (DOT) approved 55-gallon drums. The WSFs would also provide space for inspection and vehicle access requirements. No office, administrative, or sampling areas will be included within the WSFs.

TABLE 2-1: ESTIMATED ANNUAL PGDP WASTE GENERATION

WASTE TYPE	TSCA/RCRA CONSTITUENTS IN WASTE	ESTIMATED ANNUAL QUANTITY OF WASTE (required storage, ft ²)
Solid TSCA	PCBs	373 drums (746 ft ²)
Solid TSCA-MW	PCBs, Radionuclides, Hazardous Substances	3000 drums (6000 ft ²)
Liquid TSCA-MW	PCBs, Radionuclides, Hazardous Substances	227 drums (454 ft ²)
Liquid RCRA-MW	Hazardous Substances, Radionuclides	114 drums (228 ft ²)
RCRA	Hazardous Substances	1486 drums (2972 ft ²)

SOURCE: Comprehensive Waste Storage Plan Revision 1, April 1992

Construction of the PGDP WSFs and the MWSF would be in compliance with the following:

- DOE Order 5700.6C, *Quality Assurance*, August 21, 1991
- DOE Order 5820.2A, *Radioactive Waste Management*, September 26, 1988
- DOE Order 6430.1A, *General Design Criteria*, April 6, 1989
- Energy Systems Y/EF-538 Rev. 6, *General Design Criteria*, March 18, 1992
- Title 29 Code of Federal Regulations Part 1910 (OSHA), 1992
- American National Standards Institute (ANSI), 1992
- American Society for Testing and Materials (ASTM), 1992
- National Fire Protection Association (NFPA) 101, *Life Safety Code*, 1992
- Title 40 Code of Federal Regulations Part 261 (RCRA), 1992
- Title 40 Code of Federal Regulations Part 761 (TSCA), 1992

The PGDP WSFs and the MWSF would not be considered special facilities or nuclear facilities as defined in DOE Order 6430.1A, *General Design Criteria*, because of the low levels of radioactivity allowed in the wastes received (discussed further in Section 2.2.2 "Operation of the PGDP WSFs"); therefore, no special safety or environmental protection systems would be necessary. The buildings would be constructed to withstand live loads (wind, snow, movement of equipment, and variable weight) and dead loads (weight of the

structure and building materials) as specified in ASCE 7-88, *Minimum Design Loads for Buildings and Other Structures*. The buildings would be constructed for seismic loading in accordance with the 1991 Uniform Building Code or University of California Radiation Laboratory (UCRL) 15910, *Design and Evaluation Guidelines for DOE Facilities Subjected to Natural Phenomena Hazards*, whichever is more stringent. The buildings would also be classified as low hazard facilities in accordance with UCRL 15910.

Both of the PGDP WSFs would be one-story, pre-engineered, metal buildings with pre-finished metal siding and standing-seam metal rooves and gutters, and would be completely insulated. The foundation would have cast-in-place concrete footings for the metal building columns and continuous grade beams around the perimeter. A motorized, roll-up, overhead door as well as a hollow, metal, personnel access door would be furnished at both the north and south ends of the PGDP WSFs. Additional personnel doors would be installed along the length of the buildings as required.

The waste would be stored within concrete diked areas designed as part of the floor. The floors would be coated with a sealant (e.g., Carboline Starglaze) impermeable to polychlorinated biphenyls (PCBs) and easily decontaminated, if necessary. Drums would be stored within the diked areas of the facility that meet TSCA waste storage requirements (40 CFR 761.65). TSCA regulations require that a minimum of a 6-inch dike be provided and that the floor and dike must provide a containment volume equal to at least two times the internal volume of the largest container stored therein or 25% of the total internal volume of all containers stored therein, whichever is greater. In addition, the dikes would be designed to contain all fire water released during a design basis fire (Lockwood Greene 1991). Portable fire extinguishers would also be provided as required by NFPA 10. Vehicle access (trucks, forklifts) would be provided by the roll-up doors at each end of the facility and by reinforced concrete driveways. Concrete ramps would be installed inside the PGDP WSFs to provide for safe movement of forklifts carrying pallets of drums.

2.2.1.2 MWSF

The MWSF would be located on a 20-acre area adjacent to and outside of the PGDP northwest security fence (Figure 1-2) which is part of the DOE owned buffer zone. The 20-acre area consists primarily of grassy fields with approximately 10 wooded acres. Soil surveys have been performed at the site and the soil is free of contaminants that would require any remedial action. Of the 20 acres, a total of 10 acres would be developed and 6 acres would contain the building footprint and associated paved or concrete driving/parking areas. The remaining 10 acres are reserved for future waste storage facilities. The MWSF would be constructed in FY 1996, and after construction, the security fence would be relocated to encompass the MWSF site. Utilities such as gas, water, electricity, sanitary sewer, and storm water service would be connected to existing plant services. Paved or concrete surface areas and roof drainage would be routed to existing ditches via underground storm drains and by positive surface drainage from the building.

1 The MWSF consists of one building providing approximately 200,000 ft² of waste storage
2 space, based on two tier stacking (two drums high) of DOT-approved 55-gallon drums.
3 The MWSF would also provide areas for inspection and vehicle access. An administration
4 area is included as part of the MWSF to house offices and related support facilities as well
5 as changehouses for use by waste management personnel. The administration area would
6 be completely segregated from the waste storage area. Appropriate boundary control and
7 monitoring stations between regulated and non-regulated areas would be provided.
8 Receiving, sampling, repackaging, and drum crushing areas would be included as part of
9 the MWSF, and would be enclosed, regulated areas. The receiving area would provide
10 facilities for the receiving of wastes generated at PGDP. Sampling and staging would be
11 conducted to prepare those wastes for long-term storage within the MWSF.
12

13 Construction of the facility would incorporate all applicable requirements from RCRA,
14 TSCA, OSHA, state and federal regulations as well as all applicable DOE Orders for the
15 handling and storage of mixed waste. Where there is regulatory overlap, the most stringent
16 of the regulations would be instituted. Construction of the MWSF would be in compliance
17 with the regulations previously listed.
18

19 The building would be one-story, pre-engineered metal, with pre-finished metal siding and a
20 metal deck on steel joists for the roof and gutters, and would be completely insulated. The
21 foundation would have cast-in-place concrete footings for the metal building columns and
22 continuous grade beams around the perimeter. Motorized, roll-up, overhead doors would be
23 furnished as required, as well as hollow, metal, personnel access doors. Paved or concrete
24 parking areas would also be provided.
25

26 Inside the MWSF, a total of 28 pads, having nominal dimensions of 52 ft. by 102.5 ft.,
27 would be required to store the wastes. Pads would be constructed as monolithic pours, and
28 the floors and dikes in the entire waste storage area would receive a coating (e.g., Carboline
29 Starglaze) that is resistant to both chemical attack and abrasion. The enclosed arrays of
30 concrete pads would be recessed 9 inches below forklift aisles and would provide spill
31 containment. All storage areas would have perimeter dikes along with the internal diking
32 systems which would provide additional containment if necessary.
33

34 The receiving, sampling, repackaging, and drum crusher areas would be heated and
35 ventilated through a duct work system. Air would be exhausted from hoods in the
36 sampling, repackaging, and drum crusher areas through a high-efficiency particulate air
37 (HEPA) filter system to prevent any possible airborne hazardous or radioactive particulates
38 from being released during normal or emergency operations. Air would flow into the
39 hoods through wall openings equipped with transfer grilles and back flow preventers. All
40 air supply ducts would also be equipped with transfer grilles and back flow preventers and
41 the regulated areas would be maintained at negative pressure to prevent the potential spread
42 of hazardous materials to unregulated areas of the facility.
43
44

1 Approximately 15% of the MWSF drum storage area would have a heating system. The
2 heated area of the building would be used for storage of liquid waste that could freeze.
3 The rest of the building would store waste not affected by temperatures below freezing.
4 The entire building would have a ventilation system to provide cooling by using roof
5 exhausters with motorized, smoke-tight dampers.

6 7 **2.2.2 Operation of the PGDP WSFs**

8
9 The PGDP WSFs would have different operational capabilities. Each WSF is discussed
10 separately.

11 12 **2.2.2.1 PGDP WSFs**

13
14 Operation of the first PGDP WSF would be expected to begin in FY 1994. The second
15 WSF would be operating in FY 1995 or FY 1996. Waste generated by activities within
16 PGDP would be transported by trucks or trailers to the PGDP WSFs in either DOT-
17 approved 55-gallon drums or 85-gallon overpacks. Drum packaging, sampling, and labeling
18 would be accomplished at the waste generator site prior to its being transported for storage.
19 Classified waste would not be accepted for storage (Walker, 1991), and only the following
20 waste would be accepted at the PGDP WSFs:

- 21
22 1. Physical state: The waste would consist of liquids, sludges, and solids in varying
23 combinations. Pressurized vessels, including gas cylinders, would not be accepted
24 for storage.
- 25
26 2. Chemical composition: TSCA (e.g., PCB laden) or RCRA (e.g., hazardous) wastes.
- 27
28 3. Radionuclides:
29 Uranium: Content - No limit on the total uranium per container.
30 Assay - Limited to less than 1% ²³⁵U or less than 0.0875 kg
31 ²³⁵U per container in accordance with PGDP Criticality Safety
32 Requirements.
33 Transuranics*: Disintegration measurement readings would be limited to less
34 than 100 nCi/g per container (soil matrix).
35 Technetium-99: Disintegration measurement readings would be limited to less
36 than 3 Ci/m³ (aqueous).
- 37
38 4. Scrap metals would be accepted for storage if containerized.

39
40 **Transuranic elements are elements that have atomic numbers greater than 92; all*
41 *are radioactive and are products of artificial nuclear reactions (nuclear reactors).*
42 *These elements were introduced to PGDP during the reprocessing of spent nuclear*
43 *fuels and are not produced by PGDP. PGDP no longer reprocesses spent fuels and*
44 *transuranic wastes are the result of decontamination measures.*

1 All packaging would be in good condition before storage. The 55-gallon drums would be
2 placed on 4 ft. by 4 ft. pallets, with four drums to a pallet, and the 85-gallon drums would
3 be placed in similar numbers on 5 ft. by 5 ft. pallets. Pallets would be moved to the proper
4 storage area by 5000-pound capacity fork trucks. The pallets would be arranged in single
5 rows and drums would be stacked a maximum of three high within the storage areas
6 (Walker 1991). A minimum of 2 ft. of aisle space would be placed between the stacks of
7 pallets for inspection. Additionally, other approved waste storage containers (e.g. B-25
8 boxes) may be placed in the facility. Inspection procedures would comply with RCRA or
9 TSCA requirements and inspection activities would occur every 30 days.

10
11 All waste containers placed in storage would be appropriately marked and designated
12 according to the waste that is stored in each container. All markings and designations
13 would be located in a visible location for inspection purposes.

14
15 The PGDP WSFs would be considered non-regulated waste storage areas requiring standard
16 PGDP issued work clothing. In the event of a spill from a damaged or leaking drum, a
17 Chemical Operations Spill Response Team would wear appropriate personal protective gear
18 and clean-up the spill area. Damaged or leaking drums would be repackaged or
19 overpacked, as necessary.

20
21 Operations personnel would provide their own portable eyewashers, and in addition,
22 combination emergency showers and eye/face wash units would be installed at each end of
23 the building within the diked area. The units would be equipped for back draining to the
24 supply pipes to prevent freezing.

25 26 **2.2.2.2 MWSF**

27
28 Operation of the MWSF would be expected to begin in FY 1996. Generated waste from
29 activities within PGDP would be transported by trucks or trailers to the MWSF in either
30 DOT-approved 55-gallon drums or 85-gallon overpacks. The waste acceptance criteria are
31 similar to the PGDP WSFs with one exception: the MWSF would also accept RCRA
32 mixed waste. Wastes accepted by the facility would be segregated by waste type and
33 characterized as low, medium, or high hazard wastes as shown in Table 2-2. These
34 projections include waste streams from environmental restoration and decontamination and
35 decommissioning in addition to operations.

TABLE 2-2: MWSF CHARACTERIZED WASTE HAZARD LEVEL

HAZARDOUS AND HAZARDOUS MIXED SOLIDS	STORAGE SPACE (FT²) (5-year projection)	HAZARD LEVEL *
Lead	500	Medium
Potassium Dichromate Filter Cake	140	Medium
Brass Chips	100	Medium
Trichloroethylene	8000	Medium
Hot Water Rinse Tank Sludge	3000	Medium
Magnesium Fluoride Pellets	1000	Medium
Technetium **	200	High
Transuranic **	200	High
Uranium Precipitate	3000	Medium
Pesticides **	1000	High
Excess Chemicals	3000***	High
Ash Receivers **	5000	Medium
Hazardous/Hazardous Mixed Liquids	4000	High
LLW-Solid	54,360	Low
LLW-Liquid	500	High
+PCB/PCB Mixed Liquid	10,000	High
+PCB/PCB Mixed Solid	100,000	Low
Asbestos (with PCB/RCRA and/or LLW)	6000	Medium

* Hazard levels are based on exposures in the event of a spill or similar accident.

** Previously generated but require storage.

*** Excess chemical room to be separated from other high hazard areas. Smaller individual dikes will separate flammables, oxidizers, organics, combustibles.

+ Facility designed to more stringent TSCA specifications.

1 The MWSF would be divided into low, medium, and high hazard characterized waste
2 receiving and storage areas. Physical requirements for the low and medium hazard waste
3 receiving and storage areas would be the same except for posting. The main receiving area
4 would be an enclosed, non-regulated dock capable of receiving low and medium hazard
5 characterized wastes from a maximum of three trucks. High hazard wastes would be
6 received at a separate and dedicated dock to reduce the possibility of mixing/storing high
7 hazard materials with low and medium hazard materials and to reduce fire hazards. All
8 high hazard areas will be separately enclosed from the low and medium hazard areas by a
9 4-hour fire-resistant enclosure.

10
11 Drum repackaging, sampling, and crushing activities would be in enclosed and regulated
12 areas. All exits from these areas would include a boundary control station for
13 contamination control purposes, and HVAC would be supplied from a system completely
14 dedicated to these areas. Damaged drums would be repackaged or overpacked, as
15 necessary, and potential spills or leaks would be cleaned-up by an on-site Chemical
16 Operations Spill Response Team (Bell, 1991).

17 18 **2.3 ALTERNATIVE 3: ALTERNATE LOCATIONS**

19
20 Several sites were screened as potential sites for the proposed waste storage facilities. All
21 of the alternate sites evaluated are located on DOE property outside the security fence
22 (Figure 2-1).

23
24 **Alternate Site 1** This site is located to the east-southeast of the existing solid waste
25 landfill (SWL) between major power line corridors. Highway 358 transects the site, and
26 the intersection of Ogden Landing Road and Dyke Road is to the south. Alternate Site 1 is
27 essentially an open area with little topographical relief, located approximately 1200 ft west
28 of Little Bayou Creek. Main power transmission lines also bound this location.

29
30 **Alternate Site 2** This site is located adjacent to the northeast corner of PGDP on a ridge
31 that extends toward Little Bayou Creek. It is bordered by Little Bayou Creek on the
32 southeast and KPDES Outfall 002 on the south. The intersection of Highway 358 and
33 Ogden Landing Road is to the north of the site. This site has equal amounts of grasslands
34 and woodlands, and it is located near the edge of the DOE property boundary. Residences
35 are located approximately 1/4 mile east of this alternate location.

36
37 **Alternate Site 3** This site is located east of PGDP and is bordered by McCaw Road on the
38 north and Little Bayou Creek on the northwest. The area is 60% open grassland and 40%
39 hardwood forest. Alternate Site 3 is also near the DOE property boundary line with
40 residences located approximately 300 ft to the east.

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ALTERNATE SITES FOR THE
PROPOSED WSFs
PADUCAH GASEOUS DIFFUSION PLANT
PADUCAH, KENTUCKY

FIGURE No. 2-1

2.4 ALTERNATIVE 4: ALTERNATIVES CONSIDERED AND DISMISSED

Upgrading existing facilities and the off-site shipment of waste were considered as alternatives but, for reasons outlined below, were dismissed from further evaluation as not viable. They are not discussed further in this document.

2.4.1 Upgrade Existing Facilities

Upgrading and utilizing existing unoccupied buildings, or areas in process buildings, to store waste to meet RCRA and TSCA regulations and DOE Orders was considered as an alternative. Limited space is available within some facilities, but collectively these facilities could not provide the total waste storage space necessary considering projected waste generation rates. Additionally, storage of waste in some of the existing buildings would require major retrofitting and decontamination, which would result in generating substantial amounts of waste which would require storage. Existing waste storage facilities are nearing capacity and will not be able to adequately accommodate future generated PGDP wastes. Therefore, given the amount of time required to renovate a building or area for waste storage, the quantities of waste that would be generated as a result of renovation activities, and the present need for waste storage space, this alternative is not considered viable.

2.4.2 Off-Site Shipment of Waste

Based on the DOE Moratorium placed on off-site waste shipments to commercial TSD facilities as explained in Section 2.1, shipment of all wastes generated by PGDP operations is not feasible at this time (U.S. House of Representatives 1992).

3.0 DESCRIPTION OF THE EXISTING ENVIRONMENT

PGDP is located within the Jackson Purchase Region of western Kentucky in McCracken County, approximately 3.5 miles south of the Ohio River and 20 miles east of the confluence of the Ohio and Mississippi rivers. The city of Paducah is the closest municipality to PGDP, located approximately 10 miles to the east. Several small communities are situated within a 5-mile radius of the DOE property boundaries, including Heath and Grahamville to the east and Kevil to the southwest. Bordering the DOE property to the northeast is the Shawnee Steam Plant, which is owned and operated by the Tennessee Valley Authority (TVA). The area surrounding PGDP is predominately rural, with residences and farms surrounding the plant. Figure 1-1 shows the location of PGDP with respect to features described above.

The existing environmental features of PGDP are addressed in this section with respect to the following resources: geology; hydrology; soils; climate, air quality, and noise; biological resources; land use; cultural resources; and social and economic conditions.

3.1 GEOLOGY

The geology at PGDP consists of clastic continental and marine deposits. The Continental Deposits are represented by two sedimentary sequences from two distinct depositional periods (Olive 1980). The younger sequence, known as the Upper Continental Deposits (UCD), frequently contains perched water zones that comprise the Upper Continental Recharge System (UCRS). The UCD varies in thickness up to about 65 ft. The older sequence, known as the Lower Continental Deposits (LCD), contains the gravel facies that forms the Regional Gravel Aquifer (RGA), which is the primary source of drinking water north of PGDP.

PGDP is located in an area with a seismic risk rating of 3, on a scale of 1 to 3, with 3 being the most severe rating (Murray State University, 1990). Several minor seismic tremors have been recorded at PGDP since the early 1950s; the largest, in 1962, measured 5.5 on the Richter scale; however, there has never been a release or accident as the result of seismic activity. Analysis of PGDP critical facilities indicates that, based on a 237 year seismic event producing a ground acceleration of 0.18g, the only damage during an earthquake would be to nonreinforced concrete block walls (Energy Systems, 1985). The potential for releases from PGDP resulting from seismic events has not been quantified (Murray State University 1990), but this potential is being analyzed under a final safety analysis report for PGDP.

3.2 HYDROLOGY

3.2.1 Surface Water

PGDP is located in the western part of the Ohio River Basin. The confluence of the Ohio and Tennessee rivers is approximately 15 miles upstream of the site. The confluence of the Ohio and Mississippi rivers is approximately 20 miles downstream of the site.

PGDP is located on a local drainage divide; surface flow is to the east and northeast toward Little Bayou Creek and to the west and northwest toward Big Bayou Creek. The confluence of the creeks is approximately 3 miles north of the site (Figures 3-1 and 3-2). Big Bayou Creek is a perennial stream; its drainage basin extends from approximately 2.5 miles south of PGDP to the Ohio River. Big Bayou Creek flows north toward the Ohio River along a 9-mile course that passes along the western boundary of the plant. Little Bayou Creek originates in the West Kentucky Wildlife Management Area (WKWMA) and flows north toward the Ohio River along a 6.5-mile course that includes parts of the eastern boundary of the plant. The 11,910-acre drainage basin of Big Bayou Creek is about twice that of Little Bayou Creek (about 6,000 acres). Natural runoff makes up a small portion of the flow in Big Bayou and Little Bayou creeks during the dry periods. Big Bayou Creek and Little Bayou Creek have not been formally classified by the Kentucky Department for Environmental Protection (KDEP); however, according to state regulations (401 KAR 5:026) any waters not specifically classified by the KDEP are otherwise designated for the following uses: warm water aquatic habitat, primary contact recreation, secondary contact recreation, and domestic water supply (KDEP 1990). Thus, by default, Big Bayou Creek and Little Bayou Creek are classified for these uses.

Both Little Bayou and Big Bayou creeks receive effluent discharge from PGDP. Big Bayou Creek receives process effluent, treated sewage, and storm water discharge from PGDP under Kentucky Pollutant Discharge Elimination System (KPDES) permit KY0004049 dated October 22, 1986, and an Agreed Order with the Commonwealth of Kentucky dated October 12, 1987, which adjudicates the KPDES permit. The most current KPDES Permit was effective in November 1992, with an expiration date of November 1997, but is not yet in full effect, as several parameters are being adjudicated and an agreed order developed. Effluent from the outfall ditches constitutes approximately 85% of the normal flow in Big Bayou Creek and 100% of the normal flow in Little Bayou Creek. The plant effluent was in compliance with KPDES Agreed Order limits 99.5% of the time during 1991 (Energy Systems 1992). Radiological monitoring of plant effluent during 1990 indicates uranium and technetium values below the Derived Concentration Guides stated in DOE Orders 4400.4 and 5400.6 (Energy Systems 1991).

The site of the PGDP WSFs is located approximately 100 feet west of a ditch that flows to KPDES outfall 003. KPDES outfall 003 drains into a tributary of Little Bayou Creek approximately 2,500 feet from the site.

Figure 3-1
Regional Surface Water Features
in the Vicinity of PGDP

ORNL - DWG 87-8429

Figure 3-2
Local Surface Water Features
in the Vicinity of PGDP

1 Another ditch, approximately 100 feet north of the site of the PGDP WSFs, drains to
2 KPDES outfall 001. KPDES outfall 001 discharges to Big Bayou Creek, which is
3 approximately 3700 feet from the proposed site of the PGDP WSF. Both of the KPDES
4 outfalls are located on the opposite side of a roadway from the site of the PGDP WSFs.
5

6 The site of the MWSF is approximately 100 feet from KPDES outfalls 001 and 015, which
7 are located north and south of the proposed site, respectively. Both of these KPDES
8 outfalls discharge into Big Bayou Creek, which is approximately 750 feet west of the site
9 of the MWSF (Figure 3-3).
10

11 Alternate Site 1. Alternate Site 1 is located approximately 1200 ft west of Little Bayou
12 Creek. Also, a small tributary of Little Bayou Creek extends into the northeast corner of
13 the site. A small intermittent wet area exists in the center of the site, adjacent to Route
14 358. Sufficient space is available that meets the siting requirements for the proposed action
15 to construct a landfill at this site.
16

17 Alternate Site 2. Alternate Site 2 is bordered by Little Bayou Creek on the southeast and
18 KPDES Outfall 002 on the south. Two small intermittent wet areas are located within the
19 site boundaries.
20

21 Alternate Site 3. Little Bayou Creek borders approximately 300 ft of this site on the
22 northwest. Several small intermittent wet areas are located within the site boundaries.
23

24 **3.2.2 Groundwater**

25

26 The Upper Continental Recharge System (UCRS) that underlies PGDP is composed of
27 heterogeneous silt and clay layers with interbedded or interlensed layers of sand and gravel.
28 The distribution and depth of the sand and gravel layers determines the location of the
29 water table within this recharge system. The discontinuous sandy horizons interbedded
30 with finer grained units result in perched groundwater throughout the UCRS. Perched
31 groundwater levels in the immediate vicinity of the proposed sites are located 17 feet below
32 ground, with groundwater levels ranging from 37 to 51 feet below ground surface (Geotech,
33 1980).
34

35 The RGA lies within the gravel facies of the Lower Continental Deposits. It serves as the
36 primary source of drinking water for residents north of PGDP. The closest drinking water
37 well is approximately one mile north of the sites. However, this well is no longer in use
38 due to groundwater contamination. The RGA has a north to northeasterly flow direction
39 toward the Ohio River. The RGA exists as a semiconfined to confined aquifer, depending
40 on the composition of the Upper Continental Deposits, which serves as the upper confining
41 unit for the RGA. Recharge to the RGA is provided by infiltration from overlying deposits
42 (UCRS) and surficial water bodies (Big Bayou and Little Bayou creeks). Groundwater
43 conditions at the alternate locations are similar to those described for the proposed location
44 and overall site conditions.

PGDP currently has a groundwater monitoring and protection program as required by state and federal regulations and DOE Orders (Figure 3-4 and 3-5). Technetium has been detected in many plant and off-site wells; other contaminants such as heavy metals and Americium have been detected in varying concentrations (Energy Systems 1991).

3.2.3 Floodplains

Flooding in the vicinity of the proposed location for the WSFs is caused by headwater flooding from Big Bayou Creek and is not affected by backwater flooding from the Ohio River for a 500-year or lesser flood (Cross 1993). The 100-year flood elevation for Big Bayou Creek nearest these locations ranges from about 365 to 366 feet above mean sea level (MSL). The 500-year flood elevation ranges from about 366 to 367 feet above MSL (Cross 1993). The WSFs would be built at base elevations of at least 370 feet above MSL, out of the 100- and 500-year floodplains.

3.2.4 Wetlands

No large wetlands exist at the sites of the PGDP WSFs and MWSF (USFWS 1983). However, field observations at the site of the MWSF indicate the existence of two isolated, non-headwaters wetlands with less than 0.5 acre total area that meet the requirements of a jurisdictional wetland. Consultation with the U.S. Army Corps of Engineers (COE) confirmed the delineation of these wetlands. A wetlands assessment was prepared for DOE in accordance with 10 CFR 1022. The wetlands assessment concluded that none of the potentially affected wetlands is of high ecological value in a regional context (Appendix A).

Figure 3-3

MWSF Proposed Location
Major Topographical Features

Figure 3-4

Figure 3-5

Paducah Gaseous Diffusion Plant Vicinity Map - Wells Outside of Plant Fence

MARTIN MARIETTA
ENERGY SYSTEMS

Legend	
●	Wells Outside of Plant Fence
■	PGP Boundaries
—	Plant Fence
□	Plant Owned Building

Map created by Bruce E. Meadows (ED)

1/4 1/2 1 Mile

3.3 SOILS

The soils in the vicinity of PGDP consist of silty loam and silty clay loam lying above the loess and alluvium surficial deposits. Five soil series are mapped in close proximity to PGDP (Humphrey 1976). These soil series include the Calloway silt loam, Grenada silt loam, Loring silt loam, Vicksburg silt loam, and the Henry silt loam. The Calloway-Henry association is the predominant soil association found in the vicinity of PGDP.

The soils at the proposed site of the PGDP WSFs consist of disturbed Henry silt loam. Henry soils are nearly level, poorly drained soils with a fragipan that formed in thick deposits of loess or alluvium (Humphrey 1976). Henry soils have moderate permeability (0.63 to 2.0 in/hr) above the fragipan, which forms between 17 and 26 inches from the surface, and slow permeability (<0.2 in/hr) within and below the fragipan. The water table is perched above the fragipan and extends to the surface during wet seasons (Humphrey 1976).

At the proposed location of the MWSF, disturbed Henry silt loam, Calloway silt loam, and Vicksburg silt loam (Figure 3-6) are present. The Henry silt loam comprises 50-60% of the area potentially to be developed. Calloway, Grenada and Vicksburg silt loams comprise the remaining 40-50% of the area.

Calloway silt loam is somewhat poorly drained with a fragipan that formed in loess (Humphrey 1976). These soils have moderate permeability (0.63 - 2.0 in/hr) above the fragipan, which is between 26 and 50 inches below the surface, and slow permeability (<0.2 in/hr) within and below the fragipan. These soils have perched water tables which are 6 to 18 inches below the surface during wet season (Humphrey 1976). Slopes range from 0 to 6% (Humphrey 1976).

Soils in the Grenada series are moderately well drained soils formed in loess on relatively smooth uplands and in alluvium washed mostly from loess on stream terraces (Humphrey 1976). Grenada soils at the proposed MWSF site are severely eroded with 6 to 12% slopes. The depth to the fragipan ranges from 12 to 24 inches, with an average depth of 14 inches (Humphrey 1976). The soil above the fragipan is moderately permeable (0.63 - 2.0 in/hr), while the fragipan is relatively impermeable (<0.2 in/hr). Soils below the fragipan have moderately slow permeability (0.2 - 0.63 in/hr) (Humphrey 1976). The water table is perched above the fragipan during wet periods (Humphrey 1976).

The Vicksburg series consists of well-drained, nearly level soils on flood plains of branches and creeks. These soils formed in sediments washed mainly from loess (Humphrey 1976). These soils has moderate permeability (0.63 - 2.0 in/hr). The water table is generally 2 to 3 ft below ground surface (Humphrey 1976). Some soils are subject to flooding, but the floods are generally for short duration and the erosion hazard is slight (Humphrey 1976).

Prime Farmlands

The following soil series, located in the vicinity of PGDP, are considered to be representative of prime farmland: Calloway silt loam, Falaya-Collins silt loam, Grenada silt loam, Loring silt loam, and Vicksburg silt loam. None of these soil types are found at the PGDP WSF site.

Calloway, Grenada and Vicksburg soils are present at the MWSF site. However, the soils at the site have been disturbed as a result of construction and maintenance activities at PGDP since the early 1950s. For this reason, U.S. Soil Conservation Service (SCS) has determined that none of the soils present at the site of the MWSF are prime farmland (SCS, Appendix B, "Agency Letters/Correspondence").

Alternate Site 1. The Henry, Calloway, and Grenada soil associations are represented at this location. Approximately 75% of the soils at this location have the potential to be classified as prime farmland.

Alternate Site 2. The Henry silt loam, Calloway silt loam, and Falaya-Collins silt loam are represented at this location. Sixty to seventy percent of the soils at this location have the potential to be classified as prime farmland.

Alternate Site 3. Alternate Site 3 is primarily covered by the Henry silt loam with the remaining being Calloway silt loam. Ten percent of the soils at this site have the potential to be classified as prime farmland.

3.4 CLIMATE, AIR QUALITY, AND NOISE

3.4.1 Climate

PGDP is located in the humid continental climate zone, which is characterized by moderately cold winters and warm summers (Energy Systems 1991). The average monthly temperature is 57.6° F, ranging from a low monthly average of 32.6° F in January to a high monthly average of 79.1° F in July. On average, the maximum daily temperature is below 32° F 14 days of the year. Summers are typically warm and humid, with the maximum daily temperature exceeding 90° F an average of 40 days per year. The relative humidity varies between 60 and 85% throughout the year.

Precipitation averages 50.3 inches annually, with the greatest volumes occurring during the periods of March-July and November-December. Thunderstorm activity is common in the summer months. On average, a precipitation event of up to 3.6 inches within 24 hours occurs every 2 years, and a precipitation event of up to 6.6 inches occurs every 50 years. The driest period of the year is August through October. Approximately 2% of the precipitation occurs in the form of snow, with an annual average of 13.1 inches.

1 The prevailing wind direction is from the south to southwest with an average speed of
2 approximately 10 miles/hour. Stronger winds occur in the late fall and winter, and are
3 generally associated with weather fronts originating from the southwest and northwest.
4

5 **3.4.2 Air Quality**

6

7 McCracken County (which includes PGDP and the city of Paducah) is an attainment area
8 for National Ambient Air Quality Standards. The Kentucky Division for Air Quality
9 (KDAQ) measures particulate matter, sulfur dioxide, carbon monoxide, ozone, nitrogen
10 dioxide, and lead. Measurements are taken to establish values for annual arithmetic means,
11 maximum 24-hour averages, and maximum 3-hour averages. In 1991, none of these
12 standards (primary or secondary) were exceeded at any of the McCracken County
13 monitoring stations (KDAQ, 404 KAR 51:010).
14

15 PGDP collects air samples from 12 different locations to determine if there is an off-site
16 migration of airborne contaminants (Energy Systems 1991). Gaseous fluorides and
17 radioactive particles are sampled continuously via filters treated with sodium carbonate.
18 Weekly analyses are performed on the samples for fluoride concentrations, and alpha and
19 beta activity. Off-site concentrations of air-borne radionuclides and fluorides are well
20 within the federal standards (40 CFR 61.92) and the Kentucky ambient air quality standards
21 (401 KAR 53:010) (Energy Systems 1992).
22

23 **3.4.3 Noise**

24

25 Noise levels are not measured at PGDP or at any nearby facilities. There are currently no
26 local ordinances concerning noise regulation. The Commonwealth of Kentucky has a law
27 concerning noise regulation, but no enforcement or monitoring program has been created
28 and no regulations governing the implementation of this law have been promulgated. Noise
29 from industrial processes taking place at the plant are generally restricted to the interior of
30 the plant buildings. Noise levels at the plant security fence are generally the result of
31 vehicular traffic moving through the area, and not from activities occurring at the plant.
32

33 **3.5 BIOLOGICAL RESOURCES**

34

35 **3.5.1 Vegetation**

36

37 Hardwood forests and herbaceous plant communities comprise the predominant vegetation
38 types in the vicinity of PGDP. Mature hardwood forests dominate the riparian communities
39 on the banks of Little Bayou and Big Bayou creeks. Forests above the streams and over
40 the remainder of the area in the vicinity of PGDP are dominated by upland communities.
41 Virtually all non-forested areas within the PGDP boundary are managed by personnel from
42 either the PGDP or the WKWMA for wildlife habitat and food supply. Management
43 practices are primarily limited to mowing, planting, and controlled burning. This practice
44 maintains grasses as the dominant vegetation, although numerous other types of vegetation
45 exist in these areas.

Vegetation communities within the proposed PGDP WSF site reflect a history of persistent surface disturbance from plant activities and frequent mowing. Vegetation consists primarily of grasses and broad-leafed herbaceous species. No trees or shrubs are present.

Vegetation at the MWSF site represents plant communities in various stages of regrowth. The site is covered by a mixture of woodlands and mowed fields, with upland mixed hardwoods covering approximately 50% of the area. Woodland species include various oaks (*Quercus sp.*), shagbark hickory (*Carya ovata*), maples (*Acer sp.*), American elm (*Ulmus americana*), sweetgum (*Liquidambar styraciflua*), and sugarberry (*Celtis laevigata*). The woodlands are edged by a field scrub-shrub community consisting of black locust (*Robinia pseudoacacia*), sumac (*Rhus sp.*), and persimmon (*Diospyros virginiana*). Mowed fields consist of commercial grasses (e.g., fescue, timothy grass, orchard grass, etc.) and ruderal vegetation. These vegetation communities are commonly found throughout the area.

Alternate Site 1. This site is located between two high tension power line easements. The area consists of managed open grasslands with scattered stands of trees. Approximately 10% of the area consists of mixed hardwood and scrub-shrub communities. These communities are interspersed throughout the site.

Alternate Site 2. The vegetation at this site consists of equal amounts of area covered by open grasslands and woodlands. The woodlands at this location consist of an upland mixed hardwood community. The northern portion of the woodlands consists primarily of overstory trees with little ground cover. Toward the edges of the woodlands the understory is dominated by various types of common shrubs and thickets.

Alternate Site 3. The vegetation at this site consists of approximately 60% managed open grasslands and 40% upland mixed hardwood forest. The forest understory consists of common shrubs and thickets.

3.5.2 Wildlife

Wildlife species indigenous to hardwood forests and open, grassland communities occur in the vicinity of PGDP. The most abundant species is the house mouse (*Mus musculus*). Deer, cottontail, and the white-footed mouse are also common to the area (Birge 1990). Wildlife habitat at the PGDP WSF site is highly disturbed and is considered poor quality for support of a variety of terrestrial wildlife species. Because the site is within the PGDP security fence and is surrounded by buildings and other structures associated with industrial operations, animals visiting or inhabiting the site would be limited to those that are adapted to living within areas of high human activity. These animals include opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), various types of rodents (e.g., voles and mice) and songbirds.

1 At the MWSF site, wooded areas with open fields are frequented by deer, rabbits, mice,
2 songbirds, and a variety of small mammals and birds. Small mammals commonly found at
3 the site include opossum, vole (*Microtus sp.*), mole (*Scalopus sp.*), raccoon, and gray
4 squirrel (*Sciurus carolinensis*). Typical birds include killdeer (*Charadrius rociferus*),
5 bluejay (*Cyanocitta cristata*), red-winged blackbird (*Agelaius phoeniceus*), bluebird (*Sialia*
6 *sp.*), cardinal (*Cardinalis cardinalis*), mourning dove (*Zenaida macroura*), shrikes (*Lanius*
7 *sp.*), bobwhite quail (*Colinus virginianus*), meadow larks (*Sturnella sp.*), sparrows, and
8 predators such as hawks and owls (Birge 1990). The Ohio River serves as a major flyway
9 for migratory birds (Birge 1990); therefore, migratory birds and transient residents are
10 occasionally present at the site.

11
12 Amphibians and reptiles are common throughout the DOE reservation (Birge 1990).
13 Amphibians likely to occur at the MWSF site include American (*Bufo americanus*) and
14 Woodhouse's (*Bufo woodhousei*) toad. Reptiles include the eastern box turtle (*Terrapene*
15 *carolina*) and several species of snakes (Birge 1990).

16
17 Big Bayou Creek is located approximately 600 feet west of the MWSF site. These waters
18 are not considered to be outstanding resource waters, that is, they are not ecologically
19 unique nor do they support federally listed endangered or threatened species (KDEP 1990).
20 The fish populations within the section of Big Bayou Creek adjacent to the site is
21 dominated by bluegill (*Lepomis macrochirus*), creek chub (*Semotilus atromaculatus*),
22 stoneroller (*Camptostoma anomalum*), and various species of sunfish (Birge 1990).

23
24 Alternative Sites. The alternative sites consist of disturbed areas covered with a
25 combination of grassy fields and woodlands. Wildlife found within these different habitats
26 has been previously described above. The Ohio River serves as a major flyway for
27 migratory birds (Birge 1990); therefore, migratory birds and transient residents are
28 occasionally at these sites.

29
30 Amphibians and reptiles are common throughout the reservation and would be present at
31 each of the potential sites (Birge 1990). Amphibians likely to occur at all of the sites
32 include American (*Bufo americanus*) and Woodhouse's toad (*Bufo woodhousei*). Reptiles
33 include the eastern box turtle (*Terrapene carolinia*) and several species of snakes (Birge
34 1990).

35
36 All of the potential sites contain small ephemeral ponds (i.e., less than 0.5 acres). These
37 ponds do not support any visible fish life. Because of the ephemeral nature of these ponds,
38 aquatic populations are likely to include insect larvae and amphibians.

39
40 All of the sites either border Little Bayou Creek or have tributaries on the site that feed into
41 the creek (Sect. 3.2.1). The waters of Little Bayou Creek are not considered outstanding
42 resource waters, that is, they are not ecologically unique nor do they support federally listed
43 endangered or threatened species (KDEP 1990). The fish populations within the creek are
44 numerically dominated by various species of sunfish (CH2M HILL 1991).

3.5.3 Threatened and Endangered Species

To identify the presence of threatened and endangered species at the affected sites, the USFWS, Kentucky Department of Fish and Wildlife Resources (KDFWR), and the Kentucky State Nature Preservation Commission (KSNPC) were consulted. Responses from these agencies are given in Appendix B.

Federally Listed Animal Species

The bald eagle (*Haliaeetus leucocephalus*) and the Indiana bat (*Myotis sodalis*) are federally listed endangered species that may be found in McCracken County (Barclay 1992).

Indiana bats winter in caves, but during reproductive season (normally May 15 to August 15), the bats will form colonies in mature trees with loose bark, such as shagbark hickory, especially near water (Birge 1990). A single male individual was identified during mist netting surveys conducted on the WKWMA near the Ohio River in June, 1991. Subsequent mist netting surveys in similar habitats during the summer of 1992 did not capture a representative of the species.

Bald eagles are known to nest at sites 25 to 40 miles southeast and west of PGDP and in the Ballard County Wildlife Management Area, which is in the flight path between these wintering areas (Birge 1990).

Commonwealth of Kentucky Listed Animal Species

Of the state-listed birds for the area; the endangered hooded merganser (*Lophodytes cucullatus*), the fish crow (*Corvus assifragus*) and Bell's vireo (*Vireo Bellii*), all of which are species of special concern (Evans 1992); only Bell's vireo has been observed in recent years on the DOE reservation (Birge 1990). Commonwealth-listed mammals potentially occurring in the area include the evening bat (*Nycticeius humeralis*) and the northern long-eared bat (*Myotis septentrionalis*) (Evans 1992). None of the mammals have been observed on the DOE reservation. The KDFWR data base lists the northern crawfish frog (*Rana areolata circulosa*), a species of special concern, as occurring within the Heath quadrangle, which contains the proposed sites (Pelren 1992).

Additional animal species noted by other investigators as occurring within the area but not listed by the KDFWR or the KSNPC as occurring in McCracken County include the lake chubsucker (*Erimyzon sucetta*), a state threatened species, and the great blue heron (*Ardea herodias*), a species of special concern. The lake chubsucker has been found in Big Bayou Creek (CH2M HILL 1991), and the great blue heron has been observed during site reconnaissance in an KPDES outfall 001 adjacent to the MWSF site (CDM Federal 1992a) and in other plant industrial ponds. Commonwealth listed animal species known from McCracken county are presented in Table 3-1, however, not all of these species are known from the vicinity of PGDP.

1 Commonwealth of Kentucky Listed Plant Species

2
3 Commonwealth-listed endangered and threatened plants that may occur in the area include
4 the endangered Carolina silverbell (*Halesia carolina*), and the threatened compass plant
5 (*Silphium laciniatum*). The Carolina silverbell occurs in moist or hydric areas, often
6 associated with floodplains or other low lying areas in which water collects (White 1992).
7 The compass plant occurs within open fields and sometimes along road sides (White 1992).
8 Commonwealth listed plant species known from McCracken County are listed in Table 3-2,
9 however, not all of these species are known from the vicinity of PGDP.
10 Commonwealth of Kentucky listed species are not afforded any special protection, but
11 should be monitored for location and abundance if possible.
12

13 Potential Occurrence of Threatened and Endangered Species

14
15 No commonwealth or federally listed plant species are known or are likely to occur at the
16 PGDP WSF site located within the PGDP security fence. Habitat at the PGDP WSF site
17 has been previously disturbed, is mowed on a regular basis, and is unlikely to support any
18 of the listed species described above.
19

20 Because of the availability of suitable habitat at the MWSF site, three Commonwealth of
21 Kentucky listed species may occur. The presence of wooded area along KPDES outfalls
22 adjacent to the MWSF site may provide habitat for the Bell's vireo; however, this species
23 has not been sighted near PGDP recently. The great blue heron has also been observed
24 near the MWSF site, in the adjacent KPDES outfall 001. The carolina silverbell may be
25 present due to the moist woodlands on the site. However, thorough evaluations of this area
26 have not identified this species.
27

28 Shagbark hickories and elms, known to occur in the wooded area, may provide
29 approximately one to two acres of suitable habitat for the federally listed Indiana bat
30 (Bryan, Appendix B). Given the close proximity to industrial operations, it is unlikely that
31 Indiana bats would select this area for colonization, especially when other more suitable
32 areas (i.e., more secluded and mature woodlands) are readily available in the vicinity. A
33 Biological Assessment was prepared for the proposed location and submitted to the USFWS
34 for a Biological Opinion according to the Endangered Species Act. The USFWS concurred
35 that removal of this potential habitat would have minimal impact on the species due to the
36 presence of significant amounts of similar, and in some cases, more suitable habitat
37 (Appendix B).
38

TABLE 3-1

Commonwealth of Kentucky
Threatened, Endangered, and "Special Concern" Animal Species
Known from McCracken County, Kentucky

Threatened Species	
<i>Erimyzon sucetta</i>	Lake Chubsucker
<i>Hyla avivoca</i>	Bird Voiced Treefrog
<i>Lepomis punctatus</i>	Spotted Sunfish
<i>Macroclmys temminckii</i>	Alligator Snapping Turtle
<i>Notropis maculatus</i>	Taillight Shiner
<i>Nycticeius humeralis</i>	Evening Bat

Endangered Species	
<i>Acipenser fulvescens</i>	Lake Sturgeon
<i>Haliaeetus leucocephalus*</i>	Bald Eagle
<i>Hybognathus hayi</i>	Cypress Minnow
<i>Lampsilis abrupta*</i>	Pink Mucket (mussel)
<i>Lepisosteus spatula</i>	Alligator Gar
<i>Lophodytes cucullatus</i>	Hooded Merganser
<i>Myotis sodalis*</i>	Indiana Bat
<i>Orconectes lancifer</i>	Crayfish
<i>Plethobasus cooperianus*</i>	Orange Foot Pimpleback (mussel)

"Special Concern" Species	
<i>Ardea herodias</i>	Great Blue Heron
<i>Corvus ossifragus</i>	Fish Crow
<i>Esox niger</i>	Chain Pickerel
<i>Hyla cinerea</i>	Green Tree Frog
<i>Ichthyomyzon castaneus</i>	Chestnut Lamprey
<i>Ictiopsis niger</i>	Black Buffalo (fish)
<i>Lota lota</i>	Burbot (Fresh Water Cod)
<i>Myotis septentrionalis</i>	Northern Long-ear Bat
<i>Nerodia erythrogaster</i>	Copperbelly Water Snake
<i>Notropis venustus</i>	Blacktail Shiner
<i>Noturus stigmatosus</i>	Northern Madtom (fish)
<i>Rana areolata</i>	Northern Crawfish Frog
<i>Riparia riparia</i>	Bank Swallow
<i>Vireo bellii</i>	Bell's Vireo (bird)

* Also federally listed endangered species

TABLE 3-2

Commonwealth of Kentucky
Threatened, Endangered, and "Special Concern" Plant Species
Known from McCracken County, Kentucky

Threatened Species	
<i>Halesia carolina</i>	Carolina Silverbell
<i>Rudbeckia subtomentosa</i>	Sweet Coneflower
<i>Silphium laciniatum</i>	Compass Plant

Endangered Species	
<i>Hypericum adpressum</i>	Creeping St. John's-wort
<i>Prenanthes aspera</i>	Rough Rattlesnake-root

"Special Concern" Species	
<i>Baptisia leucophaea</i>	Cream Wild Indigo
<i>Carex triangularis</i>	Fox Sedge
<i>Carya aquatica</i>	Water Hickory
<i>Heterotheca latifolia</i>	Broad-leaf Golden Aster
<i>Lathyrus palustris</i>	Vetchling Peavine
<i>Malus angustifolia</i>	Southern Crabapple
<i>Muhlenbergia glabriflora</i>	Hair Grass
<i>Solidago buckleyi</i>	Buckley's Goldenrod

Habitat for the Bachmans sparrow (*Aimophila aestivalis*), a federal candidate species, includes pasture, old field habitat, short shrub or fence row ecotones, or previously disturbed grassland areas. Such habitat does exist in the vicinity. No formal information related to sightings of this species in the vicinity of the MWSF is available; however, this species is not afforded any special protection and Section 7 requirements of the Endangered Species Act do not apply.

Alternate Site 1. This site has a small intermittent stream on the northeastern end of the site, with sparse woodlands surrounding it. This area may serve as potential vireo habitat; however, it is unlikely because of the limited amount of woodlands surrounding the stream, especially given that more suitable habitats are easily found within the area of PGDP. Compass plants may be found in the fields that dominate this site. Carolina silverbells may be found within the area of the stream and the intermittent wet area.

Alternate Site 2. Because of the availability of suitable habitat at this alternate site, three listed species may potentially occur. The presence of a wooded area along Little Bayou Creek may provide habitat for the Bell's vireo. Shagbark hickories, known to occur in the wooded area, may provide suitable habitat for the Indiana bat. The compass plant may occur within the open fields. Carolina silverbell may be found within the area of the Little Bayou Creek and the intermittent wet area.

Alternate Site 3. Three listed species of animals may be present at this alternative site. The presence of woodlands along Little Bayou Creek along the northwestern boundary of the site may serve as Bell's vireo habitat. The three ponds present on the site may serve as habitat for the northern crawfish frog and the green treefrog. The compass plant may occur within the open fields. Carolina silverbell may be found within the area of Little Bayou Creek and the intermittent wet areas.

3.6 LAND USE

PGDP is on a 3,423-acre site owned by DOE. The main plant facilities (with the exception of the C-746-K landfill, the C-611 water treatment plant, and a few other sites) lie within a fenced security area of 748 acres. DOE maintains a buffer zone of approximately 585 acres surrounding the security area, which is used for support services including the wastewater treatment plant, lagoons for process wastewater, and residential and inert landfills. The remaining 2,324 acres are deeded or leased to the Commonwealth of Kentucky for the purposes of wildlife management. The KDFWR manages this area for the purpose of establishing or maintaining viable wildlife habitat. The property within the buffer zone is not deeded or leased to the Commonwealth of Kentucky but solely managed by KDFWR with the permission of DOE. DOE maintains the right to assume possession of any property within the buffer zone immediately if deemed necessary. There are no local or county comprehensive land-use plans in this area. Figure 3-7 illustrates the current land ownership in the vicinity of PGDP. Both of the preferred locations proposed for development are on property owned by DOE and are not available for recreational use or public access.

1 Alternate Site 1. The site currently consists of 90% managed open grassland. The area is
2 part of Tract 7A of the WKWMA and is open to the public for deer and small game
3 hunting, field trials, and as a training area for hunting dogs. This area is extensively
4 managed for native prairie grasses by the WKWMA.
5

6 Alternate Site 2. This site currently consists of 50% open grassland and 50% mixed
7 hardwood forest and is owned by DOE and managed by the WKWMA. This area, even
8 though owned by DOE, is used extensively by the public for dog trials (competitions).
9

10 Alternate Site 3. The land is currently leased by the Commonwealth of Kentucky as part of
11 the WKWMA. Bowhunting for deer, small game hunting, field trials, and dog training are
12 permitted in the area. Alternative Site 3 currently consists of 60% managed grassland and
13 40% mixed hardwood forest, which may provide habitat for the Indiana bat. This site is
14 also extensively managed for native prairie grasses by the WKWMA.
15

16 **3.7 CULTURAL RESOURCES** 17

18 The site of the proposed PGDP WSFs is located inside the security fence at the PGDP and
19 was disturbed during the construction of the plant, therefore there are no intact cultural
20 resources present on the site. The buildings within PGDP are less than 50 years old, and
21 therefore are not eligible for listing on the National Register of Historic Places (NRHP).
22

23 The site of the proposed MWSF lies on 20 acres just outside the existing security fence on
24 the northwest corner of the plant. This area has a railroad spur transecting it, a fence and
25 road along the eastern border, and a road running diagonally along the western border. The
26 disturbance of the area due to these construction events suggest that no intact cultural
27 resources remain that could be eligible for the National Register of Historic Places. A
28 walkover survey of the MWSF site by an archaeologist and a member of the Kentucky
29 Heritage Council (KHC) confirmed that there would be no effect on any property listed in
30 or eligible for listing in the National Register of Historic Places (Granger 1992). A letter
31 from the State Historic Preservation Officer (SHPO) confirming the above conclusions is
32 provided in Appendix B.
33

34 Alternate Site 1. Consultations with the KHC indicate that no historic structures or
35 prehistoric artifacts have been recorded for this site. This area has a low potential for
36 archaeological sites because the disturbance of the area (i.e., construction activities,
37 maintenance of power lines, etc.) would have significantly altered any sites that may have
38 been of archaeological significance.
39

CURRENT LAND OWNERSHIP MAP FOR THE PADUCAH GASEOUS DIFFUSION PLANT

CDM FEDERAL PROGRAMS CORPORATION
a subsidiary of Camp Dresser & McKee Inc.

PADUCAH, KENTUCKY

Figure 3-7

1 Alternate Site 2. The KHC indicates that no historic structures or prehistoric artifacts have
2 been recorded in this area. Based on a preliminary archaeological review by ARCS, Inc., a
3 moderate potential exists for archaeological resources to be present at this site. Further
4 survey efforts would be required before any site development (Appendix B).

5
6 Alternate Site 3. According to the KHC, no historic structures or prehistoric artifacts have
7 been recorded from this area in the past. Again, based on a preliminary archaeological
8 review by ARCS, Inc., the potential for any archaeological resources to be present at this
9 site is very low (Appendix B).

10 11 **3.8 SOCIAL AND ECONOMIC CONDITIONS**

12 13 **3.8.1 Demography**

14
15 The location of PGDP in relation to surrounding communities in McCracken and Ballard
16 counties, Kentucky and Massac County, Illinois, across the Ohio River is shown in
17 Figure 1-1. The small communities of Grahamville, Heath, and Kevil are within 3 miles of
18 the DOE property boundary, and the municipalities of Paducah and La Center, Kentucky
19 and Joppa and Metropolis, Illinois, are within a 10- to 20-mile radius of the site.

20
21 The 1990 census population for McCracken County was 62,879 persons with 27,256
22 persons residing in Paducah. Ballard County reported a population of approximately 7,920
23 persons; La Center's population was 1042; and 337 persons live in Kevil. Massac County,
24 Illinois, reported 14,752 persons, with 6,734 living in Metropolis and 492 living in Joppa.
25 Total population within a 50-mile radius of the plant is approximately 500,000 with
26 approximately 66,000 people residing within 10 miles of PGDP (U.S. Department of the
27 Interior, 1990).

28 29 **3.8.2 Economic Activities**

30
31 The total labor force for McCracken County in July 1991 was recorded at 28,684 persons
32 (Slater and Hall 1992). Total employment was recorded at 27,063 persons and 1,621
33 persons registered as unemployed (Slater and Hall 1992). Unemployment in the county
34 was 5.7% at that time as compared to 6.7% for the Commonwealth of Kentucky and 7.7%
35 for the United States as a whole (Hayghe 1992). Construction and retail sales account for
36 almost 50% of all employment (24% and 23%, respectively). Fifteen percent of
37 employment is concentrated in manufacturing and 13% in mining (Dunning 1992). PGDP
38 employs approximately 1,800 workers, and the TVA Shawnee Steam Plant employs 500
39 workers. The average 1992 per capita income in McCracken County was \$17,450 as
40 compared with an average income of \$14,992 per capita in Kentucky and an average
41 income of \$18,692 in the entire United States.

3.9 TRANSPORTATION

Interstate I-24 passes through Paducah, Kentucky, and approximately 10 miles east of PGDP. Four federal highways (U.S. 45, 60, 62, and 68) and many state highways transverse the area. Main access to the plant is via US Highway 60. Because PGDP is located in a secured area, traffic is minimal within the plant and the surrounding area and is generally limited to government or construction vehicles traveling into or out of two secured gates. Vehicles are screened by security before entering the security or fenced area of the plant. Traffic within the plant is generally limited to trucks and service vehicles that must move equipment and supplies within the facility. Employees generally park their cars within designated parking areas outside the plant facilities and walk to their respective workplaces.

4.0 ENVIRONMENTAL IMPACTS

The environmental impacts associated with the proposed action and alternatives are discussed in this section. The potential health and safety impacts from routine operation are discussed, followed by a comparison of the alternative actions that include no action, shipment of waste off-site, and upgrading and utilizing existing buildings or areas as WSFs. Cumulative effects of the proposed action and PGDP operations are summarized. Unavoidable adverse effects and irreversible and irretrievable commitment of resources are discussed.

4.1 IMPACTS FROM THE PROPOSED ACTION: CONSTRUCT AND OPERATE NEW PGDP WSFs

The environmental impacts related to geology; hydrology; soils; air quality; noise; biological resources; land use; cultural resources; social and economic conditions; and health and safety are addressed. For the purposes of this EA, potential impacts to each resource will be addressed separately for construction and operation of the facilities, if the potential impacts for construction and operation are significantly different.

4.1.1 Geology

There are no geologic resources that would be impacted at the sites of the PGDP WSFs or the MWSF. The waste storage facilities are designed to withstand a 1000-year seismic event. The potential for release during a seismic event is currently being analyzed under the final safety analysis report for PGDP.

4.1.2 Hydrology

4.1.2.1 Surface Water

Construction. The PGDP WSFs are located near KPDES outfalls 001 and 003. There is a potential for a temporary increase of silt in the surface runoff during construction activities; however, the site is level and the drainage ditches are located on the opposite sides of roadways. Best Management Practices (BMPs) such as silt fences would be used to minimize possible siltation. Given the topography of the site, the physical barriers present, and the use of BMPs, it is unlikely that construction activities at this site would impact surface waters.

The MWSF site is located between two KPDES outfalls (001 and 015), which feed into Big Bayou Creek. This site is level, and BMPs would be used to control siltation. Given the relative distance of the site to the outfall ditches, there may be a temporary increase in siltation; however, given the level topography of the site and the use of BMPs, siltation entering the creek is expected to be minimal.

1 **Operation.** An increase in the volume of surface runoff may result after construction
2 activities are completed because much of the area once covered with vegetation would be
3 covered with concrete and asphalt. A large portion of the runoff from both the PGDP
4 WSFs and the MWSF would either be captured by the storm water collection system or
5 would enter the KPDES outfalls directly. Engineering controls such as spill containment
6 dikes and floor sealants have been included in the design of the PGDP WSF and MWSF to
7 minimize potential release of chemicals from the facilities. Given that the buildings are
8 designed to contain any accidental chemical spills, and the PGDP *Spill Prevention, Control,*
9 *Countermeasures, and Contingency Plan for Oils, Chemicals, and Hazardous Wastes* (Bell
10 1991), which specifies procedures for the rapid and efficient handling of chemical spills, it
11 is unlikely that wastes accidentally spilled will migrate into surface waters.

12 13 **4.1.2.2 Groundwater**

14
15 **Construction.** Groundwater would not be affected during construction or operation of the
16 facilities. The construction plans for neither the PGDP WSFs nor the MWSF include deep
17 excavation which would result in the removal of soils down into the water table; therefore,
18 no impacts to groundwater are expected as a result of construction activities.

19
20 **Operation.** Engineering controls such as dikes, floor sealants, and spill containment have
21 been included in the design of the PGDP WSFs to minimize potential impact on the
22 environment from accidents, spills, and fires which may occur within the facilities. PGDP
23 has protocols for rapid and efficient clean-up of spills (Bell, 1991), and these protocols
24 should ensure that chemical spills would be remediated before any hazardous constituents
25 could migrate into the groundwater.

26 27 **4.1.2.3 Floodplains**

28
29 The WSFs would be built at base elevations of at least 370 feet above MSL. Therefore, no
30 100-year or 500-year floodplains would be affected by the proposed action.

31 32 **4.1.2.4 Wetlands**

33
34 No wetlands exist on the PGDP WSFs site. Two small (<0.5 acre total area), isolated, non-
35 headwaters wetlands are located on the MWSF site. Construction of the MWSF would
36 result in the loss of approximately 0.5 acre of jurisdictional wetland as identified by the
37 COE (Appendix A). A wetlands assessment has been conducted (Appendix A) which
38 indicates that the effects of the loss of 0.5 acres of wetlands would be minimal based on the
39 availability of similar habitat in the vicinity. Additionally, a Nationwide Permit has been
40 received from the COE.

4.1.3 Soils

Construction. The proposed sites of the WSFs are located in areas that have been previously disturbed by activities associated with the construction and operation of the PGDP and former KOW. The topography of the sites is relatively flat, which would minimize the amount of grading required to level the sites in preparation for building.

Construction of the facilities may increase the potential for localized soil erosion due to the removal of existing vegetation and subsequent excavation and grading of the construction site. Runoff from precipitation and wind are the two mechanisms by which soil erosion may take place. Implementation of construction management techniques (i.e., BMPs such as silt fences, vegetative controls such as a green belt, surface wetting, etc.), would minimize the amount of soil erosion anticipated from wind and runoff.

Impacts to surface soils would be limited primarily to reworking of surface soils and, to a lesser extent, subsurface soils in areas where excavation for utilities are needed. Excavated soil would be used for site leveling and no soils would be removed from the sites. Impacts to soils would be localized and short-term.

Operation. The three WSFs would cover approximately 8 acres of soils (PGDP WSFs - 2 acres, MWSF - 6 acres) with structures and pavement. Long-term erosional impacts due to increased runoff from impervious surfaces, such as parking lots, paved access roads, and roof drainage are not anticipated because the sites will be landscaped and exposed soils would be covered with vegetation. The storm water collection system and reclamation of disturbed surface areas would minimize this impact. Information received from the SCS indicates that no prime farmland exists at either of the sites (Appendix B).

4.1.4 Air Quality and Noise

Construction. Construction activities would temporarily increase fugitive emissions in the vicinity of the proposed waste storage sites. In addition, smoke, carbon monoxide, and other pollutants discharged as exhaust from combustion-powered heavy equipment would result in a temporary degradation of the site air quality. Techniques such as wetting the ground surface would minimize much of the impact from fugitive particulate matter. There would be a short-term increase in noise levels in the immediate vicinity of the sites due to construction activities.

Operation. Operation of the facilities should not require air quality permits because there would be no emissions from the facility under normal operating conditions. There would be no long-term increase in noise levels due to operation of the facilities.

4.1.5 Biological Resources

The construction of the PGDP WSFs would result in the initial loss of 3 acres of habitat (i.e. mowed, grassy area within an industrial complex). Once construction is completed, an acre of land would be seeded and converted back into a lawn.

The construction of the MWSF would result in the long term removal of up to approximately 10 acres of woodlands and 5 acres of grassy fields. These habitats are not unique to the area. Once construction is completed, 4 acres of the land would be seeded and maintained as a grassy field, similar to the grass habitat which is presently found at the site. Given that the WKWMA consists of 4,157 acres of land and that an additional 2,323 acres of adjacent DOE property is managed by the KDFWR, the construction of the MWSF represents the loss of less than 0.1% of the local acreage managed for wildlife habitat.

Migratory and wetland birds, such as the great blue heron, may occasionally visit the MWSF site because of the waterways present near the site (i.e., Big Bayou Creek and the drainage ditches). The increased presence of human activity associated with the construction and operation of the facility is likely to limit the number of visits these birds make to the site (Battelle 1982). Given the extensive habitat found along the Ohio River and within the WKWMA, construction of the proposed WSFs is not expected to have an impact upon these species.

Threatened and Endangered Species

The habitat at the PGDP WSF site has been previously disturbed, is mowed on a regular basis, and does not support any state or federally listed species.

Approximately 2 acres of mixed woodlands containing shagbark hickory (Bryan, 1993 [Appendix B]), which is considered potential habitat for the Indiana bat, would be lost by construction of the MWSF. A Biological Assessment was prepared for the proposed location and submitted to the USFWS for a Biological Opinion according to the Endangered Species Act. The USFWS concurred that removal of this potential habitat would have minimal impact on the species due to the presence of significant amounts of similar, and in some cases more suitable, habitat (Appendix B). Additionally, land clearing activities conducted outside of the known maternity season would prevent the loss of any member of the species that may be inhabiting the area.

Impacts to the lake chubsucker, a state-listed threatened species found in Big Bayou Creek, are not anticipated if all construction BMPs, such as silt fences and vegetative controls, are properly instituted and maintained. Overall impacts to surface water from facility operations are expected to be minimal and should not affect the ecology of Big or Little Bayou Creeks. The Northern Crawfish Frog and Carolina Silverbell, both state of Kentucky species of special concern, have not been identified in the area proposed for construction.

1 Bachmans sparrow, a federal candidate species, has not been observed in the area even
2 though suitable habitat exists. Impacts to this species are unlikely due to an abundance of
3 suitable habitat in the area.
4

5 Should any state or federal listed or candidate species be identified in the vicinity, all work
6 would immediately cease and consultation with the appropriate agency would be initiated to
7 determine appropriate mitigative measures.
8

9 **4.1.6 Land Use**

10
11 The land used for construction and operation of the PGDP WSFs would not be available for
12 any other use. No property transfer would be required because the property is owned by
13 DOE and is within the fenced security area.
14

15 The MWSF site is not presently in use for either PGDP operations or recreational purposes
16 for the general public. Development of the site as an industrial facility is consistent with
17 adjacent site development, operations, management practices, and agreements for the DOE-
18 owned buffer zone. The loss of this acreage is not expected to have a significant impact on
19 the availability of land because an abundance of similar land is available near the site.
20

21 **4.1.7 Cultural Resources**

22
23 Information provided by the SHPO indicates that no cultural or archeological resources are
24 present within the construction areas of the WSFs or MWSF (Morgan 1992). A letter to
25 this effect is included in Appendix B.
26

27 **4.1.8 Social and Economic Conditions**

28
29 **Construction.** The proposed action would be expected to have a positive short-term impact
30 on the local economy because the WSFs would probably be constructed by a local firm,
31 creating a short-term increase in the construction work force.
32

33 **Operation.** The proposed action would not be expected to result in any permanent increase
34 in local employment as existing PGDP personnel would operate the WSFs. In the event of
35 a spill, trained PGDP personnel would be used to isolate and remediate any such incident in
36 accordance with the procedures listed in the *Spill Prevention, Control, Countermeasures,*
37 *and Contingency Plan for Oils, Chemicals, and Hazardous Waste* (Bell 1991).
38

39 **4.1.9 Transportation**

40
41 **Construction.** Construction at the sites of the WSFs would be expected to create a small
42 increase in traffic flow within the facility, primarily from movement of construction
43 materials. Minor disturbances in traffic flow may result from the need to locate or park
44 equipment and vehicles on the road adjacent to the site. No road closures are expecting to
45 result from construction activity.
46

Operation. Operation of the WSFs would be expected to result in a slight increase in traffic in the areas of the facilities. However, this increased traffic is not expected to disrupt the normal flow of traffic within PGDP.

4.1.10 Health and Safety

In this section, the potential effects from operation of the WSFs on workers and the public are qualitatively addressed. A qualitative discussion is being presented in the absence of quantitative information on waste streams and source terms (per DOE memorandum from E. Baynard dated June 10, 1988). According to Walker (1991) and PGDP (1992), the waste types accepted into the WSFs are shown in Table 4-1.

Because of the low levels of radioactivity allowed in wastes received, the storage areas would not be considered a "special facility" or a "nuclear facility" as defined in DOE Order 6430.1A. In addition, the facilities would not be considered a "critical facility" as defined in Energy Systems engineering procedure EP-E-09. This would eliminate the need for any special safety or environmental protection systems. A Facility Safety Screening completed for the PGDP WSFs concluded that no DOE Order 5481.1B-type hazards exist, and that no further safety documentation is required (Walker 1991).

TABLE 4-1: ACCEPTED WASTE TYPES

Waste	MWSF	PGDP WSFs
Chemicals	PCB laden, RCRA characteristic	PCB laden, RCRA characteristic
Radionuclides	Uranium, <1% U-235 or 0.0875 Kg/container	Uranium, <1% U-235 or 0.0875 Kg/container
	TRU, <100 nCi/g (soils matrix)	TRU, <100 nCi/g (soils matrix)
	Technetium-99, <3 Ci/m ³ (aqueous)	Technetium-99, <3 Ci/m ³ (aqueous)

1 No Facility Safety Screening for the MWSF has been completed; therefore, DOE Order
2 5481.1B may apply (PGDP 1992). The design, construction, and operation of these
3 facilities would comply with all applicable Energy Systems standards and procedures, state
4 and federal regulations and codes, and DOE Orders (Walker 1991; PGDP 1992). There
5 would be no routine releases of hazardous materials from either the PGDP WSFs or
6 MWSF. Institutional controls (e.g., strict waste acceptance criteria, limits on drum stacking,
7 use of DOT-approved containers for storage) and engineering controls (e.g., secondary
8 containment, fire alarms, and suppression system, HEPA filters, portable ventilation control
9 systems, segregation of highly hazardous materials) are designed to prevent accidental
10 releases. In addition, dikes constructed within the facilities would be designed to contain
11 all fire water released during a design basis fire (Lockwood Greene 1991).

12
13 **Effects from Routine Operations.** The PGDP WSFs and MWSF would primarily be
14 waste storage facilities. The MWSF would have some limited repackaging capabilities. No
15 gaseous radionuclides would be accepted for storage in the PGDP WSFs or the MWSF.
16 The primary hazards to workers in the facilities would be: (1) potential inhalation of
17 radioactive particles during repackaging, (2) exposure to gamma radiation emanating from
18 packages, and (3) exposure to RCRA-listed wastes in the PGDP WSFs or MWSF (e.g.,
19 inhalation of volatiles). For normal operations, facility worker exposures to radiation would
20 be controlled via existing dosimetry controls, contamination control procedures, and
21 compliance with Standard Operating Procedures (SOPs) to less than the DOE administrative
22 control level of 2 rem/year (DOE 1988). Historically, average worker exposure has been
23 less than 0.1 rem/year. Worker exposures to chemicals, noise, and other non-radiological
24 materials would be controlled to below threshold limit value/time-weighted average levels
25 established by institutional and administrative controls (PGDP, OSHA, DOE Orders).

26
27 The WSFs will store only those wastes for which it is designed, and only in areas
28 compatible with the wastes to be stored. Operation of the WSFs would result in a single
29 pathway for exposure to occupational personnel: direct radiation. Operational procedures
30 limit the direct radiation dose rate at the surface of each container to 0.9 mrem/h. This
31 classification limits annual doses to occupational personnel engaged in waste management,
32 other personnel on-site, and members of the public. The hazardous waste component of
33 individual operations at the proposed facilities would not pose a threat because the
34 quantities would be sufficiently small, and any health hazards would be overshadowed by
35 radiological concerns.

36
37 Measures taken to control radiological hazards would also protect workers from the small
38 amounts of hazardous constituents in the mixed waste. In 1992, the cumulative annual skin
39 dose to 39 waste operations workers was 496 person-mrem (4.96 person-mSv). Waste
40 workers received an average skin dose of 12.7 mrem (0.13 mSv), and the maximum
41 recorded was 140 mrem (1.4 mSv), considerably less than the DOE administrative control
42 level of 2 rem/year. The penetrating dose to the workers was 33 person-mrem (0.33
43 person-mSv), with an average penetrating dose of 0.8 mrem (0.008 mSv) per person
44 (Osburn 1993). Radiation exposures are not anticipated to exceed these levels from
45 continued operation. Based on an occupational risk factor of 4×10^{-4} fatal cancers per

1 person-rem, workers engaged in this proposed project would not be expected to incur any
2 harmful effects from radiation exposures they receive during normal operations. Direct
3 radiation dose to the public from normal operations would be negligible.
4

5 **Effects from Accidents.** Additional hazards to workers include possible injury from waste
6 handling and common industrial operations. Transfer of containers represents the greatest
7 potential for accidents. No accidents are currently on record at PGDP resulting directly
8 from waste management or handling activities. SOPs would be prepared and approved
9 before the facilities become operational and strictly followed to ensure compliance with
10 health and safety requirements and procedures. Facility construction and operations are
11 designed with safety in mind (see Section 2.2). The PGDP Safety Analysis Department has
12 determined that no DOE Order 5481.1B type safety hazards exist for this project (Energy
13 Systems 1992). A facility risk analysis/safety assessment will be prepared for the MWSF,
14 but is not available at this time. Training programs would be instituted to ensure workers'
15 awareness of these requirements and procedures.
16

17 Standard construction practices involve some degree of hazards around the job site.
18 However, with DOE's high emphasis on safety, procedures, and oversight activities, this
19 type of risk will be kept to a minimum. Application of established standard procedures and
20 enforcement of health and safety, as well as environmental regulations in all project
21 activities, will assure minimum exposure to the normal risks associated with the types of
22 work involved in this project.
23

24 The new facilities may actually decrease the potential for accidents or radiation exposure
25 since the wastes would be stored in facilities designed for ease of storage and inspections,
26 resulting in less time spent during inspection and handling procedures.
27

28 **Closure.** Closure of the WSFs at the time of site decontamination and decommissioning is
29 not expected to contribute to any environmental degradation. The facilities are designed for
30 ease of decontamination and would support site-wide efforts.
31

32 **Potential Radiation Dose to the Public.** Table 4-2, below, summarizes the current annual
33 dose from radiological contaminants that could potentially be received by a member of the
34 public living near PGDP, assuming the worst-case exposure from all major pathways. The
35 calculated maximum combined dose is 6.2 mrem/year. The DOE annual dose limit for the
36 public is 100 mrem/year. With institutional and engineering controls in place, operation of
37 the PGDP WSFs should not generate any release above existing plant emissions.
38

TABLE 4-2

**SUMMARY OF ANNUAL DOSE FROM RADIOLOGICAL CONTAMINANTS
Worst-Case Combined Exposure Pathways**

Pathway	Dose (mrem/year)	Percent of Total
Ingestion of groundwater	0.024	0.4
Ingestion of sediments	0.65	10.5
Ingestion of food crops	1.15	18.5
Ingestion of deer meat	0.22	3.5
Direct external gamma- Little Bayou Creek	4.15	67.0
Atmospheric releases	0.00018	<0.1
Total annual dose all pathways	6.20	100.0

(Note: 1000 mrem = 1 rem)

Source: Martin Marietta Energy Systems, Inc. 1991. *Paducah Gaseous Diffusion Plant Environmental Report for 1990*, pp. 87-91.

4.1.11 Cumulative Impacts

Cumulative impacts are the effects of the proposed action considered in combination with connected, cumulative and similar actions. Activities at PGDP potentially coinciding with the proposed action are the construction of a solid waste landfill and expansion of the PGDP process tails cylinders storage yards (Figure 4-1). Each of these proposed activities are also addressed in separate EAs. The potential cumulative effects of the proposed action in conjunction with these other activities follows.

Surface Water and Groundwater. The BMPs used during construction of the facilities would minimize impacts upon surrounding surface waters. The presence of additional buildings and pavement covering the soils will increase surface runoff through permitted outfalls from the areas of the WSFs. All stormwater from construction of the solid waste landfill would also be directed through a permitted outfall and all BMPs would be applicable to this project. Operational stormwater runoff would be directed through a sedimentation basin prior to release to the outfall in accordance with the *Best Management Practices Plan for the Control of Suspended Solids* (Energy Systems 1991). Minimal runoff is expected from construction of the cylinder yards. Overall impacts to surface water are expected to be minimal and should not affect the ecology of Big or Little Bayou creeks. Groundwater would not be impacted by any of the WSFs or the cylinder yard project. The solid waste landfill is also expected to have minimal impacts to groundwater due to the dual liner required by Commonwealth of Kentucky regulations.

Wetlands and Floodplains. Construction in the area of the WSFs, the solid waste landfill, or the cylinder yards would not impact wetlands. There are approximately 0.5 acres of isolated, non-headwaters wetlands in the area of the 20-acre site, and construction on this site would result in filling of the described wetlands. There would be no impacts to floodplains from any of the proposed projects.

Soils. At most, a total of approximately 80 acres, which is approximately 3% of available DOE acreage, would ultimately be disturbed by construction of all the proposed projects: 25 acres for the WSFs, 40 acres for the solid waste landfill, and approximately 15 acres for the cylinder yard expansion project. Approximately 7 acres of prime farmland would be disturbed by the proposed actions as a result of construction of the proposed solid waste landfill. This acreage represents approximately 0.007% of the available prime farmland in the region. The overall impacts to soils in the area by the proposed projects is expected to be minimal.

CDM FEDERAL PROGRAMS CORPORATION
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LOCATION PLAN FOR
PROPOSED ACTION AT THE
PADUCAH GASEOUS DIFFUSION PLANT
PADUCAH, KENTUCKY

0 1000 2000 4000
SCALE IN FEET

FIGURE No. 4-1

1 **Air Quality and Noise.** There would be no long-term increase in air emissions due to
2 construction or operation of the WSFs or from other proposed activities. Impacts to air
3 quality would be temporary and result from fugitive emissions (dirt) from construction
4 activities and equipment exhaust emissions.
5

6 Any increase in noise levels would be due to construction activities and would terminate
7 upon completion of construction. Local traffic would increase, but the noise generated
8 would be equivalent to normal plant operations occurring immediately adjacent to this site.
9

10 **Biological Resources.** Construction of all of the WSFs would result in the long-term loss
11 of approximately 20 acres of wildlife habitat, while the solid waste landfill would ultimately
12 affect an additional 40 acres of farmland and wildlife habitat. This represents a loss of
13 approximately 0.6% of the local acreage managed for wildlife habitat.
14

15 Operation of all of the WSFs and the landfill would result in increased human activity at
16 the 60-acre areas. The human activity would discourage wildlife that may visit the area.
17 However, given the extensive surrounding habitat available in the area (approximately 7,000
18 acres), removal of 60-acres is not expected to have an impact upon wildlife found in the
19 region.
20

21 Approximately 2 acres of mixed hardwoods containing shagbark hickory, which is
22 considered potential habitat for the Indiana bat, would be lost by construction of the WSFs.
23 Significant acreage of denser woodlands that may provide more suitable habitat for the
24 Indiana bat is available in the immediate vicinity. Scheduling land clearing activities
25 around the maternity season would prevent the accidental loss of individuals of the species.
26 No potential Indiana bat habitat would be disturbed by the other proposed actions.
27

28 **Land Use.** The proposed actions would utilize land owned by DOE, which has been
29 reserved for industrial use by PGDP. Therefore, there will be no impacts to land use.
30

31 **Cultural Resources.** There would be no impacts to cultural resources (i.e., buildings on
32 the NRHP or archeological significant sites) from either construction of the PGDP WSFs or
33 from construction of the cylinder yards. An archaeological investigation is scheduled for
34 the proposed landfill site; however, no cultural resources are expected to be found at this
35 location.
36

37 **Social and Economic Conditions.** The increased construction activity at the sites would
38 result in a temporary increase in the number of individuals working within the construction
39 industry. There would be no long-term impact upon employment. In the event of a spill,
40 trained PGDP personnel would be used to isolate and remediate any release.
41
42

4.2 IMPACTS FROM NO ACTION ALTERNATIVE

4.2.1 Geology and Soils

No impacts to geology or soils should result from the no action alternative.

4.2.2 Hydrology

No additional impacts to groundwater or surface water would result from this alternative unless the wastes were stored in a non-compliant facility, which would increase the potential for waste to escape into the environment from a spill or other accident. Chemicals which escape into the environment may either leach into groundwater or may enter nearby surface waters. Activities currently in progress to characterize and remediate groundwater and surface water contamination from past plant activities would continue (Energy Systems 1992).

4.2.3 Air Quality and Noise

There would be no increased impact to air quality or noise under the no action alternative.

4.2.4 Biological Resources

There would be no increased impact to biological resources. If the waste is not stored in an appropriate manner, there is an increased potential for release of chemicals into the environment. This would result in the potential exposure of environmental receptors.

4.2.5 Land Use and Cultural Resources

There would be no impacts to land use or cultural resources should this alternative be implemented.

4.2.6 Social and Economic Conditions

The no action alternative would not increase temporary construction employment nor would it increase long-term employment opportunities at PGDP.

4.2.7 Human Health and Safety

Human health and safety would be placed at an increased potential risk if wastes are stored in a non-compliant manner.

4.3 ALTERNATE LOCATIONS

Although all locations investigated are available for development, potential impacts to these areas would be greater than those at the preferred locations. These areas, especially alternate locations 1 and 3, have been intensively managed by the WKWMA and exhibit either extensive native prairie grass vegetative characteristics or a good potential for prairie grass regrowth via management. Alternate location 2 not only exhibits potential for prairie grass regrowth, but is used extensively by the general public for field dog trials (competitions), and development of this area for a landfill would disrupt nationally recognized competitions. Alternate site 3 also has one field trial course (Logsdon, Appendix B) and consists of approximately 40% woodlands, which may provide habitat for the Indiana bat, a federally listed endangered species. The alternate sites also contain more acreage of potential wetland than the preferred location. Finally, traffic patterns to the alternate sites would require additional transportation of wastes to the east of the plant.

5.0 PERMITS AND REGULATORY REQUIREMENTS

DOE policy requires all of its operations to comply with all existing applicable federal, state, and local laws and regulations, and DOE Orders. This section discusses the major regulatory permit programs that would be applicable to the proposed action.

5.1 RCRA AND TSCA

RCRA (Subtitle C, Sect 3004) defines the requirements for operators of RCRA waste storage facilities. A RCRA Part B permit would be required for operation of the WSFs. TSCA [40 CFR 761.65(b)(1)(i to v)] designates required designs for the storage of wastes containing PCBs. All storage areas within either facility will be designed to TSCA standards, which are more stringent than RCRA requirements for secondary containment. DOE Order 5820.2A, *Radioactive Waste Management*, designates building and storage design requirements for facilities handling or storing LLW. These regulations establish standards and design requirements for facilities which handle or store RCRA, PCB-containing, and LLW, respectively. The design and construction of all the WSFs would follow the most stringent of the design requirements specified in RCRA and TSCA regulations and DOE Orders.

5.2 CLEAN AIR ACT

The Clean Air Act requirements have been adopted and are administered by the Kentucky Division for Air Quality. Air emissions during construction and operation of the storage facilities are expected to be limited to fugitive emissions, which are not regulated under the National Emission Standards for Hazardous Air Pollutants. Regulation 401 KAR 63:010, Section 3(1), "Fugitive Emissions," pertains to air contaminants emitted into the open air other than from a stack or air pollution control equipment exhaust. This regulation establishes standards and requirements to take reasonable precautions to prevent particulate matter from becoming airborne. Section 4(3) of the same regulation states that the provision of Sect. 3(1) shall not be applicable to temporary blasting or construction operations. Additional guidance is found in Chapter 11, "Miscellaneous Sources," of EPA publication AP-42, which establishes recommended controls and emission factors to estimate particulate emissions during construction and for the use of paved and unpaved roads. Emissions from the facilities would be limited to fugitive particulates and are expected to be negligible (i.e., below visible concentrations). Fugitive emissions regulations prohibit the "discharge of visible fugitive dust emissions beyond the lot line of the property on which the emissions originate [401 KAR 63:010, Section 3(2)]."

5.3 CLEAN WATER ACT

The Commonwealth of Kentucky is a delegated state under the Clean Water Act (CWA) and has a general storm water permit program. Construction operations at the site would require that a Notice of Intent be submitted to the state at least 48 hours before construction operations begin. A stormwater permit is not required since any discharge would be through an existing permitted KPDES outfall. An erosion control plan, *Best Management Practices Plan for the Control of Suspended Solids* (Energy Systems 1991), was prepared; however, this is not to be submitted to the state. Storm water and sewer discharges would be tied into the current systems. The current KPDES permits would be modified to account for the increased input into the sewer systems from the additional facilities.

5.3.1 CWA - Section 404 (Dredge and Fill Permitting)

Section 404 of the CWA requires permitting for activities which involve dredging or filling wetlands. A small (i.e., less than one acre) jurisdictional wetland has been identified at the proposed MWSF site. Under the Nationwide Permit Program (33 CFR 330) Appendix A, Section B.26, discharges which result in filling less than one acre of isolated wetlands (i.e., wetlands which are the result of ponding within an area and not connecting with another major water system) do not require formal notification to the District Engineer, Corps of Engineers, if all nationwide permit conditions are met. A Notice of Intent has been filed concerning the possible filling of a jurisdictional wetland. A permit may be needed before construction of the MWSF can begin.

5.3.2 CWA - Part 112 (Oil Pollution Prevention)

Part 112 of the CWA (Oil Pollution Prevention) establishes procedures, methods, and equipment requirements to prevent the discharge of oil from non-transportation-related facilities into or upon navigable waters. This regulation requires that any facility which stores oil or oil products have a Spill Prevention Control and Countermeasures (SPCC) Plan. PGDP presently has a *Spill Prevention, Control, Countermeasures, and Contingency Plan for Oils, Chemicals, and Hazardous Waste*, which serves as a site-wide SPCC Plan (Bell 1991). This Plan would be revised to include the PGDP WSFs and the MWSF.

5.4 EXECUTIVE ORDERS 11990 (PROTECTION OF WETLANDS) AND 11988 (FLOODPLAIN MANAGEMENT)

Two Executive Orders (E.O.s) were issued in 1977 requiring federal agencies to consider the effects of proposed actions upon floodplains (E.O. 11988 Floodplain Management) and wetlands (E.O. 11990 Protection of Wetlands). The Orders require federal agencies to avoid, to the extent possible, adverse impacts associated with the occupancy and modification of floodplains, and the destruction and modification of wetlands, and to avoid direct or indirect support of floodplain and wetlands development whenever there is a practicable alternative. Agencies must determine whether floodplains or wetlands are present which may be affected by an action, assess the impacts on such floodplains or wetlands, and consider alternatives to the action. DOE regulations (10 CFR Part 1022,

1 Compliance with Floodplains/Wetlands Environmental Review Requirements) state that the
2 potential impacts of DOE actions upon floodplains and wetlands should be evaluated as part
3 of an EA. This has been done in Section 4 and Appendix A, respectively.
4

5 **5.5 ENDANGERED SPECIES ACT**

6
7 Section 7(a)(2) of the Endangered Species Act (16 USC 1531 *et seq.*) requires that federal
8 agencies, "in consultation with and with the assistance of" USFWS, ensure that actions are
9 "not likely to jeopardize the continued existence of any endangered species or threatened
10 species or result in the destruction or adverse modification of the critical habitat of such
11 species..." This also includes species which are being considered for listing as endangered
12 or threatened species. Habitat for the Indiana bat exists at the proposed MWSF site. A
13 Biological Assessment was prepared for the proposed location and submitted to the USFWS
14 for a Biological Opinion according to the Endangered Species Act. The USFWS concurred
15 that removal of this potential habitat would have minimal impact on the species due to the
16 presence of significant amounts of similar, and in some cases, more suitable habitat
17 (Appendix B).
18

19 **5.6 NATIONAL HISTORIC PRESERVATION ACT**

20
21 Section 106 of the National Historic Preservation Act [16 USC 470(f)] requires federal
22 agencies to take into account the effects of their proposed actions on properties listed on or
23 eligible for the National Register of Historic Places (NRHP). Prior to approval of an
24 action, federal agencies must give the Advisory Council on Historic Preservation a
25 reasonable opportunity to comment on the proposed action. PGDP does not contain any
26 structures greater than 50 years old, and the area within the plant has been disturbed as a
27 result of the construction and operation of the plant; therefore, there are no sites within the
28 plant area that are eligible for listing on the NRHP or that would represent significant
29 archaeological resources. A surface survey of the proposed MWSF site by an
30 archaeologist and a member of the Kentucky Heritage Council confirms that the proposed
31 site has been previously disturbed by construction of KOW and/or PGDP, and there are no
32 sites present that would represent significant archaeological resources.
33

34 **5.7 FARMLAND PROTECTION POLICY ACT**

35
36 The Farmland Protection Policy Act (FPPA) requires federal agencies to consider the
37 effects of their proposed actions on high-quality agricultural lands. Such lands include
38 prime farmland, unique farmland, and other farmland of statewide or local importance for
39 the production of food, feed fiber, forage or oilseed crops. Specific criteria for prime
40 farmland categorization are provided in 7 CFR Part 658. Unique farmlands are more
41 generally defined to include land other than prime farmland that is used for production of
42 specific high value food and fiber crops. The SCS has promulgated a final rule which
43 implements provisions of the FPPA. All proposed sites of the WSFs are within an
44 industrial area; therefore no prime farmlands are present. The SCS concurs with this
45 conclusion.
46

1 **5.8 HAZARDOUS MATERIALS TRANSPORTATION ACT**

2
3 On-site transportation of waste material does not require permitting under DOT regulations.
4 Such transportation would be in accordance with applicable regulations, including DOE
5 Order 5480.3, *Safety Requirements for the Packaging and Transportation of Hazardous*
6 *Materials, Hazardous Substances, and Hazardous Wastes*. Off-site transport of waste
7 would come under the Hazardous Materials Transportation Act (49 CFR 171-178), which
8 regulates PCB waste and LLW and applicable requirements of the Nuclear Regulatory
9 Commission (10 CFR Part 71, Packaging and Transportation of Radioactive Material),
10 which regulates LLW which is above 0.002 microcurie/gram. It is unlikely that the TSCA
11 waste which may be shipped to the Oak Ridge incinerator will exceed this activity and
12 would not be regulated under 10 CFR Part 71. The Hazardous Materials Table (49 CFR
13 172.101) classifies each hazardous material and specifies requirements pertaining to its
14 packaging, labeling and transportation.
15

16 **5.9 OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION**

17
18 All construction activities and practices would conform with OSHA Safety and Health
19 Standards (29 CFR 1926 and 1910). OSHA requires that a personnel training program
20 must be developed for any facility which stores hazardous waste (29 CFR 1910.120).
21 Personnel working at the WSFs would be trained in accordance with the OSHA
22 requirements.

6.0 AGENCIES AND PERSONS CONTACTED

The following agencies and persons were contacted during preparation of this EA.

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APPENDIX A
WETLANDS ASSESSMENT

**DRAFT
WETLANDS ASSESSMENT
FOR THE
PROPOSED WASTE STORAGE FACILITIES
AT THE
PADUCAH GASEOUS DIFFUSION PLANT
PADUCAH, KENTUCKY**

**PREPARED FOR
MARTIN MARIETTA ENERGY SYSTEMS
PADUCAH GASEOUS DIFFUSION PLANT
PADUCAH, KENTUCKY**

**BY
SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
OAK RIDGE, TENNESSEE**

APRIL 1993

TABLE OF CONTENTS

	<u>Page</u>
List of Figures	iv
Acronyms	iv
1. INTRODUCTION	1
1.1 PROJECT DESCRIPTION	1
2. METHODS	2
2.1 BACKGROUND	2
2.2 WETLANDS	2
3. WETLANDS IMPACTS	6
3.1 AREA DESCRIPTION	6
3.2 DELINEATED JURISDICTIONAL WETLANDS	6
3.2.1 Wetland 1	7
3.2.2 Wetland 2	7
3.3 WETLAND FUNCTIONS AND VALUES	7
3.4 OTHER AQUATIC RESOURCES	8
4. CONCLUSIONS	9
5. REFERENCES	10
APPENDIX A: U.S. Army Corps of Engineers, Nashville District, Memorandum for the Record	
B: Field Data Sheets	

LIST OF FIGURES

	<u>Page</u>
Fig. 1. Location of Waste Storage Facilities at PGDP	2
Fig. 2. Location of Wetlands 1 and 2	3

ACRONYMS

CFR	<i>Code of Federal Regulations</i>
COE	U.S. Army Corps of Engineers
CWA	Clean Water Act
DOE	U.S. Department of Energy
EA	Environmental Assessment
EPA	U.S. Environmental Protection Agency
KPDES	Kentucky Pollution Discharge Elimination System
NEPA	National Environmental Policy Act
PGDP	Paducah Gaseous Diffusion Plant
RCRA	Resource Conservation and Recovery Act
SAIC	Science Applications International Corporation
SCS	Soil Conservation Service
TSCA	Toxic Substances Control Act
WSF	Waste Storage Facility

1. INTRODUCTION

1.1 PROJECT DESCRIPTION

The U.S. Department of Energy (DOE) proposes to design, construct, and operate three waste storage facilities (WSF) at DOE's Paducah Gaseous Diffusion Plant (PGDP) located in Paducah, Kentucky (Fig. 1). The facilities would be designed, constructed, and operated for the storage of hazardous waste regulated under the Resource Conservation and Recovery Act (RCRA); waste regulated under the Toxic Substances Control Act (TSCA); low-level radioactive waste regulated under the Atomic Energy Act and managed under DOE Order 5820.2A; mixed waste (radioactively contaminated RCRA waste); and radioactive contaminated with TSCA-regulated materials. This proposed project would result in the construction and operation of two 3780-m² (42,000-ft²) WSFs and one 18,900-m² (210,000-ft²) mixed waste storage facility (MWSF). Two 3780-m² (42,000-ft²) WSFs would be constructed within the PGDP security fence; the remaining 18,000-m (210,000-ft²) MWSF would be constructed outside the security fence west of the plant. The WSFs and MWSF are needed to store waste generated through Environmental Restoration remedial actions at PGDP.

The MWSF proposed for construction outside the security fence would disturb about 2.8 ha (7 acres) of land. This site contains about 1.42 ha (3.5 acres) of second-growth hardwood forest that has not been appreciably disturbed since about 1950. Two small wetlands totalling 0.19 ha (0.47 acres) are present on the site (Fig. 2).

Figure 1. Location of waste storage facilities at PGDP

Figure 2. Location of wetlands 1 and 2

2. METHODS

2.1 BACKGROUND

The U.S. Army Corps of Engineers (COE) and the U.S. Environmental Protection Agency (EPA) are responsible for making jurisdictional determinations of wetlands under Section 404(a) of the Clean Water Act (CWA) [*Code of Federal Regulations (CFR)* 320 et seq.]. Under Section 404 the COE has the authority to issue permits for the discharge of dredged or fill material into waters of the United States, including wetlands, with program oversight by EPA. EPA has the authority to make final determinations on the extent of CWA jurisdiction.

In February 1993, DOE prepared an Environmental Assessment (EA) for the proposed WSFs project in compliance with the requirements of the National Environmental Policy Act (NEPA). During the preparation of the EA, it became apparent that wetlands may be present within the proposed project area that could be impacted by construction of the proposed WSFs. In January 1993, DOE investigated the applicability of the requirements of CWA Section 404 to the proposed project and enlisted a qualified soil scientist to evaluate the potential wetland areas. On February 4, 1993, Science Applications International Corporation (SAIC), the environmental contractor to Martin Marietta Energy Systems, evaluated and delineated two wetlands located in the proposed project site area. A representative from the COE's Nashville district office was present during the February delineation (See Appendix A: COE Memorandum for Record).

Pursuant to 10 *CFR* 1022 (DOE's "Compliance With Floodplains/Wetlands Environmental Review Requirements"), as a result of the field sampling, DOE has determined that this proposed project will involve activities within wetlands. Two areas meeting all three wetlands criteria were identified and delineated during site reconnaissance. Soil, hydrologic, and vegetation data at the delineated wetlands were recorded consistent with COE wetland delineation guidelines (Environmental Laboratory 1987).

This report discusses impacts to wetlands directly associated with construction of the WSFs at PGDP.

2.2 WETLANDS

Wetlands are those areas inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (40 *CFR* 230.3 and 33 *CFR* 328.3). Wetlands generally include swamps, marshes, bogs, and similar areas.

Wetlands were inventoried during February 1993. The delineation was performed using procedures detailed in *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). The purpose of the delineation was to identify potential jurisdictional wetlands that may be affected by the proposed construction of the WSFs at PGDP.

Wetlands possess three basic attributes: wetland hydrology, hydrophytic vegetation, and hydric soils. All three criteria must be present for an area to be defined as a wetland. The presence of hydrophytic vegetation was determined by identifying the relative abundance of plant species in each stratum (trees, saplings/shrubs, herbs, woody vines, and bryophytes) at a site and recording their indicator status as defined in *National List of Plant Species That Occur In Wetlands* (Reed 1988). If the total abundance of obligate, facultative wetland, or facultative species is greater than or equal to 50%, the hydrophytic vegetation criteria is met. Obligate plants almost always occur in wetlands (probability > 99%), facultative wetland species usually occur in wetlands (probability 67 to 99%), and facultative plants have a similar probability (33 to 67%) of occurring in wetlands or nonwetlands.

The presence of hydric soils was determined by examining and describing soil samples from each site. If soils are gleyed with a chroma of 1 or less, or are mottled and the matrix color has a chroma of 2 or less, the soil is considered to be hydric (Environmental Laboratory 1987).

Wetland hydrology was determined by studying field indicators, such as inundation, saturation, water marks, drift lines, sediment deposits on plants, and oxidized root channels with live roots. A more detailed discussion of field indicators of the three criteria is found in *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987).

To initiate the wetland inventory, National Wetland Inventory maps, Soil Conservation Service (SCS) soil surveys, U.S. Geological Survey topographic maps, Geographic Information System maps, and other available, pertinent information sources were studied to determine the locations of possible wetlands. Each site was visited and thoroughly examined for indicators of the three wetlands criteria. When indicators of one of the criteria were observed, evidence of the remaining criteria were sought. Soil morphology was described using Munsell Color Charts (Kollmorgen Instruments Corp. 1992). Dominant vegetation was described in each stratum and recorded. All indicators of wetland hydrology were noted. Wetland boundaries were drawn on maps and flagged in the field with surveyor's flagging.

3. WETLANDS IMPACTS

3.1 AREA DESCRIPTION

The general environmental and hydrologic settings of the wetlands within the proposed project site area are described below, followed by a description of each wetland and a discussion of the regulatory ramifications associated with altering each wetland. A detailed description of the site, including geology and biotic resources at PGDP, is contained in the *Draft Environmental Assessment for the Proposed Construction and Operation of Three Waste Storage Facilities at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (SAIC 1993). The WSFs site is bounded on the west by Big Bayou Creek, on the north by Kentucky Pollution Discharge Elimination System (KPDES) Outfall ditch 001, on the south by KPDES Outfall Ditch 015, and on the east by the PGDP security fence (Fig. 2).

Topography in the area surrounding PGDP is relatively level to gently sloping. Soils at the proposed WSFs site includes the Henry, Calloway, Grenada, and Vicksburg series (Humphrey 1976). The wetlands at the site occur in an area mapped as Henry silt loam. Henry soils are nearly level, poorly drained soils with a fragipan that formed in thick deposits of loess or alluvium (Humphrey 1976). The depth to a seasonal high water table is 0 to 0.5 ft. The water table is often perched above the fragipan and extends to or above the soil surface in wet periods. Soil permeability is moderate (0.6 - 2.0 in./hr) in the upper 18 in. and slow (<0.2 in./hr) between 18 and 70 in. Henry soils are classified as hydric soils, fulfilling one of the three criteria defining wetlands (Soil Conservation Service 1991).

The two wetlands subject to alteration by WSFs project development are immediately west of the existing security fence between ditches 001 and 015. This area was once cleared and regraded earlier during construction of either the Kentucky Ordnance Works or the PGDP and has since returned to a hardwood forest community. Vegetation diversity is highly variable and density is typically moderate to low in the forested areas. Each delineated jurisdictional wetland is described below.

3.2 DELINEATED JURISDICTIONAL WETLANDS

Two small isolated wetlands were identified in the wooded area at the proposed WSF site (Fig. 2). Both wetlands appeared to have formed from construction activities within the last 40 or 50 years. Both wetland areas are surrounded by an upland plant community dominated by post oak (*Quercus stellata*), southern red oak (*Q. falcata* var. *falcata*), cherrybark oak (*Q. falcata* var. *pagodaefolia*), and shagbark hickory (*Carya ovata*). The combined area occupied by the two wetlands is about 0.47 acre. Field data sheets for Wetlands 1 and 2 and one nonwetland area are in Appendix B.

3.2.1 Wetland 1

Wetland 1 is located in a topographic depression near several piles of soil, rubble, and rusted drums about 50 ft northeast of the abandoned railroad track (Fig. 1). It is roughly elliptic in shape and is about 150 ft long and 50 ft wide, covering about 0.19 acre. The depression appears to have been created when the railroad bed was built. Water may have drained out to the west at one time, but the piles of soil and rubble have effectively dammed this area.

Vegetation within Wetland 1 is dominated by pin oak (*Quercus palustris*) and American elm (*Ulmus americana*) in the tree layer and American elm in the sapling layer. No other strata were evident during the February 1993 site visit. Soils around the outer margin of the wetland were mottled with a matrix color of 10 YR 5/2; mottles were 10 YR 5/4. Soils within the center of the wetland had a matrix color of 10 YR 6/1. Concretions of iron or manganese and oxidized root channels with live roots were also present in the soil. At the time of the site visit the wetland was inundated; water was 1 to 1.5 ft deep. Water marks on the trees inside the wetland indicated the site is frequently inundated for long periods. Mr. Mark Walter, an Energy Systems employee at PGDP, reported having observed standing water on the surface of the site for extended periods (of more than 1 week) as late in the season as June and July.

3.2.2 Wetland 2

Wetland 2 is located about 75 ft southeast of Wetland 1 adjacent to the abandoned railroad track (Fig. 2). This wetland may have formed in a drainage ditch along the tracks that was created when the railroad bed was built. The ditch may have emptied at one time into what is now Ditch 015, but this outlet appears to have been closed when the tracks leading into the plant were removed and the area was regraded.

Wetland 2 is roughly elliptic in shape and is about 330 ft long and 20 ft wide (Fig. 1). It covers approximately 0.28 acre. Very little perennial vegetation was evident in the wetland at the time of the February 1993 site visit. American elm dominated the sapling layer around the margin of the wetland with lesser amount of persimmon (*Diospyros virginica*). An unidentified grass dominated the herbaceous layer. Soils within the wetland were mottled with a matrix color of 10 YR 6/1 and mottles that were 7.5 YR 4/6. Iron or manganese concretions were present in the soil. The site was inundated to a depth of about 1.5 to 2 ft and oxidized root channels with live roots were present in the soil. During a site visit in September 1992, in one of the driest months of the year, a portion of the wetland had standing water on it.

3.3 WETLAND FUNCTIONS AND VALUES

Because the two wetlands are very small, isolated from free-flowing streams and other water bodies, and occur on highly impervious substrate, the potential function and

value of these wetlands for groundwater recharge or discharge, floodflow alteration, sediment stabilization, sediment/toxicant retention, nutrient removal/transformation, and production export is low. Recreation opportunities in these wetlands are low because of their proximity to the PGDP. The abundance and diversity of aquatic habitat is low because hydrologic regime is limited by the seasonal nature of inundation. These small palustrine wetlands are typical of many other wetlands in the vicinity of the PGDP and they do not represent unique resources. The primary function and value of these wetlands lies in their suitability as habitat for nearby wildlife populations, particularly whitetail deer. The loss of the wetlands and the surrounding woodland area would constitute a minor impact to the deer and other wildlife species.

3.4 OTHER AQUATIC RESOURCES

One WSF will be located about 500 ft from Big Bayou Creek, 250 ft from KPDES Outfall Ditch 001, and 300 ft from KPDES Outfall Ditch 015. Construction will not disturb these aquatic resources.

4. CONCLUSIONS

Small isolated wetlands are common in the vicinity of the proposed WSFs at PGDP. Two jurisdictional wetlands occur within an area potentially affected by the project (Fig. 2). None of the potentially affected wetlands, however, is of high ecological value in a regional context. No unique natural resources occur in any of the delineated wetlands. The area appears to be heavily used by wildlife, especially whitetail deer.

The total area of wetlands delineated in areas potentially affected by the project is approximately 0.19 ha (0.47 acre), all of which will be disturbed as a direct result of the proposed action. Nationwide Permit #26 (isolated wetlands) would apply to the construction of the WSF because the total area of wetlands disturbed by construction would be less than 1 acre.

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DEPARTMENT OF THE ARMY
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P. O. BOX 1070
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IN REPLY REFER TO

FEB 19 1993

Environmental Resources Branch

Ms. Nancy Hendrix
U. S. Department of Energy
P.O. Box 2001
Oak Ridge, Tennessee 37831-8541

Dear Ms. Hendrix:

During recent telephone conversations with Messrs. Tom Swor and Ray Hedrick of my Environmental Resources staff, you requested that early wetlands and floodplain information be developed for a priority site at the Paducah Gaseous Diffusion Plant under Inter-agency Agreement No. DE-AI05-920R22026. On February 4, 1993, Mr. Hedrick visited the proposed mixed waste storage site with Mr. James P. Groton of Science Applications International Corporation, who is preparing the Environmental Assessment for the proposal. Enclosed is a memorandum presenting Mr. Hedrick's observations concerning wetlands on the site. My Hydraulics and Hydrology staff is continuing to work with Mr. Groton concerning the floodplain issues.

I am pleased that we have the flexibility to accommodate your needs in this instance. If other situations arise whereby we may be of assistance, do not hesitate to ask.

Sincerely,

Bradley B. Lott
for R. J. Connor, P.E.
Chief, Engineering-Planning
Division

Enclosure

CF:
Mr. Jimmy Groton
SAIC
P.O. Box 2501
800 Oak Ridge Turnpike
Oak Ridge, TN 37830

012787

17 February 1993

MEMORANDUM FOR RECORD

SUBJECT: Wetland Delineation on Proposed Site of ERWM Mixed Waste Storage Facility at Paducah Gaseous Diffusion Plant, Paducah, Kentucky.

1. On 4 February 1993, I accompanied Messrs. Jimmy Groton and Mike Deacon of Science Applications International Corporation (SAIC) to the subject site. The purpose of the field investigation was to determine whether any of the proposed site is occupied by wetlands.
2. Two small areas (less than 1 acre, combined) were identified as potentially meeting the Corps of Engineers and Environmental Protection Agency joint wetland definition (*Federal Register* 1982 and 1980, respectively). The Level 2 routine wetland determination procedure presented in Technical Report Y-87-1, *Corps of Engineers Wetlands Delineation Manual* (commonly known as the "87 Manual"), was applied to both areas. The "87 Manual" is the currently recognized authority for identifying and delineating wetlands for purposes of Section 404 of the Clean Water Act.
3. The two areas of concern are marked on the attached map. Both appear to have resulted from alteration of localized drainage associated with an abandoned railway fill. Area A appears to have formed 30 to 40 years ago, when construction of the railway caused water to pond in a swale extending into the adjacent bottomland hardwood forest. Area B was apparently formed much more recently, possibly 3 to 5 years ago, when bulldozer work to breach the railway blocked the drainage swale at the toe of the railway fill. Similar wetlands commonly form where highway or railway fills alter localized drainage.
4. My observation is that Mr. Groton correctly applied the provisions of the "87 Manual", and I concur that both areas are wetlands. It appears, however, that work in these wetlands would fall under authority of Nationwide Permit No. 26 (33 CFR, 330.5) since the wetlands potentially lost are less than 1 acre in size and are above the headwaters or isolated. Nevertheless, DOE is encouraged to avoid or minimize impact to the wetlands, to the extent practicable, through alteration of the layout. Mitigation of any unavoidable wetland losses would, then, be provided in accordance with DOE's wetland policies and NEPA responsibilities.
5. I informally discussed the regulatory issues of the proposal with Mr. Dan Evans (Louisville District Regulatory Branch 502/582-5452). Mr. Evans agreed that the cleanest way to handle

the regulatory aspects of this proposal is for DOE or its authorized agent to furnish him a copy of SAIC's report which includes the wetland delineation, and request that he confirm the applicability of Nationwide Permit No. 26 to this work.

Encl

18/
Ray D. Hedrick, Ecologist
Environmental Resources
Branch

CF:
Dan Evans
CEORL-OR-L
P.O. Box 59
Louisville, KY 40201-0059

SWOR/EP-E

~~CATHEY/EP-E~~ 18

ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION
PRODUCTION PLANT

WILDLIFE MANAGEMENT AREA

ENERGY RESEARCH AND DEVELOPMENT
ADMINISTRATION
PRODUCTION PLANT

Wetlands

Industrial Waste Ponds

Hermans Dam

Substation

Filtration Plant

Sewage Disposal

WATER

1154

725

725

APPENDIX B
AGENCY LETTERS/CORRESPONDENCE

UNITED STATES
DEPARTMENT OF
AGRICULTURE

SOIL
CONSERVATION
SERVICE

ROUTE 8, BOX 229
MAYFIELD, KENTUCKY 42066
(502) 247-9529

FEBRUARY 22, 1993

NANCY HENDRIX
NEPA PROGRAM MANAGER FOR RESTORATION OF WASTE MANAGEMENT PROGRAMS
UNITED STATES DEPARTMENT OF ENERGY
105 BROADWAY
OAK RIDGE, TENNESSEE 37830

DEAR NANCY,

THIS LETTER EXPLAINS THE PRIME FARMLAND DETERMINATION THAT WAS CONDUCTED AT PROPOSED SITES FOR THE MIXED WASTE STORAGE FACILITIES AT THE PADUCAH GASEOUS DIFFUSION PLANT, ON DECEMBER 2, 1992. INDIVIDUALS PRESENT DURING THE REVIEW WERE DAVID DOLLINS (PROGRAM MANAGER FOR ENVIRONMENTAL RESTORATION--D.O.E.), NANCY HENDRIX (NEPA PROGRAM MANAGER FOR RESTORATION OF WASTE MANAGEMENT PROGRAMS--D.O.E.), AND RON FROEDGE (DISTRICT CONSERVATIONIST--USDA SOIL CONSERVATION SERVICE).

THE AREAS INVESTIGATED HAVE BEEN ALTERED FROM THEIR NATURAL STATE AND ARE NO LONGER CONSIDERED PRIME FARMLAND. MOST AREAS WERE DISTURBED BY EXCAVATION AND/OR FILLED WITH GRAVEL. THE AREAS APPEARED TO HAVE BEEN ALTERED MANY YEARS AGO, AS EVIDENCED BY AN ABANDONED RAILROAD THAT IS ADJACENT TO THE PROPOSED SITES.

NEGLIGIBLE AMOUNTS OF PRIME FARMLAND SOILS WERE FOUND IN ONE WOODED AREA, BUT WERE NOT CONTIGUOUS TO ANY OTHER PRIME FARMLAND AREAS. IT IS MY ASSESSMENT THAT THESE AREAS ARE NOT LARGE ENOUGH TO BE OF ANY CONCERN.

PLEASE CALL IF WE CAN BE OF FURTHER ASSISTANCE.

SINCERELY,

Ron Froedge

RON FROEDGE
DISTRICT CONSERVATIONIST

cc: ELIZABETH ARAMOWICZ, D.O.E., PADUCAH

Mike Boatwright, Paducah
Sam C. Potter, Jr., Bowling Green
George H. Foster, Louisville
Dr. James R. Angel, Campbellsville
Dr. James R. Rich, Taylor Mill
Mic Chism, Winchester
Paul Lyon, Salyersville
Dr. Roland L. Burns, Rush
David H. Godby, Somerset

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF FISH AND WILDLIFE RESOURCES
DON R. MCCORMICK, COMMISSIONER

October 8, 1992

Mr. Jim Dee
CDM Federal Programs
800 Oak Ridge Turnpike
Suite 500
Oak Ridge, TN 37830

Re: Endangered/threatened species, Paducah,
McCracken County, Kentucky.

Dear Mr. Dee:

I am glad to provide rare animal species lists for the quadrangles that you specified. Please find the enclosed lists for the Paducah East and Joppa USGS topographic quadrangles. Be aware that, because our database is frequently revised, the lists may not include all species that have been reported for the quadrangles.

I hope this information is helpful. Feel free to contact the Environmental Section at 502/564-5448 for further assistance.

Sincerely,

David Pelren

David W. Pelren
Environmental Section Fishery Biologist

Enclosures

ID... ~~NAME~~..... ~~SEC NAME~~..... ~~PHYSICAL~~ ~~PHYSICAL~~ ~~PHYSICAL~~.. ~~STATE~~ ~~STATE~~.. ~~SPRINT~~
 NO... ~~THREAT~~.. ~~CANDIDACY~~.. ~~NO~~.. ~~THREAT~~.. ~~CONCERN~~

Vireo. Bell's	Vireo bellii
Lamprey, chestnut	Ichthyomyzon castaneus
6706 Gar. alligator	Lepisosteus spatula
0725 Pickerel, chain	Esox niger
QJ35 Minnow, cypress	Hybognathus hayi
0768 Shiner, taillight	Notropis maculatus
-0801 Chubsucker, lake	Kribiax sucatta
0805 Buffalo, black	Ictiobus niger
A933 Madtom, northern	Noturus stigmosus
0865 Sunfish, spotted	Lepomis punctatus
1595 Frog, northern crawfish	Rana areolata circulososa

LIST OF THE SPECIES KNOWN TO OCCUR IN PADUCAH R. QUAD -- 02 OCT 1952

NAME..... SCI. NAME.....		FEDERAL END.	FEDERAL THREAT.	FEDERAL CANDIDATE	FEDERAL END.	STATE THREAT.	STATE END.	SPECIAL CONCERN
331	Swallow. bank	Riparia riparia	-	-	-	-	-	I
659	Sturgeon. lake	Acipenser fulvescens	-	-	I	I	-	-
579	Treefrog. hard-voiced	Hyla avivoca	-	-	-	-	I	-
595	Frog, northern crawfish	Rana areolata circulosa	-	-	-	-	-	I
492	Snail. Geniculate river	Lithasia geniculata	-	-	I	-	-	-
495	Snail. Verrucosa river	Lithasia verrucosa	-	-	I	-	-	-
560	Purpleback. orange-face	Plethobasus cooperianus	I	-	-	I	-	-
653	Nuckee. pink	Lampsilis abrupta	I	-	-	I	-	-

FISH & WILDLIFE COMMISSION

Mike Boarwright, Paducah
Sam C. Potter, Jr., Bowling Green
George H. Foster, Louisville
Dr. James R. Angel, Campbellsville
Dr. James R. Rich, Taylor Mill
Eric Chism, Winchester
Paul Lyon, Salyersville
Dr. Roland L. Burns, Rush
David H. Godby, Somerset

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF FISH AND WILDLIFE RESOURCES
DON R. McCORMICK, COMMISSIONER

October 12, 1992

Mr. James Dee
CDM Federal Programs
800 Oak Ridge Turnpike
Suite 500
Oak Ridge, TN 37830

Re: Endangered/threatened species, Paducah,
McCracken County, Kentucky.

Dear Mr. Dee:

I recently sent you special concern animal species lists for the Paducah East and Joppa USGS topographic quadrangles. I was informed today that an Indiana myotis (Myotis sodalis), a federally endangered bat species, was also found within the Joppa quadrangle. The bat was located on the West Kentucky Wildlife Management Area in 1991. You recently requested a list of special concern animal species for the Heath quadrangle. That list is enclosed. I regret that we cannot provide an endangered/threatened plant species list. The Kentucky State Nature Preserves Commission (502/564-2886) should be able to provide such a list for a fee.

Again, I hope this information is helpful. Feel free to contact the Environmental Section at 502/564-5448 for further assistance.

Sincerely,

David Pelren

David W. Pelren
Environmental Section Fishery Biologist

Enclosure

COMMONWEALTH OF KENTUCKY
KENTUCKY STATE NATURE PRESERVES COMMISSION
407 BROADWAY
FRANKFORT, KENTUCKY 40601
(502) 564-2886

October 21, 1992

Mr. James Dee
CDM Federal Programs Corporation
800 Oak Ridge Turnpike, Suite 500
Oak Ridge, Tennessee 37830

Re: Environmental Review 306

Dear Mr. Dee:

This letter is in response to your request of October 5, 1992 for environmental review of the vicinity of the Paducah Gaseous Diffusion Plant in McCracken County, Kentucky. We have reviewed our Natural Heritage Database to determine if any of the rare or endangered species monitored by the Kentucky State Nature Preserves Commission (KSNPC) or unique and sensitive areas occur near the project area. Based on our most current information, we have determined that sixteen of the species of plants and/or animals that are listed for monitoring by the KSNPC are known to occur in the vicinity of the plant (see attached printout).

Please note that the quantity and quality of data collected by the Kentucky Natural Heritage Program are dependent on the research and observations of many individuals and organizations. In most cases, this information is not the result of comprehensive or site-specific field surveys; many natural areas in Kentucky have never been thoroughly surveyed, and new species of plants and animals are still being discovered. For these reasons, the Kentucky Natural Heritage Program cannot provide a definitive statement on the presence, absence, or condition of biological elements in any part of Kentucky. Heritage reports summarize the existing information known to the Kentucky Natural Heritage Program at the time of the request regarding the biological elements or locations in question. They should never be regarded as final statements on the elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments.

J. Dee. CDM Federal Programs Corp.
October 21, 1992
Page Two

An invoice for the foregoing environmental review service is enclosed. If you have any questions or I can be of further assistance, please do not hesitate to contact me.

Sincerely,

Brian Palmer-Bell Jr For ME

Marc Evans
Acting Director

ME/BPB

INTERPRETATION KEY TO DATA REPORTS FROM THE
KENTUCKY STATE NATURE PRESERVES COMMISSION

Revised October, 1992

Many of the data fields on the enclosed report are easily understood. Other fields, however, use abbreviations and formats that are not always self-explanatory. A key to these fields follows. Your report may contain some or all of the following data fields.

BESTSOURCE:	Best available reference to the element occurrence: literature citation, collector, collection number, museum or herbarium code, etc.
COMMENTS:	Additional information: duplicate records, validity of record, comment on taxonomy or date of occurrence, etc.
EOCODE:	Element (species) code and occurrence number (last three digits).
EODATA:	Element occurrence data: number of individuals, health, size of colony, flowering data, etc.
EORANK:	Judgement of element occurrence quality: A = excellent, B = good, C = marginal, D = poor, E = verified extant but quality not judged, O = obscure (not found at reported site but more searching needed), H = historically known from site but no known observation or collection since 1970, X = extirpated from site.
FIRSTOBS:	Year of first known observation or collection.
GENDESC:	General description of habitat.
GRANK:	Estimate of element abundance on a global scale: G1 = extremely rare, G2 = rare, G3 = uncommon, G4 = common, G5 = very common, GH = historically known and expected to be rediscovered, GU = uncertain, GX = extinct.
IDENT:	Whether the identification has been checked by a reliable individual and is believed to be correctly identified: Y = identification confirmed and believed correct, N = No, identification determined to be wrong despite reports to the contrary, ? = Whether identification is correct or not is confusing or disputed, blank or U = unknown whether identification correct or not.
KSNPC:	Kentucky State Nature Preserves Commission status: N = none, E = endangered, T = threatened, S = special concern, H = historic.
LASTOBS:	Year(-month-date) of most recent known observation or collection.
LAT:	Latitude.
LONG:	Longitude.
MARGNUM:	Number used to location the element on KSNPC Heritage maps.
PREC:	Precision of the plotted location: SC = location accurate to within one second of latitude-longitude and confirmed by KSNPC staff, S = same as previous code but not confirmed by KSNPC staff, M = location accurate to within one minute of latitude-longitude, G = location plotted according to general locality information and accurate to one USGS 7.5 minute quadrangle, U or blank = accuracy of location unknown or not specified.
SPROT:	See KSNPC.
SRANK:	Estimate of element abundance in Kentucky: S1 = extremely rare, S2 = rare, S3 = uncommon, S4 = many occurrences, S5 = very common, SA = accidental in state, SE = exotic, SH = historically known in state, SN = migratory or nonbreeding, SR = reported but without persuasive documentation, SRF = reported falsely in literature, SU = uncertain, SX = extirpated.
USESA or US:	U.S. Fish and Wildlife Service status: N = none, C1 = category 1 status review, C2 = category 2 status review, 3A = considered to be extinct, 3B = not considered a species under the Endangered Species Act, 3C = considered to be more abundant than previously thought, LT = listed as threatened, LE = listed as endangered, PT = proposed as threatened, PE = proposed as endangered.

DANGERED, THREATENED, AND SPECIAL CONCERN SPECIES REPORTED AS OCCURRING IN
 E SHANNESSE STATE PLANT AREA IN MCCracken COUNTY, KENTUCKY
 KENTUCKY STATE NATURE PRESERVES COMMISSION
 KENTUCKY NATURAL HERITAGE PROGRAM
 OCT 1992 PAGE 1

Code	SCIENTIFIC NAME	COMMON NAME	IDENT	LAST OBS	EDRANK	SPROT	USES A	SRANK	GRANK
1 VASCULAR PLANTS									
JUGB18181802	CARYA AQUATICA	WATER HICKORY		2888-28-28	H	S		3253	65
STYB18181815	HALESIA CAROLINA	CAROLINA SILVERBELL	Y	1991-26-28	A	E		5152	3465
ASTB18911817	SILPHIUM LACINIATUM VAR LACINIATUM	COMPASS PLANT	Y	1991-26-21	C	T		52	65
ASTB18911816	SILPHIUM LACINIATUM VAR LACINIATUM	COMPASS PLANT	Y	1991-26-21	D	T		52	65
2 CRUSTACEANS									
MAL118681804	ORCONECTES LANCIFER	A CRAYFISH	Y	1975-24-26	A	E		51	63
3 FISH									
CHDB18481883	ESOX NIGER	CHAIN PICKEREL		1972-25-28	C	S		5354	65
CJB168381884	HYBOSGNATHUS HAYI	CYPRESS MINNOW	Y	1968-29-18	H	E		51	557
COB111881887	LEPOMIS PUNCTATUS	SPOTTED SUNFISH	Y	1988-25-24	A	T		52	65
CJB226581882	NOTROPIS MACULATUS	TAILLIGHT SHINER	Y	1986-27-22	A	T		5253	65
4 AMPHIBIANS									
AABCB28681835	HYLA CINEREA	GREEN TREEFROG	Y	1991-26-28	E	S		5354	65
AABCB28681834	HYLA CINEREA	GREEN TREEFROG	Y	1991-26-25	E	S		5354	65
AABHB18141889	RANA AREOLATA CIRCULOSA	NORTHERN CRAWFISH FROG	Y	1991-23-18	E	S		53	64
148818	RANA AREOLATA CIRCULOSA	NORTHERN CRAWFISH FROG	Y	1991-23-28	E	S		53	64
148814	RANA AREOLATA CIRCULOSA	NORTHERN CRAWFISH FROG	Y	1991-23-18	E	S		53	64
AABHB18141888	RANA AREOLATA CIRCULOSA	NORTHERN CRAWFISH FROG	Y	1991-23-28	E	S		53	64
AABHB18141815	RANA AREOLATA CIRCULOSA	NORTHERN CRAWFISH FROG	Y	1991-23-21	E	S		53	64
5 REPTILES									
RADB222231813	NERODIA ERYTHROGASTER NEGLECTA	COPPERBELLY WATER SNAKE	?	1987-25-28	O	S	C2	5253	3572
6 BIRDS									
BPAV188881883	CORVUS OSSIFRAGUS	FISH CROW	Y	1988-26-27	E	S		53	65
BNJB288181884	LOPHODYTES CUCULLATUS	HOODED MERGANSER	Y	1988-25-28	B	E		5152	65
BPNB11181881	VIREO BELLII	BELL'S VIREO	Y	1988-26-27	B	S		5253	65
BPNB11181882	VIREO BELLII	BELL'S VIREO	Y	1985-25-26	B	S		5253	65
7 MAMMALS									
MACCB11581878	MYOTIS SEPTENTRIONALIS	NORTHERN LONG-EARED MYOTIS	Y	1991-26-25	E	S		5354	64
MACCB11581879	MYOTIS SEPTENTRIONALIS	NORTHERN LONG-EARED MYOTIS	Y	1991-26-27	E	S		5354	64
MACCB1188181	MYOTIS SODALIS	INDIANA MYOTIS	Y	1991-26-25	E	E	LE	5152	62
MACCB28181815	NYCTICEIUS HUMERALIS	EVENING BAT	Y	1991-26-27	E	T		5253	65
MACCB28181817	NYCTICEIUS HUMERALIS	EVENING BAT	Y	1991-26-25	E	T		5253	65

DANGEROUS, THREATENED, AND SPECIAL CONCERN SPECIES REPORTED AS OCCURRING IN
 THE ~~FOODPLAIN RIDGE/TERRACE~~ AREA IN MCCrackEN COUNTY, KENTUCKY
 KENTUCKY STATE NATURE PRESERVES COMMISSION
 KENTUCKY NATURAL HERITAGE PROGRAM
 1 OCT 1992 PAGE 2

COLUE	SCIENTIFIC NAME	COMMON NAME	IDENT	LASTOBS	EDRANK	SPROT	USES	GRANK	GRANK
11	PALESTRINE COMMUNITIES								
11	FOODPLAIN RIDGE/TERRACE		Y	1991-06-08	8			S1	
	FOREST								

7 Records Processed

☒ TELEPHONE CONVERSATION
☐ INCOMING ☒ OUTGOING
☐ MEETING

DATE: 10/26/92
 TIME: 9:50 AM/PM
 RECORDED BY: James Dec

PROJECT: Paducah EA CONTRACT NO. _____
 SUBJECT: Habitat requirements for endangered plants listed for Paducah

PARTICIPANTS	ORGANIZATION/DEPARTMENT	TELEPHONE/EXT.
<u>Debbie White</u>	<u>Kentucky Nature Preserve Commission</u>	<u>(502) 564-2886</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

SUMMARY:

Carolina silver bell - floodplains or very
moist soils usually associated w/ water
courses and low-lying ponds

Compass plant - open dry xeric prairie
clear fields and roadsides road sides
in Paducah

DISTRIBUTION:

☐ PARTICIPANTS☒ FILE

INFORMATION

ACTION

OTHER: _____

United States Department of the Interior

FISH AND WILDLIFE SERVICE

~~Post Office Box 345~~

~~Cookeville, TN 38503~~

~~October 1, 1992~~

NEW ADDRESS:

446 Neal Street
Cookeville, TN 38501

Mr. James Dee
CDM Federal Programs Corporation
800 Oak Ridge Turnpike, Suite 500
Oak Ridge, Tennessee 37830

Re: 4-C-92-839

Dear Mr. Dee:

This is in response to your letter of October 5, 1992, regarding the proposal for potential landfill sites in McCracken County, Kentucky.

We have reviewed the information with regard to endangered and threatened species. According to our records, the following listed species may occur in the vicinity of the proposed projects:

Indiana bat (Myotis sodalis) (E)

Bald eagle (Haliaeetus leucocephalus) (E)

You should assess potential impacts to these species and determine if the proposed project may affect them. A "may affect" finding may necessitate formal consultation.

In addition to endangered and threatened species, there are species that, although not officially listed or proposed, are being considered for listing in the future. Status review (candidate) species that may occur in the vicinity of the project sites are:

Bachman's sparrow (Aimophila aestivalis) (SR)

This species is not legally protected by the Endangered Species Act and Section 7 requirements do not apply to it, but it is under consideration for listing and we would appreciate anything you might do to avoid impacting it.

These constitute the comments of the Fish and Wildlife Service in accordance with the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

Sincerely,

Lee A. Barclay, Ph.D.
Field Supervisor

United States Department of the Interior

FISH AND WILDLIFE SERVICE

446 Neal Street
Cookeville, TN 38501

February 10, 1993

Mr. James P. Groton, Jr.,
Environmental Scientist
Science Applications International Corp.
P. O. Box 2501
301 Laboratory Road
Oak Ridge, Tennessee 37831

Dear Mr. Groton:

This is in response to your letter and enclosures of January 29, 1993, regarding a proposal for two waste storage facilities at the Paducah Gaseous Diffusion Plant in McCracken County, Kentucky. The Fish and Wildlife Service (Service) has reviewed the information submitted and offers the following comments.

Review of the Heath quadrangle of the Service's National Wetlands Inventory maps reveals that there are no forested, emergent, or scrub-shrub wetlands in the vicinity of the proposed relocation project. Therefore, the Service anticipates that there will be no project-related adverse impacts to valuable wetland resources.

We have also reviewed the proposed project with regard to endangered species. According to our records, the following federally listed or proposed endangered or threatened species may occur in the project impact area:

Indiana bat (Myotis sodalis) (E)

* [You should assess potential impacts to this species and determine if the proposed project may affect it. We recommend that you submit a copy of your assessment and finding to this office for review and concurrence.

Thank you for the opportunity to comment on this action. If you have any questions, please contact Steve Carter of my staff at 615/528-6481.

Sincerely,

Lee A. Barclay, Ph.D.
Field Supervisor

DISTRIBUTION: Perry
Nenzel, Deacon

CONTACT TYPE:

MEETING

OTHER

PHONE

CORRESPONDENCE

DATE: 2/12/93

TIME: 4:30 EST

PERSONS
CONTACTED:

NAME Lee A. Barclay

COMPANY USFWS

NAME Jim Widelk

NAME

NAME

PHONE: 528-6481

TITLE

ADDRESS

PERSONS
CONTACTING:

NAME J. Gorton

SUMMARY OF DISCUSSION, ACTION, OR DATA EXCHANGED:

Summary of requirements alluded to in 2/10/93 letter
from USFWS letter on T&E species for MWSF EA at
PGDP - Biological Assessment is required for Indianbat!
① Onsite survey required

ECO-TECH, INC

313 Capital Avenue

P. O. Box 8

Frankfort, Kentucky

40602-0008

Phone (502) 223-8136

FAX (502) 223-3499

An Assessment of Potential Summer Habitat

of the

Federally Endangered Indiana Bat

Myotis sodalis

Hal D. Bryan

8 April 1993

Prepared for: Paducah Gaseous Diffusion Plant
McCracken County, Kentucky

Hal Bryan and Associates

I. INTRODUCTION

The consultant was contracted by the Paducah Gaseous Diffusion Plant in McCracken County, Kentucky to provide an assessment of potential habitat for the federally endangered species, the Indiana bat, Myotis sodalis. The species was identified by the Cookeville, Tennessee, Office of the U.S. Fish and Wildlife Service as federally endangered species which may occur in the vicinity of the existing plant facility and associated environs.

II. SPECIES STATUS

The Indiana bat, Myotis sodalis (Miller and Allen), formally attained endangered status March 11, 1967. Its distribution is in the eastern and midwestern United States.

Bat Cave in Carter County and Coach Cave in Edmonson County, Kentucky have been designated "critical habitat" for the Indiana bat within the boundaries of the Commonwealth.

The Indiana bat uses caves in Kentucky as hibernacula (Barbour and Davis, 1969). Although some males will remain in the caves in summer, most of the population travels north and west of the hibernacula to their nursery sites (Humphrey et al., 1977). Only a few areas in Kentucky have been documented to be the sites of maternity colonies of Indiana bats. Known locations of maternity colonies include Bullitt County along Knob Creek (Kessler et al., 1981), Daviess County along Martin Creek (Harvey and Kennedy, 1981), near Mammoth Cave in Edmonson County (field notes of J.R. MacGregor), two sites in Jefferson County, (field notes of H.D. Bryan), and a site in Breckinridge County at Yellowbanks Wildlife Management Area (personal communication with Wayne Davis, KDFWR). There are also recent records of lactating Indiana bats in the Purchase area of Kentucky collected by biologists working on an inventory of the area. They are under contract to the Kentucky Department of Fish and Wildlife Resources and the Kentucky Nature Preserves Commission. These include records of lactating Indiana bats along Little Bayou du Chien in Fulton County and along Mayfield Creek on the Ballard-Carlisle County line (KNPC, 1991). Male Indiana bats were collected in 1992 near the project site in McCracken County by biologists working on an addendum to this study.

All of these Kentucky locations have been in or adjacent to bottomland hardwood forests. In Illinois, Indiana bats' summer roost trees (some as small as six inches in diameter) occur in either lowland or upland hardwood forests, but primary foraging habitats of the species are bottomland

hardwoods (personal communication with Gene Gardner, Illinois Natural History Survey).

III. SURVEY METHODS

On February 18, 1993, the author initially visited the project area to assess potential summer habitat for the Indiana bat. Another trip was made on April 7, 1993 to examine the entire plant property from aerial photographs and field check some of the identified areas. Habitat was assessed using published information and personal knowledge of sites where lactating Indiana bats had been previously collected. Since Indiana bats sometimes forage over both fields and forests, most of the plant was considered as potential foraging area, but only forested sites were considered potential roost areas. Specific habitat characteristics sought in forests that are potential roost sites include the presence of deciduous trees with diameters at breast height (dbh) greater than six inches and with some individuals having exfoliating bark.

Those forested communities with average diameters at breast height (dbh) exceeding ten inches are subjectively considered good to excellent potential habitat, while forests with the dominant overstory trees are less than ten inches are considered fair potential summer habitat for roost sites of Indiana bats.

IV. SURVEY RESULTS

There are no caves or mines in the project that could provide hibernacula for any species of bats.

The study area includes over three thousand (3050.9) acres of forests with at least some overstory trees exceeding six inches in diameter. Approximately half of these forests (or about 1500 acres) are considered good to excellent potential roosting sites for the Indiana bat because they contain trees that average over ten inches in diameter. With a few exceptions, the most mature of the forested communities exist near the Ohio River and the major tributaries.

No actual field work other than brief windshield surveys of several of the forests was done for this evaluation.

V. SUMMARY

Substantial amounts of potential summer foraging and roosting habitat for the federally endangered Indiana bat occurs in the vicinity of the Paducah Gas Diffusion. Except for a single night of mist netting by biologists working for the

KNPC, which yielded a male Indiana bat in 1992, there have been no surveys of the plant area. Hibernacula do not occur in the project area.

VI. LITERATURE CITED

Barbour, R.W. and W.H. Davis. 1969. Bats of America. Univ. Press of Kentucky, Lexington, 286 pp

Harvey, M.J. and M.L. Kennedy. 1981. Field survey for the Endangered Indiana bat, Myotis sodalis, in the impact area of the solvent refined coal demonstration plant [SRC-1], Newman, Kentucky. Unpublished report to the International Coal Refining Co., and the U.S. Dept. of Energy.

Humphrey, S.R, A.R. Richter and J.B. Cope. 1977. Summer habitat and ecology of the endangered Indiana bat, Myotis sodalis. J. Mamm. 58:334-346.

KNPC. 1991. Biological Inventory of the Jackson Purchase Region. Kentucky Nature Preserves Commission, Frankfort, Kentucky.

Kessler, J.S., W.M. Turner, and L. Morgan. 1981. A Survey for the Indiana bat, Myotis sodalis, on Knob Creek, Bullitt County, Kentucky. Trans. Ky. Acad. Sci. 42:38-40.

ECO-TECH, INC

313 Capital Avenue

P. O. Box 8

Frankfort, Kentucky

40602-0008

Phone (502) 223-8136

FAX (502) 223-3499

AN ASSESSMENT OF POTENTIAL SUMMER HABITAT OF THE FEDERALLY ENDANGERED INDIANA BAT Myotis sodalis

PREPARED BY:

HAL BRYAN

PREPARED FOR:

PADUCAH GASEOUS DIFFUSION PLANT
McCRACKEN COUNTY, KENTUCKY

FEBRUARY 1993

Hal Bryan and Associates

I. INTRODUCTION

The consultant was contracted by the Paducah Gaseous Diffusion Plant in McCracken County, Kentucky to provide an assessment of potential habitat for the federally endangered species, the Indiana bat, Myotis sodalis. The species was identified by the Cookeville, Tennessee, Office of the U.S. Fish and Wildlife Service as federally endangered species which may occur in the impact area of the proposed project, the construction of a mixed-waste facility which would require a site of approximately ten acres.

II. SPECIES STATUS

The Indiana bat, Myotis sodalis [Miller and Allen], formally attained endangered status March 11, 1967. Its distribution is in the eastern and midwestern United States.

Bat Cave in Carter County and Coach Cave in Edmonson County, Kentucky have been designated "critical habitat" for the Indiana bat within the boundaries of the Commonwealth.

The Indiana bat uses caves in Kentucky as hibernacula [Barbour and Davis, 1969]. Although some males will remain in the caves in summer, most of the population travels north and west of the hibernacula to their nursery sites (Humphrey et al., 1977). Only a few areas in Kentucky have been documented to be the sites of maternity colonies of Indiana bats. Known locations of maternity colonies include Bullitt County along Knob Creek [Kessler et al., 1981], Daviess County along Martin Creek [Harvey and Kennedy, 1981], near Mammoth Cave in Edmonson County (field notes of J.R. MacGregor), two sites in Jefferson County, (field notes of H.D. Bryan), and a site in Breckinridge County at Yellowbanks Wildlife Management Area (personal communication with Wayne Davis, KDEWR). There are also several recent records of lactating Indiana bats in the Purchase area of Kentucky collected by biologists working on an inventory of the area. They are under contract to the Kentucky Department of Fish and Wildlife Resources and the Kentucky Nature Preserves Commission. These include records of lactating Indiana bats along Little Bayou du Chien in Fulton County, along Mayfield Creek on the Ballard-Carlisle County line. Male Indiana bats were collected in 1992 near the project site in McCracken County by these biologists (KNPC, 1991).

All of these Kentucky locations have been in or adjacent to bottomland hardwood forests. In Illinois, Indiana bats' summer roost trees (some as small as six inches in diameter) occur in either lowland or upland hardwood forests, but primary foraging habitats of the species are bottomland

hardwoods (personal communication with Gene Gardner, Illinois Natural History Survey).

III. SURVEY METHODS

The study area of approximately twenty acres is mostly fields of fescue and broomsedge. However, a small woodlot of less than two acres also occurs in the impact area. On February 18, 1993, the author visited the project area to assess potential habitat and, if deemed necessary, choose netting locations. Habitat was assessed using published information and personal knowledge of sites where lactating Indiana bats had been previously collected. Specific habitat characteristics sought include the presence of deciduous trees with diameters at breast height (dbh) greater than six inches and with some individuals having exfoliating bark.

IV. SURVEY RESULTS

There are no caves or mines in the project that could provide hibernacula for any species of bats.

The two-acre lowland woodlot was dominated by hardwood tree species from six to twenty inches in diameter. Numerous individuals of shagbark or shellbark hickory were present that have exfoliating bark. Additionally several other large trees were dying and had sloughing bark. Therefore, the potential habitat for maternity sites of Indiana bats was subjectively rated fair to good.

V. SUMMARY AND RECOMMENDATIONS

Potential summer foraging and roosting habitat for the federally endangered Indiana bat does occur in the project area. Recommendations are to sample the area with mist nets between early June and mid-August of 1993 when lactating Indiana bats could be caught if they are present in the area.

If lactating Indiana bats are collected during this effort, then a detailed search of the two acres of woodland to be impacted could be undertaken in a search for roost trees. Because of the limited area of impact this search could be accomplished by careful field investigations and aided by the use of bat detectors.

VI. LITERATURE CITED

Barbour, R.W. and W.H. Davis. 1969. Bats of America. Univ. Press of Kentucky, Lexington, 286 pp

Harvey, M.J. and M.L. Kennedy. 1981. Field survey for the Endangered Indiana bat, Myotis sodalis, in the impact area of the solvent refined coal demonstration plant [SRC-1], Newman, Kentucky. Unpublished report to the International Coal Refining Co., and the U.S. Dept. of Energy.

Humphrey, S.R, A.R. Richter and J.B. Cope. 1977. Summer habitat and ecology of the endangered Indiana bat, Myotis sodalis. J. Mamm. 58:334-346.

KNPC. 1991. Biological Inventory of the Jackson Purchase Region. Kentucky Nature Preserves Commission, Frankfort, Kentucky.

Kessler, J.S., W.M. Turner, and L. Morgan. 1981. A Survey for the Indiana bat, Myotis sodalis, on Knob Creek, Bullitt County, Kentucky. Trans. Ky. Acad. Sci. 42:38-40.

**PROPOSED MIXED-WASTE FACILITY
OF THE
PADUCAH GASEOUS DIFFUSION PLANT
McCRACKEN COUNTY, KENTUCKY
USGS - HEATH, KENTUCKY QUADRANGLE
SCALE = 1:24000**

ECO-TECH, INC

HAL BRYAN AND ASSOCIATES

CI 93 003428

United States Department of the Interior

FISH AND WILDLIFE SERVICE

446 Neal Street
Cookeville, TN 38501

April 28, 1993

TAKE
PRIDE IN
AMERICA

Mr. Donald C. Booher
Site Manager, Paducah Site Office
Department of Energy
Oak Ridge Operations
P. O. Box 1410
Paducah, Kentucky 42001

Re: FWS # 93-1310

Dear Mr. Booher:

We have reviewed the biological assessment regarding the Indiana bat, for the construction of three waste storage facilities at the Paducah Gaseous Diffusion Plant in McCracken County, Kentucky, submitted April 27, 1993.

The biological assessment is adequate and supports the conclusion of no effect with which we concur. In view of this, we believe that the requirements of Section 7 of the Endangered Species Act have been satisfied. However, obligations under Section 7 of the Act must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner or to an extent not previously considered, (2) this action is subsequently modified to include activities which were not considered in this biological assessment, or (3) new species are listed or critical habitat designated that may be affected by the identified action.

Your interest and initiative in enhancing endangered, threatened, and candidate species is greatly appreciated. If you have any questions, please contact Jim Widlak of my staff at 615/528-6481.

Sincerely,

Douglas B. Winford
Acting Field Supervisor

Education and Humanities Cabinet

KENTUCKY HERITAGE COUNCIL

The State Historic Preservation Office

Brereton C. Jones
Governor
Sherry K. Jelsma
Cabinet Secretary

David L. Morgan
Executive Director
and SHPO

November 16, 1992

Mr. John D. Young, Project Manager
CDM Federal Programs Corporation
800 Oak Ridge Turnpike, Suite 500
Oak Ridge, Tennessee 37830

**Re: Mixed Waste Storage Facilities at the Paducah Gaseous Diffusion Plant
McCracken County, Kentucky**

Dear Mr. Young:

Thank you for your letter concerning the above referenced project. Our review of this project indicates that an archaeological survey will not be required. The proposed project will have no effect on any property listed in or eligible for listing in the National Register of Historic Places. Therefore, I have no objections.

If you have any questions concerning this project please feel free to contact David Pollack of my staff at 502-564-7005.

Sincerely,

David L. Morgan, Director
Kentucky Heritage Council and
State Historic Preservation Officer

November 16, 1992

DAVID POLLACK
Kentucky Heritage Council
300 Washington Street
Frankfort, Kentucky 40601

Dear Dave,

I am writing to you concerning several tracts at the Paducah Gaseous Diffusion Plant which needed to be looked at for preparation of an Environmental Assessment. Our on-site meeting of November 13, 1992 included you, myself, Mr. Martin Evans of this firm, Ms. J. Anne Bolling of CDM Federal Services Corporation and Mr. Mark Walker of Martin-Marietta Corporation. My recollection of the on-site meeting was that we all agreed that it was probably not necessary to accomplish immediate Phase I Field Survey in order to develop an Environmental Assessment on these tracts. I am therefore writing to summarize my views and recommendations concerning all of the tracts which we reviewed by walkover or drive-by during the term of that meeting.

As a background to the on-site meeting, I had a person from this firm review all of the data on the area in the Office of State Archaeologist at University of Kentucky. In those records, 17 sites from an earlier survey were found within one mile of the plant site, but these were clustered northwest toward the Ohio River rather than back along Little Bayou Creek. We were also cognizant that a prior survey of 55 acres within the Plant Site by Tom Sussenbach had been unproductive due to prior disturbance.

The first location for study has been labeled "Site 1" and it includes a circa 2.3 Acre TSCA Waste Storage Facility tract (ESO-17549/ESO-18125) and a 20 Acre Mixed Waste Storage Facility tract (ESO-18003/ESO-18104). The 2.3 acre plot is within the plant perimeter and may arbitrarily be assumed to be disturbed based upon Sussenbach's earlier work. The 20-acre location is directly adjacent to the plant site to the west and has been affected by a rail line, impacted wetland drainage development and possible stripping along the side of a drainage ditch. Our walkover on this section showed very little area to be unaffected. I believe our conclusion was that this area had no potential to yield significant archaeological resources.

The second "Site" to be considered in the Environmental Assessment was a Solid Waste Landfill (ESO 18007) consisting of 1 preferred site (Location A) and 3 alternate sites labeled Locations B, C and D (Alternate 1, Alternate 2 and Alternate 3). Each of these was a circa 40-acre potential solid waste landfill tract generally located above the 100 floodline on Pleistocene terrace structures. We inspected each of these tracts in turn with the following findings:

← **Preferred (Location A)-** On several hogback ridges or knolls which overlook Little Bayou Creek there appears to be the potential for several archaeological sites. The best survey technique for this area would be complete plowing and disking with 5-10 meter interval walkover sampling of the ridges and/or knoll tops. If this location is cleared by survey, apparently, no further work would be necessary on other alternate locations.

Granger to Pollack
11/16/92
Page Two

Alternate 1 (Location B)- This alternate tract located between major power lines is one of very low potential for archaeological sites. It is an essentially open area situated well away from any stream and has no relief. Consultations with the local Fish and Wildlife personnel indicate no historic structures or prehistoric artifact findings on this tract. Only very low order on-the-ground survey might be necessary here.

Alternate 2 (Location C)- This alternate tract is located on a hogback terrace ridge which extends toward Little Bayou Creek. It is one of moderate potential for archaeological sites being an area which is essentially open between ridge tops which are wooded. Consultations with the local Fish and Wildlife personnel indicate no historic structures or prehistoric artifact findings on this tract. Survey of this tract might be of the Shovel Test Pit variety on 20 meter intervals.

Alternate 3 (Location D)- This alternate tract is located between a road and powerlines and is one of very low potential for archaeological sites. It is an essentially open area which extends to the south away from Little Bayou Creek and it has no relief. Consultations with the local Fish and Wildlife personnel indicate no historic structures or prehistoric artifact findings on this tract. Only very low order on-the-ground survey might be necessary here.

We have enclosed Maps for these areas and would appreciate your review of the findings of the on-site meeting.

Thanks for your willingness to endure the long ride to come to the on-site meeting at the Paducah Gaseous Diffusion Plant.

Sincerely,

Joseph E. Granger, PhD, SOPA
President & Principal Investigator

CC: John Young, Project Manager, CDM Federal Programs Corporation, Oak Ridge, Tennessee

Vernon L. Wimberly, Subcontracts Administrator, CDM Federal Programs Corporation, Fairfax, Virginia

J. Anne Bolling, CDM Federal Programs Corporation, Atlanta Georgia

Science Applications International Corporation
An Employee-Owned Company

April 6, 1993

Mr. Jerry Sparks
U.S. Army Corps of Engineers
P.O. Box 489
Newburgh, IN 47629

SUBJECT: Report on Wetlands at Proposed PGDP Waste Storage Facilities Sites

Dear Mr. Sparks:

SAIC is pleased to submit a copy of the wetlands report for the proposed waste storage facilities at the Paducah Gaseous Diffusion Plant. The report describes wetlands present at the sites. I hope this report will be of service to you in preparing your report to the District Engineer for a Nationwide Permit #26 for the proposed project.

If you have any questions about this report, I can be reached at (615) 481-8732. Thank you for your help and advice on how to proceed in this matter.

Sincerely,

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

A handwritten signature in cursive script that reads "James P. Groton, Jr." The signature is written in dark ink and is positioned above the printed name.

James P. Groton, Jr.
Environmental Scientist

cc:

C. Pergler (SAIC)
D. Wright (MMES)
M. Walter (MMES)

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, LOUISVILLE
CORPS OF ENGINEERS
P.O. BOX 88
LOUISVILLE, KENTUCKY 40201-0088

May 25, 1993

Operations and Readiness Division
Regulatory Branch (South)
ID No. 199300516-rjs

Ms. Nancy Hendrix-Ward
NEPA Program Manager
Department of Energy
Oak Ridge Field Office
P.O. Box 2001
Oak Ridge, Tennessee 37831

Dear Ms. Hendrix-Ward:

This is in response to your request for authorization to fill two small wetland areas for the U.S. Department of Energy's (DOE) proposed environmental restoration waste storage facilities at DOE's Gaseous Diffusion plant located in Paducah, Kentucky. We have reviewed the submitted material to determine whether a Department of the Army (DA) permit would be required under the provisions of Section 404 of the Clean Water Act (CWA). An onsite inspection of the property was made on March 30, 1993, by Mr. Jerry Sparks of our Newburgh field office. His inspection confirmed the presence of two jurisdictional areas estimated to be 0.47 acre.

Since less than 1 acre of "waters of the United States" (wetlands) would be affected, and the proposed work site is above the headwaters point of Big Bayou Creek, the proposed work is authorized by Nationwide Permit (NWP) under the provisions of 33 CFR Section 330, Appendix A (NWP No 26). However, the Commonwealth of Kentucky has denied the required Water Quality Certification (WQC) subject to Section 401 of the CWA for this particular NWP for activities which involve:

- a. discharges into, and causing or resulting in the loss of or adverse impact (impoundment, excavation or drainage) to 1 acre or more of wetlands.
- b. discharges into 200 linear feet or more of any stream or stream bank (below ordinary high water) depicted as an intermittent or solid blue line on a U.S.G.S. 7.5 minute (1:24,000) topographic map.

Should your plans change and you would need to exceed the limit specified in "a," then you would need to apply for a DA permit before beginning work.

Should this activity exceed the limit specified in "b," you must apply for and receive the necessary WQC from the Division of Water, Kentucky Natural Resources and Environmental Protection Cabinet (KNREPC) prior to the start of work. You may write to the KNREPC at:

Natural Resources and Environmental
Protection Cabinet
Division of Water
18 Reilly Road, Ash Building
Frankfort, Kentucky 40601

If KNREPC fails to respond to your request for authorization within 60 calendar days, the WQC is considered waived. The responsibility for obtaining the state WQC rests with you. Once you obtain your certification or waiver and provided the proposed work has not been modified, you may proceed with construction without further contact or verification from us. This verification is only valid for 2 years from the date of this letter.

Whether you receive the required water certification or meet the exemptions, you are also required to perform the work in accordance with the enclosed General Conditions for Nationwide Permits and Section 404 Only Conditions, and if issued, all conditions imposed by the WQC.

If you have any questions, please contact me by writing to the above address, ATTN: CEORL-OR-FS, or by calling (502) 582-5452. Any correspondence should reference the assigned ID Number indicated above. A copy of this letter is being sent to the Division of Water, KNREPC for their information.

Sincerely,

Ronny J. Sadri

Ronny J. Sadri
Project Manager
Regulatory Branch

Enclosures

ADDRESS FOR COORDINATING AGENCY

Mr. Jack A. Wilson
Director
Division of Water
Natural Resources and Environmental
Protection Cabinet
18 Reilly Road, Ash Building
Frankfort, Kentucky 40601

Nationwide Permit Conditions

General Conditions: The following general conditions must be followed in order for any authorization by a nationwide permit to be valid:

1. **Navigation.** No activity may cause more than a minimal adverse effect on navigation.
2. **Proper maintenance.** Any structure or fill authorized shall be properly maintained, including maintenance to ensure public safety.
3. **Erosion and siltation controls.** Appropriate erosion and siltation controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills must be permanently stabilized at the earliest practicable date.
4. **Aquatic life movements.** No activity may substantially disrupt the movement of those species of aquatic life indigenous to the waterbody, including those species which normally migrate through the area, unless the activity's primary purpose is to impound water.
5. **Equipment.** Heavy equipment working in wetlands must be placed on mats or other measures must be taken to minimize soil disturbance.
6. **Regional and case-by-case conditions.** The activity must comply with any regional conditions which may have been added by the division engineer (see 33 CFR 330.4(e)) and any case specific conditions added by the Corps.
7. **Wild and Scenic Rivers.** No activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system, while the river is in an official study status. Information on Wild and Scenic Rivers may be obtained from the National Park Service and the U.S. Forest Service.
8. **Tribal rights.** No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.
9. **Water quality certification.** In certain states, an individual state water quality certification must be obtained or waived (see 33 CFR 330.4(c)).
10. **Endangered Species.** No activity is authorized under any NWP which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act, or which is likely to destroy or adversely modify the critical habitat of such species. Non-federal permittees shall notify the district engineer if any listed species or critical habitat might be affected or is in the vicinity of the project and shall not begin work on the activity until notified by the district engineer that the requirements of the Endangered Species Act have been satisfied and that the activity is authorized. Information on the location of threatened and endangered species and their critical habitat can be obtained from the U.S. Fish and Wildlife Service and National Marine Fisheries Service. (see 33 CFR 330.4(f))
11. **Historic properties.** No activity which may affect Historic properties listed, or eligible for listing, in the National Register of Historic Places is authorized, until the DE has complied with the provisions of 33 CFR 325, Appendix C. The prospective permittee must notify the district engineer if the authorized activity may affect any historic properties listed, determined to be eligible, or which the prospective permittee has reason to believe may be eligible for listing on the National Register of Historic Places, and shall not begin the activity until notified by the District Engineer that the requirements of the National Historic Preservation Act have been satisfied and that the activity is authorized. Information on the location and existence of historic resources can be obtained from the State Historic Preservation Office and the National Register of Historic Places (see 33 CFR 330.4(g)).

Section 404 Only Conditions

In addition to the General Conditions, the following conditions apply only to activities that involve the discharge of dredged or fill material and must be followed in order for authorization by the nationwide permits to be valid:

1. *Water supply intakes.* No discharge of dredged or fill material may occur in the proximity of a public water supply intake except where the discharge is for repair of the public water supply intake structures or adjacent bank stabilization.
2. *Shellfish production.* No discharge of dredged or fill material may occur in areas of concentrated shellfish production, unless the discharge is directly related to a shellfish harvesting activity authorized by nationwide permit 4.
3. *Suitable material.* No discharge of dredged or fill material may consist of unsuitable material (e.g., trash, debris, car bodies, etc.) and material discharged must be free from toxic pollutants in toxic amounts (see section 307 of the Clean Water Act).
4. *Mitigation.* Discharges of dredged or fill material into waters of the United States must be minimized or avoided to the maximum extent practicable at the project site (i.e. on-site), unless the DE has approved a compensation mitigation plan for the specific regulated activity.
5. *Spawning areas.* Discharges in spawning areas during spawning seasons must be avoided to the maximum extent practicable.
6. *Obstruction of high flows.* To the maximum extent practicable, discharges must not permanently restrict or impede the passage of normal or expected high flows or cause the relocation of the water (unless the primary purpose of the fill is to impound waters).
7. *Adverse impacts from impoundments.* If the discharge creates an impoundment of water, adverse impacts on the aquatic system caused by the accelerated passage of water and/or the restriction of its flow shall be minimized to the maximum extent practicable.
8. *Wetland breeding areas.* Discharges into breeding areas for migratory waterfowl must be avoided to the maximum extent practicable.
9. *Removal of temporary fills.* Any temporary fills must be removed in their entirety and the affected areas returned to their preexisting elevation.

CDM FEDERAL PROGRAMS CORPORATION
a subsidiary of Camp Dresser & McKee Inc.

December 11, 1992

Mr. Charlie Logsdon
10535 Ogden Landing Rd.
Kevil, KY 42053

Post-It™ brand fax transmittal memo 7671		# of pages • 4
To	James Dee	
From	Charlie Logsdon	
Co.	CDM Fed. Prog.	
Co.	WKWMA	
Dept.		
Phone	(502) 488-3233	
Fax	615-481-3835	

Subject: Environmental Assessments at the Paducah Gaseous
Diffusion Plant, Kentucky

Document Control No. 7905-005-CO-BBLY

Dear Mr Logsdon:

Per our telephone conversation, I am sending you two maps which indicate the locations of each of the potential landfill sites. They are numbered 1 - 4. I would appreciate if you could visit these sites and determine if any native prairie grasses are present on these sites and the relative abundance of these grasses (i.e. estimated percent coverage if possible or a simple qualitative descriptor). I would also appreciate any information concerning the potential impacts these sites may have upon recreational use of the area.

We are on an extremely short deadline, so I would greatly appreciate it if you could fax your findings to me at (615) 481-3835. If this does not appear feasible, then you can phone me at (615) 482-1065. I have enclosed my business card for your convenience.

Thank you in advance for your cooperation.

Sincerely,

CDM Federal Programs Corporation

James Dee

James Dee

Enclosures

cc: File

(Present landfill)

Site 1 - There is one stand of Indian grass on a strip 50 meters wide, between the existing landfill and the first crop field north of the landfill. Two field trial courses do go through the area, but there maybe away to divert these, depending where the actual site of the landfill is finally located. The grass stand is located in an area that limits the ability to maintain it through burning. This area will probably have the fewest wetland concerns.

Site 2 (Old Ogden Landing Rd - between lines). Area represents vast potential for prairie restoration and maintenance. Presence of remnant prairie vegetation is scattered over the area with significant stands of Indian grass present. This area has 2 field trial courses through it and changing them would be difficult. There are some wetland types in this area.

Site 3 (Apple Orchard) - Wetlands (wet woodlands) along creek. Significant prairie grass stands developing. Represents greatest disruption of field trial activities

Site 4 (McCauley Rd). Has some stands of prairie vegetation developing. Represents greatest potential for prairie restoration due to pristine stands being in close proximity. Has 1 field trial course going through area (this could be diverted, but would cause some complaints from user groups).

On sites 2-4 stands of prairie vegetation may consist of nearly 50% of the total vegetation present. This is increasing due to our management plans. Site 1 is primarily agricultural land with one stand (3 acres) of grassland that contains approximately 10% Indian grass. Presettlement Kentucky had 3 million acres of prairie. At present, the West Ky WMA (including the above mentioned properties) contains the only large (several hundred acres) of protected remnant prairie left in the state. For further information on prairies contact Marc Evans (Ky. Nature Preserves Commission) at (502) 564-2886.

**Primary highway
hard surface** _____ **Light-duty road, hard or
improved surface** _____

Secondary highway.
hard surface

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JOPPA, ILL.-KY.

ME/4 :A CENTER 15' QUADRANGLE
N3707.5-W8845/7.5

1982

QUADRANGLE LOCATION

SCALE 1:24 000

OUR INTERVAL 10 FEET

FOUR INTERVAL TO FEET
; REPRESENT 5-FOOT CONTOURS
PHOTIC VERTICAL DATUM OF 1929

WITH NATIONAL MAP ACCURACY STANDARDS

WITH NATIONAL MAP ACCURACY STANDARDS
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AL SURVEY, LEXINGTON, KENTUCKY 40505,
T OF COMMERCE, FRANKFORT, KENTUCKY 40601

12/15/92 11:18

STATE OF KENTUCKY
KENTUCKY GEOLOGICAL SURVEY
UNIVERSITY OF KENTUCKY

HEATH QUADRANGLE
KENTUCKY
7.5 MINUTE SERIES (TOPOGRAPHIC)
N 2 1/2 LA CENTER 15' QUADRANGLE

RICHARD R. HANNAN
DIRECTOR

BRERETON C. JONES
GOVERNOR

COMMONWEALTH OF KENTUCKY
KENTUCKY STATE NATURE PRESERVES COMMISSION

407 BROADWAY
FRANKFORT, KENTUCKY 40601
(502) 564-2886

November 30, 1992

Jim Dee
CDM, Federal Programs Corp
800 Oak Ridge Turnpike
Suite 500
Oak Ridge, Tennessee 37830

Dear Mr. Dee:

I am sending you the information you requested on prairies in Kentucky. The article includes typical prairie grass species. I hope that this helps with your project. Please let me know if you need additional information.

Sincerely

A handwritten signature in cursive script that reads "Margaret Shea".

Margaret Shea
Botanist

enclosure

NATURAL COMMUNITIES OF KENTUCKY: PRAIRIES

by Marc Evans

A Natural Community is an assemblage of native plants and animals that are interrelated with each other and their environment. Natural Communities are usually differentiated based upon a number of criteria including vegetation structure, indicative plant and animal species, soil moisture, geologic substrate and topographic position. Kentucky, because of its diverse topography, varied geology and geographic location, has a wide variety of Natural Communities. Some examples of types of Natural Communities in Kentucky could include Dry Upland Forest, Limestone Savanna, Wet Bottomland Forest, Forested Acid Seep, Mesic Prairie, Marsh and Swamp.

Prairies are a type of Natural Community that have, unfortunately, essentially disappeared from the Kentucky landscape. In fact, most Kentuckians today do not even realize that prairies once covered thousands of square miles of the commonwealth and were an important part of Kentucky's rich natural heritage.

Basically, prairies are native grasslands with a relatively simple vegetative structure dominated by a layer of grasses intermixed with prairie forbs. Trees and shrubs are either absent or occur as scattered individuals or in groves. In Kentucky prairies occurred mainly on deep but sometimes shallow soil which usually overlies limestone bedrock. They required periodic fires to maintain their integrity and to control encroachment by trees and shrubs. In Kentucky they ranged in size from over one thousand square miles to small 1 acre or less openings in the forest. They usually occurred on relatively flat plains but also occurred (and a few still do) on steep slopes (often called hill prairies).

It is well documented that at the time of settlement in the late 18th century, Kentucky had a considerable amount of non-forested lands, mainly in the western part of the state (4, 5, 10, 11, 13). Early pioneers, emigrating from the east, encountered the first large grasslands they had ever seen. Not knowing the French word "prairie," they called these grasslands the "barrens" because of the lack of trees (13).

The main prairie region of the state, known as the "Big Barrens" occupied a large part of the Mississippian Plateau (Pennyroyal Plain) and extended in a crescent-shaped belt from near the Ohio River in Meade County south to Barren County then west to Christian County and then northwest to Caldwell County. Another large area of prairies also occurred further west in the Jackson Purchase (Gulf Coastal Plain). Other smaller prairie areas occurred in parts of Crittenden and Livingston Counties, Bullitt County, and Pulaski and Wayne Counties. Additionally, a number of small prairie openings were scattered throughout parts of Kentucky (2, 5, 6, 7, 8, 9, 10, 11, 12, 18).

It has been estimated that the major prairies of Kentucky occupied from 2 to 3.8 million acres (3-6,000 square miles) or roughly ten percent of the state (3, 11, 12, 13). The size of some of the larger prairies were estimated to be 60 miles by 25 miles, between the Green and Little Barren River, 90 miles by 15 miles, south of Russellville and 40 square miles northwest of the Rolling Fork (3, 11, 12). Today, most of the Barrens area is utilized for agricultural purposes, and only a few small scattered remnants remain that support prairie communities.

The origin and age of the Kentucky barrens, as well as its exact character and species composition, is not known. A number of authors have written on the subject expressing various theories as to the origin and age (2, 4, 5, 11, 12, 15, 18). Several factors, mainly climate, fire, grazing animals, soils and geology, have been attributed to

the origin of the barrens, and the age has been estimated from about 7,000 to 2,000 years old (1, 5, 6, 12, 13, 17, 19). It is known, however, that at the time of settlement the prairies were well established and were maintained by burning (either natural or Indian set) and by the extensive herds of grazing bison, elk, and deer.

With settlement came the rapid destruction of the prairies through elimination of the grazing herds, control of wild fires, and the conversion of prairie to crop and pasture lands. Areas that were not plowed or grazed were reported to have reverted to an oak-hickory woods, supporting the evidence that the prairies were fire maintained (5, 6, 13, 16) and not a climatic or edaphic climax community.

Unfortunately, no detailed descriptions or floristic lists were compiled before the elimination of the prairie. The early travelers through the prairie gave, at best, only general descriptions with little detail. The character of Kentucky's barrens was quite varied and, based on early descriptions, ranged from tall grass prairie to shrub prairie to savanna-woodland with a grassy understory (5, 6, 11, 13, 15, 16). Prairie natural communities and their species composition varied based upon soil depth, character, and moisture and ranged from wet to mesic to dry prairie. Few large streams or rivers flowed through the barrens; however, scattered sinkhole ponds and intermittent lakes occurred in parts of the prairie region.

Although prairie communities are very rare in Kentucky today, many of the prairie plants are still fairly common. They can be found scattered along roadsides and railroad rights-of-way, in old fields and other neglected, out of the way places. Like the tall grass prairies to the north and west of Kentucky, the dominant grasses in the barrens were Big bluestem (Andropogon gerardii), Little bluestem (Schizachyrium scoparium), and Indian grass (Sorghastrum nutans). Wetter prairies contained Switch grass (Panicum virgatum) and Prairie cordgrass (Spartina pectinata). Numerous prairie wildflowers also occurred such as Prairie dock (Silphium terebinthinaceum), Blazing stars (Liatris sp.), Rosinweed (Silphium integrifolium), Tall tickseed (Coreopsis tripteris), Prairie phlox (Phlox pilosa), and many sunflowers (Helianthus sp.), Asters (Aster sp.) and Goldenrods (Solidago sp.)

A number of prairie plants are considered endangered or rare in Kentucky because of their limited distribution or few known occurrences. The Kentucky Academy of Science-Kentucky Nature Preserves Commission's list of Endangered, Threatened, and Special Concern plants include 47 or so species that occur or occurred in prairies. Some of these include White heath aster (Aster pilosus var. priceae), Creame wild indigo (Baptisia leucophaea), Side-oats gramma (Bouteloua curtipendula), June grass (Koeleria cristata), Prairie blazing-star (Liatris pycnostachya), Dotted monarda (Monarda punctata), Sundrops (Oenothera triloba and O. linifolia), Sweet cone flowers (Rudbeckia subtomentosa), Royal Catchfly (Silene regia), Compass plant (Silphium laciniatum), Buffalo clover (Trifolium reflexum) and many others.

The beauty of tall grasses waving in the wind, brightly colored wildflowers scattered about and an endless horizon is a sight Kentuckians will probably never see again in the state. Prairies were a distinctive part of Kentucky's natural heritage and added considerably to our states natural diversity. The few scattered remnants which remain are in urgent need of protection and management. Much of the prairie regions of Kentucky have not yet been thoroughly inventoried so a chance still remains that other prairie remnants may exist, waiting to be discovered and protected. The Kentucky Nature Preserves Commission and The Nature Conservancy are working together to assure these areas remain as a reminder of our rich and varied natural heritage.

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NOTE: ALL LOCATIONS ARE APPROXIMATE

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ALTERNATE SITES FOR THE
PROPOSED WSFs
PADUCAH GASEOUS DIFFUSION PLANT
PADUCAH, KENTUCKY

FIGURE No. 2-1

**U.S. Department of Energy
Finding of No Significant Impact
Waste Storage Facilities at the
Paducah Gaseous Diffusion Plant, Paducah, Kentucky**

Proposed Action: The Department is proposing to construct and operate three waste storage facilities [one approximately 42,000 ft² waste storage facility for Resource Conservation and Recovery Act (RCRA) waste, one approximately 42,000 ft² waste storage facility for Toxic Substances Control Act (TSCA) waste, and one 200,000 ft² mixed (hazardous and radioactive) waste storage facility] at the Paducah Gaseous Diffusion Plant in Paducah, Kentucky. The facilities would be constructed and operated for the storage of process wastes, including wastes generated from associated Plant activities (e.g., routine maintenance, housekeeping, health and safety activities, and project-generated wastes). The process wastes, depending on their constituents, may be subject to regulation under RCRA, TSCA, or the Atomic Energy Act, as implemented by Department of Energy Order 5820.2A. Both the RCRA and the TSCA waste storage facilities would be designed to meet or exceed TSCA specifications for containment, which are more stringent than RCRA specifications, and the RCRA facility would comply with applicable RCRA requirements, including permits. The mixed waste storage facility would be operated under a RCRA permit to be issued by the Commonwealth of Kentucky. The RCRA and TSCA waste storage facilities would be located within the secured area of the Plant; the mixed waste storage facility would be located on the Plant site on a 20 acre area immediately adjacent to, but outside of, the secured area.

The Department has prepared an environmental assessment (DOE/EA-0937) that compares impacts of the proposed action with those of continuing with present practices (the "no action" alternative) and of using alternative locations for the facilities. The Department

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considered, but dismissed as unreasonable, two other alternatives: upgrading existing facilities and offsite shipment of the wastes.

Environmental Impacts: Cultural resources or areas of archaeological significance do not exist in the areas proposed for construction. The geology of the area would not be affected by construction of the proposed facilities. All areas have been previously disturbed, and no soils that are considered to be prime farmland would be disturbed.

The areas proposed for construction are owned by the Department and are not readily available for public access or recreational activities. Development of these areas as industrial sites is consistent with adjacent site development, site operations, management practices, and compliance agreement obligations. Construction of the proposed facilities would not affect the local economy on a long-term basis. The facilities would be operated by existing Plant personnel and only short-term construction employment would be created.

Big Bayou Creek may be affected by a temporary increase in siltation because of construction activities and the proximity of the construction site to Kentucky Pollutant Discharge Elimination System outfall ditches 001, 003, and 015, which drain into the Creek. Siltation would not affect local biota and would be controlled by standard construction management practices, such as silt fences or hay bales. During operation, engineering controls would minimize the potential for spills of hazardous substances from the waste storage facilities to enter the outfall ditches and ultimately Big Bayou Creek.

Two wetlands, approximately 0.5 acre total, would be filled by construction activities. These wetlands are isolated, non-headwaters wetlands, and a U.S. Army Corps of Engineers Nationwide Permit is applicable to the proposed action. A Notice of Involvement was published on October 5, 1993, in the Federal Register in accordance with 10 CFR Part 1022. The primary function and value of these wetlands is as habitat for nearby wildlife populations, especially whitetail deer. Loss of the wetlands from the proposed action would constitute a minor impact on the deer and other wildlife species.

Two acres of the 20-acre site for the mixed waste storage facility are potential summer habitat for the Indiana bat, a Federal endangered species, due to the presence of shagbark hickory, which may provide habitat to the bat during summer reproductive activities. A Biological Assessment has been conducted pursuant to section 7 of the Endangered Species Act and was submitted to the U.S. Fish and Wildlife Service for a biological opinion. Based on the availability of approximately 3000 acres of similar or more suitable habitat, the Service has concluded that the loss of two acres of potential habitat would not significantly affect the status of the Indiana bat. Nevertheless, land clearing activities would be done outside of the known maternity season to ensure that no individuals of the endangered species are affected. Impacts to Bachman's sparrow, a Federal candidate species, are unlikely due to an abundance of suitable habitat in the area.

Radiation levels from the proposed operation are not expected to exceed levels from current waste operations. In 1992, the cumulative annual skin dose to 39 waste operations workers was 496 person-rem. Waste operations workers received an average skin dose of 12.7 mrem. (The maximum recorded was 140 mrem.) The penetrating dose to the workers

was 33 person-rem, with an average penetrating dose of 0.8 mrem. Workers engaged in the proposed action would not be expected to incur any harmful effects from these exposures. Direct radiation dose to the public from normal operations would be negligible.

The alternative locations evaluated in the environmental assessment provided no environmental advantage over the preferred location and are actually less disturbed areas than the preferred location.

Copies of the environmental assessment are available from:

U.S. Department of Energy
Information Resource Center
105 Broadway
Oak Ridge, TN 37830

For further information on the proposed action, contact:

Patricia W. Phillips, NEPA Compliance Officer
Environmental Operations, SE-31
Oak Ridge Operations Office
U.S. Department of Energy
P.O. Box E
Oak Ridge, TN 37831
(615) 576-4200

For further information about the Department's National Environmental Policy Act process, contact:

Carol M. Borgstrom, Director
Office of NEPA Oversight
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, D.C. 20585
(202) 586-4600 or leave a message on (800) 472-2756

Finding: Based on the analysis of impacts in the environmental assessment, construction, operation, and ultimate closure of the proposed waste storage facilities would not significantly affect the quality of the human environment within the meaning of the National Environmental Policy Act, 42 U.S.C. 4321, et seq. Therefore, the Department is issuing this finding of no significant impact and an environmental impact statement is not required.

Signed in Washington, D.C. this 5th day of August, 1994.

Tara O'Toole, M.D., M.P.H.
Assistant Secretary
Environment, Safety and Health

Figure 3-3

MWSF Proposed Location
Major Topographical Features

Proposed Location
for
MWSF