DOE/EA-1493

ENVIRONMENTAL ASSESSMENT

GREENIDGE MULTI-POLLUTANT CONTROL PROJECT

AES GREENIDGE STATION
DRESDEN, NEW YORK

August 2004

U.S. DEPARTMENT OF ENERGY

TABLE OF CONTENTS

LIST OF FIGURES vii
LIST OF TABLES vii
ACRONYMS AND ABBREVIATIONS ix

1. PURPOSE AND NEED FOR AGENCY ACTION 1-1
   1.1 INTRODUCTION 1-1
   1.2 PROPOSED ACTION 1-2
   1.3 PURPOSE 1-3
   1.4 NEED 1-3
   1.5 NATIONAL ENVIRONMENTAL POLICY ACT STRATEGY 1-3

2. THE PROPOSED ACTION AND ALTERNATIVES 2-1
   2.1 PROPOSED ACTION 2-1
      2.1.1 Project Location and Background 2-1
      2.1.2 Technology Description 2-5
      2.1.3 Project Description 2-7
      2.1.4 Construction Plans 2-7
      2.1.5 Operational Plans 2-8
      2.1.6 Resource Requirements 2-9
         2.1.6.1 Land Area Requirements 2-9
         2.1.6.2 Water Requirements 2-9
         2.1.6.3 Fuel and Sorbent Requirements 2-12
      2.1.7 Outputs, Discharges, and Wastes 2-15
         2.1.7.1 Air Emissions 2-15
         2.1.7.2 Liquid Discharges 2-15
         2.1.7.3 Solid Wastes 2-16
         2.1.7.4 Toxic and Hazardous Materials 2-16
   2.2 ALTERNATIVES 2-17
      2.2.1 No-Action Alternative 2-17
      2.2.2 Alternatives Dismissed from Further Consideration 2-19
         2.2.2.1 Alternative Sites 2-20
         2.2.2.2 Alternative Technologies 2-20
         2.2.2.3 Other Alternatives 2-20

3. EXISTING ENVIRONMENT 3-1
   3.1 SITE DESCRIPTION, LAND USE, AND AESTHETICS 3-1
   3.2 ATMOSPHERIC RESOURCES 3-1
      3.2.1 Climate 3-1
      3.2.2 Air Quality 3-2
   3.3 SURFACE WATER RESOURCES 3-5
      3.3.1 Hydrology 3-5
      3.3.2 Water Quality and Use 3-6
         3.3.2.1 Water Quality 3-6

3.3.2.2 Water Use 3-6
3.3.3 Effluent Discharges 3-6
3.3.4 Thermal Discharge 3-7
3.4 GEOLOGICAL RESOURCES 3-7
3.4.1 Geology and Topography 3-7
3.4.2 Geological Hazards 3-8
3.4.3 Geological Resources 3-8
3.4.4 Groundwater 3-9
3.5 FLOODPLAINS AND WETLANDS 3-10
3.5.1 Floodplains 3-10
3.5.2 Wetlands 3-10
3.6 ECOLOGICAL RESOURCES 3-10
3.6.1 Terrestrial Ecology 3-10
3.6.2 Aquatic Ecology 3-11
3.6.3 Threatened and Endangered Species 3-11
3.6.4 Biodiversity 3-12
3.7 CULTURAL RESOURCES 3-12
3.8 SOCIOECONOMICS 3-13
3.8.1 Population 3-13
3.8.2 Employment and Income 3-13
3.8.3 Housing 3-15
3.8.4 Water and Wastewater Services 3-16
3.8.5 Local Government Revenues 3-16
3.8.6 Environmental Justice 3-16
3.9 TRANSPORTATION AND NOISE 3-17
3.9.1 Transportation 3-17
3.9.1.1 Roads 3-17
3.9.1.2 Rail 3-17
3.9.2 Noise 3-18

4. ENVIRONMENTAL CONSEQUENCES 4-1
4.1 ENVIRONMENTAL IMPACTS OF THE PROPOSED PROJECT 4-1
4.1.1 Land Use and Aesthetics 4-1
4.1.1.1 Land Use 4-1
4.1.1.2 Aesthetics 4-1
4.1.2 Atmospheric Resources and Air Quality 4-2
4.1.2.1 Construction 4-2
4.1.2.2 Operation 4-2
4.1.3 Surface Water Resources 4-6
4.1.3.1 Construction 4-6
4.1.3.2 Operation 4-6
4.1.4 Geological Resources 4-7
4.1.4.1 Rock, Soils, and Mineral Resources 4-7
4.1.4.2 Groundwater 4-7
4.1.4.3 Geological Hazards 4-8
4.1.5 Floodplains and Wetlands 4-8
4.1.5.1 Floodplains 4-8

4.1.5.2 Wetlands 4-8
4.1.6 Ecological Resources 4-8
4.1.6.1 Terrestrial Ecology 4-8
4.1.6.2 Aquatic Ecology 4-9
4.1.6.3 Threatened and Endangered Species 4-9
4.1.6.4 Biodiversity 4-9
4.1.7 Waste Management 4-9
4.1.7.1 Construction 4-9
4.1.7.2 Operation 4-10
4.1.7.3 Hazardous Waste 4-13
4.1.8 Cultural Resources 4-14
4.1.9 Socioeconomic Resources 4-14
4.1.9.1 Population 4-15
4.1.9.2 Employment and Income 4-15
4.1.9.3 Housing 4-16
4.1.9.4 Water and Wastewater Services 4-16
4.1.9.5 Local Government Revenues 4-16
4.1.9.6 Environmental Justice 4-17
4.1.10 Transportation and Noise 4-17
4.1.10.1 Transportation 4-17
4.1.10.2 Noise 4-18
4.1.11 Electromagnetic Fields 4-20
4.1.12 Human Health and Safety 4-20
4.2 POLLUTION PREVENTION MEASURES 4-21
4.3 ENVIRONMENTAL IMPACTS OF NO ACTION 4-23

5. IMPACTS OF COMMERCIAL OPERATION 5-1

6. CUMULATIVE EFFECTS 6-1

7. REGULATORY COMPLIANCE AND PERMIT REQUIREMENTS 7-1
7.1 FEDERAL REQUIREMENTS 7-1
7.2 STATE REQUIREMENTS 7-4

8. IRREVERSIBLE OR IRRETRIEVABLE COMMITMENTS OF RESOURCES . 8-1

9. THE RELATIONSHIP BETWEEN SHORT-TERM USES OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY 9-1

10. REFERENCES 10-1

11. LIST OF AGENCIES AND INDIVIDUALS CONTACTED 11-1

APPENDIX A CONSULTATION LETTERS UNDER SECTION 7 OF THE ENDANGERED SPECIES ACT A-1

APPENDIX B CONSULTATION LETTERS UNDER SECTION 106 OF THE

NATIONAL HISTORIC PRESERVATION ACT B-1

APPENDIX C PUBLIC PARTICIPATION LETTERS..... C-1

LIST OF FIGURES

2.1.1 Regional location map for the proposed project 2-1
2.1.2 Site of Greenidge Station and Lockwood Landfill 2-3
2.1.3 Photograph of Greenidge Station, as viewed toward the northwest 2-4
2.1.4 Photograph of the site for the proposed project at Greenidge Station, as viewed toward the northwest 2-4
2.1.5 A generalized diagram of the proposed multi-pollutant control system 2-6
2.1.6 Water flow diagram that depicts water requirements and discharges at Greenidge Station 2-13
3.2.1 Wind rose for Penn Yan, New York (1999-2003) 3-2

LIST OF TABLES

2.1.1 Typical operating characteristics for Greenidge Station Unit 4 alone and combined with Unit 3 2-10
2.1.2 Composition of bituminous coal consumed at Greenidge Station 2-14
3.2.1 National Ambient Air Quality Standards (NAAQS) for criteria pollutants 3-4
3.2.2 Allowable increments for Prevention of Significant Deterioration (PSD) of air quality 3-5
3.8.1 Population data for Yates County, Ontario County, and selected communities 3-13
3.8.2 Employment and income data for Yates County and Ontario County in 2000 3-13
3.8.3 Employment by industry or economic sector in Yates County and Ontario County in 2000 3-14
3.8.4 Housing data for Yates County, Ontario County, and selected communities in 2000 3-15
3.8.5 Environmental justice data for the United States, the state of New York, Yates County, and the five Census Tracts within Yates County 3-17
4.1.1 Ambient air quality standards impact analysis for the proposed project 4-4
4.1.2 Prevention of Significant Deterioration (PSD) impact analysis for the proposed project 4-4
4.1.3 State Pollutant Discharge Elimination System (SPDES) permit limits and reported values for discharge from the Lockwood Landfill sedimentation/neutralization basin 4-11
4.1.4 Selected data from monitoring of leachate collection drains at Lockwood Landfill during 2002 4-12
4.2.1 Pollution prevention measures developed for the proposed project at Greenidge Station 4-22

ACRONYMS AND ABBREVIATIONS

ADT	average daily traffic
AES	Applied Energy Services
Btu	British thermal unit
CAA	Clean Air Act
$CaCO_3$	calcium carbonate
CDS	circulating dry scrubber
CEQ	Council on Environmental Quality
CFR	*Code of Federal Regulations*
cfs	cubic feet per second
cm	centimeter
CO	carbon monoxide
CO_2	carbon dioxide
COE	U.S. Army Corps of Engineers
CWA	Clean Water Act
dB	decibels
dB(A)	decibels as measured on the A-weighted scale
DOE	U.S. Department of Energy
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMF	electromagnetic fields
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
ESP	electrostatic precipitator
°F	degrees Fahrenheit
FGD	flue gas desulfurization
FONSI	Finding of No Significant Impact
FR	*Federal Register*
ft	feet
ft^3	cubic feet
FWS	U.S. Fish and Wildlife Service
g	the acceleration of gravity
gpd	gallons per day
gpm	gallons per minute
H_2O	water
HCl	hydrogen chloride
HF	hydrogen fluoride
Hg	mercury
in.	inch
lb	pound
μg	microgram
μm	micrometer
m^3	cubic meter
mg	milligram
mg/L	milligrams per liter

MGD	million gallons per day
MW	megawatt
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NH_3	ammonia
NHPA	National Historic Preservation Act of 1966
NIOSH	National Institute for Occupational Safety and Health
NO_2	nitrogen dioxide
NO_X	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NYSDEC	New York State Department of Environmental Conservation
O_3	ozone
ORNL	Oak Ridge National Laboratory
OSHA	Occupational Safety and Health Administration
Pb	lead
pH	hydrogen-ion concentration notation
PM-10	particulate matter less than 10 μm in aerodynamic diameter
PM-2.5	particulate matter less than 2.5 μm in aerodynamic diameter
PPE	personal protective equipment
PPII	Power Plant Improvement Initiative
ppm	parts per million
PSD	Prevention of Significant Deterioration
Pub. L.	Public Law
RCRA	Resource Conservation and Recovery Act
REL	Recommended Exposure Limit
SCR	selective catalytic reduction
SCREEN3	a screening air dispersion model
sec	second
SGLP	Synthetic Groundwater Leaching Procedure
SHPO	State Historic Preservation Officer
SO_2	sulfur dioxide
SO_3	sulfur trioxide
SPCCP	spill prevention, control, and countermeasures plan
SPDES	State Pollutant Discharge Elimination System
SPL	Sound Pressure Level
TCLP	toxic characteristic leaching procedure
TWA	time weighted average
USC	*United States Code*
USGS	U. S. Geological Survey
V_2O_5	vanadium pentoxide
VOCs	volatile organic compounds
yd^3	cubic yard