MARYLAND DEPARTMENT OF NATURAL RESOURCES

PPSE-D-10-1
DNR Publication No. 12-8132010-470

PPRP

Environmental Review of the Proposed Combined Cycle Facility at Mirant's Dickerson Site

May 2005

MARYLAND POWER PLANT RESEARCH PROGRAM

Martin O'Malley, Governor ♦ Anthony G. Brown, Lt. Governor

The Maryland Department of Natural Resources (DNR) seeks to preserve, protect and enhance the living resources of the State. Working in partnership with the citizens of Maryland, this worthwhile goal will become a reality. This publication provides information that will increase your understanding of how DNR strives to reach that goal through its many diverse programs.

John R. Griffin, Secretary
Maryland Department of Natural Resources

The facilities and services of the Maryland Department of Natural Resources are available to all without regard to race, color, religion, sex, sexual orientation, age, national origin or physical or mental disability.

This document is available in alternative format upon request from a qualified individual with a disability.

Maryland Department of Natural Resources
Tawes State Office Building
580 Taylor Avenue
Annapolis, Maryland 21401-2397
Toll Free in Maryland: 1-877-620-8DNR x8660
Outside Maryland: 1-410-260-8660
TTY users call via the Maryland Relay
www.dnr.maryland.gov

Printed on Recycled Paper

Environmental Review of the Proposed Combined Cycle Facility at Mirant's Dickerson Site

May 2005

Prepared Under the Direction of:

Sandra Shaw Patty
Power Plant Research Program

Prepared By:

Connie Faustini, Robert Keating, Diane Mountain, Heather Wattenbach
Environmental Resources Management
Annapolis, Maryland

Julie Ross, Mark Garrison
Environmental Resources Management
Exton, Pennsylvania

Steve Schreiner
Versar, Inc.
Columbia, Maryland

Peter Hall
Metametrics, Inc.
Charlottesville, Virginia

Prepared For:

Power Plant Research Program
Maryland Department of Natural Resources
Tawes State Office Building, B-3
Annapolis, Maryland

FOREWORD

In May 2001, Mirant Mid-Atlantic, LLC proposed to construct a combined cycle facility on its existing Dickerson site. As part of the Public Service Commission licensing process, the Department of Natural Resources Power Plant Research Program, along with other State agencies, performed an environmental review of the proposed expansion.

The objectives of this report are to evaluate the potential impacts to environmental and cultural resources from the proposed facility. This report then summarizes the Power Plant Research Program's findings.

This report was prepared for the Power Plant Research Program in accordance with Section 3-304 of the Natural Resources Article of the Annotated Code of Maryland by Environmental Resources Management, Inc. (ERM), Versar, Inc. and Metametrics, Inc.

ABSTRACT

This report provides an environmental assessment of Mirant Mid Atlantic, LLC's proposal to construct a combined cycle facility on their existing Dickerson site, which currently consists of simple cycle units. The proposal, submitted in May 2001, includes both the conversion of the simple cycle units and the addition of a second combined cycle unit. It is a modified version of a similar proposal made by PEPCO, the former owner of the site, in 1990. The project will increase the nominal generating capacity of the Dickerson site (currently 540 MW) by 726 MW.

More specifically, this report synthesizes the evaluations prepared by the Power Plant Research Program (PPRP), along with other State agencies, in response to the proposed expansion. The information is presented as follows:

- A description of the site and proposed facility components;
- A description of the existing environmental and socioeconomic conditions at the site and in the vicinity;
- A regulatory applicability and impact analysis with respect to air emissions from the proposed facility;
- An analysis of other impact issues, including biological and socioeconomic resources and noise impacts;
- An evaluation of water supply and potential impacts to surface water resources as a result of the proposed facility;
- A comparison of the project's key environmental characteristics to those of an alternative power plant proposal at a nearby site;
- A description of the cumulative impacts of the proposed facility in conjunction with other existing and proposed plants in the vicinity;
- A summary of the findings of PPRP's evaluations.

Finally, this report includes the recommendations that were developed by the Department of Natural Resources (DNR) PPRP upon conclusion of its review. The recommendations, directed to the Public Service Commission, are for licensing conditions to be imposed upon the operation of the proposed facility to address the potential impacts analyzed in this report and were are made pursuant to Section 3-306 of the Natural Resources Article. DNR's recommendations were made in concert with the Departments of Environment, Agriculture, Business and Employment Development, Planning, and Transportation, the Office of Smart Growth, and the Maryland Energy Administration (the "State agencies").

TABLE OF CONTENTS

1.0 INTRODUCTION 1-1

1.1 BACKGROUND 1-1

1.2 COMPARATIVE AND CUMULATIVE STUDIES 1-3

1.3 REPORT ORGANIZATION 1-4

2.0 PROJECT DESCRIPTION 2-1

2.1 SITE DESCRIPTION 2-1

2.2 EXISTING FACILITY 2-1

2.3 PROPOSED PROJECT COMPONENTS 2-1

3.0 EXISTING SITE CONDITIONS 3-1

3.1 TOPOGRAPHY, SOILS, AND GEOLOGY 3-1

3.2 WATER RESOURCES 3-1

3.2.1 Surface Water 3-1
3.2.2 Ground Water 3-3

3.3 CLIMATOLOGY AND AIR QUALITY 3-3

3.4 BIOLOGICAL RESOURCES 3-6

3.4.1 Vegetation and Land Cover 3-6
3.4.2 Wildlife 3-7
3.4.3 Threatened and Endangered Species 3-9
3.4.4 Aquatic Wildlife Resources 3-10

3.5 REGIONAL SOCIOECONOMIC SETTING 3-11

3.5.1 Population Trends 3-11
3.5.2 Employment and Income Trends 3-12
3.5.3 Land Use and Zoning 3-13
3.5.4 Transportation 3-17
3.5.5 Public Safety 3-18

TABLE OF CONTENTS (CONTINUED)

3.6	***NOISE***		***3-18***
	3.6.1	*Definition of Noise*	*3-18*
	3.6.2	*Existing Noise Levels*	*3-19*
4.0	***AIR QUALITY IMPACTS***		***4-1***
4.1	***IMPACT ASSESSMENT BACKGROUND AND METHODOLOGY***		***4-1***
	4.1.1	*Overview*	*4-1*
	4.1.2	*Regulatory Considerations*	*4-1*
4.2	***PROPOSED PROJECT SOURCE CHARACTERIZATION***		***4-3***
	4.2.1	*Proposed New Sources*	*4-3*
	4.2.2	*Sequencing of the Project*	*4-4*
	4.2.3	*Potential Emissions Prior to Combined Cycle Operations*	*4-6*
	4.2.4	*Potential Emissions Once HRSGs Become Operational*	*4-7*
	4.2.5	*Existing Dickerson Station*	*4-10*
	4.2.6	*Net Emissions Increase Determination*	*4-10*
4.3	***PREVENTION OF SIGNIFICANT DETERIORATION (PSD)***		***4-27***
	4.3.1	*Applicability*	*4-27*
	4.3.2	*Best Available Control Technology (BACT)*	*4-29*
	4.3.3	*NAAQS and PSD Increment Compliance Demonstration*	*4-47*
	4.3.4	*Additional Impact Analyses*	*4-81*
4.4	***NONATTAINMENT NEW SOURCE REVIEW (NA-NSR)***		***4-100***
4.5	***EVALUATION OF NETTING IMPACTS FOR PSD AND NA-NSR***		***4-100***
	4.5.1	*Nitrogen Deposition*	*4-101*
	4.5.2	*NAAQS for NO_2*	*4-102*
	4.5.3	*Visibility in the Shenandoah National Park*	*4-103*
	4.5.4	*Ozone*	*4-104*
4.6	***APPLICABLE REQUIREMENTS REVIEW***		***4-105***
	4.6.1	*Federal Requirements*	*4-105*
	4.6.2	*State Requirements*	*4-111*

TABLE OF CONTENTS (CONTINUED)

5.0 ANALYSIS OF OTHER ENVIRONMENTAL IMPACTS 5-1

5.1 IMPACTS TO SURFACE WATER QUALITY AND AQUATIC BIOTA 5-1
5.1.1 Stormwater 5-1
5.1.2 Water Withdrawals 5-1
5.1.3 Cooling Tower Blowdown 5-2
5.1.4 Wastewater 5-5

5.2 IMPACTS TO TERRESTRIAL RESOURCES 5-5
5.2.1 Vegetation and Land Cover 5-5
5.2.2 Wetlands 5-6
5.2.3 Wildlife 5-6
5.2.4 Threatened and Endangered Species 5-6

5.3 ACCIDENTAL RELEASES 5-8

5.4 GROUND WATER IMPACTS 5-8

5.5 SOCIOECONOMIC AND CULTURAL IMPACTS 5-9
5.5.1 Employment and Income 5-9
5.5.2 Population and Housing 5-10
5.5.3 Transportation 5-10
5.5.4 Land Use 5-15
5.5.5 Visual Quality 5-16
5.5.6 Fiscal 5-17
5.5.7 Cultural Impacts 5-22

5.6 NOISE IMPACTS 5-25
5.6.1 Summary of Regulatory Requirements 5-25
5.6.2 Noise Impacts from Construction 5-25
5.6.3 Noise Impacts from Operation 5-26

6.0 WATER SUPPLY 6-1

6.1 WATER REQUIREMENTS 6-1

6.2 MARYLAND APPROPRIATIONS 6-2

6.3 AVAILABILITY OF WATER SUPPLY 6-3
6.3.1 Potomac River Flow 6-3
6.3.2 Potomac River Water Use 6-4
6.3.3 Environmental Flow-by 6-6

TABLE OF CONTENTS (CONTINUED)

6.4 ASSESSMENT OF IMPACTS 6-8
6.4.1 Impact on Potomac River Water Users 6-8
6.4.2 Impact on Aquatic Ecology 6-9

6.5 POTENTIAL FOR FUTURE WATER USE CONFLICTS 6-9
6.5.1 Single Plant Analysis 6-10

7.0 COMPARATIVE ASSESSMENT 7-1

7.1 PROJECT DESCRIPTIONS 7-1

7.2 DISCUSSION OF COMPARATIVE FACTORS 7-2

8.0 CUMULATIVE IMPACTS 8-1

8.1 AIR QUALITY 8-3
8.1.1 Overview of the Air Quality Cumulative Impact Assessment 8-3
8.1.2 Evaluation of NAAQS and PSD Increments 8-4
8.1.3 Class I Area Analysis 8-5

8.2 WATER SUPPLY 8-8

8.3 AQUATIC IMPACTS 8-11
8.3.1 Thermal Impacts 8-11
8.3.2 Water Quality Impacts from Discharges 8-13
8.3.3 Water Consumption Impacts on River Stage and Habitat 8-13

8.4 TERRESTRIAL/WATERSHED IMPACTS 8-16

8.5 CUMULATIVE SOCIOECONOMIC IMPACTS 8-17
8.5.1 Employment and Population 8-17
8.5.2 Traffic 8-17
8.5.3 Cultural Resources and Visual Impacts 8-18
8.5.4 Property Values 8-19
8.5.5 Land Use 8-20

8.6 SUMMARY OF CUMULATIVE IMPACTS 8-21

9.0 SUMMARY AND RECOMMENDATIONS 9-1

TABLE OF CONTENTS (CONTINUED)

9.1 AIR QUALITY ***9-1***
9.1.1 Source Characterization and Control Technology *9-1*
9.1.2 Compliance with Air Quality Standards *9-1*
9.1.3 Impacts of Netting *9-2*

9.2 SURFACE WATER QUALITY AND AQUATIC BIOTA ***9-2***

9.3 TERRESTRIAL RESOURCES ***9-3***

9.4 ACCIDENTAL RELEASES AND GROUND WATER IMPACTS ***9-3***

9.5 SOCIOECONOMIC AND CULTURAL IMPACTS ***9-4***
9.5.1 Traffic *9-4*
9.5.2 Land Use *9-5*
9.5.3 Visual Quality *9-5*

9.6 NOISE IMPACTS ***9-6***

9.7 WATER SUPPLY ***9-7***
9.7.1 Water Requirements *9-7*
9.7.2 Impact Assessment *9-7*

9.8 COMPARATIVE AND CUMULATIVE ANALYSES ***9-8***

10.0 REFERENCES ***10-1***

LIST OF TABLES

3-1	*BREAKDOWN OF EMPLOYMENT LOCATIONS FOR DICKERSON AREA RESIDENTS*	*3-13*
3-2	*PROTECTIVE EASEMENTS IN MONTGOMERY COUNTY*	*3-15*
3-3	*TYPICAL SOUND LEVELS FOR COMMON SOURCES*	*3-19*
3-4	*AMBIENT SOUND PRESSURE LEVELS AT DICKERSON SITE*	*3-22*
4-1	*AIR EMISSION SOURCES*	*4-4*
4-2	*SHORT-TERM EMISSION RATES: UNTIL HRSGS BECOME OPERATIONAL*	*4-8*
4-3	*MAXIMUM ANNUAL EMISSION RATES UNTIL HRSGS BECOME OPERATIONAL*	*4-9*
4-4	*SHORT-TERM EMISSION RATES UNDER VARIOUS OPERATING CONDITIONS*	*4-11*
4-5	*MAXIMUM ANNUAL EMISSION RATES*	*4-12*
4-6	*HAZARDOUS AIR POLLUTANT EMISSIONS FROM UNITS 4 AND 5*	*4-13*
4-7	*HAZARDOUS AIR POLLUTANT EMISSIONS FROM THE BOILER*	*4-14*
4-8	*ACTUAL EMISSIONS FROM EXISTING DICKERSON STATION*	*4-15*
4-9	*SUMMARY OF NET EMISSIONS INCREASE*	*4-18*
4-10	*SUMMARY OF EMISSIONS DECREASES*	*4-25*
4-11	*SUMMARY OF THE NET EMISSIONS INCREASE EVALUATION*	*4-26*
4-12	*PSD APPLICABILITY*	*4-28*
4-13	*BACT PROPOSAL FOR CO*	*4-32*

LIST OF TABLES (CONTINUED)

4-14	*BACT PROPOSAL FOR PM*	*4-33*
4-15	*BACT PROPOSAL FOR SO_2 AND H_2SO_4*	*4-34*
4-16	*COST EVALUATION: CO CATALYTIC OXIDATION EMISSIONS CONTROL*	*4-37*
4-17	*COST EVALUATION: PM EMISSIONS CONTROL*	*4-46*
4-18	*AMBIENT AIR QUALITY THRESHOLDS*	*4-48*
4-19	*MAXIMUM PREDICTED CONCENTRATIONS USING AERMOD: EXPANSION PROJECT SOURCES ONLY*	*4-58*
4-20	*MAXIMUM PREDICTED CONCENTRATIONS USING AERMOD: BY SOURCE/SOURCE GROUP*	*4-59*
4-21	*OFF-SITE SOURCES MODELED FOR THE PSD INCREMENT AND NAAQS ANALYSIS*	*4-66*
4-22	*MAXIMUM PREDICTED CONCENTRATIONS USING AERMOD: EXPANSION PROJECT AND OFF-SITE SOURCES*	*4-67*
4-23	*MAXIMUM PREDICTED CONCENTRATIONS USING AERMOD: EXPANSION PROJECT AND OFF-SITE SOURCES BY SOURCE/SOURCE GROUP*	*4-68*
4-24	*MAXIMUM PREDICTED AND MONITORED CONCENTRATION COMPARISONS*	*4-70*
4-25	*MAXIMUM PREDICTED CONCENTRATIONS RESULTING FROM ALTERNATIVE MODELS ISC AND ISCPRIME*	*4-73*
4-26	*SACTI MODELING RESULTS FOR THE MIRANT DICKERSON EXPANSION PROJECT WET COOLING TOWER*	*4-82*
4-27	*COMPARISON OF CLASS I AND CLASS II INCREMENTS*	*4-83*
4-28	*CALMET WIND FIELD PARAMETERS*	*4-89*
4-29	*CALPUFF PREDICTED IMPACTS IN THE CLASS I AREAS*	*4-93*

LIST OF TABLES (CONTINUED)

4-30	*VISIBILITY IMPACTS IN THE SHENANDOAH NATIONAL PARK*	*4-96*
4-31	*PROJECTED FORMALDEHYDE CONCENTRATIONS DICKERSON UNITS 4 AND 5*	*4-109*
4-32	*BOILER MACT EMISSIONS LIMITATIONS AND WORK PRACTICE STANDARDS FOR NEW SOURCES*	*4-111*
5-1	*THERMAL DISCHARGES TO THE POTOMAC RIVER FROM THE EXISTING DICKERSON STATION AND PROPOSED EXPANSION*	*5-2*
5-2	*AVERAGE CONCENTRATION OF BLOWDOWN WATER CONSTITUENTS FOR DICKERSON UNITS 4 AND 5 (MG/L)*	*5-4*
5-3	*ESTIMATED LEVELS OF SERVICE ON SELECTED HIGHWAY SEGMENTS DURING THE PEAK CONSTRUCTION PERIOD*	*5-12*
5-4	*CALCULATED SOUND PRESSURE LEVELS (IN DBA) RESULTING FROM OPERATION OF GENERATING COMPONENTS, PROJECTED TO RECEPTOR LOCATIONS*	*5-29*
6-1	*MIRANT'S MAXIMUM DAILY CONSUMPTIVE WITHDRAWAL COMPARED TO RIVER FLOW AT POINT OF ROCKS*	*6-8*
6-2	*SUMMARY OF MODELED OCCURRENCE OF WATER SUPPLY RELEASE DAYS FOR THE MIRANT PLANT*	*6-12*
6-3	*PEAK POWER DEMAND FOR YEARS 1997 TO 2002*	*6-14*
7-1	*COMPARATIVE ASSESSMENT RESULTS*	*7-2*
8-1	*POWER PLANT CONSUMPTIVE USE SCENARIOS EVALUATED*	*8-9*
8-2	*SUMMARY OF MODELED OCCURRENCE OF WATER SUPPLY RELEASE DAYS FOR THREE PLANTS*	*8-10*
8-3	*CUMULATIVE THERMAL DISCHARGES TO THE FRESHWATER POTOMAC RIVER IN CENTRAL MARYLAND FROM EXISTING AND POTENTIAL FUTURE POWER PLANTS*	*8-12*

LIST OF TABLES (CONTINUED)

8-4 CHANGE IN RIVER STAGE FROM 3 ADDITIONAL CLOSED-CYCLE POWER PLANTS CONSUMING 24 MGD (37 CFS) OF WATER UPSTREAM FROM THESE GAGING STATIONS DURING A DROUGHT CONDITION *8-14*

8-5 HABITAT REDUCTION IN THE LOWER FRESHWATER POTOMAC RIVER DUE TO POTENTIAL CLOSED-CYCLE COOLING WATER WITHDRAWALS FROM 3 FACILITIES IN CENTRAL MARYLAND, BASED ON HISTORICAL HABITAT MODEL RESULTS PRESENTED IN MDNR (1981) FOR TRANSECTS IN THE CARDEROCK AREA *8-16*

LIST OF FIGURES

1-1	*DICKERSON SITE LOCATION*	*1-2*
2-1	*SITE PLAN, DICKERSON STATION*	*2-3*
3-1	*WIND ROSE DIAGRAM*	*3-5*
3-2	*POPULATION DENSITY IN MONTGOMERY COUNTY*	*3-12*
3-3	*AGRICULTURAL PRESERVATION EASEMENTS IN MONTGOMERY COUNTY*	*3-16*
3-4	*TRAFFIC VOLUME ON MD 28 FROM 1996-2000*	*3-17*
3-5	*MIRANT NOISE SURVEY LOCATIONS AND NOISE LEVELS OBSERVED DURING MONITORING*	*3-20*
4-1	*MIRANT DICKERSON WIND ROSES FROM THREE LEVELS*	*4-53*
4-2	*TERRAIN FEATURES IN THE VICINITY OF DICKERSON, MD AND STERLING, VA*	*4-54*
4-3	*ILLUSTRATION OF CANDIDATE SO_2 SOURCES FOR MULTI-SOURCE MODELING*	*4-63*
4-4	*ILLUSTRATION OF CANDIDATE PM10 SOURCES FOR MULTI-SOURCE MODELING*	*4-64*
4-5	*AERMOD 24-HR SO_2 CONCENTRATIONS PROJECT SOURCES ONLY*	*4-74*
4-6	*AERMOD 24-HR SO_2 CONCENTRATIONS SOURCES OUTSIDE OF SIA*	*4-75*
4-7	*AERMOD 24-HR SO_2 CONCENTRATIONS ALL SOURCES*	*4-76*
4-8	*ISCST3 24-HR SO_2 CONCENTRATIONS PROJECT SOURCES ONLY*	*4-77*

LIST OF FIGURES (CONTINUED)

4-9	*ISCST3 24-HR SO_2 CONCENTRATIONS SOURCES OUTSIDE OF SIA*	*4-78*
4-10	*ISCST3 24-HR SO_2 CONCENTRATIONS ALL SOURCES*	*4-79*
4-11	*EXTENT OF MODELING DOMAIN*	*4-86*
4-12	*COMPARISON OF SURFACE WIND FIELDS (NIGHT)*	*4-88*
4-13	*COMPARISON OF SURFACE WIND FIELDS (DAY)*	*4-90*
4-14	*COMPARISON OF ELEVATED WIND FIELDS (DAY)*	*4-91*
4-15	*COMPARISON OF EXISTING, NEW, AND NET VISIBILITY IMPACTS*	*4-98*
5-1	*APPROXIMATE RECEPTOR LOCATIONS USED IN NOISE ANALYSIS*	*5-28*
6-1	*WATER BALANCE, DICKERSON STATION*	*following page 6-1*
6-2	*LOCATION OF LITTLE FALLS AND GREAT FALLS ON THE POTOMAC RIVER*	*6-7*
6-3	*SEASONAL DISTRIBUTION OF MODELED RELEASE DAYS FOR YEARS IN WHICH RELEASES OCCUR*	*6-13*
6-4	*COMPARISON OF MONTHLY PJM 90% PEAK LOAD EVENTS FOR THE YEARS 1997-2002*	*6-15*
8-1	*LOCATION OF POTENTIAL PLANTS EVALUATED IN COMPARATIVE AND CUMULATIVE ANALYSES*	*8-2*
8-2	*CROSS-SECTION PROFILE OF THE POTOMAC RIVER AT POINT OF ROCKS DURING LOW-FLOW PERIODS*	*8-15*

LIST OF APPENDICES

APPENDIX A	*LETTER OF RECOMMENDATION AND INITIAL RECOMMENDED LICENSING CONDITIONS, PSC CASE NO. 8888*
APPENDIX B	*SEARCH OF RBLC DATABASE*
APPENDIX C	*CUMULATIVE AIR QUALITY IMPACT ANALYSIS*
APPENDIX D	*PSC ORDER FOR THE MIRANT CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY PSC CASE NO. 8888*

1.0 INTRODUCTION

1.1 BACKGROUND

Mirant Mid-Atlantic, LLC, has proposed to construct a combined cycle facility on its existing Dickerson site on the Potomac River in western Montgomery County, Maryland. Figure 1-1 shows the existing site boundary and its location within Maryland.

The Dickerson power plant includes three coal-fired units (total capacity about 540 MW) located on the western portion of the site, adjacent to the river. Potomac Electric Power Company (PEPCO) formerly owned the facility; Mirant purchased PEPCO's generating assets in Maryland in 2000. PEPCO retained its switchyard and transmission facilities, and still owns about 200 of the Dickerson site's 1,000 acres.

PEPCO had previously planned to construct a combined cycle facility at Dickerson, and in 1990 received a license to construct two combined cycle units, designated "Station H" (Case No. 8063 before the Maryland Public Service Commission, PSC). However, the company elected to go forward with building only the simple cycle portion of one of the units, consisting of two simple cycle combustion turbines (nominal capacity 294 MW total). Mirant is now proposing to build a modified version of that earlier PEPCO proposal, by converting the simple cycle combustion turbines to combined cycle and by adding a second combined cycle unit. Much of the site preparation for this buildout was done in the early 1990s as part of Station H construction.

The Department of Natural Resources (DNR) Power Plant Research Program (PPRP), coordinating with other State agencies, performed this environmental review of the Dickerson expansion as part of the PSC licensing process. Before the new units can be constructed, the PSC must grant a Certificate of Public Convenience and Necessity (CPCN). PPRP's environmental review was conducted to evaluate the potential impacts to environmental and cultural resources from the proposed facility, pursuant to Section 3-304 of the Natural Resources Article of the Annotated Code of Maryland.

DNR used the analysis of potential impacts as the basis for establishing recommended license conditions (presented in Appendix A of this report) for operating the proposed facility, pursuant to Section 3-306 of the

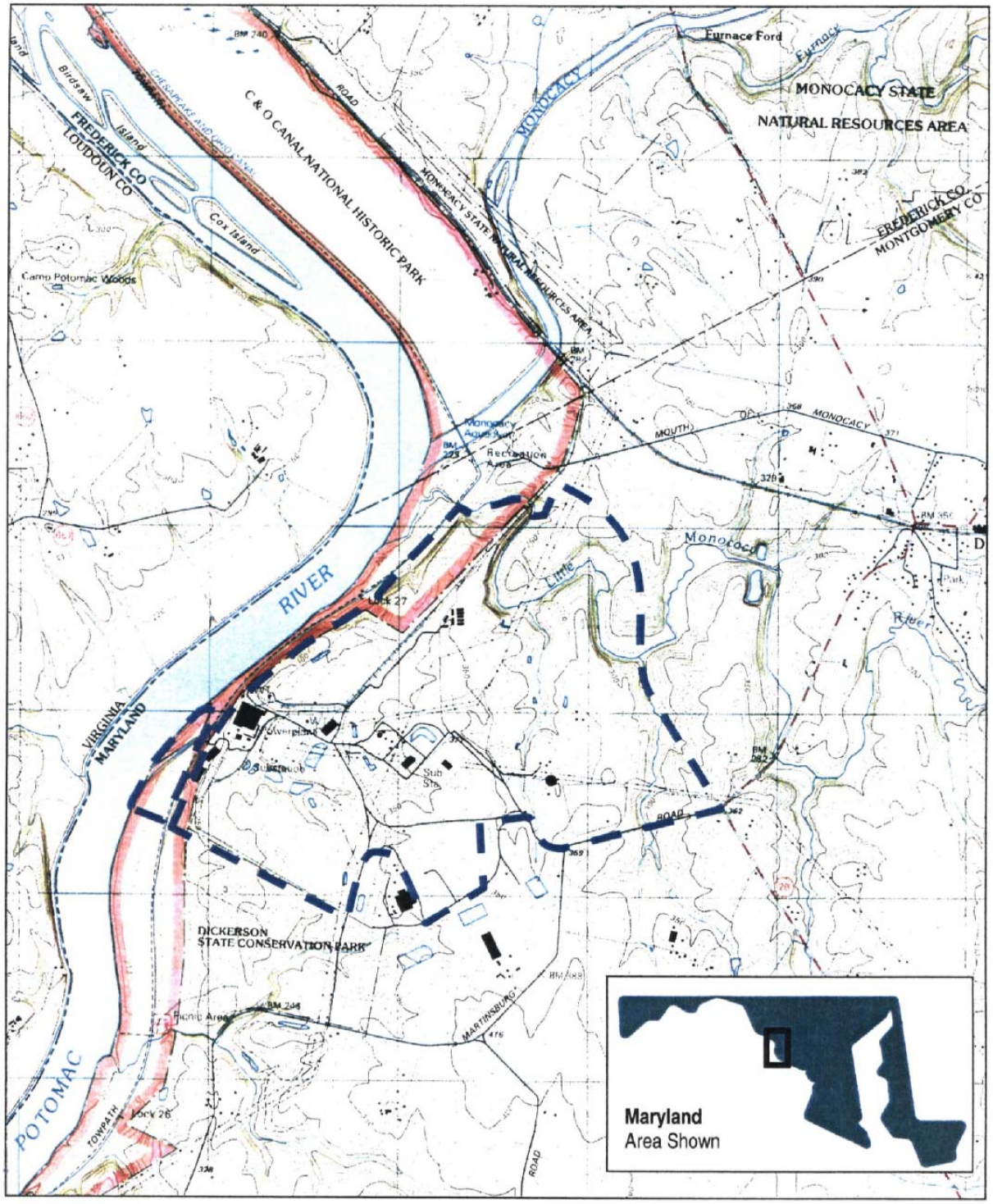


Figure 1-1 Dickerson Site Location

Source: Golder, 2001.

Natural Resources Article. DNR's recommendations were made in concert with the Departments of Environment, Agriculture, Business and Employment Development, Planning, and Transportation, the Office of Smart Growth, and the Maryland Energy Administration (the "State agencies").

1.2 COMPARATIVE AND CUMULATIVE STUDIES

On June 3, 2002, the State agencies requested from the PSC the opportunity to form a cabinet level task force that would help the agencies develop appropriate criteria for guiding site suitability recommendations, as required by Section 3-304 and 3-306 of the Natural Resources Article. These agencies felt the existing process lacked parameters by which the State agencies could constructively evaluate multiple plant proposals in close proximity to each other.

As a result of the task force efforts, in December 2002 the State agencies produced a set of recommended guidelines for multiple power plant assessments. The guidelines identify issues against which DNR and the other State agencies can evaluate multiple plants proposed in close proximity (within about 10 miles). Proposed facilities would be compared to each other and those with a higher degree of positive attributes would receive better ratings. In addition to a comparative analysis, the task force also recommended that DNR evaluate cumulative impacts of multiple power plant applications and use the results to develop licensing conditions that may be necessary to preclude unacceptable impacts from multiple plants.

Based on the results of both the cumulative and comparative analyses, the State agencies would agree upon recommendations to be submitted to the PSC in individual plant proceedings. These recommendations could find a plant unsuitable because of a flaw with that proposal or could conclude that issuing CPCNs to more than one plant exceeds the carrying capacity of one or more resources such as air, water, or land, or is otherwise not in the best interests of the State.

The current evaluation of Mirant's proposed expansion at the Dickerson facility represents the first CPCN proceeding that is going forward since the task force completed its recommended guidelines. Comparative and cumulative assessments are discussed in Sections 7 and 8 of this report, respectively.

1.3 REPORT ORGANIZATION

This report synthesizes the evaluations that PPRP conducted. The information is organized into the following sections:

- Section 2 provides a description of the site and proposed facility components.
- Section 3 describes existing environmental and socioeconomic conditions at the site and in the vicinity.
- Section 4 presents a regulatory applicability and impact analysis with respect to air emissions from the proposed facility.
- Section 5 addresses other impact issues, including biological and socioeconomic resources and noise impacts.
- Section 6 discusses the water supply evaluation and potential impacts to surface water resources as a result of the proposed facility.
- Section 7 compares the project's key environmental characteristics to those of an alternative power plant proposal at a nearby site.
- Section 8 describes the cumulative impacts of the proposed facility in conjunction with other existing and proposed plants in the vicinity.
- Section 9 summarizes the findings of PPRP's evaluations.

The Public Service Commission of Maryland granted Mirant the final Certificate of Public Convenience and Necessity on 5 November 2004 in accordance with the Final Order of the Commission on 7 December 2004. The Final Order is included in Appendix D of this report.

2.0 PROJECT DESCRIPTION

2.1 SITE DESCRIPTION

The Dickerson site is located in Montgomery County, Maryland, about 30 miles northwest of Washington, D.C., on the Potomac River. The site encompasses roughly 1,000 acres. Approximately 300 acres are used for electric power generation and support facilities. Approximately 200 acres are owned by PEPCO and used for electric substations and transmission lines. The remaining portion (roughly 500 acres) consists of undeveloped forested ravines, grasslands, and rural areas, and a shoreline habitat along the Potomac River. The site is situated at an elevation of about 350 ft-msl on the Piedmont Plateau, which is characterized by relatively flat to rolling uplands traversed by small streams. Most upland and major floodplain areas in the site vicinity have been cleared for agriculture.

The Chesapeake & Ohio (C&O) Canal National Historic Park borders the western portion of the site.

2.2 EXISTING FACILITY

The existing Dickerson power plant is an electric generating facility originally constructed in 1959. The plant consists of six units, including three 182 MW coal-fired steam units, two 147 MW gas-fired combustion turbine (CT) units, and one 13 MW distillate oil-fired CT unit. The three coal-fired units are labeled D-1, D-2, and D-3. The two gas-fired CTs are labeled H-1 and H-2. The distillate oil-fired unit is labeled CT-1.

2.3 PROPOSED PROJECT COMPONENTS

Mirant Dickerson has proposed to install gas-fired combined cycle electric generating units at the existing Dickerson Generating Station. The project will utilize a number of the existing facilities, including the gas transmission system and electric transmission lines, and increase the nominal generating capacity at the Dickerson site by 726 MW. In general, the project will consist of: (a) converting the existing Station H simple cycle units to a combined cycle unit by adding heat recovery steam generators (HRSGs), a steam turbine, and an electric generator; and (b) constructing a new combined cycle unit that will consist of two CTs, associated HRSGs, a steam turbine, and an electric generator. Closed-cycle cooling will be used with mechanical draft cooling towers. While the

combined cycle components of the facility are being constructed, the new and existing combustion turbines will operate in simple cycle mode for a period of up to two years. A general layout of plant components is shown on Figure 2-1.

Specifically, the project will consist of converting the two existing Station H units (H-1 and H-2) from simple cycle to combined cycle and constructing an additional combined cycle unit. Once converted to combined cycle units, H-1 and H-2 will be renamed Unit 4a and Unit 4b, respectively. The existing D-1, D-2 and D-3 units will be renamed Unit 1, Unit 2, and Unit 3, respectively, and the new combined cycle unit will be labeled Unit 5. A small auxiliary boiler will also be added. A brief description of the proposed reconfiguration of Units 4 and 5 is provided below.

Unit 4 - The existing Station H consists of two 147 MW GE frame 7F combustion turbines. Control of nitrogen oxides (NO_x) emissions exhausting from the CT is currently achieved by injection of demineralized water into the combustion chamber. Station H will be converted to a combined cycle unit by retrofitting each CT with a HRSG to recover the energy from the exhaust gas. Energy recovery will be in the form of steam generation to drive a nominal 196 MW steam turbine. The combined net generation capacity of Unit 4 (including Unit 4a and Unit 4b) will be a nominal 490 MW.

Unit 5 - The combined cycle Unit 5 will consist of two 160 MW GE 7FA advanced CTs with dry low-NO_x combustors and HRSGs, which will utilize the waste heat from the CTs to produce steam to drive a new nominal 210 MW steam turbine. The generating capacity of Unit 5 will be a nominal 530 MW. In the warmer months, steam injection will also be used on Unit 5 to increase the power output from the CT units ("power augmentation") when firing natural gas.

Units 4 and 5 both will be equipped with selective catalytic reduction (SCR) to limit NO_x and an oxidation catalyst to limit carbon monoxide (CO) and volatile organic compounds (VOCs) in the exhaust emissions. The CTs will use natural gas as the primary fuel with distillate oil as backup fuel. Inlet air evaporative cooling will be used to improve efficiency during periods of high ambient temperature. Power output will also be increased when needed by supplementary firing of the HRSGs using duct burners. In this process, natural gas is burned at the inlet to

Figure 2-1
Site Plan
Dickerson Station
Combined Cycle Plant
Dickerson, Maryland

the HRSG, which produces additional steam to send into the steam turbine, thereby increasing its power output.

Both Units 4 and 5 will utilize recirculating cooling water in mechanical draft cooling towers. The new units will obtain cooling tower makeup water from the discharge of the existing once-through cooling system that serves the coal-fired units (1, 2, and 3), which in turn is supplied by the Potomac River. A new intake structure will be constructed on the discharge canal and water will be pumped to the combined cycle facility via an underground piping system. Non-contact stormwater runoff will be collected and routed to a retention pond. Process wastewater will be treated and discharged to either the cooling tower basins or the once-through cooling system discharge canal. Sanitary wastes are directed to the existing treatment plant, and cooling tower blowdown will be treated before discharge into the discharge canal.

The project will require new or upgraded auxiliary facilities. A second 10-million-gallon (MG) distillate oil storage tank and up to 4 new 10-MG water storage tanks are to be added (for use during periods of low river flow). A new wastewater treatment building and warehouse will be constructed, housing two clarifiers and a demineralization system. The upgraded water treatment system will utilize the existing storage tanks at the site for holding filtered water, fire protection water, and demineralized water.

Two rail spurs with unloading stations for fuel oil and aqueous ammonia will be added. The rail unloading area will include short-term storage tanks both for fuel oil (100,000 gallon capacity) and for aqueous ammonia (40,000 gallon capacity), to be constructed within individual containment areas. Ammonia and distillate fuel oil will be piped to larger storage tanks near the combined cycle facility, a new 100,000-gallon tank for ammonia and the 10-MG oil tank mentioned earlier.

Approximately 69 acres of land will be required for construction of the new facility, broken down as follows:

Base Plant and Buildings	15 acres
Water/Wastewater Treatment	10 acres
Cooling Towers	7 acres
New Site Runoff Retention Pond	1 acre
Construction Laydown and Parking	15 acres
New Fuel Oil Tank	5 acres
New Water Storage Tank Area	8 acres
New Rail Spurs and Unloading Facilities	5 acres
Piping Corridors	3 acres
TOTAL	***69 acres***

3.0 EXISTING SITE CONDITIONS

3.1 TOPOGRAPHY, SOILS, AND GEOLOGY

The upland portion of the Dickerson site, located away from the river in the central and southeastern area, is blanketed by a 1- to 5-foot thick soil layer consisting of medium dense to hard silt and fine sand. The soil is generally slightly cemented and contains rock fragments and a trace of clay. The lowland area to the west and northwest is similar to the upland portion of the site and overlain by a thin cover of soil ranging in thickness from 2 to 4 feet. Bedrock outcrops occur at several points in this area.

The shallow bedrock beneath the site consists of a medium to coarse-grained sandstone with interbeds of siltstone. In general, the shallow bedrock units are highly weathered to a depth of 10 to 30 feet, highly fractured, and jointed.

In terms of regional geologic setting, the Dickerson site lies in the northernmost portion of an elongated north-northeast trending structural basin, the Culpepper Basin. This trough-like basin is filled with gently dipping sedimentary rocks of Triassic age, 10 to 15 miles wide, and extends about 90 miles southwestward to just north of Charlottesville, Virginia. The basin consists of interbedded conglomerates, sandstones, siltstones, and shales, red to deep maroon in color, and designated as the Newark Group (Otton 1981). Well logs suggest that Triassic rocks are at least 1000 feet thick under some portions of the Dickerson site (PPRP 1987).

3.2 WATER RESOURCES

3.2.1 Surface Water

The Dickerson site is located on the Maryland shore of the Potomac River, approximately one mile below the confluence with the Monocacy River. The Potomac River is relatively broad and flat in the vicinity of the Dickerson site, with an average depth of 3 to 4 feet. The Potomac River is designated as an American Heritage River. The Monocacy River is a major tributary to the Potomac; it is the largest Maryland tributary. In the area of Dickerson, the Monocacy is typically less than 330 feet wide and less than 3 feet deep. The Little Monocacy River and several unnamed tributaries flow through the site. The Little Monocacy River flows under the C&O Canal and enters the Potomac River less than 1,000 feet downstream from

the confluence of the Monocacy and Potomac Rivers.

The Potomac River serves as the primary water source for the Washington, D.C., metropolitan area. A great majority of the time, flow in the river is more than adequate to supply the needs of users, including a minimum flowby to support freshwater stream communities downstream of the Washington water suppliers' intake. A discussion of drought frequency is included in the water supply impacts section of this report (Section 6.0).

Water quality data from the U.S. Geologic Survey (USGS) for the Potomac River at Washington, D.C., indicate that since 1985 total phosphorus has decreased and nitrogen concentrations have stabilized (USGS 1998). Nutrient concentrations stabilized or decreased while the human population in the river basin increased by 44 percent from 1970 to 1990. USGS concluded, however, that water quality in the Potomac River will likely continue to be stressed by population growth and associated pressures well into the 21st century.

At present, water quality concerns in the section of the Potomac River near the Dickerson site primarily involve acid mine drainage (from upstream sources), agricultural and urban runoff, and industrial and domestic waste loading. Runoff and waste loading are the predominant sources of river impairment in the middle Potomac River basin. Although nutrient loading remains a water quality concern, long-term monitoring conducted in the basin indicates significant downward trends in nutrient concentrations in the river (Allegheny Energy 1999, USGS 1983, EPA 1979, USGS 1989, Chesapeake Bay Program 2000).

Over the period from 1988 to 1999, water temperatures in the Potomac River at Point of Rocks ranged from 0 to 30 degrees Celsius and followed expected seasonal variation (Allegheny Energy 1999). Average dissolved oxygen concentrations ranged from 7.3 to 13.4 mg/L in May to December for the period of 1983 to 1990 (USGS 1989).

In PPRP long-term benthic monitoring studies conducted in the middle and upper Potomac River from 1983 to 1991, water quality was classified, based on DO concentrations, as good (6.0 to 7.9 mg/L) to excellent (8.0 to 9.5 mg/L), using the Interstate Commission on the Potomac River Basin (ICPRB) water quality classification system (Versar 1992). More recent water quality data collected as part of MDNR's (MDNR 2001) fisheries surveys indicate continued good to excellent water quality in the Potomac River.

3.2.2 *Ground Water*

Ground water occurs under unconfined water table conditions in joints, fractures, and bedding planes of the shallow bedrock aquifer in the upland portion of the Dickerson site. Flow generally mimics surface topography, with recharge occurring in the upland area and ground water flowing eastward and westward toward discharge areas in the Little Monocacy River and Potomac River, respectively. The water table surface lies at a depth of 10 to 20 feet (PPRP 1987). Water resources data collected as part of the earlier Station H licensing case indicate that the nearest ground water users are located about one mile north of the Dickerson site, with the Little Monocacy River lying between the site and those users.

3.3 *CLIMATOLOGY AND AIR QUALITY*

Since an extended meteorological data record for the Mirant Dickerson facility was not available, the discussion of climatology of the area is based on data from Dulles International Airport (IAD), which is the closest National Weather Service (NWS) station to the Dickerson site. IAD climate data cited in this section is from "Local Climate Data Annual Summaries for 1995, Part I Eastern Region," as published by the National Oceanic and Atmospheric Administration, National Environmental Satellite, Data, and Information Service, and National Climatic Data Center, unless otherwise specified. IAD is located approximately 19 miles south of the Dickerson facility, and is considered representative of the area.

The climate in the vicinity of the Dickerson site is temperate with four defined seasons. The annual mean temperature is approximately 58°F, with monthly average temperatures varying from a maximum of 76°F to a minimum of 31°F. The record minimum and maximum extreme temperatures range from a low of -18°F to a high of 104°F. Normal minimum and maximum temperatures are 21°F and 87°F, respectively. Lowest yearly temperatures tend to occur in January, while highest temperatures occur in July and August.

Precipitation is evenly distributed throughout the year. The mean annual precipitation is approximately 40 inches. This total has varied from as little as 30 inches to over 59 inches from 1966-1995.

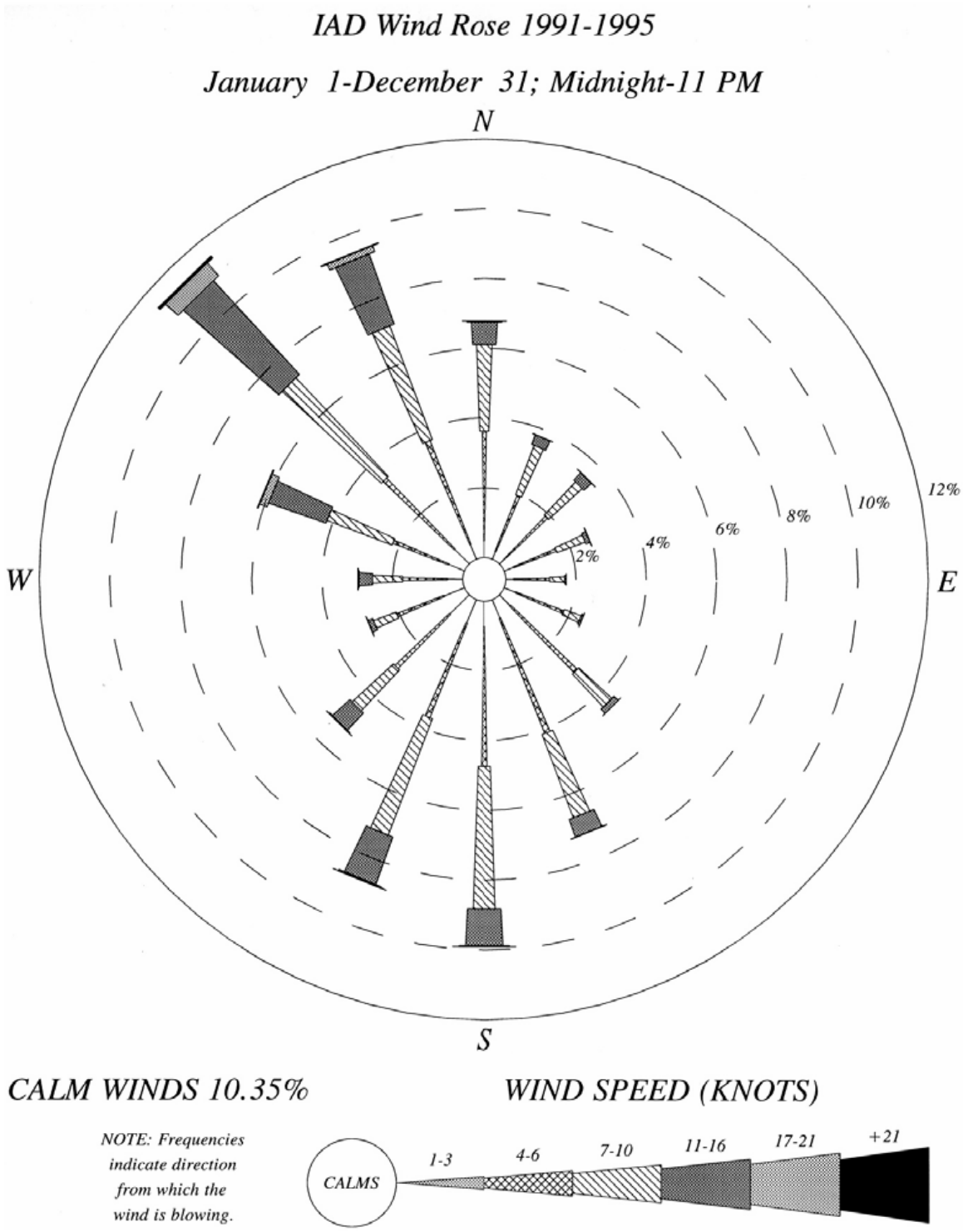
Thunderstorms occur about 28 days during an average year. Thunderstorms have occurred throughout the year, but about 58 percent occur from June through August. Tornadoes are much rarer. Montgomery County, Maryland, experienced 11 tornadoes from 1950 to 2000, an

average of 0.22 tornadoes a year. In the Dickerson vicinity, there is a 2 percent chance of occurrence for tropical storms of hurricane strength. Tropical storms have generally approached the area during the period of late August to late October.

The average annual wind speed at IAD is 7.4 miles per hour. Based on wind data at IAD from 1991-1995, prevailing winds are from the northwest and south. A wind rose of IAD wind measurements based on data from 1991 through 1995 is presented in Figure 3-1.

The U.S. Environmental Protection Agency (EPA) has designated Montgomery County in the vicinity of the Dickerson site as a nonattainment area for ozone. More information on the existing air quality at the Dickerson site and in surrounding areas is provided in Section 4.3.3.4, which discusses the incremental effect of the project on ambient air quality.

Figure 3-1 Wind Rose Diagram



3.4 BIOLOGICAL RESOURCES

3.4.1 Vegetation and Land Cover

3.4.1.1 Upland Communities

Upland areas on the Dickerson site include ruderal grasslands, mixed deciduous forest, and deciduous forest. Ruderal grassland occupies 602 acres (59 percent of the site), deciduous forest occupies 212 acres (21 percent of the site), and mixed deciduous forest covers 147 acres (15 percent of the site).

Ruderal grasslands occupy the southern, central, and most of the eastern portions of the site. The primary land use in these areas is transmission line and road rights-of-way. These areas are periodically mowed and dominated by wiregrass *(Aristida dichotoma),* goldenrod *(Solidago sp.),* and foxtail grass *(Setaria sp.),* with an assortment of common weedy ruderal species, including various asters *(Aster* spp.), pasture thistle *(Cirsium discolor),* Queen Anne's lace *(Daucus carota),* and broomsedge *(Andropogon virginicus).* Along the boundaries between ruderal areas and adjoining hardwood forests, red cedar *(Juniperus virginiana),* tulip poplar *(Liriodendron tulipifera),* black cherry *(Prunus serotina),* and a variety of shrubs and vines encroach upon the ruderal areas.

The mixed deciduous forest occupies level to gently sloping uplands on the Dickerson site. Dominant tree species in the overstory of the forest include Virginia pine *(Pinus virginiana),* red cedar, sycamore *(Platanus occidentalis),* tulip poplar, red oak *(Quercus rubra),* American elm *(Ulmus americanus),* and red maple *(Acer rubrum).* The subcanopy layer is dominated by flowering dogwood *(Cornus florida),* Virginia pine, red maple, and tulip poplar. The herbaceous groundcover is approximately 60 percent non-vegetated forest floor covered with leaf litter interspersed with species including garlic mustard *(Alliaria petiolata)* and Japanese honeysuckle *(Lonicera japonica).*

The deciduous forest community at the Dickerson site is located along the steeply sloping bluffs adjacent to the Little Monocacy River, the tributary to the Little Monocacy River, the Potomac River, and the C&O Canal. The canopy in these areas is dominated by tulip poplar, chestnut oak *(Quercus montana),* mockernut hickory *(Carya tomentosa),* American elm, black cherry, and pignut hickory *(Carya glabra).* Subcanopy trees are predominately tulip poplar and mockernut hickory. Spicebush *(Lindera benzoin),* box elder *(Acer negundo),* and papaw *(Asiminia trilobum)* are the three most common species in the shrub layer, while honeysuckle and mayapple *(Podophyllum peltatum)* are the most common herbaceous

groundcover species.

3.4.1.2 *Wetland Communities*

The Dickerson site contains 41 acres of wetland floodplain forest (4 percent of the total site area) and 13 acres of non-forested wetlands (1 percent of the total site area). Floodplain forest areas on the site lie between the C&O Canal and the Potomac River. These areas are periodically flooded by the Potomac River. Dominant canopy species include box elder, silver maple *(Acer saccharinum),* American elm, and mockernut hickory. The subcanopy contains primarily spicebush, box elder, and papaw. The shrub layer is sparsely vegetated with spicebush and box elder. The dominant herbaceous species include garlic mustard and jewelweed *(Impatiens duthicae).*

Non-forested wetlands on the Dickerson site consist of seasonally flooded depressions, shallow marshes, shrub swamps, and open freshwater. The seasonally flooded depressions are located along small drainages and poorly drained soils associated with overlying fly ash fill within the ruderal grassland areas. They are predominantly vegetated with herbaceous species such as soft rush *(Juncus efuses),* barnyard grass *(Echinochloa crusgalli),* beardgrass *(Eulalia viminea),* nutsedge *(Cyperus strigosus),* smartweeds *(Polygonum* spp.), and sedges of the genus *Carex.* Dryer areas in the wetlands contain woody shrubs and small trees such as persimmon *(Diospyros virginiana),* silver maple, and red maple.

Shallow marshes and shrub marshes are found along sections of the C&O Canal and Potomac River. The shallow marshes contain wetland species such as Joe Pye weed *(Eupatorium fistulosum),* smartweeds, sedges, rushes, jewelweed, and cattail *(Typha latifolia).* The shrub marshes contain small red maples, speckled alder *(Alnus rugosa),* and swamp rose *(Rosa palustris).* Open freshwater areas on the Dickerson site consist of small ash settling ponds located near the existing plant. These manmade ponds are typically devoid of aquatic vegetation with the exception of floating plants such as duckweed *(Lemna* spp.).

3.4.2 *Wildlife*

The terrestrial vertebrate fauna of the area in the vicinity of the Dickerson site consists primarily of mammals, birds, reptiles, and amphibians characteristic of ruderal habitats, deciduous and mixed deciduous upland forests, and forested and non-forested wetlands. Up to 39 species of mammals could potentially occur in the vicinity of the site. During site visits made in 1986 and 1987, 19 of those 39 species were directly observed. The mostly commonly observed mammals were white-tailed

deer *(Odocoileus virginianus),* Eastern cottontail *(Sylvilagus floridanus),* and white-footed mouse *(Peromyscus leucopus).* Other species on the site include house mouse *(Mus musculus),* short-tailed shrew *(Microsorex horyi),* least shrew *(Cryptotis parva),* meadow vole *(Microtus pennsylvanicus),* pine vole *(Pitymys pinetorum),* opossum *(Didelphis marsupialis),* raccoon *(Procyon lotor),* muskrat *(Ondatra zibethica),* gray fox *(Uryocyon cinereoargenteus),* red fox *(Vulpes vulpes),* and feral cat *(Felis domesticus).*

A total of 108 species of birds were seen on the Dickerson site; 62 species are known or suspected to breed on the site. In the ruderal grassy areas of the site, 26 species of birds were observed. The most common breeding bird in the area was chipping sparrow *(Spizella passerina).* Thirty-four species were observed along the tributary to the Little Monocacy. The most common species in the area were rufous-sided towhee *(Pipilo erythrophthalamus)* and wood thrush *(Hyolocichla mustelina).* Twenty-seven species were observed in the Little Monocacy Ravine; the most commonly observed were the tufted titmouse *(Parus bicolor),* Carolina wren *(Thryothorus ludocivicianus),* wood thrush, northern cardinal *(Cardinalis cardinalis),* and red-bellied woodpecker *(Melanerpes carolinus).* The forested area along the C&O Canal provides ideal habitat for migratory birds and yielded a total of 40 bird species. Examples include Eastern kingbird *(Tyrannus tyrannus),* white-breasted nuthatch *(Sitta carolinensis),* brown creeper *(Certhia americana),* hermit thrush *(Catharus guttatus),* bluegray gnatcatcher *(Polioptila caerulea),* and golden-crowned kinglet *(Regalus satrapa).* Surveys on the Potomac River in the vicinity of the Dickerson site yielded 21 species of birds, the most common being the Northern rough-winged swallow *(Stelgidopteryx serripennis),* tree swallow *(Tachycineta bicolor),* green-backed heron *(Butorides striatus),* Eastern kingbird, and mallard *(Anas platyrhynchos).*

A variety of turtles and frogs were found in the wetland areas on the Dickerson site, including stinkpot *(Sternotherus odoratus),* Eastern mud turtle *(Kinosternon subrubrum),* common snapping turtle *(Chelydra serpentina),* Eastern painted turtle *(Chrysemys picta),* red-bellied turtle *(Chrysemys rubiventris),* red-eared turtle *(Chrysemys scripta elegans),* bullfrog *(Rana catesbeana),* green frog *(Rana clametans melanota),* Southern leopard frog *(Rana utricularia),* wood frog *(Rana sylvatica),* pickerel frog *(Rana palustris),* and spring peeper *(Hyla crucifer).* Snake species observed along the C&O Canal and the Potomac River include the northern ringneck snake *(Diadophis punctatus edwardia)* and northern water snake *(Nerodia sipedon).* The long-tailed salamander *(Eurycea longicunda)* and the northern two-lined salamander *(Eurycea bislineata)* were found in the Little Monocacy River. Several other reptiles and amphibians were found in the upland areas of the site, including:

- ground skink *(Scincella lateralis)*
- five-lined skink *(Eumeces faciatus)*
- six-lined racerunner *(Cnemidophorus sexlineatus)*
- broad-headed skink *(Eumeces laticeps)*
- northern fence lizard *(Sceloporus undulatus)*
- eastern hognose snake *(Heterodon platyrhinos)*
- black racer *(Coluber constrictor)*
- eastern box turtle *(Terrapine carolina)*
- American toad *(Bufo americanus)*
- Fowler's toad *(Bufo woodhousii fowleri)*

3.4.3 Threatened and Endangered Species

A review for the presence of species of concern at the Dickerson site was performed by the Maryland DNR Wildlife and Heritage Division in the spring of 2001. The review by DNR identified two rare invertebrate species known to occur on the project site, Pizzini's cave amphipod *(Stygobromus pizzini)* and a species of isopod *(Caecidotea* sp. 4). In addition, four species of concern have occurred in the vicinity of the project site, the white trout lily *(Erythronium albidum),* Short's rockcress *(Arabis shortii),* roundtop amphipod *(Stygobromus* sp. 14), and the dickcissel *(Spiza americana).*

Pizzini's cave amphipod, the isopod species, and the roundtop amphipod are subterranean invertebrates collected outside of caves and underground streams. All three species are classified as highly rare in the state of Maryland. The white trout lily is listed as state threatened. It is found in rich deciduous woods, often along stream banks and associated ravine slopes. According to the Wildlife and Heritage Division, a known occurrence of white trout lily was recorded along the Monocacy River near the C&O Canal, west of the Dickerson property boundary. Short's rockcress is an herbaceous species currently listed as state threatened. It is found in wooded steep slopes with limestone outcrops. Short's rockcress has also been observed along the Monocacy River near the C&O Canal, west of the site boundary. The dickcissel is a small bird typically found in meadows, roadside edges and ditches, and oldfield habitats. Breeding populations of dickcissels are considered rare in the state of Maryland (their typical range is from central Ohio south to Georgia, and west across the Great Plains). Dickcissels have apparently never been observed on the Dickerson site; no historical records document their presence there.

3.4.4 *Aquatic Wildlife Resources*

The fish community in this section of the river is typical of warmwater fish communities in large rivers in the Mid-Atlantic region, being dominated by cyprinids and centrarchids. A total of 42 species were reported, including 11 species of minnow and 10 species of sunfish. Spotfin shiner and bluntnose minnow were most abundant among minnows, while redbreast sunfish, smallmouth bass, and bluegill were the most abundant sunfish species. Other numerically dominant species included the golden redhorse, channel catfish and northern hog sucker (the latter at Taylor's Landing). Smallmouth bass and channel catfish are two of the major species sought by recreational fishermen in this river region. Fish abundance varies widely from year to year, with reproductive success being strongly influenced by river conditions during the spawning season (MDNR 2001). Abundance of various species also varies considerably among sampling locations. Such differences are likely a result of differing habitat characteristics among sampling stations.

According to Mirant's CPCN application, fishery data for the Potomac River from 1979 to 1986 have shown no change in the relative proportions of the fish community during that time period. Proportions of sport, forage, and rough fish indicate a well-balanced fishery in the vicinity of the Dickerson facility. No fish species listed as threatened, endangered, or in need of conservation under federal or state law have been collected in the vicinity of the Dickerson site. This information is confirmed by a long-term study (Loos and Perry 2001) that examined fish distribution from 1979-2000 in relation to the thermal discharge at the Dickerson facility. Results of this study indicate that the thermal plume does not adversely affect the fish community in the vicinity of the facility. In fact, local enhancement may occur due to the increased prevalence of game and pan fishes in the impact region, especially during cold periods. These results show that the heated discharge has only a minor seasonal effect on the distribution of fishes in the immediate vicinity of the station and appears to have no adverse long-term effects on fish distribution in the area of the facility.

Fish collected in the Monocacy River in 1987 were similar in community composition to those collected in the Potomac River. The Little Monacacy River contained a fish community typical of small- to medium-sized streams with pool-riffle habitats.

PPRP has conducted a long-term benthic invertebrate monitoring program on the Potomac River, which includes the portion of the river near the Dickerson facility. These data were analyzed for the period from 1983 to 1985. Results indicate that significant impacts of the thermal discharge at

Dickerson are primarily restricted to the high impact area immediately below the discharge and are well within the allowable mixing zone. Additionally, there is no evidence that impacts on the benthic community are of a significant magnitude to affect the fish community in the area.

3.5 REGIONAL SOCIOECONOMIC SETTING

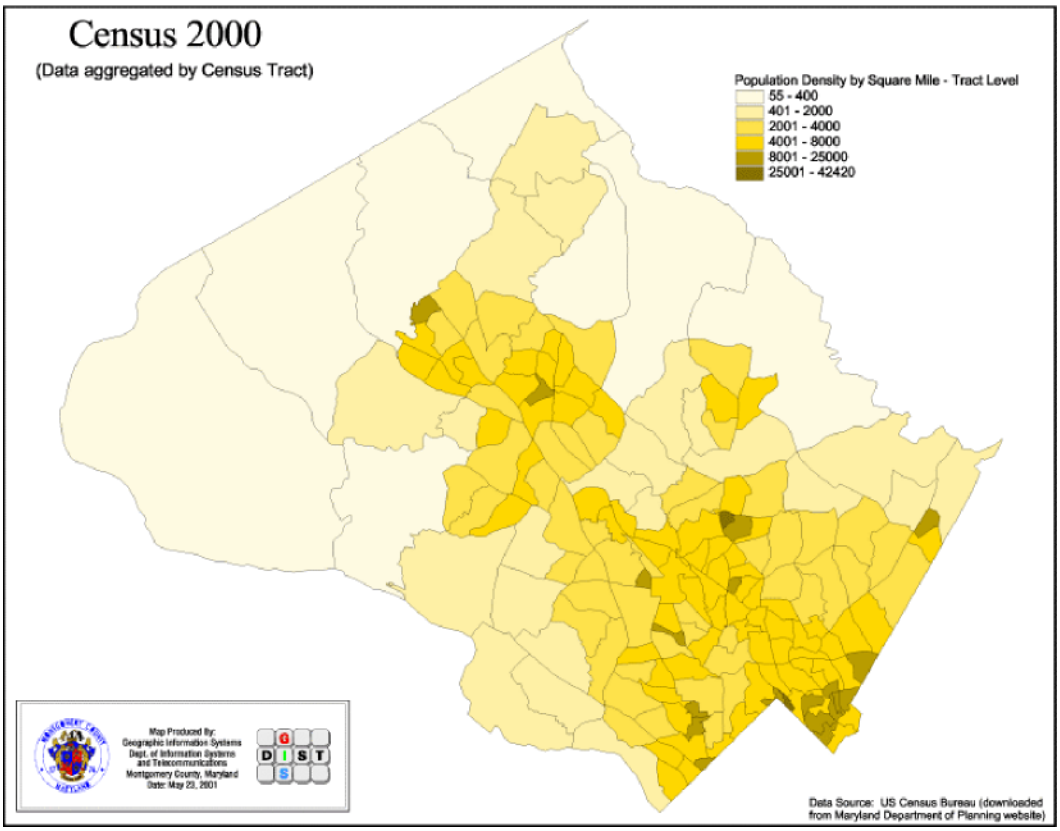
Montgomery County is located in Central Maryland, and is part of the Washington, DC metropolitan area. The Dickerson site is located in western Montgomery County within Planning Area 12: Little Monocacy Basin Dickerson – Barnesville, and is part of Community Based Planning Area 7 – Rural Area. Although the County as a whole has been affected by suburban sprawl from the Washington metropolitan area, the western part still retains a rural character throughout much of its area. The site is within the 93,000 acre Agricultural Reserve, and near the crossroads communities of Beallsville and Dickerson.

3.5.1 Population Trends

Montgomery County is Maryland's most populous county. In 2000 the population of Montgomery County was 873,341, an increase of 14.5 percent from 1990 (U.S. Census Bureau 2001). The county's growth over the decade accounted for one quarter of the State's population change during the same period. Population is projected to grow at a rate of about 0.75 percent per year through the year 2020 to slightly more than one million. By comparison, Maryland's population is projected to grow at a rate of 0.7 percent annually between 2000 and 2020 (Maryland Department of Planning 2001).

Population is concentrated in the eastern part of the county, near job centers in Maryland, northern Virginia, and the District of Columbia. Gaithersburg is the largest incorporated city with a population of 52,613, followed by Rockville (47,388), third and fifth largest cities in Maryland, respectively. Other major centers in the urban part of the county are Bethesda and Silver Spring. The closest population center to the Dickerson site is Poolesville. Population in Poolesville and vicinity (Planning Areas 12, 16, 17, and 18) was 8,335 in 1997 (M-NCPPC 2001a). Population in the area is scattered (Figure 3-2) with a density of about 81 persons per square mile compared to 1,657 persons per square mile for the county as a whole (M-NCPPC 2001b).

Figure 3-2 Population Density in Montgomery County



3.5.2 *Employment and Income Trends*

Much of Montgomery County's employment is located in the I-270 and Route 29 corridors. The county hosts more than 23,000 businesses and is a major center for high technology and government. The county is home to more than 60 percent of Maryland's biotechnology companies. Leading employers in the county include AT&T, COMSAT, Hughes Network Services, Lockheed Martin, and Marriott International. Several agencies of the federal government, including the National Institutes of Health, Food and Drug Administration, and the National Institute of Standards and Technology, have a major presence in Montgomery County.

Payroll employment in the county was 460,420 in December 2000, up from 440,976 over the previous year. Strong employment growth has kept the unemployment rate low, 2.1 percent in July 2001, up slightly from 2000. By comparison, Maryland's unemployment rate was 3.7 percent.

The total number of employed residents in Montgomery County was

464,000 in 1997 of which 25.8 percent worked for federal, state, or local governments. Nearly 60 percent worked in the county, while 31.6 percent commuted to Washington, D.C., or northern Virginia. In contrast, the number of employed residents in Poolesville and vicinity was about 4,400 in 1997 with more than 77 percent working in the county (Table 3-1). Most Poolesville and vicinity residents commute to North Bethesda, Rockville, Gaithersburg, and rural areas of Montgomery County.

Table 3-1 Breakdown of Employment Locations for Dickerson Area Residents

Planning Area	Total Employed	% in County	% Inside Beltway	% Outside Beltway	% Elsewhere in MD	% to DC	% to VA
Montgomery County	464,115	57.9%	18.4%	39.5%	9.2%	23.6%	8.0%
Poolesville & Vicinity (Planning Areas 12,16,17,18)	4,430	77.2%	11.9%	65.3%	6.0%	9.1%	6.7%

Source: Montgomery County Department of Parks and Planning 1997

Communities near the Dickerson site host small retail and service establishments but these establishments account for less than one-half percent of office and retail space in the county (Montgomery County Department of Parks and Planning 1997). With the exception of the existing Mirant facility and the adjacent Montgomery County resource recovery facility, most jobs are located elsewhere in the county.

3.5.3 Land Use and Zoning

Montgomery County has experienced rapid land use change during the past several decades, transforming itself from a rural, agricultural county in the 1950s to a major residential and commercial center in the Washington metropolitan region. The County has zoning jurisdiction over most of the land within its borders. The county's general plan is based on a "wedges and corridors" concept, which specifies that development should follow transportation corridors, while the areas between these corridors (the wedges) are preserved. In general, the county has successfully encouraged growth of jobs near transit centers and highways, although residential development has been considerably more dispersed (U.S. Department of Transportation 2001).

Montgomery County manages a 30,000-acre park system that includes neighborhood parks with playgrounds, stream valley parks with trails and recreational areas, regional parks, and conservation parks that are retained in their natural state. Dickerson Regional Park abuts the Mirant property to the south. There are also more than 34 miles of trails in the county.

Two state parks are in Montgomery County. The Patuxent River State Park is located along the upper 12 miles of the Patuxent River in Howard and Montgomery Counties. The park contains of 6,700 acres of natural areas and farmlands. A portion of the park is a state wildlands area. The 7,000-acre Seneca Creek State Park extends along 12 miles of Seneca Creek near Gaithersburg. The C&O Canal National Park stretches along the Potomac River in Montgomery County from approximately milepost 5 to milepost 42 and abuts the Dickerson site.

The Dickerson site is located within Montgomery County's Agricultural Reserve, which was created in response to increasing development pressures on agricultural land. The Reserve was set aside to preserve farmland, open space, and wooded areas for recreation, and to help protect the environment. In 1973, the Montgomery County Council adopted the Rural Zone limiting development to minimum 5-acre lots in most of the undeveloped, upper one-third of the county. With continuing erosion of farmland and open space, the Council passed interim legislation in 1979 limiting development in a defined prime agricultural area to one dwelling per 25 acres, and directed the Planning Board to develop a permanent plan to preserve farmland.

In 1980, the Council approved the Functional Master Plan for the Preservation of Agricultural & Rural Open Space, which designated the Agricultural Reserve and rezoned it from the Rural Zone to the Rural Density Transfer (RDT) Zone, where development is limited to one dwelling per 25 acres. The RDT zone allows owners to sell the development rights from their properties to buyers who can apply those rights in areas of the county identified for development.

The Dickerson site is zoned RDT except for those areas hosting existing generating facilities, which are zoned Heavy Industrial. The site is outside Montgomery County's designated Priority Funding Areas associated with the State's Smart Growth program.

Preservation of rural land for agricultural use is a high priority in Montgomery County and there are five separate agricultural land preservation programs available to landowners.

- Montgomery County Agricultural Easement Program (AEP)

- Maryland Agricultural Land Preservation Foundation (MALPF)
- Maryland Environmental Trust (MET)
- Montgomery County Transfer of Development Rights Program (TDR)
- Montgomery County Rural Legacy Program (RLP)

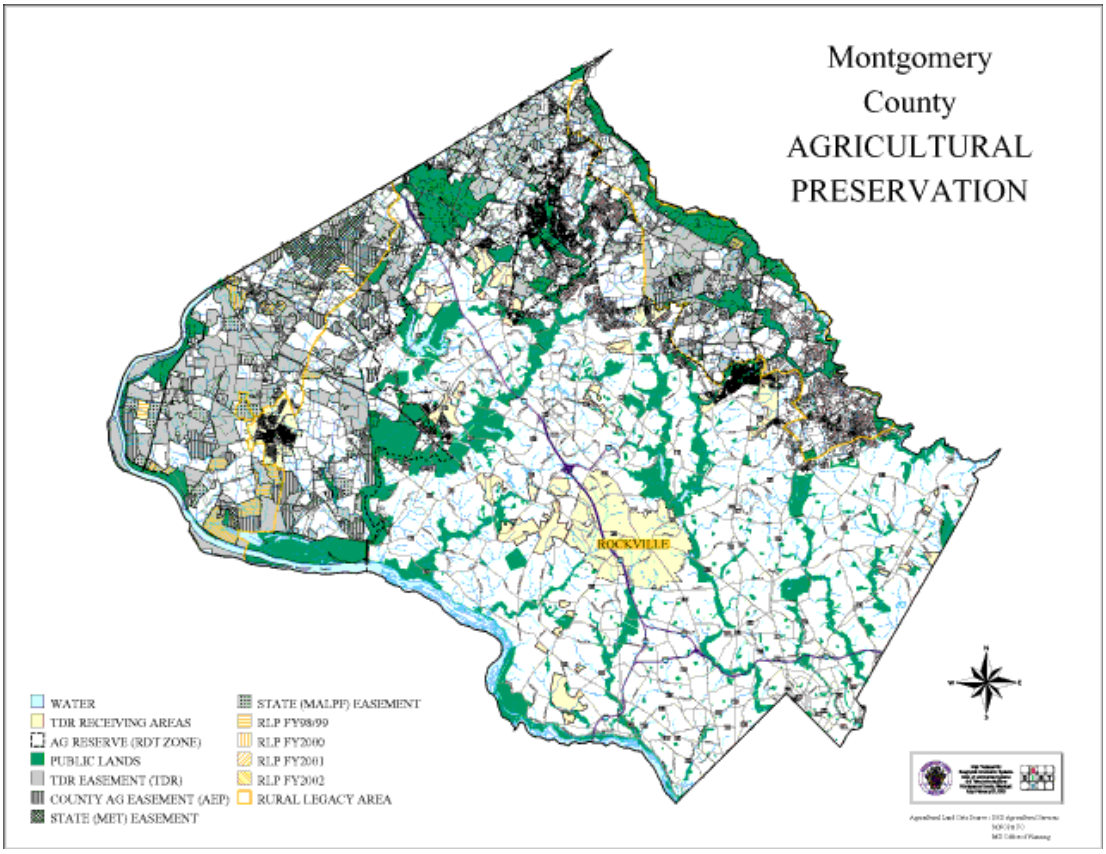
Each program places an easement on the property to prevent future commercial, residential, or industrial development of the land. Table 3-2 lists the number of acres in protective easements in Montgomery County; locations are shown in Figure 3-3.

Table 3-2 Protective Easements in Montgomery County

	Total Land (acres)	**1994 Ag. Use**	**MALPF Easements 2001**	**MET Easements 2001**	**County Easements & TDRs 2001**	**Private Conserv. Easements 2001**
Montgomery	316,272	104,800	2,305	2,122	46,227	80
%		33.1	0.7	0.7	14.6	<0.1
Maryland	6,212,804	2,289,100	128,032	49,479	75,296	21,700
%		36.8	2.1	0.8	1.2	0.3

Source: Maryland Department of Planning 2002.

Figure 3-3 Agricultural Preservation Easements in Montgomery County



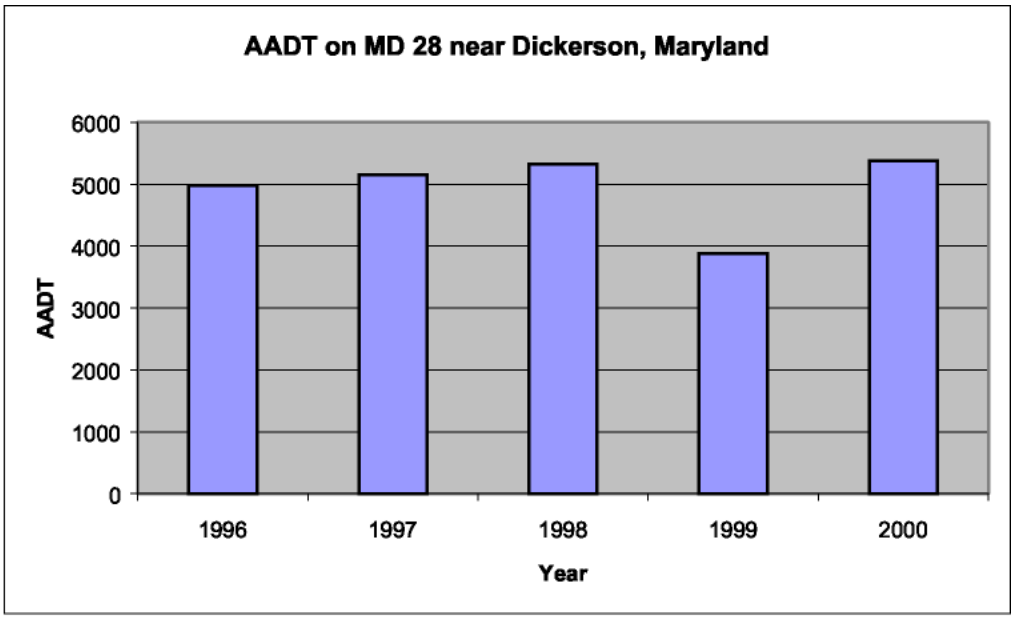
Although the Dickerson site and its environs are located within the Agricultural Reserve, large-scale, land-intensive public projects threaten agriculture in this area of the county. The Montgomery County Resource Recovery Facility (RRF) adjacent to the Mirant property began operating in 1993 and incinerates between 40,000 and 50,000 tons of waste per month. The County facility was expanded in 1999 to host a yard waste composting facility and bagging operation. In September 2001, the Maryland-National Capital Park and Planning Commission presented a draft master plan to the Montgomery County Planning Board for Woodstock Equestrian Park, a 772-acre park on MD 28 west of Beallsville. Future facilities for the park may include two riding and schooling rings, a polo field, and an indoor riding arena. Montgomery County's Comprehensive Ten-Year Solid Waste Plan includes a proposed landfill (designated as Site 2) located on 650 acres of land between Wasche Road and Martinsburg Road. A landfill permit for a 125-acre fill area on the site was issued in 1998, but the County currently has no plans to develop the site while out-of-county landfill options remain viable. The County's contract for out-of-state disposal of solid waste expires in 2012, with an option to 2017. The Site 2 landfill permit expires in 2003.

3.5.4 *Transportation*

There are approximately 3,000 miles of roads in Montgomery County. Major highways in the county include I-495 -- the District of Columbia beltway -- and I-270, which provides service to the northwest. The county is also served by two branches of the Metrorail Red Line, which provide high-speed transit access to the District of Columbia. The MARC passenger rail system originating in Brunswick traverses Montgomery County from Dickerson to Silver Spring, with a final destination at Union Station in Washington.

The Dickerson site is served by MD 28, also known as Dickerson Road in the western part of the county. MD 28 is classified as a rural minor arterial from the Frederick County line through Beallsville. It is an undivided highway with no access controls and 12-foot lanes. The speed limit in the area ranges from 40 to 50 mph except in Beallsville, where the posted speed is 30 mph (Maryland Department of Transportation 2000a). Access to the Dickerson site is via Martinsburg Road (CO 253), 2.1 miles east of the Frederick County line. The average annual daily traffic on MD 28 between Martinsburg Road and Beallsville was 5,375 in 2000 and the highway has experienced little traffic growth over the past five years. Figure 3-4 illustrates the fluctuation in annual average daily traffic (AADT) on MD 28 near the Dickerson site during recent years.

Figure 3-4 Traffic Volume on MD 28 from 1996-2000



Source: State Highway Administration 2000b

There are no projects planned for western portions of MD 28 in Montgomery County in the State's Consolidated Transportation Program (Maryland State Highway Administration 2000).

The Dickerson site is served by a spur from the CSX rail line.

3.5.5 Public Safety

Montgomery County is served by 19 fire departments responsible for direct fire suppression and emergency medical services activities. The Dickerson area is served by the Upper Montgomery County Volunteer Fire Department (Station 14) located in Beallsville. The entrance to the Dickerson site off MD 28 is less than three miles from Station 14.

Upper Montgomery County is served by the Montgomery County Sheriff's Office and the Maryland State Police. Both the Sheriff's office and State Police are located in Rockville. Emergency management is under the authority of the Fire Administrator in the Montgomery County Fire and Rescue Service, and the Local Emergency Planning Council for Hazardous Materials.

In Montgomery County, there are five major hospitals providing medical services to the public. The closest facility in the county is Shady Grove Adventist Hospital in Rockville, with a patient capacity of 563 hospital beds. The Dickerson site is also close to Frederick Memorial Hospital, a 248-bed facility located in Frederick.

3.6 NOISE

3.6.1 Definition of Noise

Noise generally consists of many frequency constituents of varying loudness. Three decibels (dB) is approximately the smallest change in sound intensity that can be detected by the human ear. A tenfold increase in the intensity of sound is expressed by an additional 10 units on the dB scale, a 100-fold increase by an additional 20 dB. Because the sensitivity of the human ear varies according to the frequency of sound, a weighted noise scale is used to determine impacts of noise on humans. This A-weighted decibel (dBA) scale weights the various components of noise based on the response of the human ear. For example, the ear perceives middle frequencies better than low or very high frequencies; therefore, noise composed predominantly of the middle frequencies is assigned a higher loudness value on the dBA scale. Typical A-weighted sound levels for various noise sources are shown in Table 3-3.

Because sound levels are expressed as relative intensities, multiple sound sources are not directly additive. Rather, the total noise is primarily a result of the source of highest intensity. For example, two sources, each having a noise rating of 50 dBA, will together be heard as 53 dBA; a source of 65 dBA combined with a source of 85 dBA will result in a noise level of 85.1 dBA. As the intensity difference between the two sources increases, the effects of the lower sound sources become negligible.

Table 3-3 Typical Sound Levels for Common Sources

Noise Source	Typical Sound Pressure Level (dBA)
Lowest sound audible to human ear	10
Soft whisper in a quiet library	30-40
Light traffic, refrigerator motor, gentle breeze	50
Air conditioner at 6 meters, conversation	60
Busy traffic, noisy restaurant, freight train moving 30 mph at 30 meters	70
Subway, heavy city traffic, factory noise	80
Truck traffic, boiler room, lawnmower	90
Chain saw, pneumatic drill	100
Rock concert in front of speakers, sand blasting, thunder clap	120
Gunshot, jet plane	140

3.6.2 Existing Noise Levels

Mirant conducted ambient noise surveys in January 2001 to characterize the existing acoustic environment in the area. Daytime and nighttime measurements were collected on January 11-12 at five locations around the site boundary, plus a sixth location in the site's center where the proposed new units will be located. These monitoring points are shown in Figure 3-5. Continuous monitoring was performed for 15-minute periods at each location, both during daytime and nighttime. During these monitoring

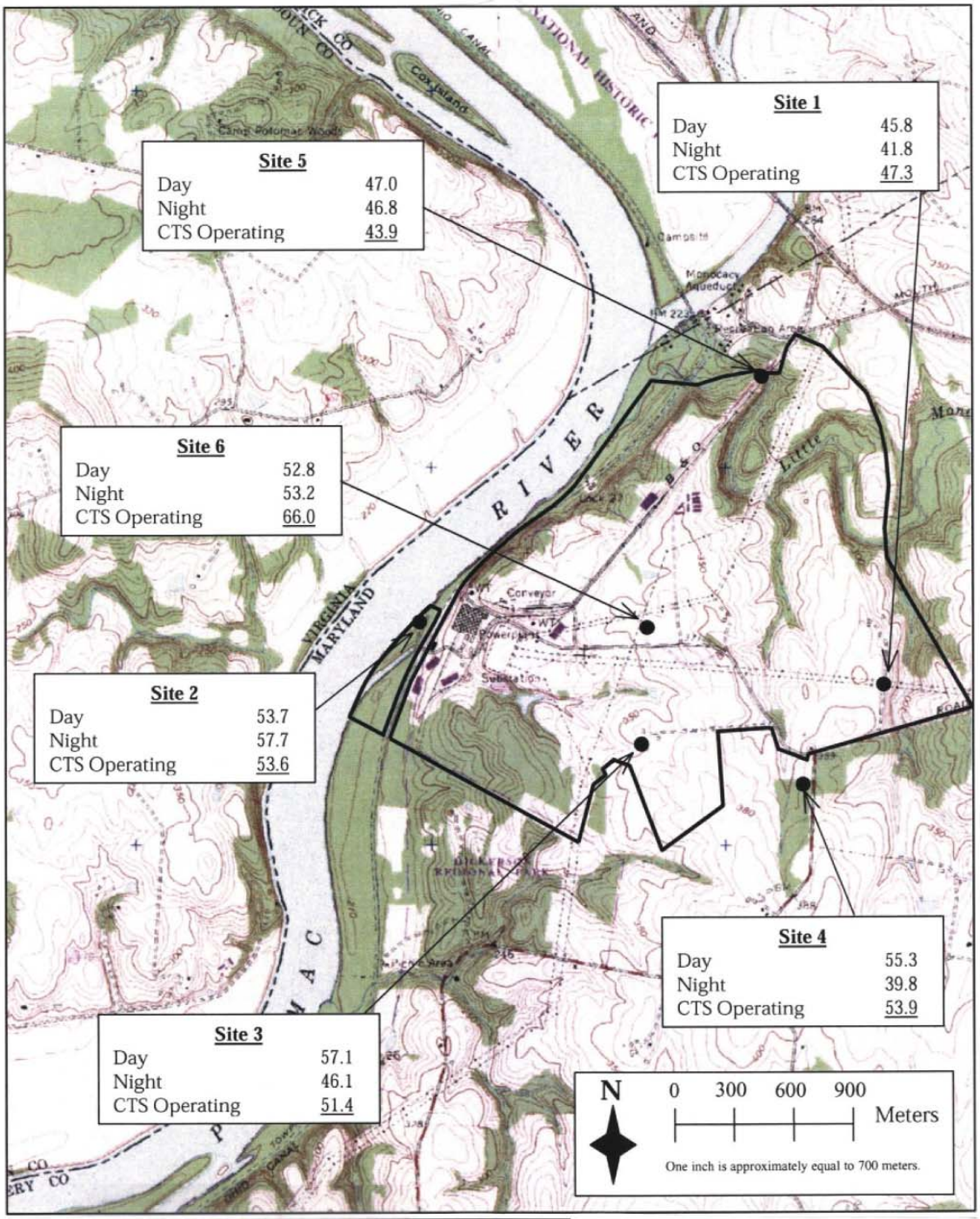


Figure 3-5 Mirant Noise Survey Locations and Noise Levels Observed During Monitoring

Source: Golder, 2001.

events, the coal-fired units were operating but the simple cycle combustion turbines (H-1 and H-2) were not. Sound pressure levels were reported as energy equivalent levels, L_{eq}, as well as minimum and maximum measured sound pressure levels (L_{min} and L_{max}). Table 3-4 summarizes the results of the ambient noise survey. Figure 3-5 also displays the L_{eq} obtained at each site for each monitoring period. The sound pressure levels reported by Mirant are generally similar to those measured in 1988 as part of the previous Station H licensing proceeding.

Mirant conducted additional daytime measurements on January 22, again for 15-minute intervals, with the combustion turbines operating; these measurements are included in Table 3-4 and Figure 3-5. In some cases, the noise levels obtained while the CTs were operating are lower than those with the CTs not operating. This reflects the variability of the ambient noise, especially given the fact that these noise levels were measured over a 15-minute period only. Furthermore, the measurements with the CTs operating were taken on a different day than the other daytime monitoring event, so atmospheric conditions and activity levels may have been somewhat different.

Ambient noise around the Dickerson site is affected by operations of the existing power plant (including coal deliveries by rail), operations of the adjacent Montgomery County RRF, and truck and automobile traffic on nearby roads. Nighttime noise levels measured at those locations toward the east of the site were quite low, consistent with the generally rural character of the area. Minimum sound pressure levels at night were 32.6 dBA at Location 1, 34.3 dBA at both Locations 4 and 5, and 42.4 at Location 3. The maximum sound levels measured at or near the site boundaries were 66.7 dBA during nighttime (at Location 2) and 74.8 dBA during daytime (at Location 1).

Table 3-4 Ambient Sound Pressure Levels at Dickerson Site

		Measured Sound Pressure Levels (dBA)		
Site Location	**Time**	**Minimum**	**Maximum**	**L_{eq}**
1 – Near eastern site boundary	Day	37.5	58.0	45.8
	Night	32.6	51.1	41.8
	w/ CTs*	36.2	74.8	47.3
2 – Western site boundary between Potomac R. and C&O Canal	Day	50.9	61.1	53.7
	Night	55.7	66.7	57.7
	w/ CTs	52.9	58.2	53.6
3 – Near southern site boundary and Montgomery Co. RRF	Day	52.0	67.0	57.1
	Night	42.4	55.8	46.1
	w/ CTs	47.6	60.9	51.4
4 – Southeast of proposed new units; nearest residence	Day	40.9	73.4	55.3
	Night	34.3	60.5	39.8
	w/ CTs	42.8	74.5	53.9
5 – Northern site boundary	Day	36.9	67.9	47.0
	Night	34.3	63.6	46.8
	w/ CTs	39.7	61.3	43.9
6 – Proposed new unit location to Station H turbines)	Day	50.4	64.0	52.8
	Night	50.9	61.0	53.2
	w/ CTs	65.0	77.4	66.0

*Measurements taken during daytime with Units H-1 and H-2 operating.

4.0 AIR QUALITY IMPACTS

4.1 IMPACT ASSESSMENT BACKGROUND AND METHODOLOGY

4.1.1 Overview

As part of the CPCN application process, PPRP, in conjunction with MDE Air and Radiation Management Administration (ARMA), evaluates potential impacts to air quality resulting from emissions of projects to be licensed in Maryland under COMAR 20.80. This evaluation includes emissions investigations and other studies, including air dispersion modeling assessments, to ensure that impacts to air quality from the proposed projects are acceptable. PPRP and ARMA also conduct a complete air quality regulatory review for two purposes: 1) to assist in the impact assessment, because air quality regulatory standards and emissions limitations define levels to protect against adverse health, welfare, and environmental effects; and 2) to ensure that the proposed project will meet all applicable regulatory requirements.

To conduct the air quality evaluation of the proposed expansion at the Dickerson site, PPRP and ARMA evaluated projected maximum potential air pollutant emissions to ensure that the project will meet applicable regulatory thresholds and limits. The proposed project was also evaluated to determine whether its emissions would have any significant impacts on the existing ambient air quality in the region. This was completed through air dispersion modeling that predicts the ambient air concentrations resulting from source emissions.

4.1.2 Regulatory Considerations

The U.S. Environmental Protection Agency (EPA) has defined concentration-based National Ambient Air Quality Standards (NAAQS) for several pollutants, which are set at levels considered to be protective of the public health and welfare. Specifically, the NAAQS have been defined for six "criteria" pollutants, including particulate matter (PM), sulfur dioxide (SO2), nitrogen dioxide (NO2), carbon monoxide (CO), ozone, and lead. Air emissions limitations and pollution control requirements are generally more stringent for sources located in areas that do not currently attain a NAAQS for a particular pollutant (known as "nonattainment" areas).

The air quality in Montgomery County in the vicinity of the Dickerson facility is in attainment for all pollutants with the exception of ozone. Because of the high levels of ozone historically found in Montgomery County during the ozone season (May-October), the County is designated a "serious" ozone nonattainment area. Emissions of the two pollutants that are the primary precursors to ozone—volatile organic compounds (VOCs) and nitrogen oxides (NOx) —are regulated more stringently in ozone nonattainment areas to ensure that air quality is not further degraded (i.e., the ambient air concentrations of ozone does not continue to increase as new sources of emissions are constructed).

Potential emissions from new and modified sources in nonattainment areas are evaluated through the nonattainment New Source Review (NA-NSR) regulatory program (COMAR 26.11.17). The goal of the NA-NSR program is to allow construction of new emission sources and modifications to existing sources, while ensuring that progress is made towards attainment of the NAAQS. Triggering NA-NSR indicates that a project could adversely impact air quality, which means that impacts must be managed. NA-NSR requires that major sources of VOCs or NOX limit emissions of pollutants through the implementation of the most stringent levels of pollution control, known as Lowest Achievable Emission Rate (LAER). In addition, NA-NSR requires pollutant "offsets" to be obtained for every ton of regulated pollutant emitted.

Potential emissions from new and modified sources in attainment areas are evaluated through the Prevention of Significant Deterioration (PSD) program. The goal of the PSD program is to ensure that emissions from major sources do not degrade air quality. Triggering PSD requires pollution control known as Best Available Control Technology (BACT) and additional impact assessments.

The Dickerson Generating Station is an existing major source of air emissions. The expansion at the Dickerson site has the potential to increase emissions of criteria pollutants PM, SO2, NO2, CO, and lead; VOCs; and several hazardous air pollutants (HAPs). Because the area in which the Dickerson facility is located is nonattainment for ozone and attainment for the other pollutants, PPRP and ARMA assessed applicability with both NA-NSR and PSD requirements to ensure no adverse impacts would be caused by the project. The results of these evaluations for the proposed project are discussed in Sections 4.3 (PSD program) and 4.4 (NA-NSR program).

Other federal and state air quality regulations may apply to the expansion at the Dickerson site. These regulations apply either as a result of the type

of emission source that is to be constructed, or as a result of the pollutants to be emitted from the system. These regulations, discussed in Section 4.6, specify limits on pollutant emissions and impose recordkeeping and reporting requirements.

4.2 *PROPOSED PROJECT SOURCE CHARACTERIZATION*

4.2.1 *Proposed New Sources*

Mirant proposes to increase generating capacity at the Dickerson site by adding heat recovery steam generators (HRSGs) and a steam turbine to convert the existing Station H simple cycle combustion turbines (CTs) to a combined cycle unit, designated as Unit 4. A second combined cycle unit, Unit 5, will also be constructed. Units 4 and 5 will include duct burners for additional power output. Emission controls will consist of selective catalytic reduction (SCR) systems to control NOx and oxidation catalyst systems to control CO and VOCs during combined cycle operations. Units 4 and 5 will both include GE Frame 7F CTs; however, there are some differences between the units because of the difference in age in the two units. Newer Unit 5, because of certain advances in technology, will have inherently lower NOx emission rates than the CTs in Unit 4. Mirant is projecting the NOx concentration at the inlet to the SCR for Unit 4 to be 42 parts per million (ppm) when firing natural gas and the inlet NOx concentration from Unit 5 to be 9 ppm.

To support the expansion, Mirant also proposes to construct a small auxiliary boiler; two mechanical induced draft, multi-cell counter flow cooling towers; and two fuel oil tanks. In its original application for a CPCN, Mirant indicated that it was also proposing to install two diesel-fired firewater pumps that would operate no more than 56 hours per year each as part of the Dickerson Expansion project. In subsequent submissions, Mirant indicated that no new firewater pumps are proposed as part of the Dickerson Expansion project.

The auxiliary boiler will emit similar pollutants as the CTs. The cooling towers will emit some PM dissolved in the vapor droplets released from the towers ("drift"). The fuel storage tanks will emit some VOCs as a portion of the petroleum constituents evaporate. Table 4-1 summarizes the specifications of the proposed units.

Table 4-1 Air Emission Sources

Component (Number of Units)	Type/Model	Rated Capacity of Each Unit	Fuel	Projected Operation
Unit 4 CT/HRSG (2)	GE Frame 7F	196 MW (at 59°F)	Natural gas, fuel oil	8,760 hr/yr
Unit 5 CT/HRSG (2)	GE Frame 7FA	210 MW (at 59°F)	Natural gas, fuel oil	8,760 hr/yr
Aboveground Storage Tanks for Distillate Fuel Oil (2)	To be determined	(1) 10 million gallon storage tank (1) 200,000 gallon surge tank at rail unloading site	NA	8,760 hr/yr
Auxiliary Boiler	To be determined	60 MMBtu/hr	Natural gas, fuel oil	8,760 hr/yr
Cooling Towers (2)	To be determined	10 cells	NA	8,760 hr/yr

Source: Mirant's CPCN application of May 2001 NA = not applicable

4.2.2 *Sequencing of the Project*

In its initial CPCN application, Mirant proposed to begin construction of the entire project described in Section 4.2.1 immediately upon obtaining the CPCN for the project. The entire project includes Unit 5 CTs able to operate in simple cycle and combined cycle modes, addition of components to convert Station H to combined cycle operations, and installation of an auxiliary boiler and a cooling tower system. After reviewing the project schedule, and the company's projected business needs, Mirant requested, in its "Eighth Supplement to the CPCN Application" of 22 January 2002, the flexibility to sequence the construction of the project. Under the new schedule, Mirant will install the Unit 5 CTs and will operate both Station H and new Unit 5 in simple cycle mode during the period of time in which the combined cycle components of the project (HRSGs, SCR and oxidation catalysts on Station H and Unit 5; auxiliary boiler; cooling towers) are constructed. Until the HRSGs become operational, Station H will continue to operate in simple cycle mode only, under the terms and conditions of the CPCN for Station H (PSC Case No. 8063) and any subsequent permitting or regulatory requirements.

Maryland (COMAR 26.11.17) and federal PSD and new source permitting regulations (40 CFR 52.21(r)(2)) contain explicit definitions of

"commencing construction" and "begin actual construction" and address the concept of the length of time during which a PSD permit to construct remains valid after its issuance. One of the primary reasons for this time limitation relates to pollution control systems and the advances that occur in control systems over time. As will be described fully in Section 4.3.2, major sources subject to PSD or new source permitting face stringent pollution control requirements. Over time, new control systems are developed, and existing systems undergo technological advances that allow the systems to become more efficient or more cost-effective to implement. In fact, significant advances in control technology can be, and are, achieved continually. If an applicant were granted blanket approval to proceed with a project with no limitation on when the project were to be constructed or when operations begin, the specified level of pollution control on the project may not be sufficient. To prevent a project from being implemented with inadequate levels of pollution control, MDE and EPA define a "reasonable" construction period for major projects.

Under 40 CFR 52.21(r)(2), the approval to construct becomes invalid "if construction is not commenced within 18 months after receipt of such approval, if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable time." The "commencement" of construction means that the owner or operator has obtained required permits and has either "begun, or caused to begin a continuous program of actual on-site construction of the source to be completed within a reasonable time" or "entered into binding agreements or contractual obligations, which cannot be canceled or modified without substantial loss to the owner or operator, to undertake a program of actual on-site construction of the source to be completed within a reasonable time" (COMAR 26.11.17.01(B) (6) and 40 CFR 52.21(b) (9)).

Applicants can apply for, and EPA and states grant, approval for projects that are "phased construction" projects. In phased construction, the applicant describes and applies for the full scope of a proposed new project, but constructs the project in distinct phases. With each phase, EPA and the state agency require that the applicant revisit the control technology determination (and other components of the project) and may require more stringent control than originally proposed for later phases of the project.

Mirant is not proposing phased construction. Instead, Mirant is proposing to begin construction on the entire project upon issuance of the CPCN; however, Mirant plans to sequence the construction so that they can bring Unit 5 on-line in simple cycle mode relatively quickly, while the company pursues "a course of continuous construction on the combined cycle

components." Mirant indicates in a response to a data request dated 26 March 2003 that it plans to have Unit 5 operational in 2006, which assumes engineering and construction begins in 2004; and to have Units 4 and 5 operational in combined cycle mode in the 2006 to 2008 timeframe.

As long as the timing and implementation of the project meet the definition of "continuous construction," the project will not be considered to be "phased construction." The schedule as indicated by Mirant in its 26 March 2003 response to data request will allow the company to complete the construction of the project in a "reasonable" period of time.

To ensure that the project proceeds as described, ARMA and PPRP: 1) evaluated the impacts of the emissions of Station H and Unit 5 operating in simple cycle mode only during the period of continuous construction; and 2) are proposing certain licensing conditions (see Appendix A) that will allow the State to track the progress of the Dickerson Expansion project to ensure that it proceeds as currently proposed, and to ensure that the air quality impacts of the sequenced project remain at levels that do not exceed applicable thresholds.

4.2.3 *Potential Emissions Prior to Combined Cycle Operations*

The Dickerson Expansion project involves two operating schedules to accommodate the sequencing of the project. Mirant is proposing one operating schedule during the period of continuous construction of the combined cycle facilities (i.e., for the period of time beginning when the Unit 5 CTs become operational and until the HRSGs become operational on either Unit 4 or Unit 5) and one operating schedule beginning at the point at which the HRSGs become operational and extending through the life of the project (unless Mirant applies for and is granted an alternate operating schedule).

During the initial period when Unit 5 can operate in simple cycle mode only, and until the HRSGs become operational, potential annual emissions from the Unit 5 CT are based on an ambient temperature of 59°F and the following operating assumptions:

- Operations at Unit 5 will be limited to 1,500 hours per year in simple cycle mode, with a maximum of 500 hours per year per CT burning fuel oil.

- Operation of Unit 5 in simple cycle mode when firing fuel oil will not take place during the ozone season (1 May through 30 September), except when natural gas is unavailable due to an emergency.

- The primary fuel for Unit 5 will be natural gas, with distillate fuel oil as backup.
- The maximum sulfur content of the fuel oil allowable on Unit 5 is 0.05 % sulfur by weight.

Short-term emission rates during that period of time until the HRSGs become operational are shown in Table 4-2. Annual emission rates of regulated pollutants are shown in Table 4-3.

4.2.4 Potential Emissions Once HRSGs Become Operational

Units 4 and 5 will operate in both simple cycle and combined cycle modes. The primary fuel will be natural gas, with distillate fuel oil as backup. Potential annual air emissions from the proposed Units 4 and 5 are based on an ambient temperature of 59°F and the following operating assumptions:

- Each HRSG has the capacity of duct firing at up to 328 million Btu per hour (MMBtu/hr) (higher heating value) for a maximum of 2,100 hours per year;
- Distillate fuel firing in the CTs is limited to 720 hours per year in combined cycle mode;
- Each CT will operate in simple cycle mode for no more than 500 hours per year, with no more than 250 hours per year on oil firing;
- Maximum sulfur content of the fuel oil for both units is 0.05 % sulfur by weight;
- The SCR system on Unit 4, the older CT, which due to age and design has an inherently higher NOx emission rate, will operate at a NOx reduction efficiency of approximately 89 percent, for a maximum NOx emission rate of 4.5 ppm when firing natural gas; the SCR system on Unit 5, the newer unit that is equipped with advanced dry low-NOx burners and thus an inherently lower NOx emission rate, will operate at a reduction efficiency of approximately 61 percent for a maximum rate of 3.5 ppm;
- The oxidation catalyst will reduce uncontrolled CO emissions by 90 percent and VOC emissions by 80 percent and will run during combined cycle operation only; and
- The units will operate at base or 100 percent load.

Table 4-2 Short-Term Emission Rates: Until HRSGs Become Operational

			Emission Rate per CT (lb/hr)[1]				
Air Emission Source	**Fuel**	**Duct Firing**	**PM**	**SO2**	**NOx**	**CO**	**VOC**
Station H[2]							
Simple Cycle	Natural Gas	No	21	34	321	90	2
Simple Cycle	Fuel Oil	No	27	579	608	91	4
Units[3]							
Simple Cycle	Natural Gas	No	9	9.8	57.9	28.8	2.8
Simple Cycle	Fuel Oil	No	17	97.4	314.2	65	7.4

Source: CPCN Application, May 2001

(1) Ambient temperature 59 degrees F, 100 % load

(2) Station H short-term emissions in Condition 17 of the CPCN for Case No. 8063

(3) Short-term emissions from CPCN application; operating restrictions outlined in 8th Supplement to CPCN Application 1/22/02

Table 4-3 Maximum Annual Emission Rates Until HRSGs Become Operational

				Emission Rate (tons per year)[1]				
Air Emission Source	**Fuel**	**Duct Firing**	**Annual Hours of Operation**	**PM**	**SO2**	**NOx**	**CO**	**VOC**
Station H (2 CTs)[2]								
Simple Cycle	Natural Gas	No	1500	31.5	51.0	481.5	135.0	3.0
Simple Cycle	Fuel Oil	No	1500	40.5	868.5	912.0	136.5	6.0
Maximum annual allowable emissions				72	920	1,394	272	9
Unit 5 (2 CTs)[3]								
Simple Cycle	Natural Gas	No	1000	9.0	9.8	57.9	28.8	2.8
Simple Cycle	Fuel Oil	No	500	8.5	48.7	157.1	32.5	3.7
Maximum Annual emissions				17.5	58.5	215.0	61.3	6.5

Source: CPCN Application, May 2001

(1) Ambient temperature 59 degrees F, 100 % load

(2) Station H operating restrictions in CPCN for Case No. 8063

(3) Operating restrictions outlined in 8th Supplement to CPCN Application 1/22/02

Short-term emission rates associated with the proposed project are shown in Table 4-4. Annual emission rates of regulated pollutants are shown in Table 4-5.

In addition to the regulated pollutants identified above, the CTs will have the potential to emit several of EPA's listed hazardous air pollutants (HAPs). A discussion of the HAP Maximum Achievable Control Technology (MACT) requirements is presented in Section 4.l.6.3. Table 4-6 summarizes projected HAP emission rates for Units 4 and 5. Table 4-7 summarizes projected HAP emissions from the auxiliary boiler. The other proposed new sources will have negligible or zero HAP emissions.

4.2.5 *Existing Dickerson Station*

Air emission sources present at the existing site consist of three tangentially fired coal boilers (Units 1, 2, and 3), Station H CTs, and support equipment. Actual air emissions as reported by Mirant in its annual emissions certification report for Dickerson from 1996 through 2000 are shown in Table 4-8.

In addition to the new units described in the previous section, Mirant is proposing the following changes to existing air emission sources as part of the Dickerson expansion project:

- Reduction in the allowable sulfur content of the fuel oil used in Unit 4 to 0.05 percent sulfur once the HRSGs become operational; and
- Installation of additional NOx control technology on existing coal-fired Units 1, 2, and 3 to ensure that there is no net increase in NOx emissions from the operation of Unit 4 in combined cycle mode, or from the installation and operation of Unit 5 in either simple cycle or combined cycle mode.

The reduction in emissions resulting from reductions in the allowable sulfur content in the fuel oil and the addition of NOx control on Units 1, 2, and 3 is designed to minimize the impact of the new generation sources.

4.2.6 *Net Emissions Increase Determination*

Mirant calculated the net increases in pollutant emissions from the expansion project to determine applicability with PSD and NA-NSR. PPRP and ARMA conducted an independent evaluation of the net emissions increase and the associated regulatory issues. Note that PPRP

Table 4-4 Short-Term Emission Rates under Various Operating Conditions

			Emission Rate per CT (lb/hr)[1]				
Air Emission Source	**Fuel**	**Duct Firing**	**PM**	**SO2**	**NOx**	**CO**	**VOC**
Unit 4							
Combined Cycle	Natural Gas	No	22.9	9.2	28.3	7.5	0.3
Combined Cycle	Natural Gas	Yes	25.9	11	39.4	11.5	2
Combined Cycle	Fuel Oil	No	38.7	81.1	97.2	7.6	0.7
Simple Cycle	Natural Gas	No	21	9.2	263.8	75.3	1.7
Simple Cycle	Fuel Oil	No	22	81.1	369.5	76.3	3.5
Unit 5							
Combined Cycle	Natural Gas	No	11	9.8	22.5	2.9	0.6
Combined Cycle	Natural Gas	Yes	14.7	11.6	26.9	6.2	1.9
Combined Cycle	Fuel Oil	No	37.1	97.4	112.2	6.5	1.5
Simple Cycle	Natural Gas	No	9	9.8	57.9	28.8	2.8
Simple Cycle	Fuel Oil	No	17	97.4	314.2	65	7.4
Auxiliary Boiler	Natural Gas	NA	0.6	0.34	4.8	9	0.24
Auxiliary Boiler	Fuel Oil	NA	3	3.13	7.8	9	0.24
Fuel Storage Tank	NA	NA	0	0	0	0	0.73
Cooling Tower - Unit 4	NA	NA	0.22	0	0	0	0
Cooling Tower - Unit 5	NA	NA	0.24	0	0	0	0

Source: CPCN Application, May 2001

(1) Ambient Temperature 59 degrees F, 100 % load NA = not applicable

Table 4-5 Maximum Annual Emission Rates

				Emission Rate (tons per year)[1]				
Air Emission Source	**Fuel**	**Duct Firing**	**Annual Hours of Operation**	**PM**	**SO2**	**NOx**	**CO**	**VOC**
Unit 4 (2 CTs)								
Combined Cycle	Natural Gas	No	5,440	124.6	50.0	154.0	40.8	1.6
Combined Cycle	Natural Gas	Yes	2,100	54.4	23.1	82.7	24.2	4.2
Combined Cycle	Fuel Oil	No	720	27.9	58.4	70.0	5.5	0.50
Simple Cycle	Natural Gas	No	250	5.3	2.3	66.0	18.8	0.43
Simple Cycle	Fuel Oil	No	250	5.5	20.3	92.4	19.1	0.88
Unit 5 (2 CTs)								
Combined Cycle	Natural Gas	No	5,440	59.8	53.3	122.4	15.8	3.3
Combined Cycle	Natural Gas	Yes	2,100	30.9	24.4	56.5	13.0	4.0
Combined Cycle	Fuel Oil	No	720	26.7	70.1	80.8	4.7	1.1
Simple Cycle	Natural Gas	No	250	2.3	2.5	14.5	7.2	0.7
Simple Cycle	Fuel Oil	No	250	4.3	24.4	78.6	16.3	1.9
Auxiliary Boiler	Natural Gas	NA	7790	2.34	1.32	18.70	35.06	0.93
Auxiliary Boiler	Fuel Oil	NA	970	1.46	1.52	3.78	4.37	0.12
Fuel Storage Tank	NA	NA	8,760	0.00	0.00	0.00	0.00	3.20
Cooling Tower - Unit 4	NA	NA	8,760	0.96	0.00	0.00	0.00	0.00
Cooling Tower - Unit 5	NA	NA	8,760	1.05	0.00	0.00	0.00	0.00
MAXIMUM ANNUAL EMISSIONS (TPY)				347.3	331.6	840.2	204.7	22.77

Source: CPCN Application, May 2001

(1) Ambient Temperature 59 degrees F, 100 % load

Table 4-6 Hazardous Air Pollutant Emissions from Units 4 and 5

Air Emission Source	Heat Input (MMBtu/hr)	Fuel	Duct Firing	Annual Hours of Operation
Unit 4 (2 CTs)				
Combined and Simple Cycle	1666	NG	No	6,660
Combined Cycle	1994	NG	Yes	2,100
Combined and Simple Cycle	1574	FO	No	970
Unit 5 (2 CTs)				
Combined and Simple Cycle	1771	NG	No	6,660
Combined Cycle	2099	NG	Yes	2,100
Combined and Simple Cycle	1889	FO	No	970

	Unit 4 Emissions (tpy)			**Unit 5 Emissions (tpy)**			
Hazardous Air Pollutant	**Natural Gas**	**NG w/duct firing**	**Fuel**	**Natural Gas**	**NG w/duct firing**	**Fuel Oil**	**Annual HAP Emissions (tpy)**
1,3-Butadiene	4.77E-03	1.80E-03	2.44E-	5.07E-03	1.90E-03	2.93E-02	6.73E-02
Acetaldehyde	4.44E-01	1.67E-01	NA	4.72E-01	1.76E-01	NA	1.26E+00
Acrolein	7.10E-02	2.68E-02	NA	7.55E-02	2.82E-02	NA	2.02E-01
Benzene	1.33E-01	5.02E-02	8.40E-	1.42E-01	5.29E-02	1.01E-01	5.63E-01
Ethlylbenzene	3.55E-01	1.34E-01	NA	3.77E-01	1.41E-01	0.00E+00	1.01E+00
Formaldehyde	1.66E+00	6.28E-01	4.27E-	6.61E-01	2.75E-01	5.13E-01	4.17E+00
Naphthalene	1.44E-02	5.44E-03	5.34E-	1.53E-02	5.73E-03	6.41E-02	1.59E-01
PAH	2.44E-02	9.21E-03	6.11E-	2.59E-02	9.70E-03	7.33E-02	2.04E-01
Propylene Oxide	3.22E-01	1.21E-01	NA	3.42E-01	1.28E-01	NA	9.13E-01
Toluene	3.66E-01	1.38E-01	NA	3.89E-01	1.45E-01	NA	1.04E+00
Xylene	7.10E-01	2.68E-01	NA	7.55E-01	2.82E-01	NA	2.02E+00
Arsenic	NA	NA	1.68E-	NA	NA	2.02E-02	3.70E-02
Beryllium	NA	NA	4.73E-	NA	NA	5.68E-04	1.04E-03
Cadmium	NA	NA	7.33E-	NA	NA	8.80E-03	1.61E-02
Chromium	NA	NA	1.68E-	NA	NA	2.02E-02	3.70E-02
Lead	NA	NA	2.14E-	NA	NA	2.57E-02	4.70E-02
Manganese	NA	NA	1.21E+0	NA	NA	1.45E+00	2.65E+00
Mercury	NA	NA	1.83E-	NA	NA	2.20E-03	4.03E-03
Nickel	NA	NA	7.02E-	NA	NA	8.43E-03	1.55E-02
Selenium	NA	NA	3.82E-	NA	NA	4.58E-02	8.40E-02
TOTAL HAPS (TONS PER YEAR)						14.5	

Source: CPCN Application, May 2001

NG = Natural Gas
FO = Fuel Oil

Table 4-7 Hazardous Air Pollutant Emissions from the Boiler

HAP	Nat. Gas EF (lb/10^6 scf)	Nat. Gas Emissions (lb/hr)	Nat. Gas Emissions (tpy)	Fuel Oil EF (lb/10^3 Gal)	Fuel Oil Emissions (lb/hr)	Fuel Oil Emissions (tpy)	Annual Emissions (tpy)
1,1,1-Trichloroethane	NA	NA	NA	2.36E-04	1.04E-04	5.04E-05	5.04E-05
1,3-Butadiene	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	2.40E-05	1.41E-06	5.49E-06	NA	NA	NA	5.49E-06
3-Methylchloranthrene	1.80E-06	1.06E-07	4.12E-07	NA	NA	NA	4.12E-07
7,12-Dimethylbenz (a) anthr acene	1.60E-05	9.40E-07	3.66E-06	NA	NA	NA	3.66E-06
Acenaphthene	1.80E-06	1.06E-07	4.12E-07	2.11E-05	9.29E-06	4.50E-06	4.92E-06
Acenaphthalene	1.80E-06	1.06E-07	4.12E-07	2.53E-07	1.11E-07	5.40E-08	4.66E-07
Anthracene	2.40E-06	1.41E-07	5.49E-07	1.22E-06	5.37E-07	2.60E-07	8.10E-07
Antimony	NA	NA	NA	5.25E-03	2.31E-03	1.12E-03	1.12E-03
Arsenic	2.00E-04	1.18E-05	4.58E-05	1.32E-03	5.81E-04	2.82E-04	3.28E-04
Barium	4.40E-03	2.59E-04	1.01E-03	2.57E-03	1.13E-03	5.49E-04	1.56E-03
Benz(a)anthracene	1.80E-06	1.06E-07	4.12E-07	4.01E-06	1.76E-06	8.56E-07	1.27E-06
Benzene	2.10E-03	1.23E-04	4.81E-04	2.14E-04	9.42E-05	4.57E-05	5.26E-04
Benzo(a)pyrene	1.20E-06	7.05E-08	2.75E-07	NA	NA	NA	2.75E-07
Benzo(b)fluoranthene	1.80E-06	1.06E-07	4.12E-07	1.48E-06	6.51E-07	3.16E-07	7.28E-07
Benz o (g,h,i)perylene	1.20E-06	7.05E-08	2.75E-07	2.26E-06	9.95E-07	4.82E-07	7.57E-07
Benzo(k)fluoranthene	1.80E-06	1.06E-07	4.12E-07	NA	NA	NA	4.12E-07
Beryllium	1.20E-05	7.05E-07	2.75E-06	2.78E-05	1.22E-05	5.93E-06	8.68E-06
Butane	2.1	1.23E-01	4.81E-01	NA	NA	NA	4.81E-01
Cadmium	1.10E-03	6.46E-05	2.52E-04	NA	NA	NA	2.52E-04
Chloride	NA	NA	NA	3.47E-01	1.53E-01	7.41E-02	7.41E-02
Chromium	1.40E-03	8.23E-05	3.20E-04	8.45E-04	3.72E-04	1.80E-04	5.01E-04
Chromium VI	NA	NA	NA	2.48E-04	1.09E-04	5.29E-05	5.29E-05
Chrysene	1.80E-06	1.06E-07	4.12E-07	2.38E-06	1.05E-06	5.08E-07	9.20E-07
Cobalt	8.40E-05	4.94E-06	1.92E-05	6.02E-03	2.65E-03	1.29E-03	1.30E-03
Copper	8.50E-04	5.00E-05	1.95E-04	1.76E-03	7.75E-04	3.76E-04	5.70E-04
Dibenzo(a,h)anthracene	1.20E-06	7.05E-08	2.75E-07	1.67E-06	7.35E-07	3.56E-07	6.31E-07
Dichlorobenzene	1.20E-03	7.05E-05	2.75E-04	NA	NA	NA	2.75E-04
Ethane	3.1	1.82E-01	7.10E-01	NA	NA	NA	7.10E-01
Ethylbenzene	NA	NA	NA	6.36E-05	2.80E-05	1.36E-05	1.36E-05
Fluoranthene	3.00E-06	1.76E-07	6.87E-07	4.84E-06	2.13E-06	1.03E-06	1.72E-06
Fluorene	2.80E-06	1.65E-07	6.41E-07	4.47E-06	1.97E-06	9.54E-07	1.60E-06
Fluoride	NA	NA	NA	3.73E-02	1.64E-02	7.96E-03	7.96E-03
Formaldehyde	7.50E-02	4.41E-03	1.72E-02	3.30E-02	1.45E-02	7.04E-03	2.42E-02
Hexane	1.8	1.06E-01	4.12E-01	NA	NA	NA	4.12E-01
Indeno (1,2,3-c d)pyrene	1.80E-06	1.06E-07	4.12E-07	NA	NA	NA	4.12E-07
Lead	NA	NA	NA	1.51E-03	6.65E-04	3.22E-04	3.22E-04
Manganese	3.80E-04	2.23E-05	8.70E-05	3.00E-03	1.32E-03	6.40E-04	7.27E-04
Mercury	2.60E-04	1.53E-05	5.95E-05	1.13E-04	4.97E-05	2.41E-05	8.36E-05
Molybdenum	1.10E-03	6.46E-05	2.52E-04	7.87E-04	3.46E-04	1.68E-04	4.20E-04
Naphthalene	6.10E-04	3.58E-05	1.40E-04	1.13E-03	4.97E-04	2.41E-04	3.81E-04
Nickel	2.10E-03	1.23E-04	4.81E-04	8.45E-02	3.72E-02	1.80E-02	1.85E-02
OCDD	NA	NA	NA	3.10E-09	1.36E-09	6.62E-10	6.62E-10
o-Xylene	NA	NA	NA	1.09E-04	4.80E-05	2.33E-05	2.33E-05
Pentane	2.6	1.53E-01	5.95E-01	NA	NA	NA	5.95E-01
Phenanthrene	1.70E-05	9.99E-07	3.89E-06	1.05E-05	4.62E-06	2.24E-06	6.13E-06
Phosphorus	NA	NA	NA	9.46E-03	4.16E-03	2.02E-03	2.02E-03
Propane	1.6	9.40E-02	3.66E-01	NA	NA	NA	3.66E-01
Pyrene	5.00E-06	2.94E-07	1.14E-06	4.25E-06	1.87E-06	9.07E-07	2.05E-06
Selenium	2.40E-05	1.41E-06	5.49E-06	6.83E-04	3.01E-04	1.46E-04	1.51E-04
Toluene	3.40E-03	2.00E-04	7.78E-04	6.20E-03	2.73E-03	1.32E-03	2.10E-03
Vanadium	2.30E-03	1.35E-04	5.26E-04	3.18E-02	1.40E-02	6.79E-03	7.31E-03
Zinc	2.90E-02	1.70E-03	6.64E-03	2.91E-02	1.28E-02	6.21E-03	1.28E-02
HAP TOTAL (TONS PER YEAR)							**2.72**

Source: AP-42 Table 1.4-3 and 1.4-4, March 1998

EF = Emission Factor

Table 4-8 Actual Emissions from Existing Dickerson Station (tons)

Year	NOx	VOC	SO2	PM	CO
2000	7,127	38.4	29,201	677	347
1999	10,841	45.1	30,643	512	421
1998	13,601	48.7	40,097	806	428
1997	12,765	43.7	34,675	400	402
1996	11,248	43.0	31,553	369	391

Source: Annual Emissions Certification Report

and ARMA evaluated the net emissions implications of the Dickerson Expansion project both in its full extent (Units 4 and 5 able to operate in combined cycle mode; auxiliary boiler; cooling towers), and during the sequencing of the construction.

In general, for the PSD evaluation, the applicant looks at the increases in potential emissions from the project itself to determine applicability with PSD. If new project potential emissions are below the PSD significance thresholds, PSD does not apply. If emissions of any pollutant are above a PSD threshold, the applicant may, under certain conditions discussed below, also take into consideration emissions decreases that have taken place at the existing site in the previous five years to determine whether the "net emissions increase" triggers PSD. For the NA-NSR review, the applicant must consider both the projected potential increases from the new project and all other increases in the pollutants that have occurred at the site over the past five years. The implications of this netting analysis as it relates to PSD and NA-NSR applicability will be discussed further in Sections 4.3 and 4.4 of this document. A summary of the net emissions increase evaluation for the two NA-NSR pollutants — NOx and VOCs — follows.

The netting analysis, by requirement, considers emissions increases of regulated pollutants source-wide associated with the modification itself, plus other "creditable" and "contemporaneous" source-wide emissions increases and decreases, in accordance with COMAR 26.11.17.01B(15). To be creditable, emissions decreases must be surplus, permanent, quantifiable, and enforceable, as described below.

- To be "surplus," the emission reductions must be included in the current State emissions inventory, and must not be required to meet past State Implementation Plan (SIP) requirements or compliance plans;

- To be "permanent," the reductions must be federally enforceable and be assured for the life of the corresponding increase;
- To be "quantifiable," the reductions must be quantified in a credible, workable, and replicable method consistent with procedures promulgated by ARMA and EPA; and
- To be "enforceable," the reductions must be subject to a federally enforceable emissions limitation, which often takes the form of a permit condition in a construction permit.

Contemporaneous is defined in COMAR 26.11.17.01B(15)(b) as:

> "In determining whether an increase or decrease in actual emissions of a particular pollutant is contemporaneous with the increase from the particular change, the full 5 year period preceding the date on which a complete permit application for the change shall be used."

Mirant's original CPCN permit application was filed on 23 May 2001; Mirant filed its "Eighth Supplement to the CPCN Application" on 22 January 2002; Mirant filed Supplement Direct Testimony on the case on 18 March 2002, at which point the application was essentially complete.

In a netting analysis, emissions decreases are based on the "representative" actual operations at the source, generally calculated as the average of actual emissions at the facility from the most recent two years preceding commencement of the modification, or other representative period; however, the period can vary (see Section 4.2.6.2).

In accordance with COMAR 26.11.17.01B(15)(e)(iv), a decrease is only creditable to the extent that the decrease has approximately the same qualitative significance for public health and welfare as that attributed to the increase from the particular change. The impact of the Units 1, 2, and 3 NOx controls proposed by Mirant on ambient air quality and public health and welfare is discussed in Section 4.5.

4.2.6.1 Source-wide Emission Increases

There were no reported increases in VOCs at the site during the contemporaneous period. This section focuses on NOx increases during the contemporaneous period.

In addition to the increases from the proposed Dickerson expansion project itself (summarized in Table 4-5), Mirant has had one other NOx

emissions increase during the contemporaneous period. The increase results from the installation of inlet foggers on the Station H CTs. In August 2000, Mirant installed inlet foggers on Unit 4, which resulted in an increase in NOx of 2.5 tons per year (tpy). The inlet foggers reduce the inlet air temperature and increase the efficiency, mass flow, and power output of the CTs. The fogging system only operates when the ambient temperature is 60°F or greater and the CTs are operating on gas.

Emission increases from the proposed new equipment and the inlet foggers are summarized in Table 4-9.

Table 4-9 Summary of Net Emissions Increase

Net Emission Increase defined in COMAR 26.11.17.01:
Net Emission Increase = Potential new project emissions + source wide emission increases - source wide emission decreases

Potential New Project Emissions (from Table 4-5):

	NOx Emissions (tpy)	VOC Emissions (tpy)
Unit 4 (2 CTs)	465.0	7.6
Unit 5 (2 CTs)	352.7	10.9
Auxiliary Boiler	22.48	1.05
Fuel Storage Tank	0.00	3.20
TOTAL	840.2	22.8

Source: CPCN Application, May 2001

Unit 5 (simple cycle only) Emissions (from Table 4-3):

Source	NOx Emissions (tpy)	VOC Emissions (tpy)
Unit 4 (2 CTs)	0	0
Unit 5 (2 CTs)	215.0	6.5
Auxiliary Boiler	0	0
Fuel Storage Tank	0	0
TOTAL	215.0	6.5

Source: CPCN Application, May 2001

Source Wide Actual Emission Increases

Source	NOx Emissions (tpy)	VOC Emissions (tpy)
Inlet Fogger	2.5	0
TOTAL	2.5	0

Mirant Response to DR#3 indicates 2.5 tpy actual increase in NOx

4.2.6.2 *Source-wide Emission Decreases*

Mirant is not claiming any creditable decreases in VOCs; therefore, this section focuses on potentially creditable NOx decreases.

Mirant proposes a decrease in actual NOx emissions from Units 1, 2, and 3 of 0.04 lb NOx/MMBtu. Mirant proposes to achieve this reduction by installing separated overfire air (SOFA) on Units 1, 2, and 3 to reduce the rate of NOx emissions to a maximum of 0.36 lb/MMBtu per boiler. PPRP and ARMA evaluated the proposed NOx emissions to determine what proportion of the decrease in NOx emissions to 0.36 lb/MMBtu constitutes a creditable decrease.

To determine if the emission reductions are surplus, PPRP and ARMA reviewed applicable NOx emission requirements for the boilers. Potentially applicable NOx requirements are derived from MDE's NOx reduction regulations, and from the Clean Air Act Title IV Acid Rain program.

Maryland's NOx reduction program has been implemented in three phases. The first phase in COMAR 26.11.09.08 required affected sources to implement Reasonably Available Control Technology (RACT) by 31 May 1995. The second phase, COMAR 26.11.27 and 26.11.28, included the adoption of the NOx Budget Rule, which requires a reduction in NOx emissions from stationary sources by 65 percent of 1990 levels before the 2001 ozone season. In the third phase of NOx reductions, which is included in COMAR 26.11.29 and 26.11.30, the State of Maryland is required to reduce NOx emissions to meet a statewide budget established by the U.S. EPA by 2007.

Units 1, 2, and 3 are subject to all three phases of NOx reduction requirements. In order to determine if the NOx reductions proposed are surplus (that is, whether the NOx emissions reductions from installation of SOFA on Units 1-3 are beyond existing regulatory requirements), PPRP and ARMA reviewed these requirements.

The boilers (Units 1-3) are subject to COMAR 26.11.09.08, which required facilities to install RACT during the 1990s. Affected sources were provided the option of complying with NOx RACT in Maryland by meeting an emission limit defined in the regulation, known as the "presumptive RACT" standard, or by developing a NOx RACT proposal indicating an alternative RACT for consideration by MDE. An alternative RACT was applied for by Mirant and issued by MDE for Units 1, 2, and 3 of 0.7 lb/MMBtu per boiler. The allowable RACT emission rate is higher than

the proposed post-SOFA emission rate of 0.36 lb/MMBtu.

Units 1, 2, and 3 are budget sources under Maryland's NOx trading program. In accordance with COMAR 26.11.28.11, the budget allocations for Dickerson Units 1, 2, and 3 are 536, 586, and 571 tons of NOx during the ozone season, respectively (for a total of 1,693 tons of NOx during the ozone season). With the promulgation of COMAR 26.11.30.09, the ozone season NOx budget allocation for Units 1, 2, and 3 in 2003, 2004, and 2005 was reduced to 452, 441, and 461 tons of NOX, respectively (total of 1,354 tons of NOx during the ozone season). Mirant can satisfy NOx budget requirements by reducing emissions at the plant (such as by installing control equipment), by system averaging NOx emissions, by purchasing allowances, or by a combination of these approaches. Mirant proposes to satisfy the NOx budget requirements for Units 1-3 through 2005 through system averaging and purchase of allowances. MDE will adjust the Units 1-3 budget allocations for 2006 and beyond to consider the NOx reductions realized by the SOFA system.

The Clean Air Act Acid Rain Program requirements (40 CFR Parts 72 through 77) are applicable to "affected" units at electric utility sources. Dickerson Units 1, 2, and 3 are Phase II boilers under the Acid Rain Program. Phase II boilers were required to meet Acid Rain Program emission limits by 2000. An affected utility could choose to comply with the Acid Rain rule in one of three ways:

- Meet the standard emission limitations, which for tangentially fired boilers such as Units 1, 2, and 3 is 0.4 lb NOx/MMBtu;
- Average the emission rates of two or more boilers, which allows utilities to over-control at units where it is feasible and less expensive; or
- If a utility cannot meet the standard emission limit, it can apply for a less stringent alternative emission limit (AEL) if the utility uses the appropriate NOx emission control technology on which the applicable emission limit is based, and shows, through a demonstration period, that the unit cannot actually meet the limit despite proper installation and operation of the technology.

In order to reduce NOx emissions at Dickerson Units 1-3 to comply with the Acid Rain rule, Mirant solicited bids from vendors for a low-NOx burner technology that would achieve the Title IV required NOx emission rate of 0.4 lb NOx/MMBtu. Mirant was unable to get a vendor to guarantee an emission rate of 0.4 lb NOx/MMBtu; therefore, Mirant installed low-NOx burners designed to achieve the lowest NOx emissions

possible with the technology, and petitioned EPA for an AEL for the action. After review of the petition, EPA concluded that Mirant had met the general intent of the NOx emissions limitation requirement with installation of low-NOx burner technology. Further, EPA concluded that Mirant Units 1-3 would be granted an "AEL demonstration period" if the units complied with interim NOx AELs of 0.48 lb/MMBtu for Unit 1, 0.51 lb/MMBtu for Unit 2, and 0.47 lb/MMBtu for Unit 3 (EPA, March 2001).

Beginning 1 January 2000, the units were subject to the interim AELs throughout the demonstration period and "… if Mirant submits a timely petition for a final AEL…until the date a final AEL is approved or denied" (EPA, March 2001, pg 4). The demonstration periods were initially established as follows:

- Units 1 and 3: January 1, 2000 through December 31, 2001; and
- Unit 2: November 4, 1999 through December 31, 2001.

To obtain final AELs, Mirant must complete the demonstration period and propose a final AEL for each unit, demonstrating that the proposed emission rates represent the minimum emission rate the units can achieve with the installed technology. Mirant must then submit a petition to EPA for a final AEL. Provided Mirant continues to make appropriate petitions for extensions of the demonstration period and/or final AELs, the interim AELs define allowable NOx emission rates for the three coal-fired units at Dickerson.

As is allowed under the Acid Rain rules, Mirant requested timely extensions of the demonstration period. On March 27, 2002, Mirant applied to EPA for "final" AEL for NOx emissions from Units 1-3 under the Clean Air Act Title IV acid rain program; there is reportedly no decision from EPA on the matter. Mirant requested the following AEL emission rates:

- 0.53 lb/MMBtu for Unit 1;
- 0.52 lb/MMBtu for Unit 2; and
- 0.46 lb/MMBtu for Unit 3.

Mirant, in a meeting with PPRP in Annapolis on February 21, 2003, indicated that when the SOFA systems are installed, the company intends to withdraw the AEL request.

However, rather than using the interim AELs as the baseline allowable emission rate for the net emissions increase evaluation, Mirant is instead

proposing to use the default Phase II NOx emission limit of 0.40 lb/MMBtu for Units 1, 2, and 3 as the baseline allowable emission rate. As such, instead of claiming credit for reductions of 0.12, 0.15, and 0.11 lb/MMBtu for Units 1, 2 and 3, respectively, from application of SOFA (e.g., 0.48 - 0.36 = 0.12 lb/MMBtu for Unit 1), Mirant is claiming a creditable reduction of just 0.04 lb/MMBtu (0.4 – 0.36 lb/MMBtu) for each of the boilers. Should EPA grant final AELs for the units equal to the interim AELs, Mirant may be entitled to apply for additional NOx reduction credits from application of SOFA on Units 1-3.

Based on this evaluation, reducing NOx emissions by 0.04 lb/MMBtu (from the allowable baseline of 0.40 lb/MMBtu to a new lower rate of 0.36 lb/MMBtu) appears to represent a creditable decrease in emissions. To determine the amount of creditable NOx reductions (in tpy) that the 0.04 lb/MMBtu rate represents, operating data (heat input rates) from Mirant Units 1-3 were evaluated to determine "representative" operations and, thus, actual emissions.

COMAR 26.11.17.01B(1) defines actual emissions for the purposes of calculating a net emission increase. Actual emissions are defined, in general, as the average rate in tons per year at which the unit actually emitted the pollutant during a two-year period that precedes the particular date, and which is representative of normal source operations. MDE and EPA regulations allow the use of a different time period than the two years immediately preceding the change upon a determination that it is more representative of normal source operations. The actual emissions reduction is calculated using the emissions unit's actual operating hours, fuels combusted, and heat input rates during the selected time period and the defined emission rate (in this case, a reduction of 0.04 lb/MMBtu).

EPA has considered specific issues related to determining periods of normal operations for electric utility generating units, given the fact that actual emissions from electric steam generating utilities can vary based on electricity demand and other factors. Information in the Federal Register (57 FR 32314) outlining parts of the findings of the Wisconsin Electric Power Company (WEPCO) rulemaking, and recent NSR Reform rulemaking (67 FR 80186) clarify this "baseline actual emissions" issue. The Federal Register Notice for the NSR reform rulemaking allows "utility sources to consider any two consecutive years within the five years prior to the proposed change as representative of normal source operations." The NSR reform rulemaking Federal Register notice indicates that the "baseline actual emissions for EUSGUs (electric utility steam generating units) is the average rate, in tpy, at which that unit actually emitted the

pollutant during a 2-year (consecutive 24-month) period within the 5-year period immediately preceding when the owner or operator begins actual construction."

As outlined in Section 4.2.6, the definition of the five-year contemporaneous period. MDE does not typically issue "permit application completeness" determinations in these cases. However, for reference, Mirant's original CPCN permit application was filed on 23 May 2001; Mirant filed its "Eighth Supplement to the CPCN Application" on 22 January 2002; Mirant filed Supplement Direct Testimony on the case on 18 March 2002, at which time the application was complete. This results in a five-year period which would be 1997-2001.

In its initial application, Mirant provided actual emissions data for 1996 to 2000. Mirant has not been asked to provide actual emissions data for 2001 and 2002. Considering demand and other factors specific to Dickerson, Mirant contends that the most recent two years of complete data representative of normal operations are 1997 and 1998. Specifically, Mirant reports that 1999 and 2000 are not representative of normal operating conditions at Units 1, 2, and 3 because the units experienced unusual outages in both years (Mirant, 2001). Mirant reports that it normally schedules one outage per unit per year for routine maintenance and related activities. Depending on demand requirements and the nature of the maintenance or repairs that are needed, two outages can occur in one calendar year. In addition to routine maintenance, there were unusual outages at Units 1, 2, and 3 resulting from the installation of low-NOx burners and completion of new system tie-ins, actions that were conducted by Mirant to meet certain Title IV Acid Rain Phase II requirements. Mirant reports that Unit 2 was out of service during 1999, and Units 1 and 3 were out of service during 2000 for low-NOx burner installation. The system tie-in work was conducted on all three units during 1999. The unusual outages would have affected average heat input rates at the units over the period 1999-2000.

Therefore, for Units 1, 2, and 3, the average actual emissions that represent creditable reductions are calculated by multiplying the average heat input for Units 1, 2, and 3 for 1997 and 1998 (the representative two-year period) by 0.04 lb/MMBtu (the creditable reduction in emission rate).

To complete the evaluation, Mirant evaluated the creditable reduction in emissions that existing CT Unit 4 will realize when converted from simple cycle to combined cycle with SCR as part of the proposed Dickerson expansion project. Projected emissions for Unit 4, after conversion to combined cycle mode, were presented in Table 4-5. To determine the net

increase from this modification, Mirant determined actual emissions from existing Unit 4 during the 1997-1998 period (the same period determined to be the most representative of normal facility operations), and subtracted this amount from potential emissions from the modification (conversion to combined cycle with installation of SCR) itself. Actual NOx emissions from 1997 and 1998 for the Station H CTs are based on measured stack emissions.

A summary of the calculated average actual emissions from 1996 through 2000 from Units 1, 2, and 3, and from existing Station H are shown in Table 4-10. This represents the creditable decreases in emissions that may be used to determine the net emissions increase for the proposed project.

4.2.6.3 *Summary of the Net Emissions Increase Evaluation*

Table 4-11 summarizes the NOx and VOC net emissions increase analyses for the Dickerson Expansion project. With operation of Units 4 and 5 CTs, the auxiliary boiler, and the cooling towers, as described in Section 4.2, and implementation of SOFA systems on Units 1-3, the project will result in a net increase of 22.8 tpy of VOC emissions. The project results in a reduction in NOx emissions of approximately 1.1 tpy.

Mirant indicates in its response to a date request of 8 March 2002 that its preliminary plans are to install SOFA on Dickerson Unit 1 in the Fall of 2003, on Unit 3 in the Fall of 2004, and on Unit 2 in the Spring of 2005. As Mirant sequences the construction of combined cycle operations, the company must implement SOFA systems on one or more of coal-fired Units 1-3 to ensure that there is no net increase in emissions of NOx at any point in the project. For example, Mirant is apparently proposing to obtain a creditable decrease from implementation of SOFA on Unit 1 to ensure no net emissions increase in NOx emissions with installation of the Unit 5 CTs. As indicated in Table 4-11, the creditable decrease from addition of SOFA on Unit 1 is 236.6 tpy. The projected maximum increase in NOx emissions with the initial sequence of the project (installation of the two Unit 5 CTs capable of operating in simple cycle mode only for 1,500 hours per year) is 215 tpy, which results in a net decrease in NOx emissions for this portion of the project of 19.10 tpy (Table 4-11).

Table 4-10 Summary of Emissions Decreases

Net Emission Increase defined in COMAR 26.11.17.01:
Net Emission Increase = Potential new project emissions + source wide emission increases - source wide emission decreases

Source Wide Emission Decreases

Actual NOx Emission Reduction - Units 1, 2, 3 assuming a baseline of 0.4 lb/MMBtu and a new SOFA rate of 0.36 lb/MMBtu

	Heat Input (MMBtu per year)				NOx Emissions Reductions (tons per year)				
Year	**Unit 1**	**Unit 2**	**Unit 3**	**TOTAL**	**Unit 1**	**Unit 2**	**Unit 3**	**TOTAL**	**2-year Average**
1996	11,927,483	12,116,128	9,889,737	33,933,348	238.55	242.32	197.79	678.67	--
1997	10,374,168	12,057,444	12,196,893	34,628,505	207.48	241.15	243.94	692.57	685.62
1998	13,286,127	12,816,675	13,908,615	40,011,417	265.72	256.33	278.17	800.23	746.40
1999	11,747,539	11,637,214	10,208,046	33,592,799	234.95	232.74	204.16	671.86	736.04
2000	8,035,109	11,324,673	8,941,511	28,301,293	160.70	226.49	178.83	566.03	618.94
2001	10,386,089	10,302,962	9,421,488	30,110,539	207.72	206.06	188.43	602.21	584.12

Actual NOx Emission Reductions - Station H Unit 4 with conversion from simple cycle to combined cycle with SCR

	NOx Emissions Reductions (tons per year)			
Year	**HCT1**	**HCT2**	**TOTAL**	**2-year Average**
1996	48.7	57.8	106.5	--
1997	62.5	57.9	120.4	113.45
1998	13.2	61.1	74.3	97.35
1999	57.2	66.2	123.4	98.85
2000	21.0	43.3	64.3	93.85
2001	52.2	34.7	86.9	75.6

Note: Based on 5/01 CPCN application; however, annual emission inventory submitted to MDE for 2000 states 21.9 tpy for HCT1 and 55.7 tpy for HCT2

TOTAL 2-year Emission Reduction		**2-year Emissions Reduction:**	**Coal-fired Unit 1 Only**
1996/1997	799.07 tpy	1996/1997	223.02 tpy
1997/1998	**843.75 tpy**	**1997/1998**	**236.60 tpy**
1998/1999	834.89 tpy	1998/1999	250.34 tpy
1999/2000	712.79 tpy	1999/2000	197.83 tpy
2000/2001	659.72 tpy	2000/2001	184.21 tpy

Table 4-11 Summary of the Net Emissions Increase Evaluation

Net Emission Increase defined in COMAR 26.11.17.01:
Net Emission Increase = Potential new project emissions + source wide emission increases - source wide emission decreases

Total Project (Units 4 & 5 with combined cycle capacity; auxiliary boilers)

Net Emission Increase	NOx Emissions (tpy)	VOC Emissions (tpy)
Potential New Project Emission	840.2	22.8
Source Wide Potential Emission Increase	2.5	0
Source Wide Emission Decreases	843.75	0
Net Emission Increase	-1.07	22.77

Initial Installation of Unit 5 with Simple Cycle Capacity Only (no combined cycle capacity, no changes to Unit 4, no other sources)

Net Emission Increase	NOx Emissions (tpy)	VOC Emissions (tpy)
Potential New Project Emission	215.0	22.8
Source Wide Potential Emission Increase	2.5	0
Source Wide Emission Decreases	236.60	0
Net Emission Increase	-19.10	22.77

4.3 *PREVENTION OF SIGNIFICANT DETERIORATION (PSD)*

4.3.1 *Applicability*

Based on the facility's potential to emit, the existing Dickerson facility is considered a major source for PSD purposes. Therefore, potential emissions from the proposed project itself were evaluated to determine whether the project will result in a major modification, and thus whether the project is subject to PSD.

As indicated in Table 4-12, projected potential emissions of lead, mercury, beryllium, fluorides, hydrogen sulfide, total reduced sulfur, vinyl chloride, chlorofluorocarbons (CFCs), and halons are below the significance thresholds, and no further analysis is required. However, emissions of NOx/NO2, CO, PM, SO2, and sulfuric acid mist from the Dickerson expansion project exceed major source thresholds; therefore, a netting analysis for these pollutants was conducted to evaluate PSD applicability further. The net emissions increase of NOx given the significant reductions in NOx to be achieved from operation of SOFA on Units 1, 2 and 3, are below the significance threshold, and therefore, the proposed project is not subject to PSD for NOx. However, the net emission increases of CO, SO2, H2SO4, and PM exceed the significance thresholds and are subject to PSD review. VOCs (a nonattainment pollutant) and NOx (both an attainment and nonattainment pollutant) are discussed further in Section 4.4.

For regulated pollutants with potential emissions that exceed the PSD significant thresholds, Mirant must:

- Use Best Available Control Technology (BACT) for regulated pollutants emitted above PSD thresholds (Section 4.3.2);
- Assess the ambient impact of emissions through the use of dispersion modeling (Section 4.3.3);
- If the impact is significant, evaluate (through refined dispersion modeling) compliance with the NAAQS and consumption of air quality increments (Section 4.3.3); and
- Conduct additional impact assessments that analyze impairment to visibility, soils, and vegetation as a result of the modification, as well as impacts on Class I areas (Section 4.3.4).

Table 4-12 PSD Applicability

Pollutant	Potential Project Emissions (tpy)	Net Emission Increase (tpy)	PSD Significance Level (tpy)	Exceed PSD Significance Level?
NO_X/NO_2	840	-0.5	40	No
CO	205	205	100	**Yes**
PM10[1]	347	347	15	**Yes**
PM2.5[1]	347	347	not established	NA
Total suspended particulate[1]	347	347	25	**Yes**
Ozone[2]	23	23	nonattainment pollutant	NA
SO_2	332	332	40	**Yes**
Lead	0.05	0	0.6	No
Fluorides	negligible	negligible	3	No
Sulfuric acid mist	16.5	17	7	**Yes**
Hydrogen sulfide	negligible	negligible	10	No
Total reduced sulfur	negligible	negligible	10	No
Mercury	0.004	0.004	0.1	No
Beryllium	0.001	0.001	0.0004	No
CFCs (11, 12, 113, 114, 115)	0	0	Any increase	No
Halons (1211, 1301, 2402)	0	0	Any increase	No

Source: CPCN Application, May 2001

Notes:

(1) PM2.5 and PM10 assumed to be equal to total particulate; no significance level established for PM2.5.

(2) Ozone impacts are represented by VOC emissions.

4.3.2 *Best Available Control Technology (BACT)*

Based on projected potential emissions, BACT is required for SO2, H2SO4, CO, and PM emissions from the CTs and duct burners, boiler, and cooling towers. This section summarizes the BACT determination for these pollutants.

4.3.2.1 *Definition*

BACT for any source is defined in COMAR 26.11.17.01 as:

> "(a)…an emissions limitation, including a visible emission standard, based on the maximum degree of reduction for each pollutant subject to regulation under the Clean Air Act which would be emitted from any proposed major stationary source or major modification which the Department, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for that source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combination techniques for control of the pollutant.
>
> (b) Application of best available control technology may not result in emissions of any pollutant which would exceed the emissions allowed by an applicable standard under 40 CFR 60 and 61."

The Code of Federal Regulations (CFR) Title 40, Parts 60 and 61, include the New Source Performance Standard (NSPS) and National Emission Standard for Hazardous Air Pollutant (NESHAP) regulations, respectively.

BACT analyses are conducted using EPA's "top-down" BACT approach, as described in EPA's *Draft New Source Review Workshop Manual* (EPA 1990). Two key elements of a top-down analysis are that: 1) the most stringent control technologies must be considered; and 2) a decision to require a lesser degree of emissions reduction must be based on an objective analysis of energy, environmental, and economic impacts.

The five basic steps of a top-down BACT analysis are listed below:

Step 1: Identify potential control technologies

Step 2: Eliminate technically infeasible options

Step 3: Rank remaining control technologies by control effectiveness

Step 4: Evaluate the most effective controls and document results

Step 5: Select BACT

The first step is to identify potentially "available" control options for each emission unit triggering PSD, for each pollutant under review. Available options should consist of a comprehensive list of those technologies with a potentially practical application to the emission unit in question. The list should include technologies used to satisfy LAER requirements, innovative technologies, and controls applied to similar source categories.

For this analysis, the following sources were investigated to identify potentially available control technologies:

- EPA's New Source Review website,
- U.S. EPA's RACT/BACT/LAER Clearinghouse (RBLC) database,
- In-house experts,
- State air regulatory agency contacts,
- Control technology vendors,
- Technical books and articles, and
- Guidance documents and personal communications with state agencies.

After identifying potential technologies, the second step is to eliminate technically infeasible options from further consideration. To be considered feasible, a technology must be both available and applicable. It is important, in this step, that the technical basis for eliminating a technology from further consideration be clearly documented based on physical, chemical, engineering, and source-specific factors related to safe and successful use of the controls.

The third step is to rank the technologies not eliminated in Step 2 in order of descending control effectiveness for each pollutant of concern. If the highest ranked technology is proposed as BACT, it is not necessary to perform any further technical or economic evaluation. Potential adverse impacts, however, must still be identified and evaluated.

The fourth step entails an evaluation of energy, environmental, and economic impacts for determining a final level of control. The evaluation begins with the most stringent control option and continues until a technology under consideration cannot be eliminated based on adverse energy, environmental, or economic impacts. The economic or "cost-

effectiveness" analysis is conducted in a manner consistent with EPA's *OAQPS Control Cost Manual* Fifth Edition (EPA 1996) and subsequent revisions. An important aspect of the top-down BACT methodology is the establishment of baseline emission levels that are used in calculating the cost-effectiveness of alternative control options. EPA's Draft *New Source Review Workshop Manual* states that baseline emissions should be a realistic upper bound estimate of emissions taking into account physical or operational constraints and historical operating data.

The fifth and final step is to select as BACT the most effective of the remaining technologies under consideration for each pollutant of concern.

4.3.2.2 *BACT for the Proposed Units*

A summary of Mirant's BACT proposals for CO, PM, and SO2/H2SO4 are shown in Tables 4-13, 4-14, and 4-15, respectively. PPRP, in conjunction with ARMA, conducted an independent evaluation of potentially applicable control technologies.

4.3.2.3 *BACT for Units 4 and 5*

CO Emissions Control

CO emissions from CTs and other combustion sources result from incomplete combustion, typically when there is insufficient residence time or insufficient temperatures to complete the hydrocarbon oxidation. In gas turbines, quenching by dilution air results in CO emissions. CO emission rates are typically higher at low operating loads.

CO control technologies with potential practical application to combustion sources include combustion controls and post-combustion catalytic oxidation. Each control technology is described briefly below.

- Generally, optimizing the residence time, temperature, and turbulence results in efficient combustion and reduced CO emissions. Good combustor design and operation practices can improve the oxidation process by controlling the operating temperature and distribution of excess air in the flue gas to ensure that there is enough oxygen present at an optimum temperature for complete combustion.
- In catalytic oxidation, a catalyst enhances the oxidation reaction of CO to CO2 at lower temperatures and with a shorter residence time than the uncatalyzed reaction would require. The most efficient catalysts are precious metals dispersed on high surface area

Table 4-13 BACT Proposal for CO

	Technology	Proposed Emission Limit	Units	Fuel	Operating Conditions
Unit 4	- Combustion Controls	8.4	lb/hr	Natural Gas	Combined Cycle
	- Oxidation Catalyst	11.5	lb/hr	Natural Gas	Combined Cycle w/Duct Firing
	with 90% Removal	84.2	lb/hr	Natural Gas	Simple Cycle
	Efficiency	8.5	lb/hr	Distillate Oil	Combined Cycle
		85.3	lb/hr	Distillate Oil	Simple Cycle
Unit 5	- Combustion Controls	3.2	lb/hr	Natural Gas	Combined Cycle
	- Oxidation Catalyst	7.6	lb/hr	Natural Gas	Combined Cycle w/Duct Firing
	with 90% Removal	32.2	lb/hr	Natural Gas	Simple Cycle
	Efficiency	7.2	lb/hr	Distillate Oil	Combined Cycle
		72.4	lb/hr	Distillate Oil	Simple Cycle

Source: CPCN Application, Table 6.4-1, Table 6.2-7

Notes:
(1) Natural gas, distillate fuel with 0.05% sulfur content

Table 4-14 BACT Proposal for PM

	Technology	Proposed Emission Limit	Units	Fuel	Operating Conditions
Unit 4	- Combustion Controls	23	lb/hr	Natural Gas	Combined Cycle
	- Clean Fuels(1)	26	lb/hr	Natural Gas	Combined Cycle w/Duct Firing
		21	lb/hr	Natural Gas	Simple Cycle
		41	lb/hr	Distillate Oil	Combined Cycle
		22	lb/hr	Distillate Oil	Simple Cycle
Unit 5	- Combustion Controls	11	lb/hr	Natural Gas	Combined Cycle
	- Clean Fuels(1)	15	lb/hr	Natural Gas	Combined Cycle w/Duct Firing
		9	lb/hr	Natural Gas	Simple Cycle
		39	lb/hr	Distillate Oil	Combined Cycle
		17	lb/hr	Distillate Oil	Simple Cycle

Source: CPCN Application, Table 6.4-1, Table 6.2-7

Notes:

(1) Natural gas, distillate fuel with 0.05% sulfur content

Table 4-15 BACT Proposal for SO_2 and H_2SO_4

	Technology	Proposed SO2 Emission Limit	Units	Fuel	Operating Conditions
Unit 4	- Combustion Controls	11	lb/hr	Natural Gas	Combined Cycle
	- Clean Fuels(1)	11	lb/hr	Natural Gas	Combined Cycle w/Duct Firing
		11	lb/hr	Natural Gas	Simple Cycle
		92	lb/hr	Distillate Oil	Combined Cycle
		92	lb/hr	Distillate Oil	Simple Cycle
Unit 5	- Combustion Controls	12	lb/hr	Natural Gas	Combined Cycle
	- Clean Fuels(1)	12	lb/hr	Natural Gas	Combined Cycle w/Duct Firing
		12	lb/hr	Natural Gas	Simple Cycle
		106	lb/hr	Distillate Oil	Combined Cycle
		106	lb/hr	Distillate Oil	Simple Cycle

Source: CPCN Application, Table 6.4-1, Table 6.2-7

Notes:

(1) Natural gas, distillate fuel with 0.05% sulfur content

washcoats that are bonded to ceramic honeycomb blocks. Catalysts are designed to operate at temperatures between 600°F to 1,200°F and operating pressures up to 300 psig. Catalytic oxidation systems typically convert 70 to 90 percent of CO in the gas stream to CO2. Catalytic oxidation was used to satisfy BACT requirements for the Kelson Ridge combined cycle facility proposed for Charles County, Maryland, which was issued a CPCN on September 27, 2001.

- The SCONOx~ system is a catalytic oxidation system developed by Goal Line Environmental Technologies. The optimal temperature window for operation of the SCONOx~ system is from 300°F to 700°F (Goal Line 1998). SCONOx~ has reportedly achieved very low NOx and CO limits, averaging 2 ppm and 1 ppm, respectively. SCONOx~ is used primarily for NOx control. SCONOx~ has been applied commercially on two small (<100 MW) combined cycle combustion turbines.
- XONON® is an emerging control technology primarily used to reduce NOx emissions; it also reduces CO and VOCs through the use of a catalyst (XONON 2000). The primary target is generally NOx, and the manufacturer does not claim appreciable reductions in CO emissions. Although a XONON® system is proposed for a combined cycle plant in California, there are no existing commercial applications of the technology.

Mirant is proposing to install an oxidation catalyst with 90 percent removal efficiency on Units 4 and 5. The oxidation catalyst will reside in the HRSGs and therefore will control CO emissions from both the CTs and the duct burners when the CTs are operating in combined cycle mode. There is no proposed add-on CO control during simple cycle operation.

A search of the RBLC database, included in Appendix B, and a review of other sources of information indicated that catalytic oxidation systems and combustion controls are technically feasible CO controls for both simple cycle and combined cycle CTs. Because catalytic oxidation is potentially technically feasible, it was evaluated further through an analysis of economic impacts to determine whether it is feasible for application to the Dickerson expansion.

A cost-effectiveness analysis was performed by Mirant to determine whether an oxidation catalyst would be economically feasible for the proposed facility. Since the cost of installing an oxidation catalyst was less than $4,000 per ton CO removed for combined cycle operations, Mirant concluded that an oxidation catalyst with 90 percent removal efficiency was sufficient to meet BACT requirements.

PPRP and ARMA conducted an independent cost-effectiveness analysis to verify the cost analysis performed by the applicant. Results of this evaluation are summarized in Table 4-16. In addition to confirming Mirant's evaluation on the cost of reducing CO emissions from combined cycle operations, PPRP and ARMA calculated the cost of installing an oxidation catalyst on the simple cycle stack to control emissions when operating in simple cycle mode. Due to the restricted operation in simple cycle (500 hours per year), the cost of installing an oxidation catalyst to reduce emissions during simple cycle operations was more than $20,000 per ton of CO removed, which is cost prohibitive. Even assuming up to 1,500 hours per year in simple cycle mode, as Mirant will be allowed during the sequencing of construction proposed for this project, an oxidation catalyst system to reduce CO is estimated to be more than $14,800/ton of CO removed, which is, again, cost-prohibitive.

It was determined that the installation of an oxidation catalyst with 90 percent removal efficiency for combined cycle operations, and implementation of good combustion practices during simple cycle operation satisfies the BACT requirement for Units 4 and 5.

SO_2 and H_2SO_4 Emissions Control

Sulfur dioxide is formed when fuel that contains sulfur is burned. The sulfur content in fossil fuels varies widely. Fuels such as coal and fuel oil can contain significant amounts of sulfur. Natural gas is free of sulfur except for small amounts found in the odor additive mercaptan (Khartchenko 1998). SO2 is oxidized to sulfur trioxide (SO3) as a combined result of turbine combustion and the oxidation catalyst. Oxidation catalysts are nonselective and will oxidize other compounds in addition to CO. Therefore, SO2 will be further oxidized in the catalyst to form SO3. Virtually all the SO3 hydrolyzes by reaction with water vapor in the exhaust gas to sulfuric acid (H2SO4), resulting in sulfuric acid mist emissions. Sulfuric acid mist emissions also lead to increased PM emissions.

There are two basic approaches to controlling SO2 in any combustion system: remove or limit sulfur from fuel before it is burned or remove the SO2 from the exhaust gases. There are no known add-on controls to remove SO2 from exhaust gases from plants firing natural gas. Sulfuric acid mist emissions can be reduced by controlling SO2 emissions, by removing sulfur from fuel before it is burned, or by removing the SO2 from the exhaust gases.

Table 4-16 Cost Evaluation: CO Catalytic Oxidation Emissions Control

Capital Costs for CO Catalytic Oxidation Unit 4

Cost Item	Cost	Basis
Direct Costs		
Purchased Equipment Cost		
Initial Equipment Cost	$887,505	CPCN Application Table 6.4-2
Instrumentation	$88,750.50	10 % Initial Equipment Cost
Sales Tax	$35,500.20	4 % Initial Equipment Cost
Freight	$44,375.25	5 % Initial Equipment Cost
Subtotal - Purchased Equipment Cost	$1,056,131	
Direct Installation Cost		
Foundations & supports; handling & erection; electrical; piping; etc.	$316,839.29	30% of Purchased Equipment Costs
Site Preparation / Buildings (Site Specific)	$5,000	CPCN Application Table 6.4-2
Subtotal - Direct Installation Cost	$321,839	
Total Direct Costs	$1,377,970	
Indirect Costs		
Engineering	$105,613.10	10% of Purchased Equipment Costs
Construction and field expenses	$52,806.55	5% of Purchased Equipment Costs
Contractor fees	$105,613.10	10% of Purchased Equipment Costs
Start-up and performance tests	$31,683.93	3% of Purchased Equipment Costs
Contingencies	$31,683.93	3% of Purchased Equipment Costs
Total Indirect Costs	$327,401	
TOTAL CAPITAL COSTS	$1,705,371	

Table 4-16 continued

Annual Cost for CO Catalytic Oxidation Unit 4

Cost Item	Cost	Basis
Direct Annual Costs		
Operation and Maintenance Labor		
Operation Labor	$6,240	8 hours per week, $15/hour
Supervision Labor	$936	15% of operation labor
Maintenance Labor	$6,240	8 hours per week, $15/hour
Maintenance Materials	$6,240	100% of maintenance labor
Subtotal Operation and Maintenance Labor	$19,656	
Catalyst Replacement		
Catalyst Cost	$528,065	50 % Purchased Equipment Costs
Catalyst Disposal Cost	$50,000	Engineering Estimate
Sales Tax	$369,646	7% of Catalyst Cost
Catalyst Life (yrs)	3	
Interest Rate (%)	10	
Capital Recovery Factor (CRF)	0.4	
Subtotal Catalyst Replacement	$381,089	Sum of Costs*Capital Recovery Factor
Utilities		
Heat Rate Penalty	$122,026	0.1% MW output, $3/MMBtu fuel cost
Subtotal Utilities	$122,026	
Total Direct Annual Costs	$522,771	
Indirect Annual Costs		
Overhead	$11,794	60% of O&M and materials
Property Tax	$17,054	1% of Total Capital Costs
Insurance	$17,054	1% of Total Capital Costs
Administration	$34,107	2% of Total Capital Costs
Total Indirect Annual Costs	$80,008	
TOTAL ANNUAL COST	$602,779	

Table 4-16 continued

Capital Costs for CO Catalytic Oxidation Unit 5

Cost Item	Cost	Basis
Direct Costs		
Purchased Equipment Cost		
Initial Equipment Cost	$887,505	CPCN Application Table 6.4-2
Instrumentation	$88,750.50	10 % Initial Equipment Cost
Sales Tax	$35,500.20	4 % Initial Equipment Cost
Freight	$44,375.25	5 % Initial Equipment Cost
Subtotal - Purchased Equipment Cost	$1,056,131	
Direct Installation Cost		
Foundations & supports; handling & erection; electrical; piping; etc.	$316,839.29	30% of Purchased Equipment Costs
Site Preparation / Buildings (Site Specific)	$5,000	CPCN Application Table 6.4-2
Subtotal - Direct Installation Cost	$321,839	
Total Direct Costs	$1,377,970	
Indirect Costs		
Engineering	$105,613.10	10% of Purchased Equipment Costs
Construction and field expenses	$52,806.55	5% of Purchased Equipment Costs
Contractor fees	$105,613.10	10% of Purchased Equipment Costs
Start-up and performance tests	$31,683.93	3% of Purchased Equipment Costs
Contingencies	$31,683.93	3% of Purchased Equipment Costs
Total Indirect Costs	$327,401	
TOTAL CAPITAL COSTS	$1,705,371	

Table 4-16 continued

Annual Cost for CO Catalytic Oxidation Unit 5

Cost Item	Cost	Basis
Direct Annual Costs		
Operation and Maintenance Labor		
Operation Labor	$6,240	8 hours per week, $15/hour
Supervision Labor	$936	15% of operation labor
Maintenance Labor	$6,240	8 hours per week, $15/hour
Maintenance Materials	$6,240	100% of maintenance labor
Subtotal Operation and Maintenance Labor	$19,656	
Catalyst Replacement		
Catalyst Cost	$528,065	50 % Purchased Equipment Costs
Catalyst Disposal Cost	$50,000	Engineering Estimate
Sales Tax	$369,646	7% of Catalyst Cost
Catalyst Life (yrs)	3	
Interest Rate (%)	10	
Capital Recovery Factor (CRF)	0.4	
Subtotal Catalyst Replacement	$381,089	Sum of Costs*Capital Recovery Factor
Utilities		
Heat Rate Penalty	$132,893	0.1% MW output, $3/MMBtu fuel cost
Subtotal Utilities	$132,893	
Total Direct Annual Costs	$533,638	
Indirect Annual Costs		
Overhead	$11,794	60% of O&M and materials
Property Tax	$17,054	1% of Total Capital Costs
Insurance	$17,054	1% of Total Capital Costs
Administration	$34,107	2% of Total Capital Costs
Total Indirect Annual Costs	$80,008	
TOTAL ANNUAL COST	$613,646	

Table 4-16 continued

Capital Costs for CO Catalytic Oxidation Unit 5 in Simple Cycle

Cost Item	Cost	Basis
Direct Costs		
Purchased Equipment Cost		
Initial Equipment Cost	$515,000	Vendor Estimate
Instrumentation	$51,500.00	10 % Initial Equipment Cost
Sales Tax	$20,600.00	4 % Initial Equipment Cost
Freight	$25,750.00	5 % Initial Equipment Cost
Subtotal - Purchased Equipment Cost	$612,850	
Direct Installation Cost		
Foundations & supports; handling & erection; electrical; piping; etc.	$183,855.00	30% of Purchased Equipment Costs
Site Preparation / Buildings (Site Specific)	$5,000	Engineering Estimate
Subtotal - Direct Installation Cost	$188,855	
Total Direct Costs	$801,705	
Indirect Costs		
Engineering	$61,285.00	10% of Purchased Equipment Costs
Construction and field expenses	$30,642.50	5% of Purchased Equipment Costs
Contractor fees	$61,285.00	10% of Purchased Equipment Costs
Start-up and performance tests	$18,385.50	3% of Purchased Equipment Costs
Contingencies	$18,385.50	3% of Purchased Equipment Costs
Total Indirect Costs	$189,984	
TOTAL CAPITAL COSTS	$991,689	

Table 4-16 continued

Annual Cost for CO Catalytic Oxidation Unit 5

Cost Item	Cost	Basis
Direct Annual Costs		
Operation and Maintenance Labor		
Operation Labor	$6,240	8 hours per week, $15/hour
Supervision Labor	$936	15% of operation labor
Maintenance Labor	$6,240	8 hours per week, $15/hour
Maintenance Materials	$6,240	100% of maintenance labor
Subtotal Operation and Maintenance Labor	$19,656	
Catalyst Replacement		
Catalyst Cost	$306,425	50 % Purchased Equipment Costs
Catalyst Disposal Cost	$50,000	Engineering Estimate
Sales Tax	$214,498	7% of Catalyst Cost
Catalyst Life (yrs)	3	
Interest Rate (%)	10	
Capital Recovery Factor (CRF)	0.4	
Subtotal Catalyst Replacement	$229,576	Sum of Costs*Capital Recovery Factor
Utilities		
Heat Rate Penalty	$132,893	0.1% MW output, $3/MMBtu fuel cost
Subtotal Utilities	$132,893	
Total Direct Annual Costs	$382,125	
Indirect Annual Costs		
Overhead	$11,794	60% of O&M and materials
Property Tax	$9,917	1% of Total Capital Costs
Insurance	$9,917	1% of Total Capital Costs
Administration	$19,834	2% of Total Capital Costs
Total Indirect Annual Costs	$51,461	
TOTAL ANNUAL COST	$433,587	

CO Emissions from Simple Cycle (500 hr/yr) = 23.5 tons per year
CO Emissions removed (500 hr/yr) = 21.2 tons per year
Cost Effectiveness of CO removal (500 hr/yr) = $20,452
CO Emissions from Simple Cycle (1500 hr/yr) = 32.5 tons per year
CO Emissions removed (1500 hr/yr) = 29.3 tons per year
Cost Effectiveness of CO removal (1500 hr/yr) = $14,798

Mirant has proposed the use of natural gas and limited use of low sulfur fuel oil as BACT for SO2 and H2SO4. Mirant estimates that the natural gas will contain less than 2 grains per 100 standard cubic feet. The maximum allowable sulfur content of natural gas in recent permits for similar sources defined as BACT range from 0.8 to 2 grains per 100 standard cubic feet. The sulfur content of natural gas is typically a function of the source of natural gas.

Mirant has proposed a limit on sulfur content of fuel oil to 0.05 percent at all times on Unit 5, and use of the same fuel oil specifications for Unit 4 once the HRSGs become operational.

In addition, use of fuel oil will be restricted. During the period of continuous construction of the combined cycle facilities, Unit 4 will be limited to fuel oil usage as specified in the CPCN for Case 8063, and Unit 5 will be limited to 500 hours per year on oil. Once the HRSGs become operational, fuel oil use in Units 4 and 5 will be restricted to a maximum of 970 hours per year. A review of the RBLC shows that BACT for SO2 and H2SO4 for combustion turbines, boilers, and engines is low sulfur fuel specification and in some cases an annual emission limitation on SO2 emissions. The lowest reported fuel oil sulfur content documented in the RBLC is 0.05 percent sulfur. Mirant's proposal of 0.3 percent sulfur and/or 0.05 percent sulfur fuel oil is as protective. The results of the RBLC search are presented in Appendix B.

PPRP and ARMA determined that Mirant's proposal constitutes BACT for Units 4 and 5.

PM Emissions Control

PM emissions from Units 4 and 5 result primarily from the carryover of noncombustible materials in the fuel. Constituents of concern in natural gas include ash, fuel-bound sulfur, and nitrogen. Natural gas has negligible amounts of these constituents when compared to other liquid or solid fuels. The fuel oil proposed for use at the Dickerson facility has a low sulfur content (0.05 percent sulfur by weight).

Gas-fired CTs can produce PM when hydrocarbons are not fully combusted, or from poor air/fuel mixing or maintenance problems. Because of the nature of the fuel, PM emissions from natural gas firing in CTs are significantly lower than most oil- or coal-fired combustion processes.

Technologies or systems that may be available for controlling PM

emissions and provide an assessment of the feasibility of application of these technologies to the types of combustion sources proposed by Mirant are described below.

- Centrifugal collectors (or cyclones) are primarily used to recover material from an exhaust stream before the stream is ducted to the principal control device. Typically, cyclones are effective in removing only large (greater than 10 microns) size particles. They work by forcing particle-contaminated gas into a downward spiral within the unit while centrifugal force and inertia push the particles in the gas outward toward the outer wall. Contact with the wall causes the particles to slide down and out the bottom of the cyclone, while the cleaned gas exits through the top of the device.
- Electrostatic precipitators (ESPs) use electrical forces to move PM out of the flowing gas stream and onto collector plates. By being forced through a corona, a region in which gaseous ions flow, the PM is given a negative electrical charge. After the PM is collected on the positive ground plates, it is removed and collected from the plates without reentering the gas stream. This is done by knocking the PM loose from the plates and allowing the collected layer of PM to slide down into a hopper. ESPs can achieve better than 99 percent PM reduction, depending on the particle source, on traditional boilers burning solid fuels and other PM sources.
- The baghouses are a system of elements that use fabric filtration to remove particles from the gas stream. As the gas stream passes through the filters, various mechanisms can be used to filter the PM, including inertial impaction impingement and accumulated dust cake sieving. The accumulated dust must be periodically removed. Baghouses have a collection efficiency on the order of 99 percent, even for small particles.
- Wet gas scrubbers remove particles from gas by capturing the particles in liquid (usually water) droplets and separating the droplets from the gas stream. The droplets act as conveyors of the particulate out of the gas stream. PM removal efficiencies in the range of 90 to 99 percent can be expected from wet gas scrubbers when applied to solid or high sulfur content liquid fuel fired boilers and other PM sources.

Add-on control devices are not generally considered effective for control of PM from combustion turbines burning natural gas with backup fuel, for two primary reasons: the particle size of PM from CTs is small (<1 micron) and PM is diluted by the high volumes of exhaust from the turbine. The California Air Resources Board (CARB 1999) indicates that the only

meaningful control of particulate matter from turbine exhaust emissions is through limitations on fuel type and sulfur content.

Although there are no known applications of add-on controls of PM for combined cycle CTs combusting natural gas with back-up fuel oil, some of the technologies discussed above may theoretically be transferable to the CTs. Therefore, a cost-effectiveness analysis was performed by PPRP to determine whether any PM control technologies would be economically feasible for the proposed facility. Where applicable, conservative assumptions were made in the analysis so that the cost-effectiveness values (in $/ton pollutant removed) would not be overstated. Based on vendor emissions specifications for the equipment, it was estimated that Units 4 and 5 would emit PM at rates of 218 and 124 tpy, respectively. A PM removal efficiency of 99 percent was also assumed.

Table 4-17 shows a breakdown of the annualized capital and O&M costs, as well as the associated cost-effectiveness for applying these potential PM control technologies to the CTs. This analysis shows that the cost of controlling PM emissions ranges from about $8,000 to $141,000 per ton PM removed; therefore, no add-on control system would be cost effective for the equipment proposed by Mirant for the expansion.

4.3.2.4 *BACT for the Auxiliary Boiler*

Mirant proposed the use of clean fuel and good combustion practices for BACT for the 60 MMBtu/hr auxiliary boiler to achieve the emission rates shown in Tables 4-13 to 4-15. The boiler will be designed to satisfy New Source Performance Standards, which are discussed in Section 4.6.

Catalytic oxidation systems and combustion controls may theoretically be feasible for the proposed boiler for CO control. These technologies were described earlier for CTs. However, a search of the RBLC database and review of additional sources indicated only the use of inherently lower emitting fuels and good combustion practice as control for CO on auxiliary boilers of the size proposed for the Dickerson expansion.

According to the RBLC database search (Appendix B), the only potentially feasible technology to control PM and SO2/H2SO4 from auxiliary boiler sources is to utilize clean burning fuel (natural gas) with a low sulfur content. Mirant has proposed to use natural gas as the primary fuel in the auxiliary boiler. Fuel oil usage in the boiler will be limited to 970 hours per year. The sulfur content of the fuel oil will be limited to 0.05 percent sulfur.

Table 4-17 Cost Evaluation: PM Emissions Control

Control Technology	Annualized Capital Costs ($1,000)	Annual Operating & Maintenance Costs ($1,000)	Total Annual Costs ($1,000)	Control Efficiency	Annual tons Removed	Cost Effectiveness ($/ton)
Unit 4						
Mechanical Collector/ Cyclone	260	557	817	99%	99.0	$8,252
Fabric Filter	551	1,568	2,119	99%	99.0	$21,407
Electrostatic Precipitator	4,451	2,064	6,515	99%	99.0	$65,812
Wet Scrubber	180	2,353	2,533	99%	99.0	$25,591
Unit 5						
Mechanical Collector/ Cyclone	268	575	843	99%	47.5	$17,738
Fabric Filter	614	1,626	2,240	99%	47.5	$47,128
Electrostatic Precipitator	4,576	2,125	6,701	99%	47.5	$141,020
Wet Scrubber	183	2,427	2,610	99%	47.5	$54,931

Assumptions:
Natural Gas Firing

4.3.2.5 *BACT for the Cooling Towers*

Emissions of PM from cooling towers are generated when a small portion of the recirculating cooling water becomes entrained in the air stream and is discharged. Emissions for the recirculated water includes small amounts of dissolved solids that may be deposited in the area surrounding the cooling tower. Drift eliminators are a means for limiting PM emissions from cooling towers.

The only feasible technology for controlling PM emissions from the proposed cooling towers is the use of drift eliminators. Inertial separation caused by airflow directional changes is used to separate water droplets from the air stream leaving the tower. A search of the RBLC database (Appendix B) shows that cooling towers equipped with eliminators, and the proposed PM emission rate of 0.001 percent of the cooling tower recirculating water flow is comparable to the other sources in the database.

4.3.3 *NAAQS and PSD Increment Compliance Demonstration*

The NAAQS are concentrations in the ambient air that are established by EPA at levels intended to protect human health and welfare, with an adequate margin of safety. The air quality analysis required for sources subject to PSD includes an evaluation of the impact of the new source's emissions on the NAAQS, and also includes an evaluation of the impact of the new source's emissions on applicable PSD increments. PSD increments are established by EPA as allowable incremental increases in ambient air concentrations due to new sources in attainment areas, set at levels that are substantially less than the NAAQS. PSD increments cannot be exceeded even if the NAAQS evaluation would allow for impacts from new sources that are greater than the PSD increments.

To evaluate impacts to ambient air quality, air quality dispersion modeling was used to model emissions from the proposed Units 4 and 5 CT/HRSG units, the auxiliary boiler, and the wet mechanical draft cooling towers. Mirant submitted the results of modeling intended to determine compliance with the NAAQS and PSD increments for each criteria pollutant with a significant emissions increase from the proposed Dickerson expansion. Additional modeling was conducted and submitted to PPRP and ARMA, to demonstrate that the sequencing of construction would continue to comply with air quality impact requirements.

PPRP and ARMA verified the results of the applicant's modeling, and conducted additional modeling as described in this section. The NAAQS

for the six criteria pollutants NO2, SO2, CO, lead (Pb), PM10, and ozone, defined by federal regulations (40 CFR 50), are shown in Table 4-18. NAAQS for PM2.5 and 8-hour ozone are also listed in Table 4-18 for completeness; however, evaluation of the attainment status relative to the new standards, and subsequent development of requirements for nonattainment areas, is currently on-going. The new standards are not evaluated further in this report, although it is anticipated that consideration of the new standards would not affect the outcome of this CPCN review.

Table 4-18 Ambient Air Quality Thresholds

Pollutant	Averaging Time	Primary NAAQS	Secondary NAAQS	PSD Increment	Monitoring *de minimis*	Significant Impact Level
NO_2	Annual	100 (0.053 ppm)	100 (0.053 ppm)	25	14	1.0
SO_2	Annual	80 (0.03 ppm)	—	20	—	1.0
	24-hr	365 (0.14 ppm)	—	19	13	5.0
	3-hr		1300 (0.5 ppm)	512	—	25.0
CO	8-hour	10,000 (9 ppm)	—	—	575	500
	1-hour	40,000 (35 ppm)	—	—	—	2000
PM10	Annual	50	50	17	--	1.0
	24-hr	150	150	30	10	5.0
PM2.5	Annual	15	15	—	—	—
	24-hr	65	65	—	—	—
Pb	Calendar quarter	1.5	1.5	—	0.1	—
Ozone	1-hr	235 (0.12 ppm)	235 (0.12 ppm)	—	100 tpy VOC(1)	—
	8-hr	156 (0.08 ppm)	156 (0.08 ppm)	—	—	—

(1) Ozone does not have a specified monitoring *de minimis* concentration; as specified in the PSD regulations, VOC emissions greater than 100 tpy are used as a surrogate for a monitoring *de minimis* concentration.

ppm = parts per million

Source: 40 CFR 50; all values are shown in $\mu g/m^3$ except as noted.

The significant impact levels (SILs) for these pollutants are also provided in the table. SILs have been established by EPA to serve as an initial test of air quality impacts. Predicted impacts less than the SILs are considered low enough that no threat to the NAAQS or PSD increments is present due to the sources being evaluated by dispersion modeling analyses, and generally additional analyses relative to attainment of the NAAQS and PSD increments are not required or necessary. Impacts greater than the SILs need to be evaluated to determine whether additional modeling or analysis is necessary to demonstrate NAAQS and increment attainment. Based on the netting analysis discussed in Section 4.2, SO2, CO, and PM10 are the only criteria pollutants with significant emissions increases, and are therefore the only criteria pollutants subject to PSD and included in the dispersion modeling.

Another criteria pollutant for which NAAQS have been defined, namely ozone, is not emitted directly from the proposed Mirant Dickerson expansion sources. Ozone is formed by reactions of VOCs and NOx emissions (called "ozone precursors") in the presence of sunlight and in the presence of precursors emitted by other sources. Ozone is considered to be a regional pollutant, in that the effects of individual sources are not ordinarily distinguishable from the effects of literally thousands of ozone precursor sources. Furthermore, the net increase of NOx and VOCs was shown to be insignificant (Section 4.2), therefore, emissions of NOx and VOCs from the Mirant Dickerson expansion project combustion sources were not evaluated as part of the NAAQS and PSD increment compliance demonstration. Further discussion of the relative impacts of increasing and decreasing sources at the Mirant Dickerson facility on ozone concentrations is contained in Section 4.5.

PSD regulations require a source impact analysis (NAAQS and PSD increments) and an ambient air quality evaluation. The ambient air quality evaluation requires the analysis of monitored concentrations in the vicinity of the PSD source if the source impacts are greater than the monitoring *de minimis* values displayed in Table 4-18, and allows the regulatory agency to exempt a source from the analysis if impacts are less than the *de minimis* values.

4.3.3.1 *NAAQS and PSD Increment Modeling: Project Sources Only*

To initiate the compliance demonstration for the NAAQS and PSD increments, CO, PM10, and SO2 emissions from sources associated with the Mirant Dickerson expansion were modeled using the American Meteorological Society (AMS)/EPA Regulatory Model (AERMOD), version 99351. The purpose of this initial modeling analysis was to

determine maximum expansion project impacts relative to the significant impact levels and monitoring *de minimis* concentrations. Approval to use AERMOD from EPA Region III is needed since the model is only proposed for inclusion in the modeling guidelines.

AERMOD Approval

The PSD regulations (codified at 40 CFR 51.166) specify that air quality modeling be based on models in the guideline on air quality models (GAQM, 40 CFR Part 50, Appendix W), except where the GAQM model is inappropriate. In that case a modified or alternative model can be used. The GAQM states in Section 3.2.2: "Determination of acceptability of a model is a Regional Office responsibility. Where the Regional Administrator finds that an alternative model is more appropriate than a preferred model, that model may be used subject to the recommendations below." In the specific case involving the compliance modeling for the Mirant Dickerson expansion project, the alternative model is AERMOD while the preferred model is the Industrial Source Complex (ISCST3) model.

AERMOD is a model that was developed by scientists representing AMS and the U.S. EPA in response to a long-standing need to update the scientific basis of routinely-used air quality models. AERMOD was proposed by EPA for inclusion into the GAQM (April 2000) but the proposal has not been finalized; therefore, AERMOD does not currently have guideline status. EPA is currently in the process of reviewing and responding to comments received on the proposed rule, but the improvements introduced in this new model make its use in the interim desirable for certain situations including the proposed project.

ARMA requested approval of AERMOD for use in the area where the Mirant Dickerson station is located, by letter to the EPA Region III Regional Administrator dated 19 March 2001. Approval from Region III was provided in a letter dated 18 April 2001, stating that the model is appropriate for use in the area of the proposed project.

Meteorological Data Representativeness

The AERMOD approval letter emphasized the importance of reviewing the representativeness of the meteorological data used in the model. For the Mirant expansion project modeling, Mirant used surface and upper air data from Dulles Airport (located approximately 27 kilometers south of Dickerson) for the time period 1991-1995.

The Mirant CPCN application did not contain a discussion of the representativeness of the Dulles data for the Dickerson project area. In response to PPRP Data Request No. 1, Question 2, Mirant provided a discussion that included consideration of terrain and land use at the two locations, and a comparison of seasonal wind roses generated from the 10-meter level at an on-site meteorological tower (1987-1988) with seasonal wind roses generated from the 6.1-meter level at the Dulles National Weather Service (NWS) site.

The 1987-1988 meteorological data was collected in order to provide onsite data for conducting modeling in support of a PSD application for the two Station H simple cycle CTs. The meteorological database developed for this modeling consisted of measurements taken on a 90-meter tower (10-, 60-, and 90-meter levels) at the site, supplemented by measurements of winds at heights greater than 90 meters taken by a Doppler SODAR, also located on site.

PPRP and ARMA have developed some additional information relative to the issue of meteorological representativeness. This information consists of annual wind roses developed from the same 10-meter on-site level as Mirant's seasonal wind roses, and annual wind roses developed from the 90-meter and 250-meter levels of the same database. This database was developed when the original Station H was permitted in the late 1980s. Figure 4-1 illustrates the wind roses from these three levels. Figure 4-2 illustrates the area surrounding both the Dickerson station and Dulles airport, with terrain elevations emphasized.

A review of the information presented by Mirant and of the additional information developed by PPRP and ARMA reveals the following:

- Based on visual inspection of the terrain and land use surrounding the two sites, it is noted that differences exist but these are judged to be not significant enough to invalidate the use of the Dulles meteorological data for the Dickerson AERMOD modeling. No major terrain features are located in between the Dickerson site and Dulles.
- Comparison of low-level wind roses from Dickerson and Dulles, taken during the same time period, reveals a similar pattern.
- Wind roses at different heights above ground at the same location as the 10-meter data reveal that, as expected, wind speeds increase with height above the ground, and that wind directions are similar. With height, however, there is more of a tendency for winds from

the northwest and southwest.

PPRP and ARMA conclude that the five-year data set from the Dulles airport is representative and suitable for use with the Mirant Dickerson expansion project modeling.

Figure 4-1 Mirant Dickerson
Wind Roses From Three Levels

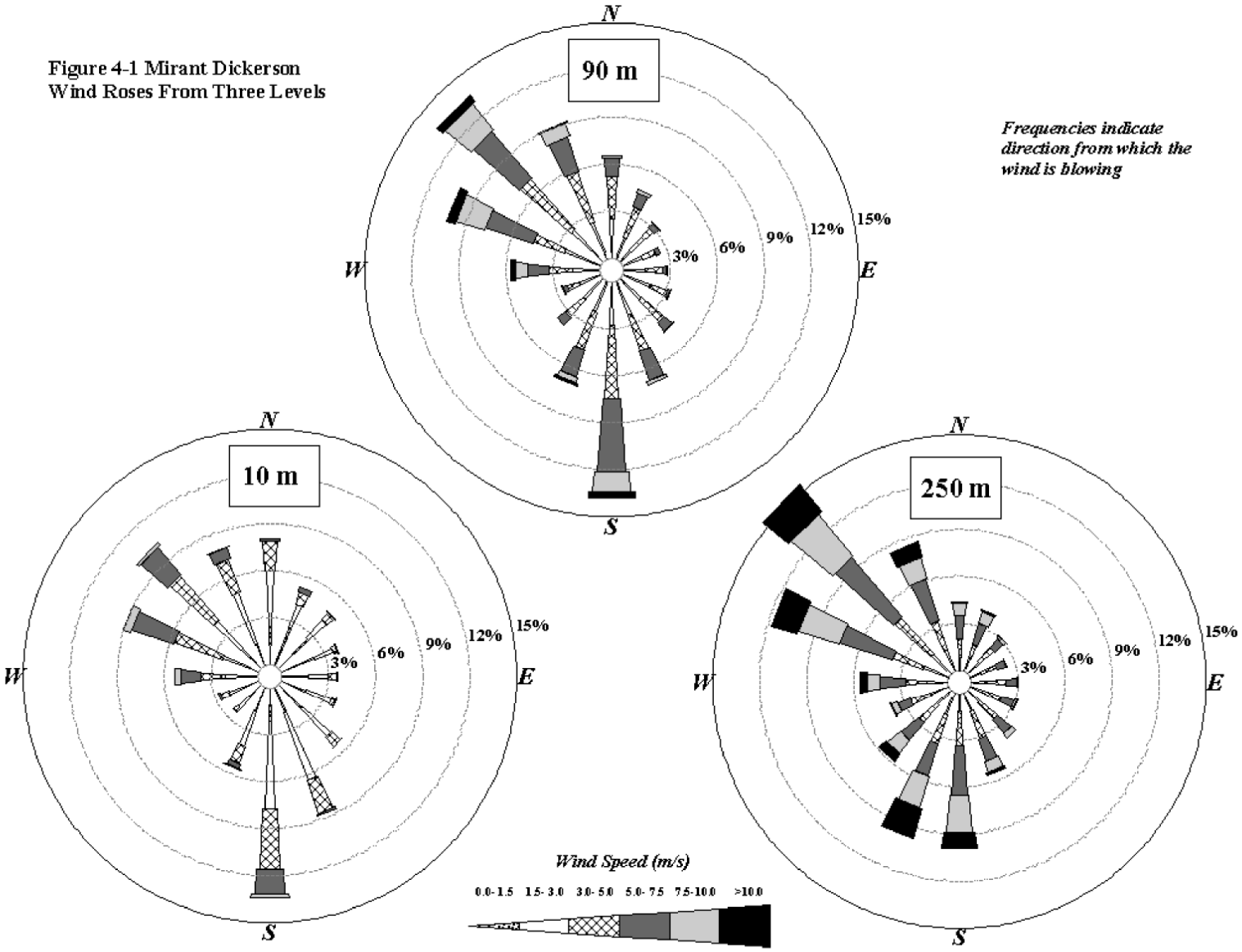
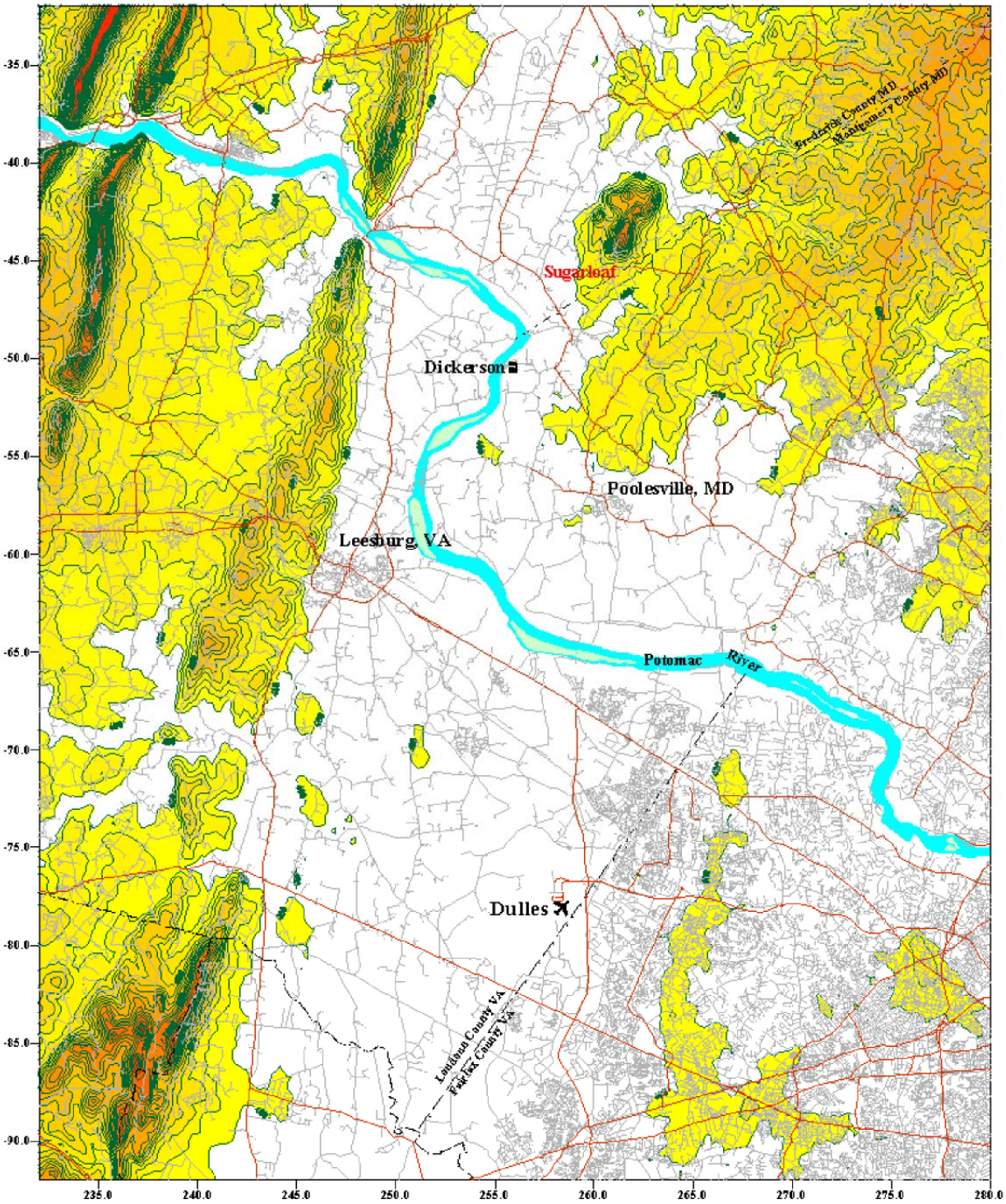


Figure 4-2 Terrain Features in the Vicinity of Dickerson, MD and Sterling, VA



Terrain elevations are shown in feet; minimum elevation 400 ft, contour 50 feet

Meteorological Data Processing

The surface and upper air data collected at Dulles was processed by Mirant utilizing the AERMET program. AERMET is the recommended processor for developing inputs to AERMOD. AERMET requires, at a minimum, hourly NWS data and twice-daily upper air sounding profiles and it produces two files for input to AERMOD: a surface file containing calculated micrometeorological variables (heat flux, stability, and turbulence parameters) that represent the dispersive potential of the atmosphere, and a profile file that provides vertical profiles of wind speed, wind direction, and temperature. In the case of meteorological data files developed from NWS data, the profiles contain only one level --the surface level –- and a meteorological interface within AERMOD generates profiles of wind, temperature, and turbulence from the input data files. The Mirant AERMET analysis used parameters for surrounding land characteristics (albedo, or reflectivity of the ground surface; bowen ratio, an indicator of surface moisture; and the roughness length, an indicator of surface roughness) based on tables 4-1 through 4-3 provided in the AERMET users guide.

PPRP and ARMA have reviewed the meteorological data processing, and conclude that the AERMET processing conducted by Mirant is suitable for use with the Mirant Dickerson expansion project modeling.

Source Characterization

Different load conditions for the CT/HRSG units (100, 75, and 50 percent) were examined since lower loads can result in lower plume heights, which in turn can result in higher predicted impacts even at the lower emission rates associated with the lower loads. Ambient temperature can also affect the pollutant emission rates and stack exhaust parameters, since air is more dense at lower temperatures. Emission rates and stack parameters were developed for three ambient temperatures: 0, 59 and 95 degrees F for each load condition and for each fuel used (oil or gas), and for each mode of operation (simple and combined cycle). For natural gas firing in combined cycle mode (the primary fuel), additional steam will be generated through the use of gas-fired duct burners (Units 4 and 5) and steam injection for power augmentation (Unit 5 only). The two fuels, two operating conditions (simple vs. combined), three ambient temperatures, and three operating loads (with the 100 percent load operation employing duct burners and power augmentation), created 36 different operating scenarios. The complete set of emission rates and stack parameters are listed in the Mirant CPCN application.

Aerodynamic downwash caused by buildings and structures in the vicinity of exhaust stacks can cause an increase in ground level concentrations. Mirant accounted for downwash effects by using EPA's Building Profile Input Program (BPIP). The BPIP program generates information on the location and size of buildings and structures relative to each stack, and AERMOD uses this information to calculate downwash effects.

BPIP also calculates the good engineering practice (GEP) stack height for a given stack location. GEP is the height at which downwash effects are considered to be insignificant. For the Mirant expansion project CT/HRSG units, the GEP height as determined by BPIP is 205 feet or 62.47 meters. Since the proposed stack heights for both simple and combined cycle modes (130 and 190 feet, respectively) are less than GEP and are therefore affected by downwash, the direction-specific building dimensions generated by BPIP were used in the AERMOD model runs. Direction-specific building dimensions were also specified for the auxiliary boiler and the cooling towers.

Receptor Grid Development

A receptor grid was developed by Mirant that extended to approximately 20 kilometers from the Dickerson site in each direction. Receptor spacing was set to 100 meters along the site boundary and increased gradually to 480 kilometers at 5 kilometers from the site. Sugarloaf Mountain is a significant terrain feature approximately 6 kilometers to the northeast of the Dickerson site. A receptor grid with 100 meter spacing was used to augment the receptor grid in the vicinity of Sugarloaf.

A total of 9,471 receptors were analyzed in the model. Terrain elevations were assigned to each receptor, and a hill scale was calculated with the use of the program AERMAP. AERMAP is a companion program to AERMOD that utilizes digitized USGS data files to assign elevations and hill scales to receptors. The hill scale assigned to each receptor is used by AERMOD to determine the appropriate terrain algorithm to use for the receptor. AERMOD calculates a critical dividing streamline height, based on the hill scale, that divides the approach flow towards the hill into two parts: one that rises over the terrain obstacle, and one that passes around the side of the obstacle. Based on the plume height relative to the terrain and relative to the receptor, AERMOD calculates concentration contributions from different parts of the plume following the different flow regimes.

Source-only Modeling Results and Discussion

Mirant conducted modeling using AERMOD for each of the 36 emissions-stack parameter combinations for CO, PM10, and SO2, for five years of meteorology for each receptor. Annual average impacts for PM10 and SO2 were conservatively calculated with the same emission rates used for the short-term averages.

PPRP and ARMA have evaluated the modeling methodology including the model used, the development and application of the meteorological data base, the use and application of BPIP to determine downwash effects, the design of the receptor grid, and the actual model application. PPRP and ARMA's conclusion based on this evaluation is that the methodology is adequate to determine the impact of significant emissions from the Mirant Dickerson expansion project.

Model results for all 36 scenarios were presented in the Mirant CPCN application. PPRP and ARMA conducted independent modeling of selected scenarios to verify the results reported by Mirant. The CT/HRSG scenarios selected for this modeling represent three ambient temperature scenarios for the worst-case oil firing load, and a "typical" gas firing scenario at 59°F. Gas firing at 59°F represents the anticipated most frequent mode of operation of the new and modified units. All stack parameters and emission rates for the CT/HRSG units, the auxiliary boiler, and the cooling towers used in the source-only modeling conducted by PPRP and ARMA are displayed in the Mirant CPCN application.

The additional modeling conducted in support of Mirant's construction sequencing request focused on the impacts of Unit 5 alone in simple cycle mode. This modeling was intended to illustrate air quality impacts that would occur prior to completion of the HRSG components of the project. Table 4-19 provides an overall summary of the source-only modeling for the Mirant Dickerson expansion project, including the results of Unit 5 (simple cycle) alone. The maximum overall concentrations predicted by AERMOD are intended to be compared to the SILs and monitoring *de minimis* values that are also shown on Table 4-19. The modeling results as presented in the Mirant CPCN application are shown, as well as the results of the independent modeling conducted by PPRP and ARMA. It should be noted that the PPRP/ARMA impacts shown in Table 4-19 are somewhat higher than the impacts reported in the CPCN, since upon review of the electronic files provided with the CPCN it was determined that Mirant's modeling did not include the auxiliary boiler. Auxiliary

Table 4-19 Maximum Predicted Concentrations using AERMOD: Expansion Project Sources Only (µg/m³)

Pollutant	Averaging Time	Max. Over 5 Years	SIL	Moni-toring *de minimis*	1991	1992	1993	1994	1995
Model Results as Reported in CPCN Application									
SO2	Annual	**1.90**	1.0	n/ a	1.65	1.90	1.85	1.05	1.90
	24-hr	**19.79**	5.0	13.0	16.94	19.79	18.24	11.74	19.26
	3-hr	**40.66**	25.0	n/ a	39.41	40.55	37.80	40.66	34.26
CO	8-hour	15.96	500	575	12.23	12.35	15.96	9.65	12.92
	1-hour	48.97	2000	n/ a	37.35	37.20	34.94	48.97	36.06
PM10	Annual	0.92	1.0	n/a	0.80	0.92	0.89	0.53	0.92
	24-hr	**9.11**	5.0	10.0	7.69	9.11	8.09	6.04	8.80
Model Results Based on PPRP/ARMA Modeling									
SO2	Annual	**2.05**	1.0	n/ a	1.76	2.04	1.99	1.15	2.05
	24-hr	**20.26**	5.0	13.0	17.48	20.26	18.82	12.31	19.74
	3-hr	**41.22**	25.0	n/ a	39.97	41.22	38.35	40.69	34.65
CO	8-hour	17.43	500	575	13.22	13.18	17.43	11.32	13.97
	1-hour	49.05	2000	n/ a	37.50	37.35	35.08	49.05	36.18
PM10	Annual	0.92	1.0	n/a	0.80	0.92	0.89	0.53	0.92
	24-hr	**9.11**	5.0	10.0	7.69	9.11	8.09	6.04	8.80
Model Results Based on Unit 5 in Simple Cycle Mode									
SO2	Annual	0.27	1.0	n/a	0.22	0.27	0.26	0.13	0.26
	24-hr	4.29	5.0	13.0	3.16	3.66	4.29	2.79	3.21
	3-hr	12.99	25.0	n/a	9.65	12.99	10.61	10.07	9.73
CO	8-hour	6.20	500	575	4.49	4.79	6.20	5.20	4.87
	1-hour	20.02	2000	n/ a	15.72	15.79	14.51	20.02	14.98
PM10	Annual	0.07	1.0	n/a	0.06	0.07	0.07	0.03	0.07
	24-hr	1.07	5.0	10.0	0.82	0.93	1.07	0.61	0.83

NOTE: Predicted concentrations greater than the applicable SIL or monitoring *de minimis* are shown in bold; Short-term concentrations represent high values.

boiler impacts are relatively small, and inclusion in the modeling conducted by PPRP and ARMA only made a slight difference in the reported results. As shown in this table, CO maximum impacts are less than applicable SILs while SO2 and PM10 maximum impacts are greater than the applicable SILs and, in the case of SO2, greater than the monitoring *de minimis* concentration. The impacts from Unit 5 (simple cycle) are less than the SILs for all pollutants. Table 4-20 shows the maximum impacts from individual sources or groups of sources, including the four selected CT/HRSG scenarios. Since these are individual maxima, their sum does not necessarily equal the overall maximum.

Table 4-20 Maximum Predicted Concentrations using AERMOD: by Source/ Source Group (Maximum over 5 years, μg/m³)

Pollutant	Averaging Time	SIL	CT/HRSG Operating Scenarios				Aux Boiler	Cooling Tower
SO_2								
	Operating Mode:		Comb.	Comb.	Comb.	Comb.		
	Operating Load:		Base	Base	Base	Base		
	Fuel:		Oil	Oil	Oil	Gas		
	Ambient Temp (F):		95	59	0	59		
	Annual	1.0	1.86	1.90	1.86	0.31	0.21	-
	24-hr	5.0	19.32	19.79	19.45	3.05	1.09	-
	3-hr	25.0	37.23	39.53	40.66	5.68	4.32	-
CO								
	Operating Mode:		Simple	Simple	Comb.			
	Operating Load:		Base	50%	Base			
	Fuel:		Oil	Oil	Gas			
	Ambient Temp (F):		0	0	59			
	8-hour	500	11.87	15.96	3.59	-	7.20	-
	1-hour	2000	27.41	30.76	4.72	-	24.03	-
PM10								
	Operating Mode:		Comb.	Comb.	Comb.	Comb.		
	Operating Load:		75%	75%	75%	Base		
	Fuel:		Oil	Oil	Oil	Gas		
	Ambient Temp (F):		95	59	0	59		
	Annual	1.0	0.87	0.85	0.80	0.31	0.003	0.09
	24-hr	5.0	8.83	8.77	8.36	3.06	0.02	0.71

NOTE: Short-term concentrations represent high values over five years; annual averages represent maximum over five years.

As illustrated in greater detail in Tables 4-19, 4-20, and in the Mirant CPCN application, the results of modeling of combined cycle operation (utilizing fuel oil) are significantly greater than the results of modeling of simple cycle operation, with the exception of CO. The explanation for this is that the simple cycle operation produces large quantities of very hot flue gas, and the heat in the exhaust results in higher plume rise than when the exhaust is used first to generate electricity in the HRSG (combined cycle operation). The higher plume rise results in lower ground-level concentrations for PM10 and SO2. CO emissions, however, are much higher in simple cycle than in combined cycle mode and the higher emissions more than offset the beneficial effect of higher plume rise. As displayed in Table 4-19, however, maximum CO impacts are nonetheless only a small fraction of the SILs.

Since impacts are greater than the SILs for PM10 and SO2, additional steps need to be taken to demonstrate compliance with the NAAQS and PSD increments for these pollutants. Mirant identified a "significant impact distance" (SID) of 2.5 and 7.5 kilometers for PM10 and SO2, respectively. The significance of the SID is that multi-source modeling must be conducted to determine the total impact on PSD increments and NAAQS within a circle with a radius equal to the SID. The area within this circle is frequently referred to as the significant impact area (SIA). The inventory of sources to be evaluated for possible inclusion in the multi-source modeling should include all sources within a distance of 50 kilometers of the outer edge of the SIA. The development of multi-source inventories for SO2 and PM10 is described in Section 4.3.3.2, and the multi-source modeling for SO2 and PM10 is described in Section 4.3.3.3.

Maximum 24-hr average SO2 impacts are greater than the monitoring *de minimis* concentration of 13 $\mu g/m^3$. The issue of preconstruction monitoring is discussed further in Section 4.3.3.7.

4.3.3.2 *Multi-Source Inventory Development for SO2 and PM10*

The process of developing an appropriate inventory to conduct multi-source modeling involves several steps, and is frequently aided by developing information from different sources for the sake of intercomparison. This intercomparison of information from different sources allows for choices to be made that help ensure that conservative estimates of background source impacts are made. The largest nearby sources in terms of total emissions are the three existing Dickerson coal-fired units located approximately 800 meters to the west of the expansion project location. The Montgomery County RRF, located less than a kilometer to the southeast of the expansion project site, is the only other

major facility within the PM10 or SO2 SIA. Information on these two sources is readily available, in the first case (the Dickerson coal units) due to co ownership with the expansion project and in the second case (the RRF) since the facility was permitted in the early 1990s and emissions and stack information can be readily obtained.

In response to PPRP's Data Request 1, Question 3, Mirant clarified the origin of inventory information and emission rates for the background sources modeled in the increment and NAAQS analyses. Mirant indicated that the "worst case" emissions level (i.e., the highest level identified in any of the data sources) was used in the modeling. The information sources are:

1. A file provided by ARMA containing information on all sources of SO2 and PM10 within 60 kilometers of Dickerson. This file was provided directly to Mirant based on a request to ARMA;
2. A listing from EPA's National Emissions Trend (NET) Inventory for 1996, including all facilities with actual 1996 emissions of SO2 or PM10 greater than 1 tpy (this listing was provided by PPRP in electronic and hard copy format);
3. For SO2 only, peak (allowable) emissions for selected facilities obtained from Table III-3 of the PPRP report "Environmental Review of Potomac Electric Power Company's Proposed Station H Element I" (Draft, August 1989); and
4. Title V Applications and Emissions Inventory (for Mirant sources).

PPRP and ARMA have reviewed the development of Mirant's multi-source inventories. The results of this review are discussed in two parts: first, for the selection of sources to model, and second, for the development of modeling inputs including stack parameters and emission rates.

Source Selection

For the purpose of the PSD increment evaluation, increment-consuming emissions for facilities in operation should represent actual emissions. For the purpose of the NAAQS evaluation, emissions should represent the potential to emit, defined in EPA's GAQM as the product of an allowable emission limit (in lb/MMBtu) and an operating level (in MMBtu/hr), and assumed to occur continuously (i.e., 8,760 hrs/yr).

The first step in developing a multi-source inventory is to identify sources within 50 kilometers of the SIA. For SO2, the distance is 57.5 kilometers

and for PM10, the distance is 52.5 kilometers. Mirant took the first step for the expansion project by identifying sources of SO2 and PM10 out to a distance of 60 kilometers from Dickerson (a few kilometers further than required). Data were requested by Mirant from ARMA, for sources of SO2 and/or PM10 within this area. PPRP independently extracted information from the EPA NET inventory for 1996 on sources of SO2 and/or PM10 in the same area. The ARMA data represent actual annual emissions for 2000, while the NET data represent actual annual emissions for 1996.

The information retrieval resulted in data for approximately 100 facilities (NET) and 200 facilities (ARMA). Many of the ARMA facilities only had emissions of VOCs, and these facilities were excluded from further consideration.

The ultimate goal of a NAAQS and PSD increment consumption analysis is to demonstrate compliance with these standards within a source's SIA. The selection of which sources to model in addition to the source requesting a permit is intended to accomplish this goal. The basic selection criterion, according to the EPA GAQM, is to model all sources with a significant concentration gradient within the SIA. A significant concentration gradient would suggest that the source's impacts may not be captured in the ambient monitoring and that modeling is necessary to define whether the source's impacts, in conjunction with impacts from the new source, are within ambient standards.

A source that is within the SIA is almost certain to have a significant concentration gradient in the SIA, and most sources within the SIA should be modeled. For sources outside of the SIA, however, the definition of significant concentration gradient is not well defined, and source selection relies on more qualitative judgments.

To help visualize the inventories for SO2 and PM10, PPRP and ARMA created plots that illustrate the location and relative magnitude of the emissions from sources within the 60 kilometer area, relative to the SIA. These plots are presented in Figures 4-3 and 4-4. The following observations can be made regarding these plots:

- The existing Dickerson coal plant and the Montgomery County RRF are the only identified sources within the SIA;
- For SO2, the Dickerson coal plant is the largest source within the entire 60 kilometer area;
- For PM10, the Dickerson coal plant is one of the largest in the 60 kilometer area; other larger sources are located to the north of the Dickerson site.

Figure 4-3 Illustration of Candidate SO2 Sources for Multi-Source Modeling

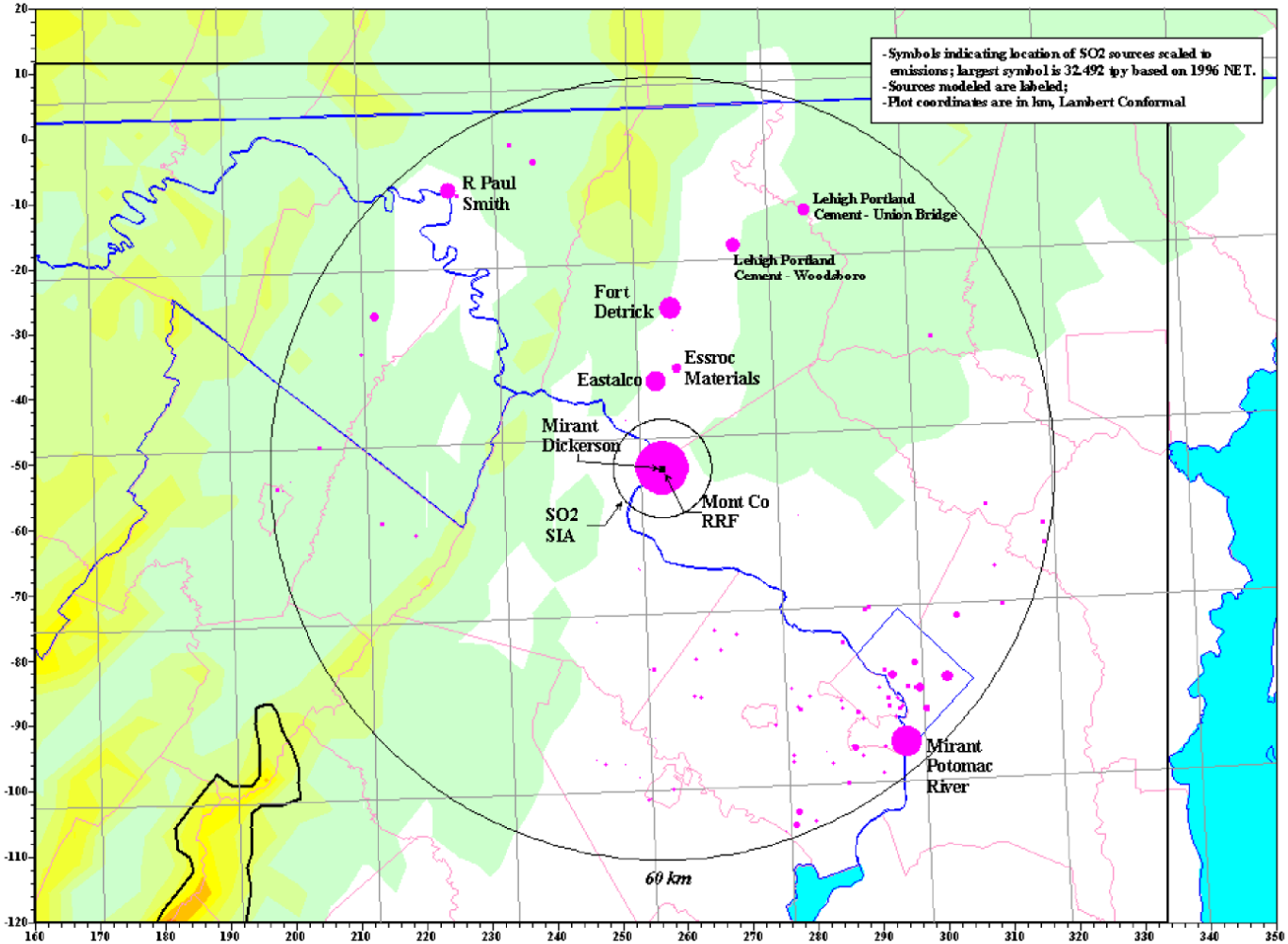
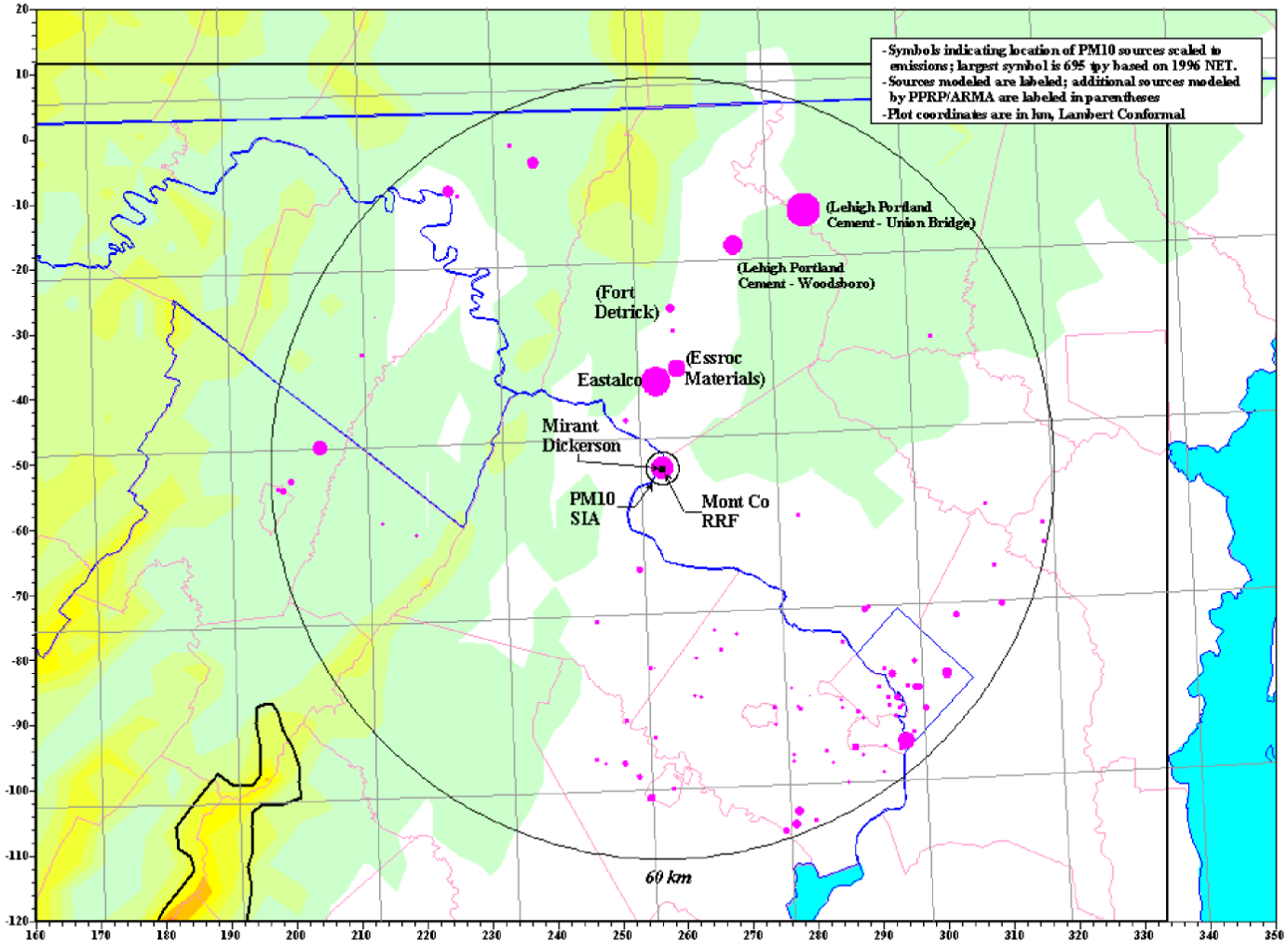


Figure 4-4 Illustration of Candidate PM10 Sources for Multi-Source Modeling



- The majority of PM10 and SO2 sources are located some distance (greater than 10 kilometers) from the SIA.

Mirant applied a screening technique to select background sources for modeling. The screening technique compares the annual emissions of a source (in tpy) to 20 times the distance of the source from the SIA. If the ratio of these values (tpy/20D) is greater than 1, Mirant selected the source for modeling. The so-called 20D technique is frequently used for screening sources to model, but has not been approved generically either by ARMA or EPA. It does, however, provide a first cut at limiting the number of sources that can serve as a useful starting point. The facilities that were selected by Mirant, using the 20D technique, are shown in Table 4-21.

PPRP and ARMA have reviewed the selections made by Mirant and have considered the location and relative magnitude of background sources as displayed in Figures 4-3 and 4-4. This review concludes that the nine facilities selected for SO2 modeling, including one PSD source (Montgomery County RRF), are appropriate for determining attainment of the SO2 NAAQS and PSD increments in the SO2 SIA defined for the Mirant Dickerson expansion project. The review also concludes, however, that four additional facilities to the north of Dickerson should be included in the multi-source modeling for PM10. These four additional facilities are also identified in Table 4-21. Although these facilities pass the 20D test, the impacts from sources to the north have the potential to combine in the SIA, and should be considered in the assessment of PM10 standards attainment. The modeling that PPRP and ARMA conducted to verify Mirant's results included these four additional facilities.

Development of Model Inputs for Background Sources

Premise information, including stack parameters and emissions of PM10 and SO2, were provided to Mirant by ARMA. For facilities outside of the respective SIAs, emissions were combined into a single stack representative of the stack with the highest emission rates. As noted above, four data sources were used to develop emissions data. In addition to these four data sources, PPRP and ARMA reviewed premise files to evaluate the accuracy of the inventory and to determine if the appropriate parameters and emissions were modeled in the multi-source analyses. The review included stack parameters and emission rates with the primary emphasis on sources within the SIA.

Table 4-21 Off-Site Sources Modeled for the PSD Increment and NAAQS Analysis

Facility Name	Pollutant(s) Modeled		Increment (I) or NAAQS (N) Analysis	
Mirant Atlantic - Dickerson Station	SO2	PM10	N	-
Montgomery County Resource Recovery Facility	SO2	PM10	N	I
Eastalco Aluminum Company	SO2	PM10	N	-
Essroc Materials	SO2	(1)	N	-
Fort Detrick	SO2	(1)	N	-
Lehigh Portland Cement – Woodsboro	SO2	(1)	N	-
Lehigh Portland Cement – Union Bridge	SO2	(1)	N	-
Potomac Edison - R. Paul Smith	SO2	-	N	-
Mirant Atlantic - Potomac River	SO2	-	N	-

(1) Source also modeled for PM10 in PPRP/ARMA Analysis

Mirant's methodology and results for developing the inventory were reviewed in conjunction with the ARMA premise information. PPRP and ARMA conclude that the emissions inventory utilized by Mirant in its multi-source modeling, with the modifications and additions recommended by PPRP and ARMA, is adequate for determining compliance with the SO2 and PM10 NAAQS and PSD increments within the respective SIAs. The inventories for sources outside of the SIA appear to be conservative, both in the stack parameters selected and in the emissions modeled. It should be noted that additional refinement of the inventories for sources outside of the SIAs would be necessary in order to determine standards compliance close to these facilities.

4.3.3.3 *NAAQS and PSD Increment Modeling for SO2 and PM10: Project and Background Sources*

To demonstrate compliance with the PSD increments and the NAAQS for SO2 and PM10, modeling using AERMOD was conducted using the same methodology as with the project source only analysis. For the increment and NAAQS analyses, model runs were conducted using five years of meteorology but only at receptors located in the SO2 or PM10 SIA. The

worst-case operating scenario for the CT/HRSG units was modeled, along with the appropriate multi-source inventories. The single CT/ HRSG operating scenario corresponded to the one scenario (out of 36) that resulted in the highest project source impacts for each pollutant. PPRP and ARMA conducted independent modeling both to verify Mirant's results and to determine the effect of the changes (adding four facilities) in the multi-source inventory for PM10. Increment and NAAQS modeling results are shown in Table 4-22, and the maximum impacts of individual sources or groups of sources, are shown in Table 4-23.

The multi-source modeling results demonstrate compliance with the PSD increments for SO2 and PM10. The results of modeling project sources in conjunction with off-site NAAQS sources show that maximum impacts are less than the NAAQS for SO2 and PM10, for all averaging periods. Representative background concentrations must be added to modeled results in order to determine full compliance with the NAAQS; background concentrations and overall results are discussed in the next section.

Table 4-22 Maximum Predicted Concentrations using AERMOD: Expansion Project and Off-Site Sources (μg/m³)

Pollutant	Averaging Time	Max. Over 5 Years		1991	1992	1993	1994	1995
Model Results for PSD Increment Consuming Sources (based on PPRP/ARMA Modeling)								
			Incre-ment					
SO_2	Annual	2.43	19	2.32	2.40	2.38	1.44	2.43
	24-hr	17.76	91	16.31	17.76	17.30	11.61	15.38
	3-hr	43.39	512	36.49	39.50	38.49	43.39	37.30
PM10	Annual	0.99	17	0.89	0.98	0.97	0.57	0.99
	24-hr	7.80	30	7.33	7.80	6.82	5.10	6.84
Model Results for NAAQS Sources (based on PPRP/ARMA Modeling)								
			NAAQS					
SO_2	Annual	24.03	80	22.72	23.30	22.91	16.50	24.03
	24-hr	165.25	365	153.57	165.25	155.63	131.15	161.01
	3-hr	655.36	1300	461.33	444.07	459.05	655.36	400.16
PM10	Annual	1.38	50	1.27	1.35	1.35	1.00	1.38
	24-hr	9.70	150	8.28	9.70	8.53	6.95	8.01

NOTE: Short-term concentrations represent high, second-high values.

Table 4-23 Maximum Predicted Concentrations using AERMOD: Expansion Project and Off-Site Sources by Source/Source Group (µg/m³)

Pollutant	Averaging Time	Project Sources	Dickerson Coal Units	Montgomery County RRF	Other Background Sources
Model Results Based on PPRP/ARMA Modeling					
SO2	Annual	2.05	21.65	1.05	6.99
	24-hr	17.76	159.26	7.47	65.76
	3-hr	40.23	642.08	21.03	361.39
PM10	Annual	0.92	0.46	0.18	0.37
	24-hr	7.80	3.34	1.30	6.95

NOTE: Short-term concentrations represent high, second-high values over five years; annual averages represent maximum over five years.

The source/source group results presented in Table 4-23 suggest that SO2 air quality in the vicinity of the Mirant expansion project is dominated by other sources: the existing Dickerson coal-fired units, and other industrial sources outside of the SIA. The maximum impacts of other sources occur to the north of the project site, primarily in the elevated terrain on Sugarloaf Mountain.

4.3.3.4 *Ambient Air Monitoring and Background Concentrations; Overall Impact Results*

To fully address attainment of the NAAQS, background monitored concentrations must be added to modeled concentrations to compare total predicted ambient levels with the standards. Background concentrations are intended to account for the effects of distant, natural, and other non-modeled sources. The most common way of determining background concentrations is to identify maximum concentrations recorded at ambient measurement stations. These maximum values are then used as background values for each pollutant-specific averaging time. Monitored concentrations can be derived from site-specific monitoring or from existing monitors that can provide appropriate, representative background levels. The issue of preconstruction monitoring is addressed in Section 4.3.3.7, while the development and evaluation of background concentrations is addressed in this section.

In the CPCN application, Mirant identified background concentrations by relying on data from an existing monitoring station in McLean, Virginia. PPRP and ARMA have obtained and evaluated monitoring summaries

from additional stations near Dickerson from EPA's AIRData web site, at www.epa.gov/air/data. Data were obtained from the three stations closest to Dickerson with complete data available for three years, 1998-2000. Table 4-22 provides a summary of concentrations measured at all stations, including the station (McLean, VA) used by Mirant.

When the existing simple cycle combustion turbines were permitted in the late 1980s, the owner of the Dickerson plant at the time, PEPCO, established a monitoring network for SO2 in the vicinity of the plant. The network consisted of six monitoring stations, and a year of hourly SO2 data collected at the stations were used to develop background concentrations that were used in the air quality impact evaluation for Station H. The background concentrations developed from the monitoring station data are shown in Table 4-24. Two values for the 3-hr and 24-hr averaging periods are shown. The first represents the highest value monitored, and the second represents estimates that were made after excluding time periods when the plume from Dickerson was directed towards the monitoring station. The second set of estimates are considered more representative of background due to non-modeled sources, since the Dickerson plume was modeled as part of the NAAQS analysis.

Table 4-24 also provides a summary of applicable concentration standards, maximum modeled concentrations, and the total impact (modeled plus monitored concentration) for comparison to the NAAQS. The total impact was determined in two different ways: first, by using the background values used by Mirant in the CPCN application, and second, by using the maximum of any monitored concentration measured at any of the identified monitors. The purpose of selecting the maximum of the three closest stations was to add a degree of conservatism to the identification of background concentrations, and to evaluate the resultant effect on predicted ambient air quality levels.

Analysis of the results presented in Table 4-24 results in the following conclusions:

- NAAQS attainment is demonstrated with both values of background concentrations (McLean, or maximum of three closest stations).
- The background SO2 concentrations developed by identifying the maximum concentrations measured at the closest three monitoring stations, and the background SO2 concentrations used by Mirant in the CPCN, are higher than the background SO2 concentrations utilized in the 1989 permit application based on on-site monitoring data. The reason for this is that the monitoring stations identified in

Table 4-24 Maximum Predicted and Monitored Concentration Comparisons

Pollutant:	**SO2**	**SO2**	**SO2**	**CO**	**CO**	**PM10**	**PM10**
Averaging Time:	**Ann**	**24-hr**	**3-hr**	**8-hr**	**1-hr**	**Ann**	**24-hr**
SIL:	1	5	25	500	2000	1	5
Monitoring *de minimis:*	-	13	-	575	-	-	10
PSD Class II Increment:	20	91	512	-	-	17	30
NAAQS:	80	365	1300	10,000	40,000	50	150
Maximum Modeled Concentration (Dickerson expansion only) :	2.05	20.26	41.22	17.43	49.05	0.92	9.11
Maximum Modeled Concentration (Dickerson expansion and background sources) :	24.03	165.25	655.36	n/a	n/a	1.38	9.70
Background Concentration (1989):	19	54	59	na	na	na	na
Background Concentration (1989, wind direction exclusion):	-	25	38	na	na	na	na
Background Concentration (Mirant CPCN Application):	23.6	96.9	149.3	na	na	18.6	42
Maximum Monitored Concentration:	26.0	96.9	149.3	na	na	24.4	64
Total Impact: Modeled plus Background (Mirant):	**47.6**	**261.3**	**804.7**	**na**	**na**	**20.0**	**51.7**
Total Impact: Modeled plus Background (Maximum):	**50.0**	**261.3**	**804.7**	**na**	**na**	**25.8**	**73.7**

Monitored Data Summary

Location			**County**	**(1)**							
McLean	VA	SUBURBAN	Fairfax	38 SE	23.4	96.9	149.3	4,556	11,086	19.5	45
Seven Corners	VA	SUBURBAN	Fairfax	46 SE	26.0	80.6	148.2	3,111	4,914	-	-
Cub Run Chantilly	VA	RURAL	Fairfax	34 S	20.8	59.8	93.6	2,060	2,857	20.3	56
Suitland-Silver Hill	MD	SUBURBAN	Prince George's	60 SE	-	-	-	-	-	24.4	64
Springfield	VA	SUBURBAN	Fairfax	52 SE	-	-	-	-	-	20.7	52

NOTE (1) Approximate distance in kilometers and direction from Dickerson to monitor site.
All concentrations are shown in µg/m3
Source of monitored concentrations: EPA AIRS web site accessed November 2001

Table 4-24 are located in generally more developed areas than the Dickerson station, and are likely influenced by a larger number of background sources than monitoring stations in the vicinity of Dickerson.

PPRP and ARMA conclude from this analysis that the Dickerson expansion project sources will not cause or contribute to violations of the NAAQS for PM10 or SO2.

4.3.3.5 *Further Evaluation using Alternative Models*

The use of AERMOD for the Mirant Dickerson expansion project air quality evaluation, as discussed previously, has been approved by EPA Region III. PPRP and ARMA believe that application of this model provides adequate estimates of the air quality impacts of the project. In order to provide additional perspective on these impacts, however, PRPP and ARMA have conducted additional modeling on a limited number of scenarios with two additional models – ISCST3 and ISCPRIME. ISCST3 is the current Guideline model that, in the absence of AERMOD, would be used to estimate the expansion project sources impacts. The ISCPRIME model was developed by the Electric Power Research Institute in response to a need to improve the downwash algorithms within ISCST3. The algorithms contained in ISCST3 are known to have several deficiencies, most of which tend to make its predictions conservative (i.e., predict higher impacts than a more accurate model would predict). ISCPRIME, as with AERMOD, has also been proposed by EPA to be included in the GAQM, and will be undergoing the same review process as AERMOD for eventual inclusion in the GAQM.

AERMOD contains the same downwash algorithms as ISCST3, and the same comments with respect to the deficiencies and conservative tendencies of these algorithms apply to AERMOD. In the case of the Dickerson expansion project sources, the distance from the stacks to the closest fenceline receptors is approximately 500 meters. The largest structure contributing to downwash effects on new project sources is 82 ft (25 m) tall. Downwash effects are considered to be less important at receptors that are at a greater distance from the stack than ten times the height of the downwashing structure. Since the closest receptor to the stacks is greater than this distance, downwash effects are not anticipated to be important.

PPRP and ARMA used ISCST3 and ISCPRIME to conduct additional modeling of Dickerson expansion project impacts. This modeling considered the same scenarios (expansion sources and background

sources) that were modeled by PPRP and ARMA with AERMOD. In order to implement its improved downwash algorithms, ISCPRIME needs additional building and structure information that is not provided by the version of BPIP that is used with ISCST3. A revised version of BPIP has been developed by EPA and was used by PPRP and ARMA to develop the additional parameters for this analysis. Five years of data were utilized in this additional modeling, and a summary of the results is presented in Table 4-25.

The following observations can be made regarding these results.

- ISCST3 generally predicts smaller concentrations in the vicinity of the source and larger concentrations at a distance, i.e. on Sugarloaf Mountain. This reflects the fact that ISCST3 treats dispersion in rural settings as though the source were on a flat plain. Since AERMOD is capable of taking the effects of local topography and land use into account, the resultant increased dispersion causes higher impacts close to the source and lower concentrations at a distance.
- The ISCPRIME results are similar to the ISCST3 results, in keeping with the anticipation that downwash effects are not important in this analysis.
- Concentration values for the alternative models continue to demonstrate that the Dickerson expansion project meets air quality standards.

Table 4-25 Maximum Predicted Concentrations Resulting From Alternative Models ISC and ISCPRIME (µg/m³)

Pollutant	Averaging Time	AERMOD	ISCST3	AERMOD (Limited)	ISCST3 (Limited)	ISCPRIME
Model Results Based on Mirant Project Sources Only						
SO2	Annual	2.05	1.09	2.05	0.33	0.33
	24-hr	20.26	8.57	20.26	4.38	5.97
	3-hr	41.22	50.59	41.22	17.60	25.12
PM10	Annual	0.92	0.45	0.92	0.16	0.21
	24-hr	9.11	3.81	9.11	2.11	2.49
Model Results Based on Mirant Project Sources and Off-Site Sources						
SO2	Annual	24.03	32.69	24.03	14.34	14.33
	24-hr	165.25	177.61	165.25	110.42	110.45
	3-hr	655.36	894.62	404.81	359.21	359.21
PM10	Annual	1.38	1.74	1.38	1.74	1.77
	24-hr	9.70	19.18	9.70	19.18	19.18

NOTE: Short-term concentrations represent high, second-high values over five years (high value for project sources only); annual averages represent maximum over five years. Limited refers to a limited receptor area for comparison to ISCPRIME predictions.

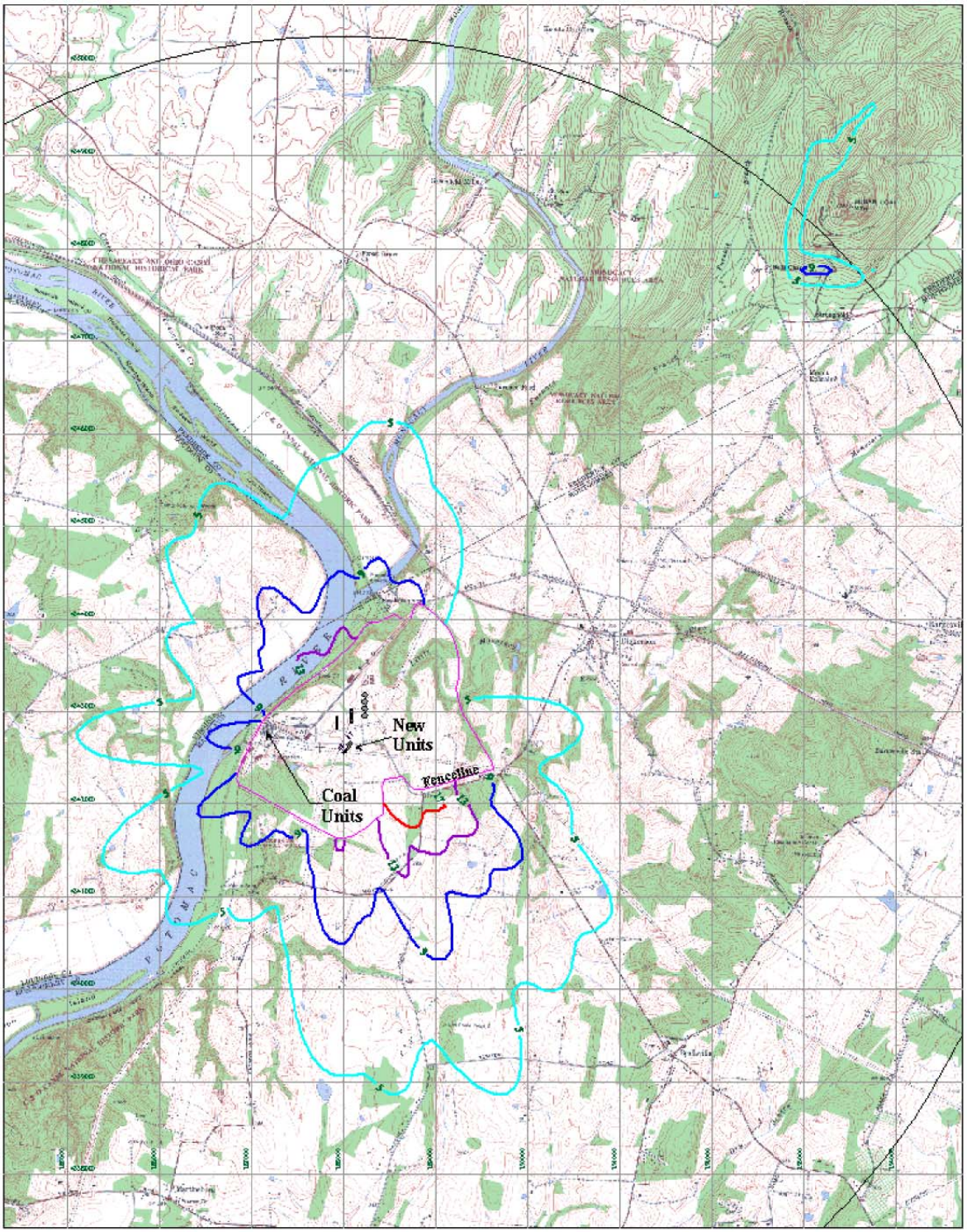
4.3.3.6 *Further Discussion and Analysis of Selected Modeling Results*

The geographic distribution of selected predicted air quality impacts are displayed in a series of isopleth maps. Figures 4-5 through 4-7 display the predicted concentrations of SO2, 24-hr average, for project sources only, sources outside of the SIA, and all sources based on AERMOD results. Figures 4-8 through 4-10 display similar maps for SO2, 24-hr average, based on ISCST3 results. As displayed in these figures, AERMOD predicts higher concentrations close to the sources and lower concentrations at further distances.

4.3.3.7 *Preconstruction Monitoring*

The air quality modeling analyses described in Sections 4.3.3.2 and 4.3.3.3, which address attainment of the NAAQS and PSD increments, are intended to fulfill the requirements contained in the PSD regulations at 40 CFR Part 52.21(k), "source impact analysis". Additional requirements at 40 CFR Part 52.21(m) require an analysis of air quality in the vicinity of the PSD source, including preconstruction monitoring. If the ambient impacts of a new source or modification are less than the monitoring *de minimis*

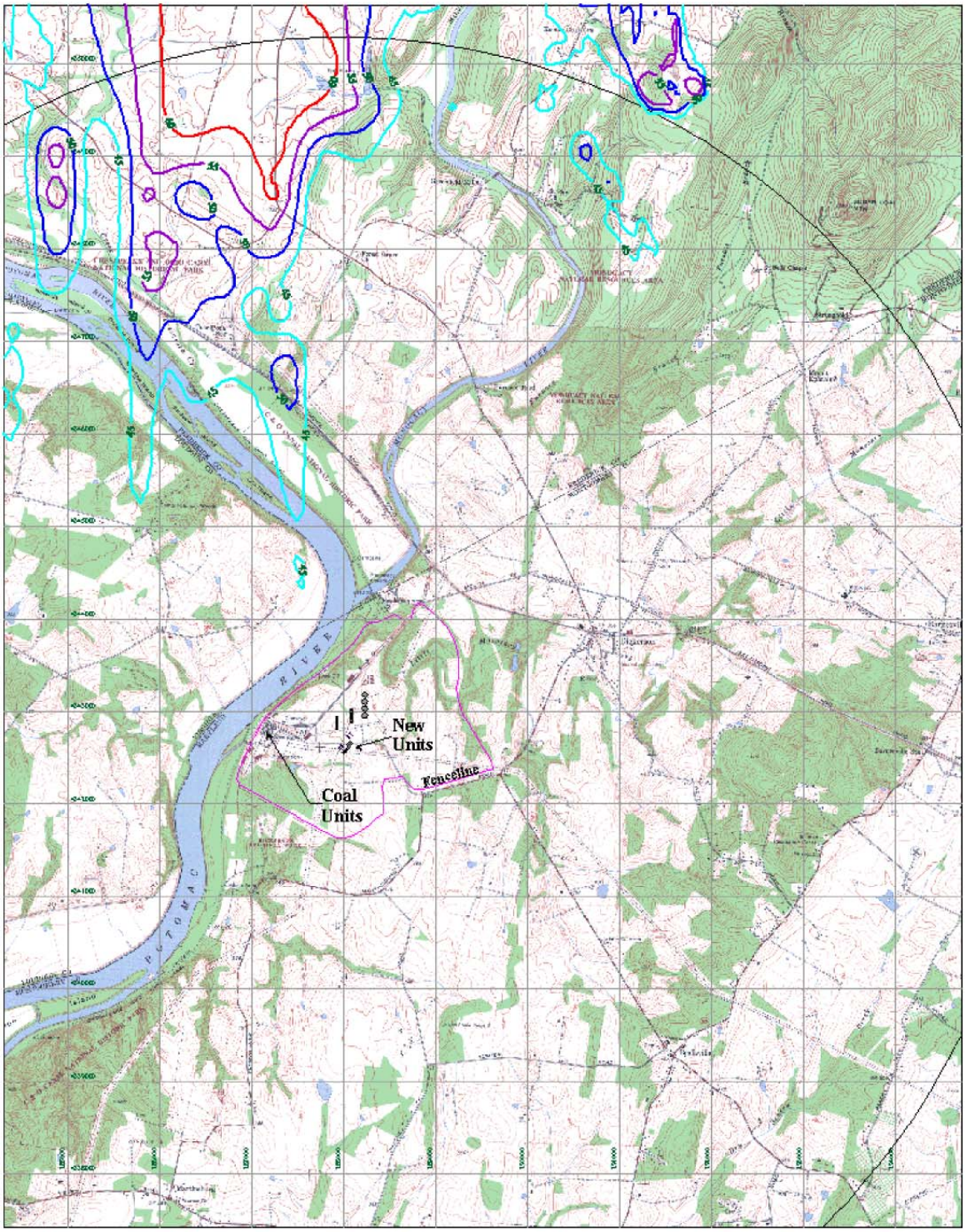
Figure 4-5 AERMOD 24-hr SO2 Concentrations Project Sources Only



Contours represent modeled concentrations only (no background); Highest 24-hr concentration over 5 years of meteorology. Units are ug/m3. Minimum contour 5 ug/m3, interval 4

Base map derived from Poolesville (1978) and Buckeystown (1984) USGS 7.5 minute maps

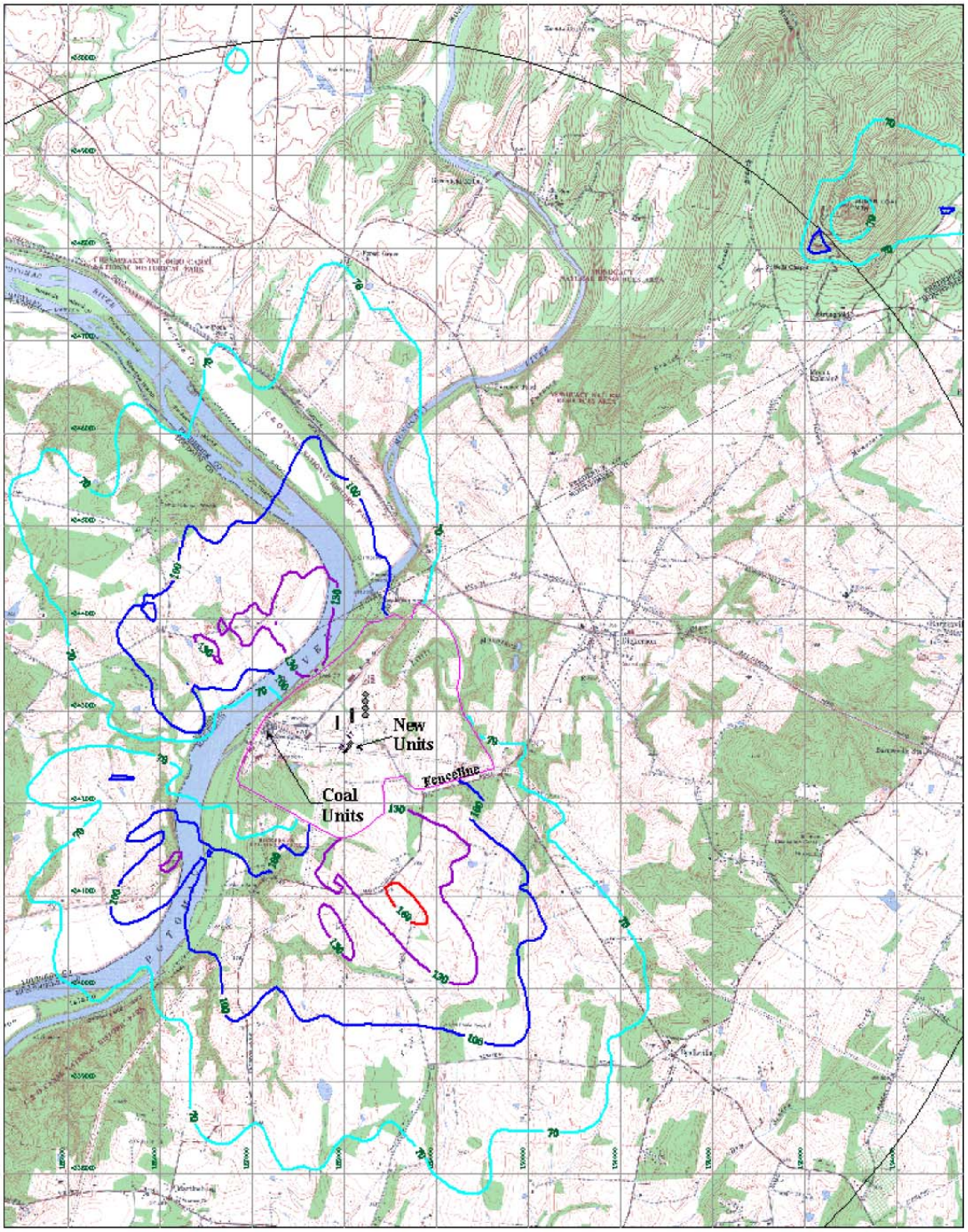
Figure 4-6 AERMOD 24-hr SO2 Concentrations Sources Outside of SIA



Contours represent modeled concentrations only (no background); High, second-high 24-hr concentration over 5 years of meteorology. Units are ug/m3. Minimum contour 45 ug/m3, interval 5

Base map derived from Poolesville (1978) and Buckeystown (1984) USGS 7.5 minute maps

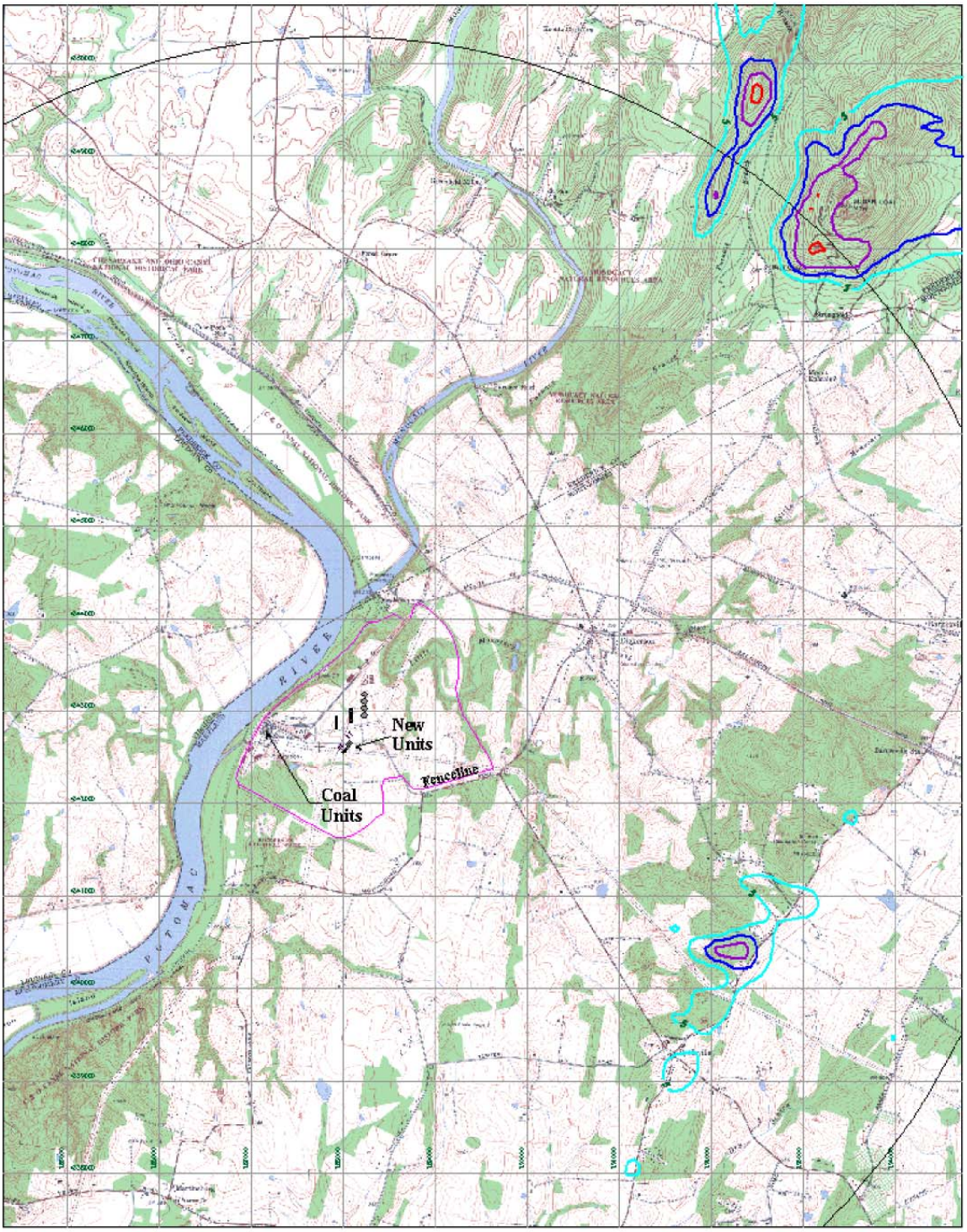
Figure 4-7 AERMOD 24-hr SO2 Concentrations All Sources



Contours represent modeled concentrations only (no background); High, second-high 24-hr concentration over 5 years of meteorology. Units are ug/m3. Minimum contour 70 ug/m3, interval 30

Base map derived from Poolesville (1978) and Buckeystown (1984) USGS 7.5 minute maps

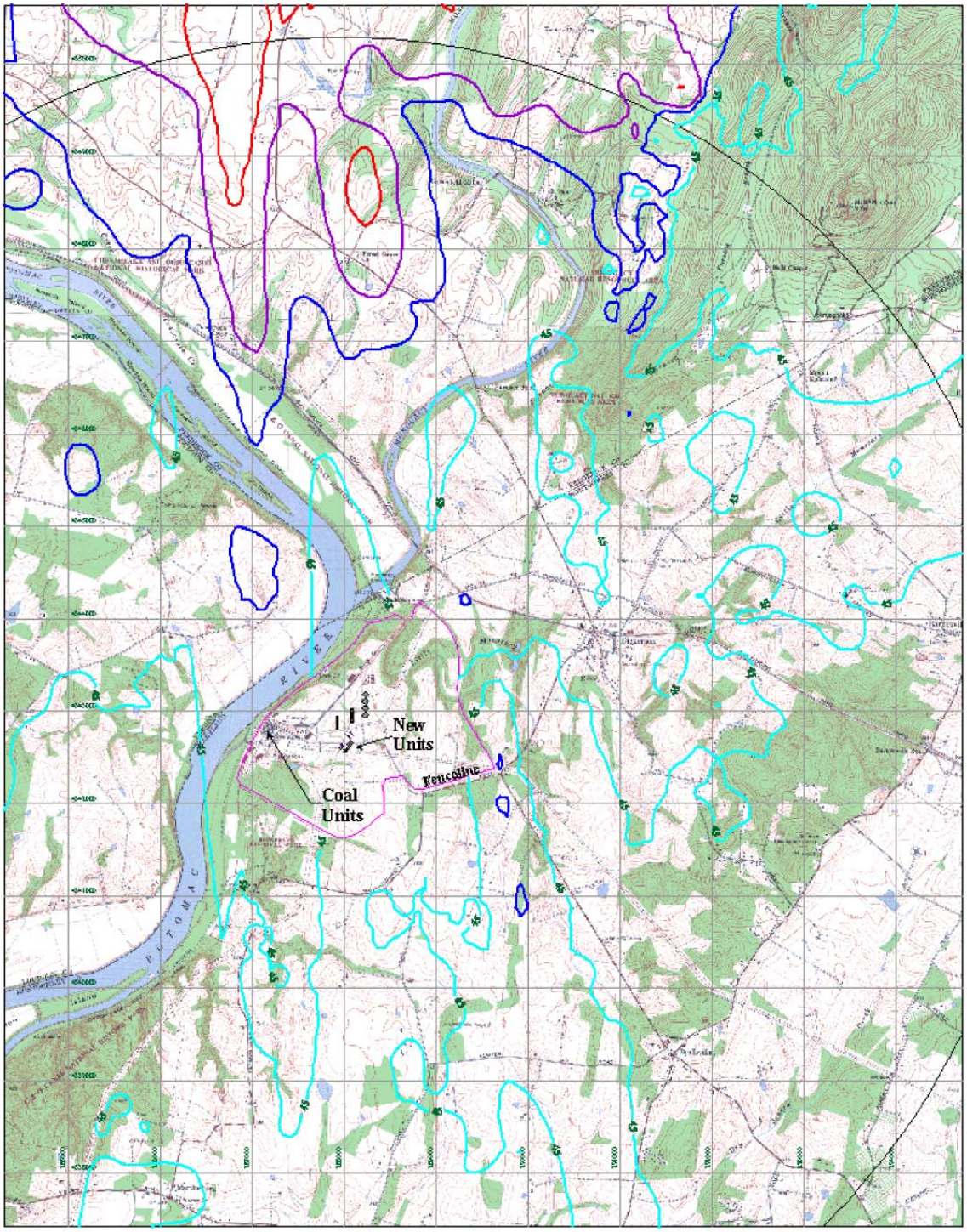
Figure 4-8 ISCST3 24-hr SO2 Concentrations Project Sources Only



Contours represent modeled concentrations only (no background); Highest 24-hr concentration over 5 years of meteorology. Units are ug/m3. Minimum contour 5 ug/m3, interval 1

Base map derived from Poolesville (1978) and Buckeystown (1984) USGS 7.5 minute maps

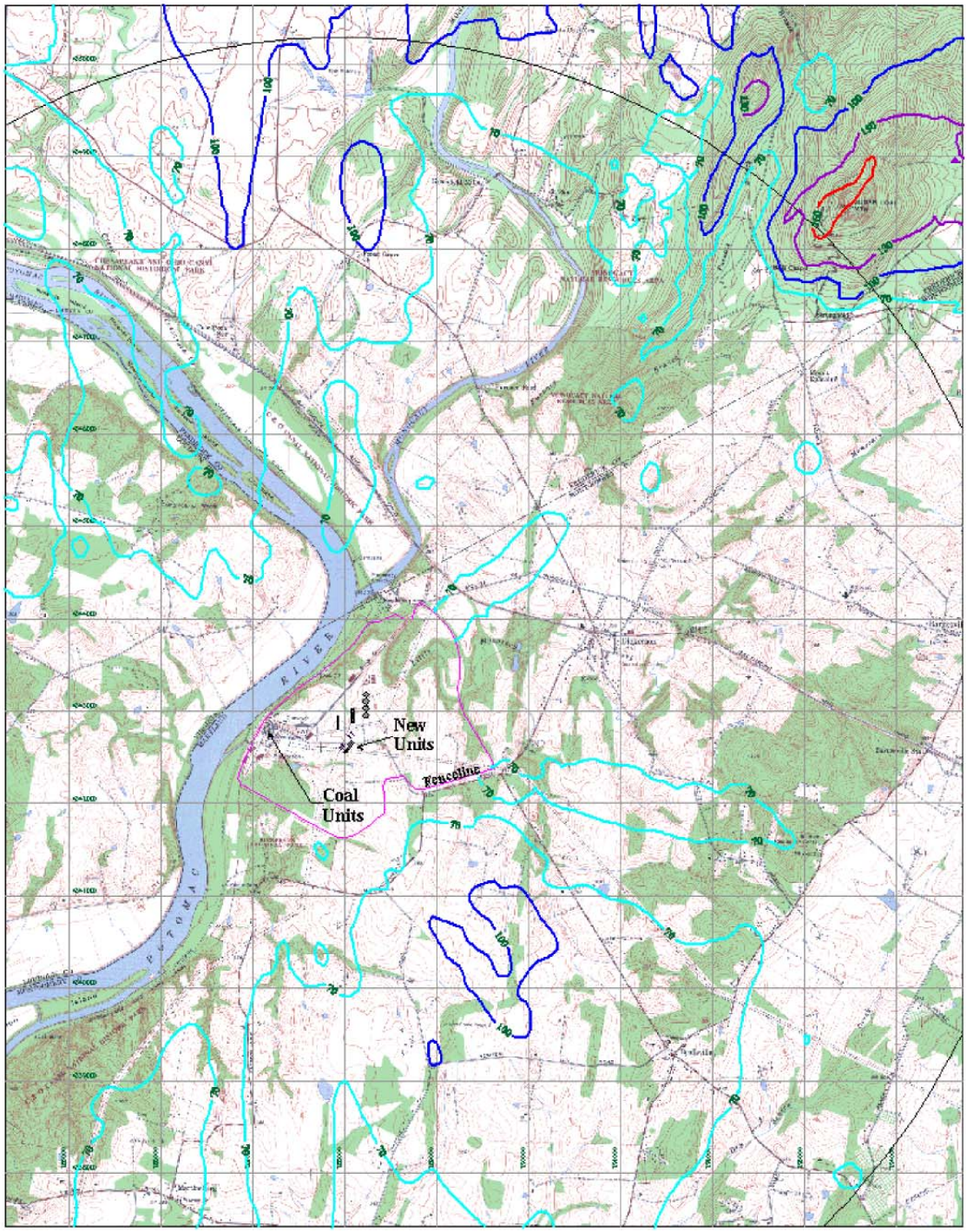
Figure 4-9 ISCST3 24-hr SO2 Concentrations Sources Outside of SIA



Contours represent modeled concentrations only (no background); High, second-high 24-hr concentration over 5 years of meteorology. Units are ug/m3. Minimum contour 45 ug/m3, interval 20

Base map derived from Poolesville (1978) and Buckeystown (1984) USGS 7.5 minute maps

Figure 4-10 ISCST3 24-hr SO2 Concentrations All Sources



Contours represent modeled concentrations only (no background); High, second-high 24-hr concentration over 5 years of meteorology. Units are ug/m3. Minimum contour 70 ug/m3, interval 30

Base map derived from Poolesville (1978) and Buckeystown (1984) USGS 7.5 minute maps

levels specified in Part 52.21(i)(8), and exemption may be granted from the air quality analysis. Since the impacts of the Dickerson expansion project exceed the monitoring *de minimis* levels for SO2, an exemption cannot be granted. In response to PPRP Data Request No. 1, Question 1, Mirant contended that the use of air quality data collected at an existing site (McLean, VA) would meet the requirements for the air quality analysis. Mirant based this conclusion on several factors:

- The McLean site is located in a more developed area that is more likely to experience higher background concentrations than close to Dickerson;
- The values in excess of the monitoring *de minimis* concentration occur in a limited geographic area, and occur only when the new units fire fuel oil (0.05 percent sulfur), which would occur a maximum of 720 hours per year;
- The existing, simple cycle units that comprise Station H have an impact greater than the *de minimis* level in a larger area than the new units, due to the replacement of the current 0.3 percent sulfur fuel oil with the new limit of 0.05 percent sulfur. The net impact of the Dickerson expansion project, therefore, is less than the *de minimis* level;
- Six SO2 monitoring stations were operated in the vicinity of Dickerson in the late 1980s, in support of the permit application for the original Station H. Background concentrations derived from these stations, calculated by removing the influence of the existing Dickerson sources, are less than the values used in the analysis.

PPRP and ARMA have reviewed this response and have conducted further investigations. Monitored concentrations from additional stations in the area were reviewed. In some cases (notably, PM10) concentrations at other stations are higher than the concentrations selected by Mirant. However, using even these higher background concentrations would result in demonstrating that the new expansion project sources would achieve compliance with the NAAQS. Furthermore, PPRP and ARMA have independently determined that even the maximum monitored concentrations from the six sites around Dickerson would yield lower background concentrations than the values used in the Mirant application. For all of these reasons, PPRP and ARMA conclude that the air quality analysis requirements of 52.21(m) have been satisfied for the Dickerson expansion project.

4.3.3.8 *Summary and Conclusions*

Based on the information provided in the Mirant Dickerson expansion project CPCN application, supplemented with independent analyses, PPRP and ARMA conclude that criteria pollutant impacts for the Mirant Dickerson expansion project will not adversely affect the NAAQS or PSD increments for SO2, PM10, and CO.

4.3.4 *Additional Impact Analyses*

The PSD regulations require additional analyses beyond the NAAQS and PSD increment assessment described in the previous section. In particular, the regulations require an assessment of any impairment to visibility, soils, and vegetation that would occur as a result of the new source and of general commercial, residential, industrial, and other growth associated with the new source. Furthermore, impacts on Class I areas must be analyzed in order to determine compliance with Class I increments and to assess the impacts of new emissions on air quality related values (AQRVs). A review of Mirant's analyses, and a discussion of further analyses conducted by PPRP and ARMA, follows.

4.3.4.1 *Impacts on Soils and Vegetation; Impacts of Growth*

Mirant Dickerson has conducted an analysis of the effect of the growth associated with the Mirant Dickerson expansion project sources, and of the impact of project emissions on soils and vegetation. These analyses consist of a cataloging of soil and vegetation types in the vicinity of the proposed expansion project, research into what ambient pollutant levels would be harmful, and a comparison of harm levels to projected levels due to the expansion project. PPRP and ARMA have reviewed this analysis and agree with the conclusion that impacts from the Mirant Dickerson expansion project will not cause harmful effects on local soils and vegetation. PPRP and ARMA also agree with the conclusion that growth associated with the expansion project will not have a significant effect on air quality.

4.3.4.2 *Cooling Tower Deposition, Fogging, and Icing*

Modeling to determine the frequency of occurrence by direction and downwind distance for plume visibility, shadowing, salt deposition, fogging, and icing that result from the Mirant Dickerson cooling systems was performed using the Seasonal Annual Cooling Tower Impact (SACTI) model.

The proposed expansion project at Mirant Dickerson includes the option of two linear mechanical draft cooling towers, each with 10 cell modules. The circulating flow rate through the tower will be 125,870 gallons per minute (gpm) for Unit 4 and 134,442 gpm for Unit 5. The drift loss rate will be a maximum of 0.0005 percent. The drift loss is expected to be approximately 130.2 gpm for the entire cooling tower. The design air flow rate per cell is expected to be 1.43 MM acfm (air flow cubic feet per minute) for Unit 4 and 1.434 MM acfm for Unit 5 and will reject approximately 1,060 MMBtu/hr and 1,090 MMBtu/hr respectively.

The SACTI model calculations utilized a polar coordinate receptor grid system centered on the tower. Receptors were placed surrounding the tower at 22.5-degree intervals at varying distances. Model results regarding salt deposition, shadowing, plume visibility, and icing are outlined in Table 4-26.

The model used hourly surface meteorological data from Dulles International Airport, and twice daily mixing height data from Sterling, VA. The data collected was for the years 1991 through 1995. Default values provided by SACTI documentation were used for long-term monthly clearness indices and daily solar insulation.

Table 4-26 SACTI Modeling Results for the Mirant Dickerson Expansion Project Wet Cooling Tower*

Season	Maximum Salt Deposition ($kg/km^2/month$)	Fogging (hours/season)	Rime Icing (hours/season)	Typical Plume Length (meters)	Typical Plume Height (meters)
Winter	72.73	10.1 @ 200 SSE	0	100	30
Spring	77.73	12.6 @ 100 SW	1.4 @ 200 SE	100	30
Summer	28.46	1.0 @ 400 S	0	100	30
Fall	38.27	1.0 @ 400 N	0	100	30
Annual	54.99	14.5 @ 200 SSE	1.4 @ 200 SE	100	30

* All references are relative to the cooling tower location.

The applicant concludes, based on this analysis, that impacts due to the cooling tower will be insignificant. PPRP and ARMA have reviewed this analysis and agree with the conclusions.

4.3.4.3 *Impacts on Class I Areas*

PSD Class I areas are areas that are designated as requiring special protection from the effects of pollutants emitted by PSD sources, and are defined in the Clean Air Act as national parks over 6,000 acres and wilderness areas and memorial parks greater than 5,000 acres established as of 1977. The Class I area that is closest to the Mirant Dickerson site is Shenandoah National Park (SNP) in Virginia, managed by the National Park Service. Two additional Class I areas, located in West Virginia, are Dolly Sods and Otter Creek Wilderness Areas (DSWA and OCWA), managed by the U.S. Forest Service. The distances from Mirant Dickerson to these Class I areas are approximately 70, 160, and 180 kilometers for Shenandoah, Dolly Sods, and Otter Creek respectively.

Requirements for PSD Class I Areas

The means of providing the additional protection for Class I areas include limits to increases in air quality impacts based on Class I air quality increments that are considerably more stringent than the corresponding Class II increments. Table 4-27 provides a comparison of the Class I and Class II PSD increments; the NAAQS and Class II SILs are also shown on this table for comparison.

Table 4-27 Comparison of Class I and Class II Increments

Pollutant	Averaging Time	Primary NAAQS	Secondary NAAQS	PSD Increment (Class II)	PSD Increment (Class I)	Significant Impact Level (Class II)
NO2	Annual	100	100	25	2.5	1.0
SO2	Annual	80	__	20	2.0	1.0
	24-hr	365	__	19	5.0	5.0
	3-hr		1300	512	25.0	25.0
PM10	Annual	50	50	17	4.0	1.0
	24-hr	150	150	30	8.0	5.0

Source: 40 CFR 51; all values are shown in $\mu g/m^3$.

In addition to demonstrating compliance with the Class I increments, PSD applicants are required to show that new emissions will not have an adverse impact on the AQRVs of the Class I areas under consideration.

The PSD regulations do not contain a definition of AQRVs, and in fact, the assessment of impacts on AQRVs has historically been less prescriptive than the assessment of impacts on PSD increments. The Federal Land Manager (FLM) of the Class I area under consideration has an affirmative responsibility, under the PSD regulations, to ensure that AQRVs are not adversely affected. A working definition of AQRVs can be found in a report prepared by representatives of the U.S. Forest Service, the National Park Service (NPS), and the U.S. Fish and Wildlife Service – the Federal Land Managers' Air Quality Related Values Workgroup (FLAG) Phase I Report, December 2000. The FLAG report's definition of an AQRV is "a resource, as identified by the FLM for one or more Federal areas, that may be adversely affected by a change in air quality. The resource may include visibility or a specific scenic, cultural, physical, biological, ecological, or recreational resource identified by the FLM for a particular area."

The FLAG report identifies three types of AQRV impacts that are common to all Class I areas: visibility, ozone, and deposition. These types of impacts are influenced by the concentrations in the Class I area of PM10, SOx, NOx, and VOCs due to PSD sources. Emissions from the proposed Mirant Dickerson expansion project are significant only for SO2 and PM10, therefore these two pollutants were analyzed.

Mirant Dickerson performed air quality modeling of PM10 and SO2 emissions using the CALPUFF model to estimate concentration and deposition impacts in Shenandoah, Dolly Sods, and Otter Creek. CALPUFF is a variable-trajectory, Lagrangian puff model that is not currently recommended in EPA's GAQM. However, the use of CALPUFF has been recommended by an interagency workgroup for assessment of impacts at distances greater than 50 kilometers, and has further been proposed by EPA for inclusion in the GAQM for applications involving long-range transport.

The CALPUFF modeling was conducted with a three-dimensional data set prepared by Mirant for modeling the Dickerson expansion project. The three-dimensional data set contains hourly meteorology for 1990 and was developed using the MM4 data set prepared by EPA and the National Park Service. The development and evaluation of the meteorological database used for the CALPUFF modeling is described in the following section.

Class I Impacts: Development of Meteorological Data

The modeling domain used in the analysis was a rectangle extending 305 km in the east-west direction and 280 km in the north-south direction. The

southwest corner of the rectangle was the origin of the modeling domain and was located at 37.35°N latitude and 80.0°W longitude. The northeast corner of the domain was located at 39.75°N latitude and 76.5°W longitude. This domain was of sufficient area to not only include the Mirant Dickerson site, but also SNP, DSWA, and OCWA. The domain consisted of 61 grid cells in the east-west direction and 56 grid cells in the north-south direction. A 5-km grid spacing was used.

Several meteorological parameters are needed as input to CALMET for the formation of a complete meteorological dataset. These parameters include:

- Hourly surface data,
- Twice daily upper air data,
- Hourly precipitation data,
- Initial wind field (Mesoscale Model – Generation 4 (MM4) data,
- 1° land use data, and
- USGS 1° Digital Elevation Model (DEM) terrain data.

These data were obtained and processed for the calendar year of 1990, the year where MM4 data was available. Hourly surface data were processed using the CALMET pre-processor SMERGE from Hourly United States Surface Weather Observations (HUSWO) for 77 stations within the modeling domain. Twice daily upper air data were processed using READ62, the CALMET pre-processor for upper air data, from soundings taken at Sterling, VA, the only upper air station within the modeling domain. Hourly precipitation data from 43 stations within the domain were processed using the CALMET pre-processor PMERGE. One-degree land use data, processed with CTGCOMP and CTGPROC, and USGS 1° DEM terrain data, processed with TERREL, were combined using MAKEGEO to create a terrain and land use data set for the modeling domain. The extent of the domain, the location of Dickerson, the location of meteorological stations, and terrain elevations are shown in Figure 4-11.

In addition to the data needs listed above, the CALMET processor requires a control file, which contains several groups of parameters that need to be given. One group of parameters that is particularly important is the wind field parameter group, as these parameters are crucial in obtaining a realistic picture of the atmosphere. Specifically, the parameters in this group determine the amount of influence terrain features have over winds at different levels of the atmosphere, as well as the amount of influence actual meteorological observations have on the first guess wind field provided by the MM4 data. Several of these parameters are described

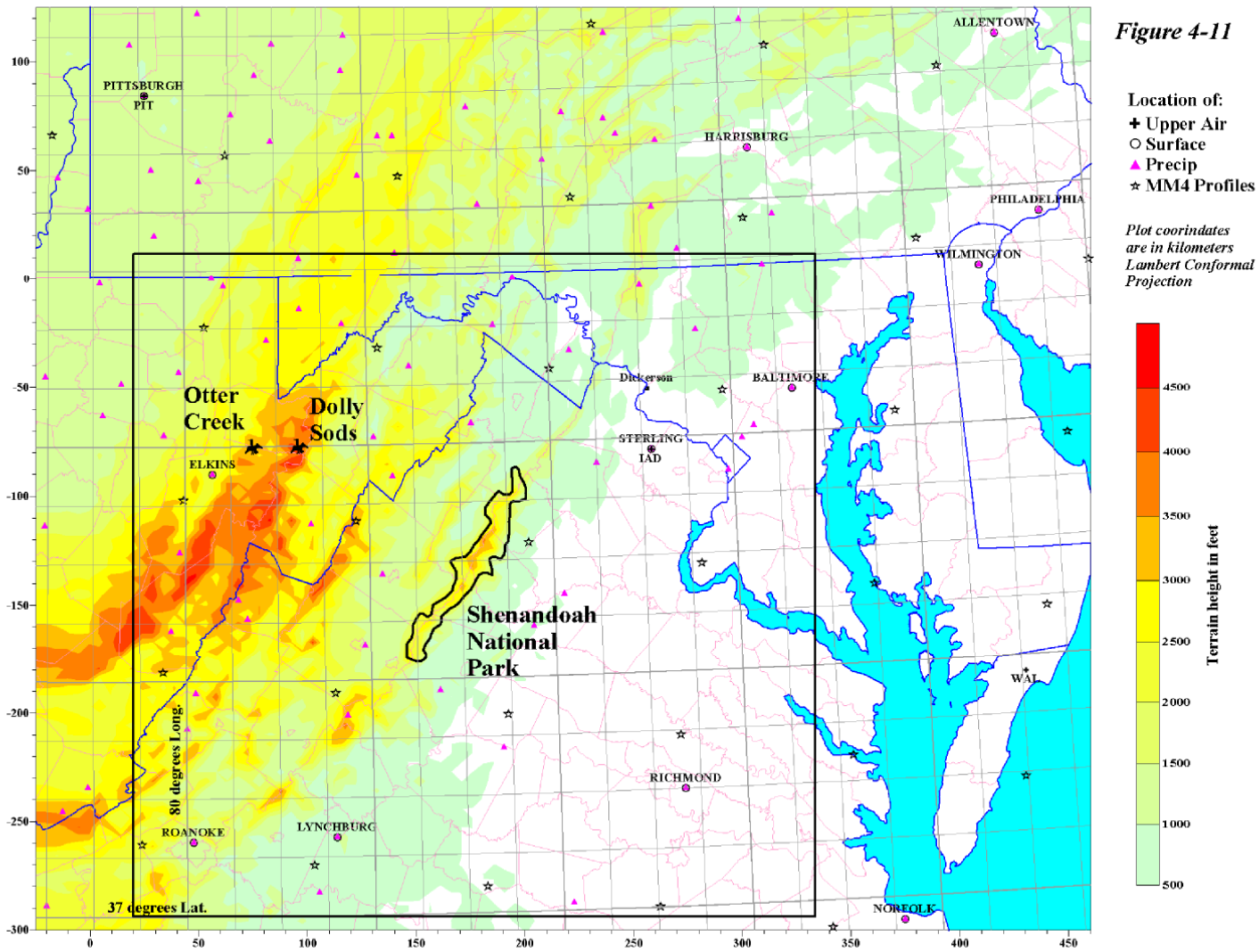

ALLENTOWN
PITTSBURGH
PIT
HARRISBURG
PHILADELPHIA
WILMINGTON
Dickerson
BALTIMORE
STERLING
IAD
Otter Creek
Dolly Sods
ELKINS
Shenandoah National Park
WAL
RICHMOND
ROANOKE
LYNCHBURG
NORFOLK
80 degrees Long.
37 degrees Lat.
100
50
0
-50
-100
-150
-200
-250
-300
0
50
100
150
200
250
300
350
400
450
Location of:
Upper Air
Surface
Precip
MM4 Profiles
Plot coorindates are in kilometers Lambert Conformal Projection
Terrain height in feet
4500
4000
3500
3000
2500
2000
1500
1000
500

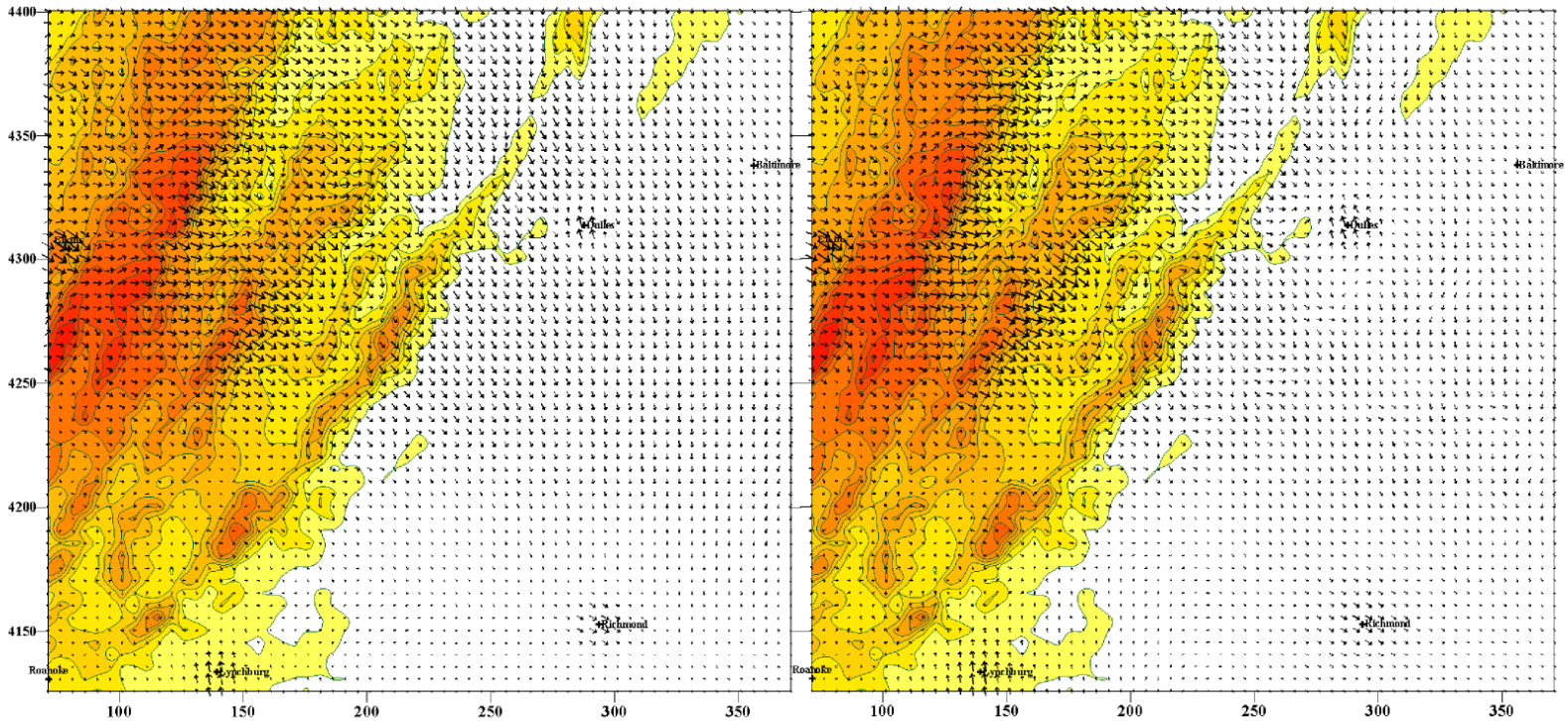
Figure 4-11

below, as explained in the CALMET User's Guide.

- TERRAD – Radius of influence of terrain features.
- RMAX1 – Maximum radius of influence over land in the surface layer. This parameter reflects the limiting influence of terrain features on the interpolation of the wind field.
- RMAX2 - Maximum radius of influence over land in layers aloft. RMAX2 is generally larger than RMAX1 because the effects of terrain decrease with height.
- RMAX3 – Maximum radius of influence over water.
- RMIN1 – Minimum radius of influence used in the wind field interpolation.
- R1 – Weighting parameter for the diagnostic wind field in the surface layer. R1 is the distance from an observational station at which the observation and the first-guess field are equally weighted.
- R2 – Weighting parameter for the diagnostic wind field in the layers aloft. R2 is applied in the same manner as R1 is used in the surface layer.

The values of these parameters used by Mirant Dickerson in their CALMET run are shown in Table 4-28. Using PRTMET, a postprocessor designed to aid in the analysis of the CALMET output data by allowing the user to display selected portions of the meteorological data, a series of plots were created to display the wind field at different levels and times using the parameters listed in Table 4-28. The surface wind field over the modeling domain created by CALMET for 6 January 6 1990, hour 5 is shown in the left panel of Figure 4-12. In this figure and other figures depicting the surface winds, the crosses represent surface meteorological stations, and the arrows represent the wind direction scaled to the speed of the wind. The contours shown represent the terrain heights with a 100-meter contour interval. As shown in this figure, the treatment of the winds over the ridges in the western half of the domain is satisfactory, with wind speeds decreasing up the windward sides of the ridges and increasing on the lee side of the ridges. However, in the flatter terrain of the southern portion of the domain, sharp changes in wind direction appear, especially around stations near Richmond, VA, and Dulles airport.

Figure 4-12 Comparison of Surface Wind Fields (night)



Original CALMET Parameters **PPRP/ARMA CALMET Parameters**

CALMET wind field for January 6, 1990 Hour 5 (surface winds)
Terrain elevations are in meters; minimum contour is 200 meters, interval 100 meters

Table 4-28 CALMET Wind Field Parameters

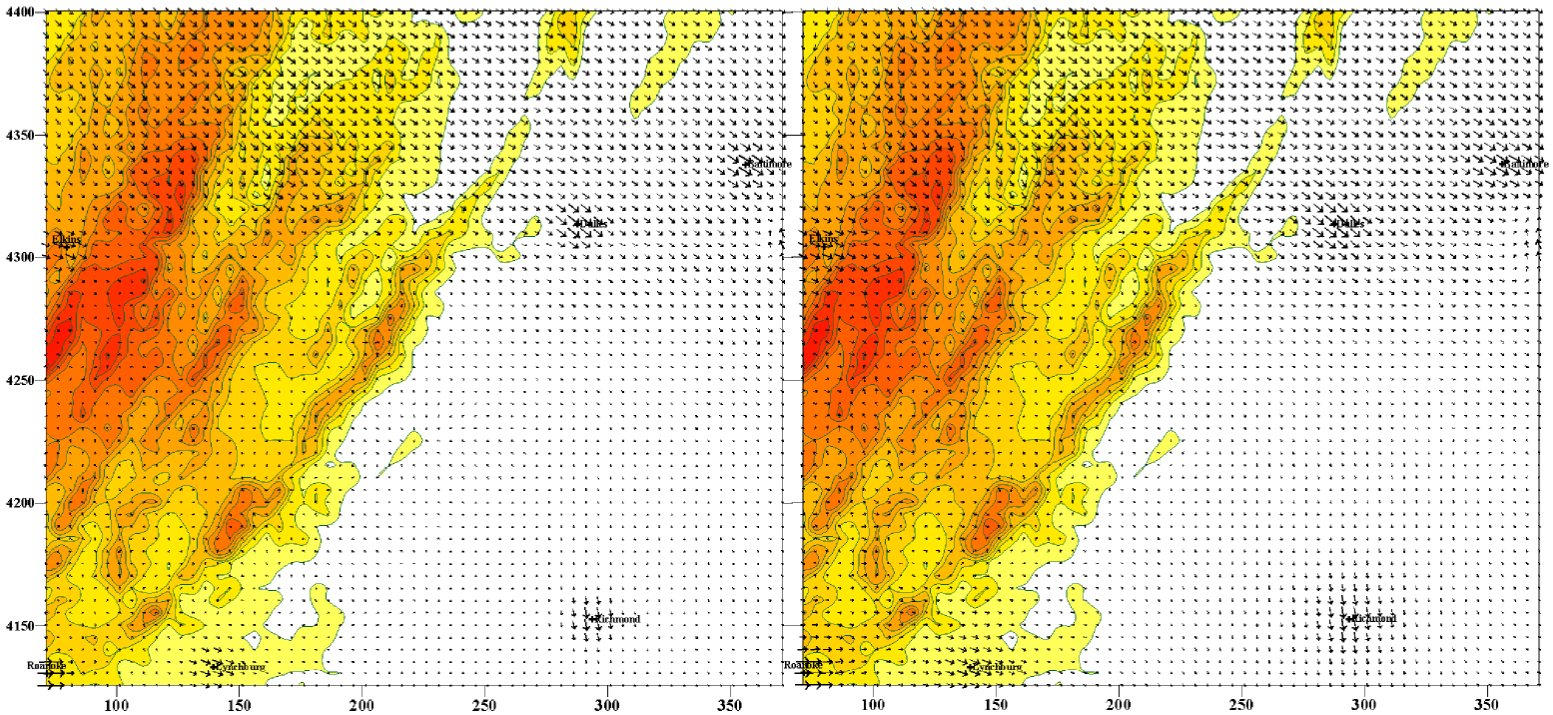
	TERRAD (km)	RMAX1 (km)	RMAX2 (km)	RMAX3 (km)	RMIN1 (km)	R1 (km)	R2 (km)
Original Mirant	10	10	50	500	0.1	10	25
PPRP/ ARMA	100	100	250	500	0.1	10	150

PPRP and ARMA evaluated the Mirant approach to CALMET by running CALMET with modified parameter settings, also shown in Table 4-28. The selection of these alternative parameters was guided by an attempt to remedy the unrealistic wind changes over the flatter terrain of the modeling domain. These modified parameters give a wider radius of influence to the terrain features than the original parameters, and the effect of applying them is shown in the right panel of Figure 4-12. The wind field in this panel over the complex terrain is similar to that shown in the left panel. However, the wind field over the flatter terrain is much smoother in the right panel, especially around Richmond.

Similar patterns can be seen in Figure 4-13. This figure represents the surface wind field at hour 12 on 6 January 1990. The left panel displays the wind field created with the original parameters, while the right panel shows the wind field using the adjusted parameters. Both figures exhibit similar patterns to each other over the complex terrain, where valley-to-mountain flow is evident and expected for mid-day heating. However, over the flatter terrain, the revised parameters result in smoother wind direction transitions in the southeastern quadrant of the modeling domain.

The effects of the upper level parameters RMAX2 and R2 were also examined by plotting the wind field created at 80 meters above the surface. Figure 4-14 show the resulting wind field for 6 January 1990 at hour 15; the location of the upper air station in Sterling, VA (Dulles airport) is also shown. Sharp changes in wind direction around the Sterling station and in the southeastern quadrant of the modeling domain result from application of the original parameters. However, the wind field resulting from application of the revised parameters is smooth over the whole domain. This is due to the large value of RMAX2, which does not allow the terrain to influence the upper air winds as much as a small value of RMAX2.

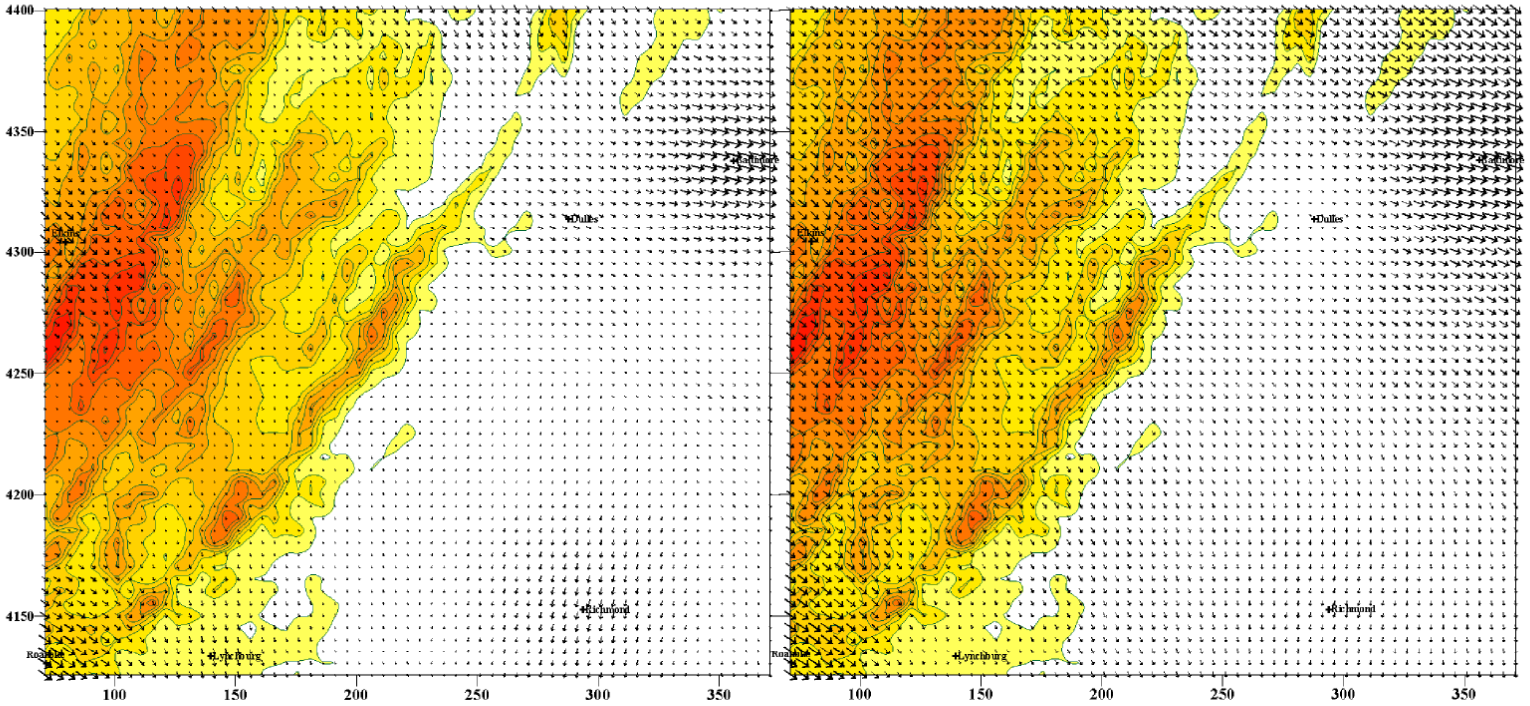
Figure 4-13 Comparison of Surface Wind Fields (day)



Original CALMET Parameters **PPRP/ARMA CALMET Parameters**

CALMET wind field for January 6, 1990 Hour 12 (surface winds)
Terrain elevations are in meters; minimum contour is 200 meters, interval 100 meters

Figure 4-14 Comparison of Elevated Wind Fields (day)



Original CALMET Parameters **PPRP/ARMA CALMET Parameters**

CALMET wind field for January 6, 1990 Hour 15 (80-m winds)
Terrain elevations are in meters; minimum contour is 200 meters, interval 100 meters

While it appears that some wind field improvements would occur with the use of revised parameters, PPRP and ARMA examined the effect of revised parameters on the CALPUFF modeling results and conclude that the differences are small – likely due to the fact that the receptor areas are in complex terrain where the two different approaches yield similar results. Consequently, the CALMET processing as conducted by Mirant is considered acceptable for determining Class I area impacts for the Dickerson expansion project.

After the submittal of the original CPCN application, Mirant informed PPRP and ARMA that the MM4 data base used for developing CALPUFF meteorological inputs contained errors. The errors were associated with the extraction of a sub-domain for the Dickerson expansion project modeling from the set of CD-ROMs obtained from EPA, and resulted in a mis-alignment of the wind fields. A corrected MM4 data set was provided by Mirant to PPRP and ARMA, and all subsequent processing and modeling was conducted with the corrected data set. PPRP and ARMA also conducted additional, confirmatory model runs with an MM4 data set developed entirely by PRRP and ARMA, to further check and verify the CALPUFF modeling conducted for the Class I area analyses. The results that are presented below are based on modeling with the corrected MM4 data bases.

Class I Impacts: Concentration Increments

The CALPUFF concentration increment modeling results for the Dickerson expansion project sources are presented in Table 4-29. The Virginia Department of Environmental Quality (DEQ) has developed significant impact levels, analogous to the SILs for Class II modeling. EPA and FLM representatives have also proposed significant impact levels (proposed in FR 61, No. 142, Tuesday, 23 July 1996) that are shown in the table. The significant impact levels shown in this table are intended to be used only as thresholds for determining whether detailed Class I increment modeling needs to be conducted. None of these levels are currently considered absolute thresholds for determining impacts on AQRVs; however, they are helpful as indicators of the severity of predicted impacts.

Table 4-29 CALPUFF Predicted Impacts in the Class I Areas

Pollutant and Averaging Period		Thresholds (1) PSD Increment (Class I)	VDEQ Sig. Levels	FLM Proposed Sig. Levels	EPA Proposed Sig. Levels
SO2	Annual	2.00	0.10	0.03	0.10
	24-hr	5.00	0.27	0.07	0.20
	3-hr	25.00	1.23	0.48	1.00
PM10	Annual	4.00	0.27	0.08	0.20
	24-hr	8.00	1.35	0.27	0.30

Pollutant and Averaging Period		Model Results Scenario 1: Unit 5 Simple Cycle fuel oil				Scenario 2: Unit 5 SC, no oil May-Sept			
		SNP_A	SNP_B	DSWA	OCWA	SNP_A	SNP_B	DSWA	OCWA
SO2	Annual	0.005	0.007	0.0005	0.0003	n/a	n/a	n/a	n/a
	24-hr	**0.254**	**0.313**	0.020	0.044	**0.161**	**0.180**	0.013	0.033
	3-hr	**0.942**	**0.773**	0.100	0.178	**0.572**	**0.773**	0.100	0.144
PM10	Annual	0.001	0.001	0.0001	0.0001	0.0008	0.0011	0.0001	0.0001
	24-hr	0.042	0.055	0.005	0.009	0.0422	0.0547	0.0045	0.0089
Sulfates (2)	Annual	0.001	0.001	0.0002	0.0001	n/a	n/a	n/a	n/a
	24-hr	0.023	0.039	0.006	0.018	**0.009**	**0.039**	**0.003**	**0.003**

Pollutant and Averaging Period		Model Results Scenario 3: Full project (gas firing)				Scenario 4: Oil firing, credit from U4			
		SNP_A	SNP_B	DSWA	OCWA	SNP_A	SNP_B	DSWA	OCWA
SO2	Annual	0.002	0.002	0.0002	0.0001	0.014	0.022	0.001	0.001
	24-hr	0.124	0.090	0.009	0.017	**0.232**	**0.571**	0.017	0.014
	3-hr	0.398	0.266	0.033	0.065	**1.454**	**1.022**	0.132	0.076
PM10	Annual	0.004	0.005	0.0004	0.0003	0.007	0.009	0.001	0.001
	24-hr	0.251	0.178	0.024	0.046	**0.408**	0.266	0.042	0.083
Sulfates (2)	Annual	0.0002	0.0002	0.0001	0.00004	0.002	0.002	0.0005	0.0004
	24-hr	0.010	0.011	0.003	0.007	0.018	0.027	0.003	0.004

SNP_A: Shenandoah National Park, original receptor grid; SNP_B: comprehensive receptor grid; DSWA: Dolly Sods Wilderness Area; OCWA: Otter Creek Wilderness Area.
Concentrations in bold exceed the proposed EPA significance criteria.
(1) Source: 40 CFR 51 and 61 FR 38292; all values are shown in $\mu g/m^3$;
(2) There are no PSD Class I Increments for sulfates; however these concentrations are considered as PM10.

The concentration values presented in Table 4-29 represent four different scenarios:

1. Unit 5 operating in simple cycle mode firing fuel oil;
2. Unit 5 operating in simple cycle mode firing fuel oil, accounting for the reduced impacts resulting from a limitation on the use of fuel oil during the months of May through September;
3. Units 4 and 5 operating in combined cycle mode on gas (the most frequent operational mode anticipated for the expansion project) including impacts of particulate emissions from the cooling towers and SO2 and particulate emissions from the auxiliary boiler firing gas; and,
4. Units 4 and 5 operating in combined cycle mode on fuel oil, including impacts of particulate emissions from the cooling towers and SO2 and particulate emissions from the auxiliary boiler firing oil, accounting for the reduced SO2 impacts resulting from a reduction in the sulfur content of the fuel oil for Unit 4 from 0.3 % to 0.05 % (the annual averages for this scenario do not account for any crediting emissions).

This table presents concentration predictions in the Shenandoah National Park and in the Dolly Sods and Otter Creek Wilderness Areas. For Shenandoah, results for two sets of receptors are presented. The first set represents receptors used in Mirant's analysis that focus on elevated terrain in the park, and the second set is a more comprehensive set of receptors developed by PPRP and ARMA with a 1-kilometer spacing throughout the park. PPRP and ARMA conducted independent modeling with CALPUFF for the second set of receptors.

These predicted impacts suggest that the Mirant Dickerson expansion project will have a minimal impact on the Class I increment in the Shenandoah National Park when firing natural gas. Oil firing (maximum of 720 hours per year) results in higher impacts, but will be offset by a reduction in the sulfur content of the fuel oil used in Unit 4 from the current 0.3 % to 0.05 %. Net impacts are shown to be greater than the proposed EPA significant impact levels for SO2 and PM10 for some conditions, however, the overall maximum SO2 and PM10 impacts will decrease due to the decrease in sulfur content of the fuel oil for Unit 4. Limiting Unit 5 to not firing fuel oil during the summer months (May – September) results in impacts less than the significant impact levels. All annual averages shown in this table assume that the given fuel and configuration will occur all year; furthermore, for all annual averages, no credit was modeled for the sulfur in fuel reduction for Unit 4. Even with this conservative assumption, annual impacts for all pollutants are less

than the proposed significant impact levels.

The following sections describe analyses conducted by Mirant and PPRP and ARMA to examine the three types of AQRV impacts described in the FLAG report – visibility, deposition, and ozone.

Class I Impacts: Visibility

Mirant conducted a refined visibility analysis using CALPUFF at the Shenandoah National Park, Dolly Sods Wilderness Area, and Otter Creek Wilderness Area. Discussions with the NPS, and the FLAG report recommendations, suggest that the appropriate background visual range to be used in Transport Scenario Specifications is an estimate of natural visual range. The FLAG report contains a value of the natural visual range for Shenandoah National Park of approximately 233 km. PPRP and ARMA subsequently confirmed the applicant's visibility analysis of impacts in Shenandoah, Dolly Sods, and Otter Creek.

Visibility is usually characterized by either visual range (VR) (the greatest distance that a large dark object can be seen) or by the light-extinction

$$VR(km) = \frac{3.912}{b_{ext}(km^{-1})}$$

coefficient (b_{ext}) (the attenuation of light per unit distance due to scattering and absorption by gases and particles in the atmosphere). Under certain assumed conditions, these parameters are inversely related to each other.

The dimensions of VR are length and the dimensions of b_{ext} are 1/length. Visual range is usually expressed in kilometers.

Visibility degradation is associated with concentrations of primary particulate, sulfates, and nitrates in the ambient air. The impact of sulfates and nitrates on visibility impairment is sensitive to relative humidity. The CALPUFF model and its companion postprocessor, CALPOST, were used to calculate the impact of the Mirant Dickerson sources on visibility impairment. Separate model runs were conducted for future PM10 and SO2 emissions (combined cycle, oil firing), and for existing simple cycle oil firing SO2 emissions at the current 0.3 percent sulfur fuel. The impact of the expansion project was calculated as the difference between future and existing impacts. The FLAG report indicates that if a single source does not cause an impairment greater than 5 percent (of the background visibility), then as a general rule the FLM will not object to permit issuance.

CALPUFF/ CALPOST visibility impacts were calculated and the results are summarized in Table 4-30 for SNP. Visibility impairment (in terms of the extinction coefficient and the percent change due to the new sources) was calculated for each day of the input meteorological data set, based on concentrations predicted at receptors located in Shenandoah National Park - including the more comprehensive set. Results in Table 4-30 represent three of the four operational scenarios described above for the concentration impacts. Only one scenario resulted in visibility degradation greater than the Federal Land Manager's criterion of 5%. This predicted value was 5.5%, and occurred for the full project - fuel oil firing scenario. The maximum visibility impairment in both DSWA and OCWA was calculated to be less than 1 percent.

Table 4-30 Visibility Impacts in the Shenandoah National Park

Pollutant	**Modeled Extinction due to Mirant Dickerson Sources (Mm^{-1})**		**Modeled Extinction – Background (Mm^{-1})**		**Percent Change**	
	SNP_A	SNP_B	SNP_A	SNP_B	SNP_A	SNP_B
Scenario 1: Unit 5 Simple Cycle fuel oil						
Sulfates	0.82	1.10	27.80	24.68	2.94	4.44
PM10	0.01	0.03	27.80	24.68	0.04	0.12
Total	0.83	1.13	27.80	24.68	2.98	4.57
Scenario 3: Full project (gas firing)						
Sulfates	0.07	0.24	22.27	24.68	0.30	0.97
PM10	0.25	0.16	22.27	24.68	1.13	0.64
Total	0.32	0.40	22.27	24.68	1.42	1.60
Scenario 4: Oil firing, credit from U4						
Sulfates	0.09	1.41	22.27	26.99	0.41	5.22
PM10	0.38	0.08	22.27	26.99	1.71	0.30
Total	0.47	1.49	22.27	26.99	2.12	5.52

SNP _A: Shenandoah National Park, original receptor grid; SNP_B: comprehensive receptor grid

Some further perspective on the visibility impacts in the SNP can be gained by examining Figure 4-15. This figure illustrates a frequency distribution of daily impairment values for the existing and new sources separately, and the net impairment. This plot shows that the existing source impacts are greater than new source impacts at all levels of the frequency distribution; however, some meteorological conditions occur to result in a net increase at a limited number of receptors.

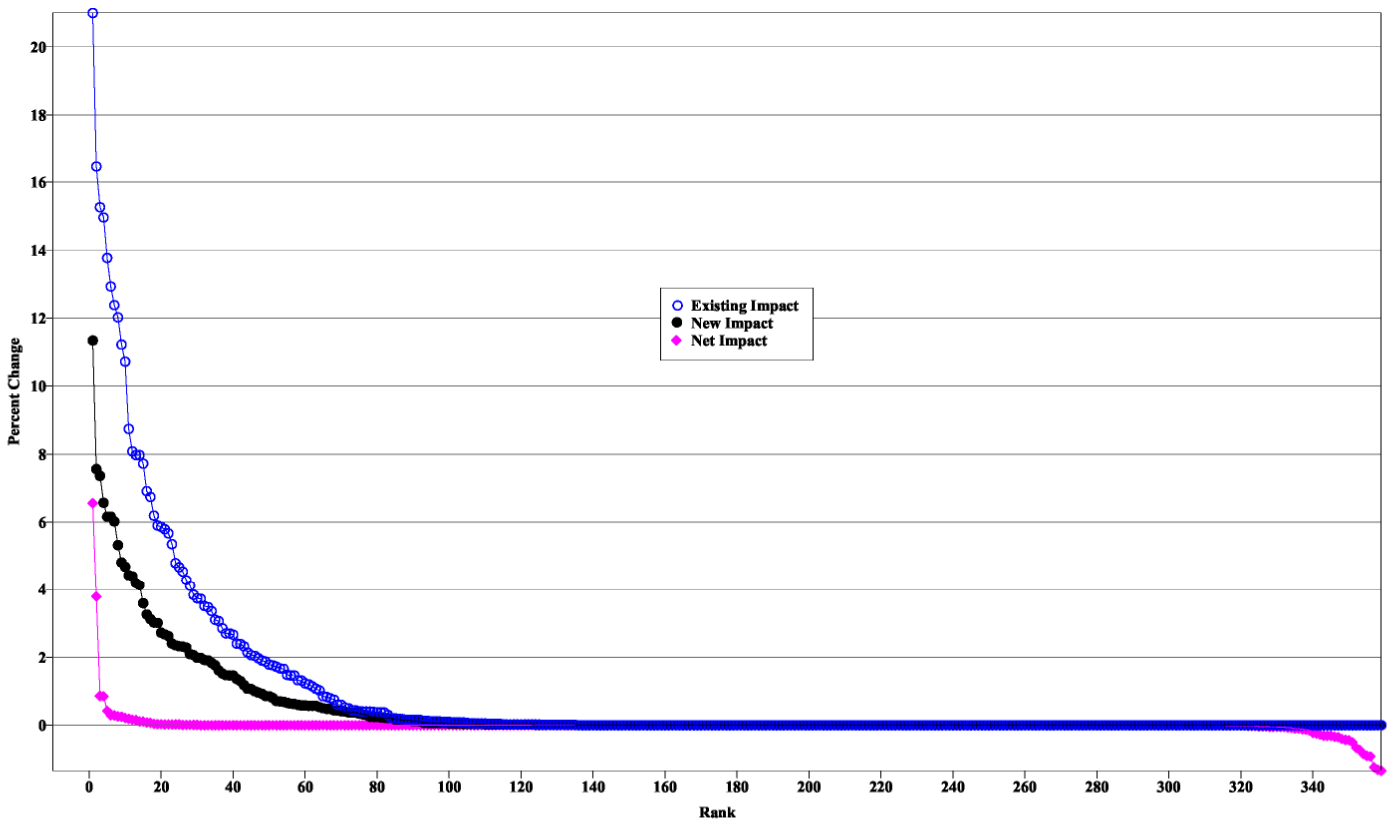
Deposition in the Class I Areas

Deposition is a term that is used to describe the result of the interaction of pollutants with the ground surface, where some of the pollutant mass is deposited on the ground or is absorbed by vegetation. Deposition occurs through physical and biological processes, and is generally thought of as a secondary pollution problem – i.e., pollutants that are directly emitted by combustion sources must undergo chemical transformation in the atmosphere before deposition becomes a significant factor. For combustion sources, SO2 emissions can transform in the atmosphere to sulfates and NOx emissions can transform to nitric acid (HNO3) and particulate nitrate (NO3 -). Since the net increase in NOx emissions from the Mirant Dickerson expansion project is not significant, this discussion regarding deposition in the Shenandoah is focused on sulfur deposition.

CALPUFF was used to model the proposed expansion project's deposition impacts at the three Class I areas including Shenandoah receptor locations. The model was configured to calculate deposition fluxes of SO2 and SO4 using default approaches for deposition chemistry and pollutant-specific deposition parameters. Deposition can occur as a dry process (interaction with the ground surface, uptake by plants) or a wet process (where precipitation essentially "washes out" the pollutant mass from the atmosphere). Wet and dry deposition fluxes were calculated by the model at all Shenandoah receptors for both SO2 and SO4, and a total deposition flux was calculated by summing over species and wet and dry processes.

CALPUFF yielded a deposition flux of 1.48 E-5 ug/m^2/second (sulfur-equivalent, maximum over all receptors, sum of wet and dry and SO2 and SO4). Deposition impacts are more commonly evaluated in units of kilograms of sulfur per hectare (10,000 m^2) per year. Converting the CALPUFF-derived value to the more common units yields a total flux of 4.68E-3 kilograms of sulfur per hectare per year (kg S/ha/yr). Deposition rates have been estimated from data collected at the Shenandoah National Park, Big Meadows monitoring station for several years. For the past three years, average sulfur-equivalent deposition rates are 3.3 kg/ha/yr (dry) and 4.6 kg/ha/yr (wet; NADP, 2000; CASTNET,2000). The predicted

Figure 4-15 Comparison of Existing, New, and Net Visibility Impacts



values are nearly three orders of magnitude lower than existing deposition rates, and are substantially lower than the recently revised deposition analysis threshold (DAT) level of 10 g/ha/yr. for sulfur established by the National Park Service.

Ozone Impacts in the Shenandoah National Park Class I Area

The FLAG report identifies some plant species located in the Shenandoah National Park (e.g., black cherry, yellow poplar) that are susceptible to adverse effects from ozone. Furthermore, ozone measurements taken at monitoring stations within the park indicate that exposure levels currently exist that may be detrimental to some of these plant species. In the FLAG report, it is acknowledged that ozone is a regional issue involving the interaction of emissions from many sources, and that there is no methodology currently available for adequately assessing the impact of individual sources on ozone levels. Since source-specific impacts *can* be determined for visibility and deposition, and since visibility and deposition involve at least one of the pollutants (NOx) that is of concern for ozone impacts, a new source's impact on visibility and/or deposition levels can serve as an indicator of source impacts on ozone levels.

In the case of the Mirant Dickerson expansion project, however, precursor emissions increases of NOx are not significant and therefore no analysis was conducted of project NOx emissions. Section 4.5 provides an analysis and discussion of the different impacts of new unit increases compared to existing coal unit emissions decreases that were used for netting.

4.3.4.4 Conclusions Regarding Class I Impacts

PPRP and ARMA believe that it can be reasonably concluded that the Mirant Dickerson expansion project's impacts on primary pollutant concentrations, visibility, deposition, and ozone in the Shenandoah National Park and in the Dolly Sods and Otter Creek Wilderness Class I areas are acceptable. Even though an assessment of impacts on AQRVs is less prescriptive than the assessment of impacts on the NAAQS and PSD Class II increments, the analyses reported in the Mirant application and reviewed here, supplemented by analyses conducted by PPRP and ARMA, support the conclusion of acceptable impacts.

4.4 *NONATTAINMENT NEW SOURCE REVIEW (NA-NSR)*

In a severe ozone nonattainment area such as Montgomery County, an existing facility is considered a major stationary source for NA-NSR purposes if it has the potential to emit 25 tpy of either VOCs or NOx (the ozone precursor pollutants). The Dickerson facility is considered an existing major stationary source for NOx for NA-NSR purposes because existing potential emissions of NOx and VOCs exceed 25 tpy.

The proposed expansion has been evaluated to determine whether the modification will result in a net emissions increase for either NOx or VOCs that exceeds the significant emissions increase thresholds. For the area in which the Dickerson facility is located, a modification is considered major, and therefore subject to NA-NSR, if the net emission increase for either VOCs or NOx exceeds 25 tpy (COMAR 26.11.17.01.B(17)). The net increase includes potential emissions for the new project, plus other creditable increases and decreases source-wide realized during the contemporaneous period. The evaluation of the net emissions increases was described in Section 4.2.6.

As outlined in Section 4.2.6.2, Mirant will realize sufficient reductions in NOx emissions from the existing coal-fired Units 1, 2, and 3 by operation of SOFA systems to offset the projected increase in NOx emissions attributable to the new CTs and auxiliary boiler. The net emissions increase is essentially zero, and is therefore below the 25 tpy trigger threshold.

Similarly, the net emissions increase in VOC emissions from the project (see Section 4.2.6) will be below 25 tpy of VOCs, and thus the project will not be subject to NA-NSR for VOCs.

4.5 *EVALUATION OF NETTING IMPACTS FOR PSD AND NA-NSR*

Annual NOx emissions from the full Mirant Dickerson Expansion project (Units 4 and 5 with combined cycle capacity; auxiliary boilers; cooling towers) will be a maximum of approximately 840 tons per year, mostly from the CT/HRSG units. A decrease in emissions from the coal-fired Units 1-3 is proposed to provide enough of a reduction in NOx emissions to "net out" of PSD and nonattainment NSR. In order to be creditable for use in netting, an emissions decrease must have "...approximately the same qualitative significance for public health and welfare as that

attributed to the increase from the particular change…" (40 CFR Part 52.21(3)(vi)(c)). The same requirement is contained in the nonattainment regulations in COMAR 26.11.17.01(15)(e)(4). Section 4.2.3 of this document provides an evaluation of the netting analysis submitted by Mirant. This section discusses the decrease in NOx emissions from the coal units and compares the impact of the decrease with the impact of the increase from the new units, in order to evaluate the decrease with respect to 40 CFR Part 52.21 (3)(vi)(c). Four topics are discussed: nitrogen deposition, the NO2 NAAQS, visibility impacts in the Shenandoah National Park, and the impact on ozone levels.

4.5.1 Nitrogen Deposition

An issue that is of ongoing interest and concern to PPRP is the impact of atmospheric nitrogen on water quality in the Chesapeake Bay. Through the processes of wet and dry deposition, both onto the water surface and onto land areas within the Bay watershed, a significant quantity of nitrogen can reach the bay from airborne sources of NOx. Although nitrogen is one of the essential nutrients for phytoplankton production in estuaries and coastal waters, too much nitrogen, combined with an abundance of other nutrients, can become a problem. Phytoplankton blooms, resulting from a high availability of nutrients, can reduce the amount of available oxygen due to bacterial decomposition of excess phytoplankton. Frequent phytoplankton blooms can result in hypoxia (a reduced supply of oxygen) or anoxia (a complete lack of oxygen) in the affected water body. These conditions can affect living resources in the water body, and reduce its value as a natural resource and as a source of livelihood and recreation. The Chesapeake Bay is the largest of the 130 estuaries in the United States, and has experienced periods of anoxia and degraded water and living resource quality increasingly this century due largely to manmade pollution. Nutrient loading resulting from deposition of airborne pollutants has been the subject of much recent research, and a recent EPA report to Congress suggests that up to 27 percent of the nitrogen loading reaching the Bay can be attributable to air pollution.

The proposed Mirant Dickerson expansion project is located within the Chesapeake Bay watershed area. PPRP has conducted deposition modeling to calculate nitrogen loading in the vicinity of the proposed site, using the same modeling approach as for the Class I area deposition analysis. A receptor grid was generated to encompass the Chesapeake Bay watershed area. CALPUFF was run on this grid with a full year (1990) of three-dimensional meteorological data to determine wet and dry deposition fluxes of nitrogen species, and total nitrogen deposition in this area was calculated.

The maximum deposition flux rate is predicted to occur within 2 kilometers of Dickerson, to the east. The average deposition flux rate predicted by CALPUFF (total over NO3 and HNO3, wet and dry) in the Chesapeake Bay watershed area – approximately 21 million hectares - was used to calculate the total tons (nitrogen-equivalent) deposited in the watershed over a year due to the proposed new sources. The result of this calculation is approximately 5.1 metric tons (nitrogen-equivalent) per year. The average deposition flux rates in closer proximity to the Dickerson site are higher than the watershed average. Using the average total flux rate predicted by CALPUFF within 30 kilometers of the site (360,000 hectares), total deposition from new sources is calculated to be approximately 1.8 metric tons (nitrogen-equivalent) per year. Utilizing the same methodology for the coal units results in a decrease over the watershed of the same amount, 5.1 metric tons per year. A slightly smaller decrease, 1.4 metric tons per year, is predicted from the coal units in the area within 30 kilometers of Dickerson. The reason for the greater impact of the new units close to the plant site is that the new units have a smaller stack height than the coal units, leading to higher deposition rates close to the stacks. This effect is balanced out, however, when considering deposition over the larger watershed area.

Deposition impacts do not trigger any regulatory requirements. However, these levels should be considered in the context of nutrient loading goals for the Chesapeake Bay as a whole. In the case of the Dickerson expansion project, the effect of the decrease appears to be qualitatively equivalent to the effect of the increase.

4.5.2 NAAQS for NO2

Although NOx emissions are precursors to the formation of ozone, NO2 should also be evaluated as a criteria pollutant by itself. The NAAQS for NO2 is 100 $\mu g/m^3$, annual average. PPRP and ARMA conducted modeling to examine the effect on ground-level NO2 concentrations of the new expansion units for comparison to the decrease expected from the coal units. The analysis used AERMOD and followed the methodology described in Section 4.3.3.

Based on the modeling, the maximum annual average NO2 concentration due to the new units in the vicinity of the station is 0.77 $\mu g/m^3$, while the maximum annual average NO2 concentration due to the coal units is 0.23 $\mu g/m^3$. As discussed previously, this difference is due to the difference in stack heights of the new units and the coal units. This shows that a net increase in annual average NO2 concentrations will occur as a result of the

netting. The significant impact level (SIL) for NO2, however, is 1.0 μg/m^3. Impacts of both new and old emissions are less than the SIL for NO2. Since both new and old impacts are insignificant, PPRP and ARMA conclude that the effect of the decrease appears to be qualitatively equivalent to the effect of the increase.

4.5.3 Visibility in the Shenandoah National Park

Section 4.3.4.3 discussed the impacts of the Mirant Dickerson expansion project on visibility resources in three Class I areas (Shenandoah National Park, and the Dolly Sods and Otter Creek Wilderness Areas). Visibility impacts are evaluated on a 24-hour basis, and the modeling conducted by Mirant was reviewed by PPRP and ARMA. Additional modeling was conducted by PPRP and ARMA, and these results indicated that the maximum visibility degradation due to the Mirant Dickerson expansion project is 5.5 percent, which exceeds the FLAG threshold of 5 percent for single source impacts. This impact occurs in Shenandoah, and occurs only when the new units are firing oil. Since the maximum impacts are only slightly greater than the 5% threshold, occur during infrequent operating conditions, and a frequency distribution reveals that impacts will decrease, PPRP and ARMA concluded that further analysis is not necessary.

The analysis presented in Section 4.3.4.3 considered the effect of SO2 emissions only, since NOx emissions increases are not significant on an annual basis. PPRP and ARMA have conducted additional modeling with CALPUFF in order to evaluate possible NOx impacts on visibility on a 24-hr basis. This modeling looked at the visibility impacts of NOx emissions from the new units on gas and oil, simple cycle (Unit 5 only) and combined cycle (both units). NOx emissions for these four cases were obtained from Mirant's CPCN application, and represent maximum short-term emission rates. A similar analysis was conducted for the coal-fired units to look at the beneficial impacts on visibility of a reduction of 0.4 lb/MMBtu at the unit's maximum firing capacity.

The modeling results can be summarized in terms of the maximum predicted visibility impairment for the four new unit cases:

Simple cycle	Gas	4.7
Simple cycle	Oil	25.5
Combined cycle	Gas	5.5
Combined cycle	Oil	8.7

The calculated improvement in visibility impacts due to the reduction in

emissions from the coal-fired units is 7.8 percent. For the simple cycle oil scenario, impairment greater than 7.8 percent is calculated on 9 days out of the year of meteorology used, days which occur in May, July, August, and September.

PPRP and ARMA believe that for three of the four new source operating cases, the predicted visibility benefits in the Shenandoah National Park due to the decrease in emissions from the coal units result in a qualitatively equivalent (and, in the gas-firing cases, a slightly beneficial) impact. For the simple cycle, oil firing case (Unit 5 only), emissions on a short-term basis are higher and the impacts – as the emissions difference would suggest – are not qualitatively equivalent.

PPRP and ARMA conclude from this analysis that the following conditions should be included in the CPCN:

1. Restrict oil firing in Units 4 and 5 to combined cycle only in the summer months;
2. Emissions from the coal units must meet the limit of 0.36 lbs/MMBtu for 30-day rolling averages (as opposed to an annual average) to minimize the potential for short-term increases and to ensure that beneficial effects are achieved.

4.5.4 Ozone

Montgomery County is designated nonattainment for ozone, triggering requirements that have been discussed previously including the need to apply LAER control technology and to secure offsets for significant increases of NOx and VOCs. The emissions increases from the Mirant Dickerson expansion project of NOx and VOCs, due to netting in the case of NOx, are not significant. Both NOx and VOC emissions are precursors to the formation of ozone, and both are regulated as nonattainment pollutants in areas that are not meeting the ozone standard.

Currently no adequate technique exists for determining the effect of a single source on ambient ozone levels. This is acknowledged in the Maryland regulations (COMAR 26.11.17.03, where " …(4) The emission offsets will provide a positive net air quality benefit in the affected area, although for sources of VOC or NOx, atmospheric simulation modeling is not necessary for VOC and NOx and fulfillment of §B(3) of this regulation is considered adequate to meet this condition"), and in the FLAG report cited earlier in reference to impacts in Class I areas.

The difficulty with determining an individual source's impact on ambient

ozone concentrations revolves around the complex photochemical mechanism by which ozone is formed. NOx from combustion sources is emitted primarily as NO, which reacts with ozone (O3) to form NO2. This reaction occurs fairly rapidly, so that in the immediate vicinity of a combustion source ozone levels can actually be reduced by the source's emissions. Once NO2 has been formed, it can react in the presence of strong sunlight to again form NO and, in the presence of other precursors such as VOCs, participate in the cycle of additional ozone formation.

A recent paper in Science magazine (Ryerson *et al.* 2001) provides some insights into formation of ozone in power plant plumes. In general, the paper concludes that larger, more dilute plumes (more dilute as a consequence of higher stacks and higher plume rise) have less potential for ozone formation than more concentrated plumes from sources with shorter stacks. Although it is not possible to use the information in this paper to quantify ozone formation from the coal units as compared to the shorter stacks of the Dickerson expansion project combustion turbines, the paper would suggest that qualitatively, at the very least crediting emissions should not be greater than new emissions for the time frame of ozone formation. This time frame is on the order of several hours, and PPRP and ARMA believe that this supports the conditions identified above for the new units – namely, that the coal units should be restricted to meeting the 0.36 lb/MMBtu limit on a 30-day rolling average basis (as opposed to an annual average), and that Units 4 and 5 should be restricted to burning oil only in combined cycle mode in the summer months to avoid large NOx emissions increases on a short-term basis.

4.6 APPLICABLE REQUIREMENTS REVIEW

This section briefly outlines the federal and State air quality requirements to which the proposed expansion will be subject, in addition to the PSD and NA-NSR requirements presented previously. Specific applicable requirements are found in recommended licensing conditions for the project (presented in Appendix A).

4.6.1 Federal Requirements

4.6.1.1 New Source Performance Standards (NSPS)

The combustion turbines for the proposed facility are subject to 40 CFR Part 60 Subpart GG, "Standards of Performance for Stationary Gas Turbines."

All stationary gas turbines with a heat input at a peak load equal to or greater than 10.7 gigajoules per hour (10 MMBtu/hr) are subject to the following requirements:

- Subpart GG restricts NOx emissions based upon the manufacturer's heat rate at manufacturer's rated load (or actual measured heat rate at actual peak rates) and the amount of nitrogen bound to the fuel (§60.332(a) (1)).
- Subpart GG prohibits SO2 emissions greater than of 0.015 percent by volume at 15 percent oxygen or burning fuel that contains greater than 0.8 percent sulfur by weight (§60.333(a) and (b)).
- Subpart GG requires initial performance (stack) testing, monitoring, and, if NOx or SO2 emissions are exceeded, requires the reporting of such periods to the regulatory agency (§60.334 and 60.335).

The duct burners for the proposed facility are subject to 40 CFR Part 60 Subpart Da, "Standards of Performance for Electric Utility Steam Generating Units for which Construction is Commenced after September 18, 1978" because the rated heat input of each duct burner is greater than 250 MMBtu/hr. Subpart Da limits the duct burners to:

- 0.03 lb PM emissions per MMBtu (§60.42a(a)(1));
- 20 percent opacity (6-minute average), except for one 6-minute period per hour of not more than 27 percent opacity (§60.42a(b));
- 0.20 lb SO2 emissions per MMBtu (§60.42a(b)(2)); and
- 1.6 lb NOx per megawatt-hour (§60.43a(d)(1)).

The auxiliary boiler is subject to 40 CFR Part 60 Subpart Dc, "Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units" because the rated heat input of the boiler is greater than 10 MMBtu/hr and less than 100 MMBtu/hr. Subpart Dc requirements for the auxiliary boiler are as follows:

- 20 percent opacity (§60.43c); and
- 0.50 lb SO2 emissions per MMBtu (§60.43c).

The aboveground fuel oil storage tank is subject to 40 CFR Part 60 Subpart Kb, "Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced after July 23, 1984." Subpart Kb does not contain emission control requirements for the tanks; however, Mirant will be required to maintain a record of the

contents of the tanks.

In addition to the emissions limitations, NSPS requires operators of affected units to make agency notifications, and to conduct various monitoring, recordkeeping, and reporting activities.

Based on the information presented by Mirant, the project as designed will meet applicable NSPS limitations.

4.6.1.2 *Title IV: Acid Rain Program Requirements*

The Acid Rain Program requirements, included in 40 CFR Parts 72 through 77, are applicable to affected units at electric utility sources. Part 72 requires the submission of a complete Acid Rain permit application (including a compliance plan) at least 24 months before the unit begins operation. The proposed facility must hold allowances for SO2 to achieve compliance with the SO2 emission standard (Part 72 Subpart A 72.9(c)). It is also required to comply with the applicable emission limitations for NOx, as cited in Part 72 Subpart A 72.9(d). Furthermore, the proposed facility will be subject to a range of monitoring, recording, and reporting requirements for SO2, NOx, and CO emissions in accordance with the procedures described in Part 75.

Based on the information in Mirant's CPCN application, the project will meet the applicable Acid Rain Program requirements.

4.6.1.3 *National Emissions Standards for Hazardous Air Pollutants (NESHAPs) - Combustion Turbines*

Background

On 5 March 2004, the EPA published in the Federal Register the Maximum Achievable Control Technology (MACT) standard for the "Stationary Combustion Turbine" source category (40 CFR Part 63 Subpart YYYY).

The CT MACT affects "stationary combustion turbines" located at "major" sources of HAPs, such as the Dickerson facility. A major HAP source is a facility that has the potential to emit 10 tpy or more of any single HAP, or 25 tpy or more of all HAPs combined. A stationary combustion turbine is "one that is not self propelled or intended to be propelled while performing its function, although it may be mounted on a vehicle for portability or transportability" (40 CFR 63.6085). The CT MACT does not cover duct burners or other waste heat recovery units in combined cycle configurations.

The CT MACT differentiates "new" CTs from "existing" CTs and establishes different requirements for each type of CT. New CTs include CTs that "commenced construction" after the publication date of the proposed MACT in the Federal Register (after 14 January 2003 for the CT MACT), and as such, includes the new Dickerson Unit 5. All other affected CTs are considered "existing" CTs. New affected CTs must comply with applicable MACT requirements by the effective date of the standard, or upon startup if the unit initiates operation after the effective date of the standard.

Applicability to the Proposed Dickerson Combustion Turbines

Using AP-42 emission factors (AP-42 Table 1.1-15), and reported fuel use data from 2001 reported in the EIA-767 database, we estimate that the Dickerson facility emits more than 680 tpy of HCl alone (the largest HAP by volume from coal-burning sources). Therefore, it is assumed that the Dickerson facility is an existing major HAP source and that the Dickerson CTs will be subject to the CT MACT. Different types of CTs are regulated differently under the proposed CT MACT; it is assumed Dickerson Units 4 and 5 are "lean premix" CTs.

Applicable Requirements

In developing the CT MACT, EPA recognizes that oil- and gas-fired CTs can emit a range of HAPs; however, four HAPs reportedly account for essentially all of the mass of HAPs emitting by CTs: formaldehyde, toluene, benzene, and acetaldehyde. Further, EPA has determined that CO from CTs equipped with oxidation catalysts is acceptable as a surrogate for HAP emissions. Therefore, CT MACT standard (40 CFR 63.6100) allows many affected units to either reduce CO by 95% or more using oxidation catalysts, or meet a formaldehyde limitation of 43 parts per billion by volume, dry basis (ppbvd) by means other than an oxidation catalyst to comply with the MACT. These options apply to existing lean premix CTs (Station H) and any new or reconstructed CT (Unit 5).

Mirant presented formaldehyde emission rates in its CPCN application (Tables A-25 and A-26). Converting the emissions estimates to concentrations (see Table 4-31) indicates that Mirant would not be able to meet the formaldehyde MACT compliance option. However, in Mirant's response to DNR Data Request No. 4, Mirant indicates that the formaldehyde emissions estimates presented in the CPCN were conservatively high. Limited information publicly available on

formaldehyde emissions from combustion turbines suggests that emissions below 43 ppb could be expected.

Table 4-31 Projected Formaldehyde Concentrations Dickerson Units 4 and 5

Natural Gas		Distillate Oil	
Formaldehyde Concentration (ppb)		Formaldehyde Concentration (ppb)	
Unit 4	Unit 5	Unit 4	Unit 5
70	72	117	104

Both Units 4 and 5 will be equipped with oxidation catalysts when operating in combined cycle mode. A CO reduction of 90% is expected with the systems. If the formaldehyde emissions limit cannot be met, Mirant will have to improve the efficiency of the oxidation catalyst to 95% or higher to meet the MACT requirements.

Monitoring, Recordkeeping, Reporting and Notification Requirements

CTs subject to the MACT have a series of notification, performance testing, compliance demonstration, and reporting requirements.

- **Initial performance test**—must be conducted within 180 days of the compliance date for the emission standards (either on startup, or on the effective date of the standards for the new CTs (40 CFR 63.6110).
- **Subsequent performance tests** —lean premix CTs complying with the formaldehyde emissions limits, but that are not achieving manufacturer's guaranteed NOx levels may require additional performance tests.
- **Deviation reports** —there are series of CT MACT-specific and general MACT requirements for reporting deviations from emissions or operating limits.
- **Notifications**—units subject to the CT MACT are also subject to general MACT notification requirements, including notification of unit startup, performance testing, and compliance status.

4.6.1.4 *NESHAPs – Boilers*

Background

Simultaneous with the publication of the CT MACT in January 2003, EPA also published a MACT standard for the "Industrial, Commercial, and Institutional Boilers and Process Heaters" source category, 40 CFR Part 63 Subpart DDDDD. The Boiler MACT applies to nine subcategories of boilers and heaters at major HAP facilities based on fuel type and capacity ("small units" at <10 MMBtu/hr, "large units" at >10 MMBtu/hr, and "limited use units" which are large units with a capacity factor of <10%). The Boiler MACT exempts "fossil fuel-fired electric utility boilers" from the Boiler MACT. A fossil fuel-fired utility boiler is defined as "a fossil fuel-fired combustion unit of more than 25 MW that serves a generator producing electricity for sale." The auxiliary boiler does not qualify as a electric utility generator.

The CT MACT is proposed at present, but has not yet been promulgated; the final form of the regulation may change.

Applicability to the Proposed Dickerson Auxiliary Boiler

The proposed new 60 MMBtu/hr gas- and oil-fired auxiliary boiler will likely be considered a large, new boiler for Boiler MACT purposes.

Applicable Requirements

The boiler will be subject to requirements (Table 4-32) for both large liquid fuel and large gaseous fuel boilers. There are no emissions limitations during natural gas firing; however, there is a "work practice" limitation of 400 ppm CO (@3% oxygen on a daily basis). During oil firing, the unit will be subject to PM and HCl emissions limitations and the 400 ppm CO standard.

Table 4-32 Boiler MACT Emissions Limitations and Work Practice Standards for New Sources

Pollutant	Liquid Fuel/ Large Units	Gas Fuel/ Large and Limited Use Units
PM	0.03 lb/ MMBtu	NA
HCl	0.0005 lb/ MMBtu	NA
Hg	NA	NA
CO*	400 ppm @ 3% O2 (w/ averaging time 1 calendar day)	400 ppm @ 3% O2

Surrogate for organic HAPs; CO limit is considered a "work practice."
NA – no emission limits proposed

We estimated HAP emissions from the auxiliary boiler (see Table 4-7) using boiler specifications in Mirant's CPCN application and emission factors from AP-42; there was no reported emission factor for HCl from oil firing at an industrial boiler. Mirant presented emissions information for PM and CO from the proposed auxiliary boiler. According to Mirant's CPCN application, the unit is projected to have a maximum PM emission rate during oil firing of 0.05 lb/MMBtu, which does not meet the currently proposed MACT standard for large, liquid fuel-fired boilers of 0.03 lb/MMBtu. Mirant's projected maximum CO emissions for the auxiliary boiler are 0.15 lb/MMBtu, or 142 ppm.

4.6.2 State Requirements

In addition to PSD and NA-NSR requirements and applicable federal requirements, there are a number of State requirements applicable to the proposed expansion. The more significant requirements related to emissions limitations are outlined briefly below.

Unless otherwise indicated, the following State requirements apply to the CTs, HRSGs, and auxiliary boiler. To meet applicable State requirements, Mirant must:

- Prohibit the discharge of emissions beyond the property line in quantities that would create a nuisance (COMAR 26.11.06.08 and .09);
- Prohibit the discharge of emissions from any installation, other than water in any uncombined form, which is visible to human observers, except for emissions during start-up and process modifications or adjustments, or occasional cleaning of control equipment if the visible emissions are not greater than 40 percent opacity, and the visible emissions do not occur for more than 6 consecutive minutes in any 60 minute period (COMAR 26.11.06.02C(2));
- Prohibit the discharge of emissions, other than water in an uncombined form, which is visible to human observers from fuel burning equipment, except for emissions during load changing, soot blowing, startup, or adjustments or occasional cleaning of control equipment if the visible emissions are not greater than 40 percent opacity, and the visible emissions do not occur for more than 6 consecutive minutes in any 60 minute period (COMAR 26.11.09.05A(2));
- Satisfy Reasonably Available Control Technology (RACT) requirements for Unit 4 and Unit 5, which require the control of NOx emissions to 0.25 lb/MMBtu (COMAR 26.11.09.08B(1)(c));
- Demonstrate compliance with NOx emission standards through continuous emissions monitoring (CEM) data or stack tests (COMAR 26.11.09.08B(2)(a)(i) and (ii));
- Install, operate, calibrate, and maintain a NOx CEM on each of the combustion turbines (COMAR 26.11.09.08C(1)(c)); and
- For operations during ozone seasons beginning in 2003 and beyond, comply with the NOx Reduction and Trading Program regulations, which require trading sources to have NOx allowances available for each ton of NOx emitted during the ozone season.

In addition to the requirements outlined above, there are operating permit requirements for the project. The CPCN represents the construction permit, and the PSD and NA-NSR approvals. The applicant will be required to obtain a State Operating Permit prior to start-up and, subsequently, a Title V operating permit after start-up in accordance with COMAR 26.11.02.14 and 26.11.03, respectively.

5.0 ANALYSIS OF OTHER ENVIRONMENTAL IMPACTS

5.1 IMPACTS TO SURFACE WATER QUALITY AND AQUATIC BIOTA

5.1.1 Stormwater

According to Mirant, there will be no direct discharges of stormwater or wastewater from the site to any surface waters in the vicinity of the Dickerson site during the construction phase of the project. Stormwater runoff from the facility will be collected in ponds on the property. The overflow from these ponds, if any, will discharge into existing swales or pipe systems that convey stormwater to a natural drainage, eventually reaching the Potomac River. Mirant has indicated that the stormwater management system will be designed in accordance with MDE and Montgomery County requirements to ensure that any discharges occurring after the completion of construction are equal to or less than that of the pre-development discharge area. Therefore, the stormwater impacts to surface waters in the vicinity of the plant are likely negligible. The primary impacts to surface waters will be erosion and sedimentation associated with construction activities. These impacts will be controlled and minimized through proper design and placement of runoff-control features and impacts to the surface waters will be minimal. Because there will be no encroachment by the proposed project upon any surface waters on the site, there will be no impact to aquatic biota in any of the surface waters on or in the vicinity of the Dickerson facility.

5.1.2 Water Withdrawals

The Mirant expansion proposes to withdraw water from the Dickerson discharge canal at a rate of 10 million gallons per day (MGD), of which about 8 MGD is consumed. The thermal loads and maximum temperature from the existing and expanded facilities are shown in Table 5-1.

These results show a net decrease in thermal loading from the Dickerson discharge canal back to the river. This is because the proposed combined cycle plant will remove some of the heated water from the discharge canal and evaporate it in cooling towers. The maximum temperature of the combined discharge would increase from 22°F to 22.05°F, using the worst-case temperature increase.

Table 5-1 Thermal Discharges to the Potomac River from the Existing Dickerson Station and Proposed Expansion

Facility combination	Thermal load, Btu/day	Temperature Increase
Dickerson (existing)	8.3×10^{10} (permit limit) 7.257×10^{10} (calculated actual)	22°F (summer) 32°F (winter) (permit limits)
New combined cycle facility (proposed)	0.0533×10^{10}	32°F (maximum assumed for worst-case analysis)
TOTAL	7.074×10^{10}	22.05°

The thermal mixing zone for Dickerson would not change with the addition of the discharge from the expanded facility. Although the thermal load will decrease and the temperature will increase very slightly, the effect on the thermal plume from the Dickerson discharge canal will not change significantly.

Since cooling water withdrawals and discharges will be made from the existing Dickerson discharge canal, there will be no entrainment or impingement associated with the new project. Cooling tower blowdown constituents are not expected to significantly change the characteristics of the Dickerson discharge to the Potomac River. The slight increase in consumptive water use is not expected to significantly change the amount of aquatic habitat or biota dependent on that habitat even during low flow conditions. However, since Mirant has agreed to reduce consumptive use during low flow conditions, no impacts would occur (see further discussion of water supply in Section 6.0).

5.1.3 Cooling Tower Blowdown

Cooling tower make-up water for Units 4 and 5 will be withdrawn from the existing Dickerson discharge canal. Evaporative losses in the cooling towers will result in a concentration of constituents in the cooling tower circulation water (Table 5-2). To prevent these undesirable constituents from exceeding acceptable concentration limits, chemicals will be added to control water chemistry and a stream of water (blowdown) will be removed from the tower and discharged back to the existing discharge canal. The chemicals that will be added to the water include acids/bases for pH control, polyphosphates for corrosion/scale control, and biocides for microbial control. Intermittent oxidizing and non-oxidizing biocides will also be used to prevent biofouling. To control discharge of residual biocides, cooling tower blowdown will be discontinued while this process is conducted.

The concentrations of most of the constituents in the cooling tower blowdown are directly related to the number of cycles of concentration. The cooling towers at Units 4 and 5 are designed to operate at five cycles of concentration. The average total dissolved solids (TDS) concentration in the make-up water is about 200 milligrams per liter (mg/L) and the maximum TDS is usually less than 300 mg/L. Therefore, the TDS in the cooling tower blowdown will average about 1000 mg/L and the maximum concentrations will be less than 1500 mg/L. The average and maximum cooling tower blowdown discharge rates will be 1.47 and 1.8 MGD, respectively. Consequently, when the cooling tower blowdown enters the discharge canal, it will be diluted by a factor of 200 to 1.

Because of evaporative losses in the cooling towers, water quality constituent concentrations in the existing discharge canal will increase by about 2 percent. As a point of reference, TDS concentrations in the existing discharge canal and in the Potomac River typically vary about the mean value by plus or minus 50 percent. Therefore, this slight change should not cause significant or measurable environmental effects.

For blowdown constituents listed by Mirant, MDE has promulgated water quality standards for chromium, copper, zinc, and chlorine to protect freshwater aquatic life. Based on data provided by Mirant, the concentrations of chromium and copper in the source water already exceed MDE water quality standards. As shown in Table 5-2, there will be only a slight increase in chemical concentrations of these constituents in the Dickerson discharge canal following discharge of the new cooling tower blowdown.

Mirant did not report the average concentration of chlorine in the source water. Table 5-2 lists the previous permit limit for the Dickerson discharge (0.2 mg/L residual chlorine), which exceeds MDE's water quality standards. Actual permitted chlorine values will be less than 0.1 mg/L (the analytical method detection limit) for both the Dickerson facility and the proposed new facility.

Operation of Dickerson Units 4 and 5 will not cause significant impacts to water quality in the Potomac River.

Table 5-2 Average Concentration of Blowdown Water Constituents for Dickerson Units 4 and 5 (mg/L)

Constituent	Average Source Water Concentration (a)	Concentration after blowdown mixes with Dickerson once through cooling discharge	MDE Standard - Acute	MDE Standard - Chronic
Calcium	36	36.7		
Magnesium	2.7	2.75		
Sodium	12	12.24		
Potassium	2.2	2.24		
Strontium	0.0064	0.0065		
Barium	0.0047	0.0048		
Iron	0.0348	0.0355		
Manganese	0.013	0.0133		
Aluminum	0.13	0.133		
Chromium	0.02	0.022	0.016	0.012 (b)
Copper	0.0177	0.0181	0.013	0.009
Zinc	0.02	0.022	0.12	0.12
Sulfate	0.0462	0.0471		
Nitrite/Nitrate	0.008 / 3.5	0.0082 / 3.57		
Fluoride	0.15	0.153		
Silica	4	4.08		
Total Dissolved Solids	205	209.08		
Total Suspended Solids	43	43.86		
Total Organic Carbon	5	5.10		
Chemical Oxygen Demand	30	30.60		
Biological Oxygen Demand	3	3.06		
Residual Chlorine	0.02 (c)	0.02 (c)	0.019	0.011
Hardness	146	148.91		
Alkalinity	87.2	88.94		
Conductivity	193	196.84		

(a) Concentration of constituent in makeup water before entering the cooling towers. Source: Golder, 2001
(b) Assumes chromium VI
(c) Calculated using the maximum chlorine concentration in the source water (previous Dickerson permit limit) and from the blowdown, assuming no concentration from the source water

5.1.4 *Wastewater*

Four sources of low-volume industrial process wastewater will be generated from the operation of Units 4 and 5: backwash from the activated carbon system (10 gallons per minute, gpm, average daily), regeneration wastewater from the demineralizer system (137 gpm), blowdown from the heat recovery steam generators (114 gpm), and miscellaneous service wastewater (36 gpm). These waste streams will be combined and treated in a neutralization basin. This water will then be added to the cooling tower make-up water. Therefore, wastewater from these sources will have virtually no adverse surface water quality impacts.

5.2 *IMPACTS TO TERRESTRIAL RESOURCES*

5.2.1 *Vegetation and Land Cover*

The new construction of Units 4 and 5 of the Dickerson facility will affect about 70 acres of land, the majority of which have been affected by previous activities. About 55 acres will be used for permanent facilities associated with Units 4 and 5, while about 15 acres are associated with construction laydown and parking.

Large areas of ecologically significant habitat have already been preserved on the Dickerson site. These areas will remain unchanged as a result of the addition of Units 4 and 5. Site construction will involve the clearing of approximate 20 acres of ruderal grasslands and 7 acres of mixed deciduous forest for the cooling towers and construction laydown. The grassland habitat includes a fallow baseball field as well as maintained areas around the existing Unit 4. All impacted areas of grassland have been previously cleared and are periodically mowed. The impacted grasslands are not ecologically significant and large areas of similar habitat are found in the vicinity of the Dickerson site.

The 7 acres of mixed deciduous forest that will be impacted by the proposed development is isolated, surrounded by cleared grasslands and access roads. As suggested by guidelines issued by DNR's Wildlife and Heritage Division for minimization of impacts to forest species, clearing of forest land would be concentrated on the perimeter of the wooded parcel, leaving a portion of the existing forest intact. Despite its apparently low habitat value in general, the forest does offer some value to wildlife, and it is possible that forest interior species could use the upland forest to some degree. It is doubtful, however, whether the small tract of remaining upland deciduous forest could provide any useful habitat value for wildlife.

At a minimum, re-planting the 7 acres of upland forest, in addition to an amount equivalent to the remaining affected upland forest, would be appropriately required as a stipulation in a CPCN license condition for the project.

The majority of impacts to the terrestrial habitat resulting from site clearing and construction would occur in already disturbed ruderal grassland habitats. Given the previous disturbances and the absence of ecologically unique vegetative communities, no significant ecological impacts resulting from facility construction are expected.

5.2.2 Wetlands

Approximately 5 percent of the total Dickerson site area (54 acres) consists of forested and non-forested wetlands. None of the 70 acres to be affected by construction lies within any identified wetland area. Because of the small area of wetland communities on site and the absence of any unique wetland vegetation, no significant direct or indirect ecological impacts resulting from construction are expected.

5.2.3 Wildlife

Impacts to onsite and regional terrestrial wildlife species due to plant operations will likely be limited. The large population of deer and other mammals currently on the site will not be significantly affected by the loss of 7 acres of isolated mixed deciduous forest even if it were not replaced. Since the site is situated in an area of pre-existing industrial activities, the likelihood of migratory birds using the site as a corridor or thoroughfare is low. Because of its small size, the forested area to be impacted is not suitable for use by most forest interior-dwelling bird species, therefore only minimal impacts to these important avian species are expected. Because of its isolation, no wildlife corridors lead from the site to the more densely forested stands along the Little Monocacy or C&O Canal. It is unlikely that wildlife using those forest areas are dependent on the isolated parcel of forest that will be impacted.

5.2.4 Threatened and Endangered Species

No threatened or endangered species were discovered during vegetative and wildlife surveys conducted in 1986-1987 and subsequent field reconnaissance in March 2001. According to the DNR Wildlife and Heritage Division, two species of rare invertebrates are found on the Dickerson site. Four additional species of concern have been observed in the area.

Pizzini's cave amphipod and a species of isopod *(Caecidotea* sp. 4) are the

two rare invertebrate species known to exist on Dickerson property. They are subterranean invertebrates, inhabiting habitats outside of caves and underground streams. The construction on the Dickerson site will not impact any areas of caves, surface seeps, wells, or springs. It is expected that any individuals of these species would be located near the Little Monocacy, its tributaries, or the C&O Canal. These habitats will not be impacted during project construction or operation; therefore no impacts to these species are anticipated.

The roundtop amphipod is an invertebrate species of concern known to occur in the vicinity of the Dickerson property. It is also a subterranean species known to be found outside of caves and underground streams. Because these habitats will not be impacted by construction at the site, no impacts to the roundtop amphipod are expected.

The white trout lily, another species of concern, is an herbaceous plant found in deciduous forests along stream banks and associated ravine slopes. There is a recorded occurrence of the plant along the Monocacy River near the C&O Canal. The proposed project involves disturbance of ruderal grasslands and upland forest. No areas of streams, floodplains, or ravines are within the construction area. The impacted habitats do not support the white trout lily; therefore no impacts on the existing population are expected as a result of this project.

Short's rockcress is an herbaceous species that is typically found on wooded steep slopes with limestone outcrops. It has been observed along the C&O Canal west of the Dickerson property boundary. The area proposed for construction contains no habitat suitable for Short's rockcress and no impacts to suitable ravine habitat adjacent to the Little Monocacy River, its tributaries, or the Potomac River is anticipated.

The dickcissel is a territorial bird commonly found in meadows, roadside edges and ditches, and oldfield habitats. No dickcissels have been observed on the Dickerson site, nor are there any historical records of their presence. Construction at the site will involve the disturbance of a limited acreage of grassy oldfield habitat. Large areas of similar habitat will be left undisturbed, and the area surrounding the Dickerson site is interspersed with oldfield and meadow habitat throughout the agricultural landscape. No significant loss of dickcissel habitat is expected.

5.3 *ACCIDENTAL RELEASES*

Mirant proposes to add a second 10-million-gallon storage tank for No. 2 distillate fuel oil. This tank will be added within the diked area surrounding the existing oil storage tank; the area was originally designed to accommodate two tanks and has sufficient containment capacity. A new 200,000-gallon surge tank will be constructed at the fuel oil unloading station on the rail spur. This tank will be located within a containment dike of sufficient capacity to hold 110 percent of the tank's contents. Unloading of rail cars will be carried out within curbed areas.

Mirant will have to prepare an updated Spill Prevention, Control and Countermeasures (SPCC) Plan and obtain a modified Oil Operations Permit from MDE. The SPCC Plan addresses spill prevention procedures, containment methods, inspection, training, and emergency response.

The only other hazardous substance to be used or stored in significant quantities will be aqueous ammonia for the NO_x emission control system. Ammonia will be unloaded from rail cars within a curbed area; pumps used for unloading and transporting ammonia will also be housed within adequate containment to prevent any leaks or drips from being released to the environment. A 40,000-gallon holding tank will provide surge storage at the unloading site, and ammonia will then be pumped to a 100,000-gallon permanent storage tank near the combined cycle units. Both ammonia storage tanks will have adequate containment. Mirant has not specified the concentration of ammonia in the aqueous ammonia solution; however, if the concentration is 20 percent or greater, the company must prepare a Risk Management Program for EPA to address accidental release prevention.

5.4 *GROUND WATER IMPACTS*

According to Mirant's application, no significant dewatering activities will be required during construction of the proposed facility. Furthermore, the existing on-site well, which is used to supply potable water for the combustion turbine facility, can supply the potable water needs of the expanded facility within its existing appropriation limit. Therefore, the only potential for ground water impacts will arise from accidental releases (see Section 5.3) or infiltration of contaminated stormwater.

With respect to stormwater runoff, Mirant will collect and manage stormwater from the developed portions of the property. In accordance with MDE regulations, Mirant will have to update its Stormwater Pollution Prevention Plan, which must incorporate best engineering practices for

managing stormwater runoff. Following the requirements of this plan and the SPCC plan should provide adequate protection of ground water resources at the site.

5.5 SOCIOECONOMIC AND CULTURAL IMPACTS

5.5.1 Employment and Income

Employment and income impacts from construction of the proposed facility would be sizable in absolute terms, but in the context of the Montgomery County economy, would be insignificant. Mirant estimates that the average annual construction labor force would be about 250 fulltime equivalent employees with an estimated total payroll of $84 million (2001 dollars) over the three-year construction period. Using multipliers from the Maryland Department of Business and Economic Development (DBED), the stimulus to the economy would result in the creation of nearly 570 additional person-years of employment over the construction period and nearly $50 million of additional income in Montgomery County and surrounding counties.

Purchases totaling $20 million for goods and services would generate an additional $18 million of sales (output) from supplying industries over the construction period. Most economic impacts would be internalized in Maryland. Although some out-of-state construction workers would likely commute from Virginia and West Virginia via U.S. 15 and perhaps as far away as Pennsylvania, there is a large construction labor force in the Washington metropolitan area. In 1990, construction jobs made up nearly 7 percent of all jobs in Montgomery County, and since that time the labor force has grown about 12 percent (Maryland Department of Planning 2001). A booming economy and low unemployment rate have tightened the regional labor market in recent years, which could affect the availability of skilled construction labor for this project. However, construction activity has weakened throughout Montgomery County and the region in recent months, suggesting that Mirant could be facing completely different labor market conditions when construction begins in 2007.

Once the facility is operational, employment requirements of the facility would be smaller – 15 employees – with an average annual payroll of between $500,000 and $750,000. As a result, operations and maintenance (O&M) employment and earnings would have a smaller, though positive effect upon the regional economy. DBED multipliers suggest that the employment at the facility would add fewer than 10 jobs and up to $300,000 in annual earnings overall to the region in addition to that attributable directly to the generating facility. Unlike the construction era, jobs generated

both directly and indirectly by the project would be permanent over the operational life of the project.

5.5.2 *Population and Housing*

The proposed project would not perceptibly affect population or the demand for housing in Montgomery County. In addition to a sizable construction labor force within the Washington metropolitan area (including Frederick), Montgomery County is within commuting distance from Baltimore via I-70 and Loudoun County, Virginia, through Leesburg and Point of Rocks. With a construction labor force that is expected to commute to the Dickerson site, no population effects are expected from construction of the facility. The small size of the O&M contingent means that even if workers are recruited from outside the area to work at the facility, the effects from in-migration on population and housing would be minimal.

5.5.3 *Transportation*

Local access to the proposed facility would be via Martinsburg Road, which intersects with MD 28 approximately one mile from the plant gate. Between MD 28 and the plant gate, Martinsburg Road is a paved, twolane undivided minor road with no shoulders. The posted speed limit is 35 miles per hour. Martinsburg Road meets MD 28 at an intersection signalized by flashing traffic lights. There is a dedicated lane for westbound traffic on MD 28 turning onto Martinsburg Road. Through traffic on MD 28 must negotiate a curve with a posted safe speed of 25 mph. Sightlines toward oncoming eastbound MD 28 traffic from left turning vehicles onto Martinsburg Road are poor, while the exit onto Martinsburg Road from the direction of Dickerson is in direct alignment with MD 28.

MD 28 would be the primary collector road for construction workers and O&M employees, connecting with I-270 in Rockville and US 15 in Point of Rocks. The Dickerson site is approximately 18 miles from I-270 in Rockville and 9.6 miles from the Virginia state line at Point of Rocks. Travel distance to the city of Frederick via MD 28 and MD 85 is approximately 14 miles. In the vicinity of Martinsburg Road, MD 28 is a two-lane, undivided highway with 12-foot lanes and a posted speed limit of 40 mph near the intersection of Martinsburg Road. The average annual daily traffic volume on MD 28 in the segment between Dickerson and Beallsville was 5,375 in 2000 (Maryland Department of Transportation 2000). MD 28 is a Maryland Scenic Byway from Beallsville to the Frederick County line. Other roads that could potentially be affected by increased traffic, primarily during construction, include MD 109 from Poolesville, MD 107 and Wasche Road from Whites Ferry, and MD 85 in Frederick County, which connects Frederick City to

MD 28 near Tuscarora.

Mirant estimates that, on average, 250 construction workers will be employed on-site, although the number could be as high as 350 during peak construction periods. Since some degree of car-pooling can be expected, the number of vehicle-trips generated by construction activities will probably be less than the number of workers. Vehicles delivering goods and services throughout the day would generate additional traffic. Thus, the number of vehicle-trips to and from the plant could exceed 700 during peak construction (up to 350 inbound and 350 outbound plus delivery vehicles).

Despite this additional traffic, major road segments that service the Dickerson site are expected to provide acceptable levels of service, even during peak commuting hours. This conclusion is based upon review of traffic impact estimates provided by Mirant and from PPRP's independent analysis using Mirant's construction traffic distribution assumptions. Table 5-3 summarizes the results of PPRP's evaluation; a discussion of the results and expected impacts is provided below.

MD 28 is the major east-west route through western Montgomery County, connecting rural households in Frederick and Montgomery counties to urban and suburban employment areas to the east. MD 28 therefore experiences high traffic volumes during morning and evening periods that are skewed to the east and west, respectively. (For example, during the one evening peak traffic period, nearly 80 percent of the traffic was observed to be traveling westbound between 4:00 and 5:00 pm.) However, traffic flow on MD 28 in both directions generally flows at the posted speed limit without significant platooning and with sufficient gaps in oncoming traffic to satisfy passing demand. As a result, highway segments in the vicinity of Dickerson operate at levels of service "A" or "B" in the afternoon peak period.

The addition of construction traffic to MD 28 would add 350 vehicles at most to local roadways (if no workers carpool) during the peak construction period. Although the number appears to be significant, most of the additional traffic would flow in the opposite direction to existing rush hour traffic if the labor force originates primarily from the Washington metropolitan area. For example, in the afternoon peak period, construction worker traffic entering MD 28 from Martinsburg Road would be traveling eastbound while most other commuters would be traveling westbound. As a result, levels of service on local highway segments are expected decline, but not to unacceptable levels. For MD 28 eastbound, which will carry most of the construction traffic leaving the Dickerson site, the level of service on the segment between Martinsburg Road and MD 109 is projected to decline from "B" to "C". This means that for a short period during the afternoon

rush hour, speeds on MD 28 will likely be slightly lower because of the higher volume and less opportunity for vehicles to pass.

Table 5-3 Estimated Levels of Service on Selected Highway Segments During the Peak Construction Period

Route	From	To	Direction	AADT - Baseline	LOS	AADT – During Construction	LOS
MD 28	Martinsburg Rd	MD 109	E	123	B	424	C
MD 28	MD 109	Peach Tree Rd	E	53	A	176	B
MD 109	MD 28	Barnesville Rd	N	132	B	309	C
MD 28	Martinsburg Rd	Mt. Ephraim Rd	W	123	B	172	B
MD 28	Mt. Ephraim Rd	MD 85	W	139	B	188	B

AADT = annual average daily traffic LOS = level of service

MD 109 from Beallsville to Barnesville Road will also be affected for a brief period in the afternoon by northbound traffic from MD 28 comprised of construction traffic arriving from the west and commuters returning to the area from the east. Because of rolling terrain and narrower lanes, motorists could experience minor delays along this segment from turning movements of vehicles in the traffic stream. However, the increased traffic volume and inconvenience it would cause would occupy only a small part of the peak traffic period in the area.

Much of the increased traffic volume would flow through the intersection of MD 28 and MD 109 in Beallsville. This is a simple four-leg signalized intersection with both highways having one lane in each direction. The intersection is controlled by a traffic-actuated signal with a cycle length (green-yellow-red) varying from 45 to 60 seconds during the afternoon peak period. In the late afternoon, the predominant traffic movement through the intersection is east-to-west through-traffic on MD 28. Other major movements are right turns from eastbound MD 28 onto southbound MD 109, and left turns from northbound MD 109 onto MD 28 west. Currently, the intersection of MD 29 and MD 109 generally clears queued vehicles from all directions, even during periods when traffic volumes are high.

The addition of eastbound construction worker traffic on MD 28 could create delays at the intersection due to the increased left-turn demand in eastbound traffic on MD 28 against the predominant through-traffic flow from the east. Mirant projects that about 60 percent of construction worker traffic (210 vehicles) from the Dickerson site would exit onto MD 109 northbound. This could lead to vehicle queuing waiting to turn left and could also delay eastbound through traffic, although there appears to be sufficient lane width to allow some through traffic to pass the queue and proceed through the intersection. However, Mirant's estimate of the proportion of eastbound traffic turning left onto MD 109 seems high. If fewer vehicles actually turn left at the intersection, traffic delays are less likely to occur.

If they occur, delays from queuing could be reduced by requesting the State Highway Administration to extend the cycle length of the signal and to allocate additional green time to MD 28 traffic. Alternatively, Mirant could stagger shift schedules to moderate construction worker traffic leaving the Dickerson site in the afternoon. Mirant should monitor the performance of the intersection during the period when construction traffic volume is greatest and take appropriate steps to reduce congestion at this intersection.

Another intersection of concern is the intersection of MD 28 with Martinsburg Road, a "T" intersection that contains a turning lane for westbound traffic on MD 28 exiting onto Martinsburg Road. Currently, the intersection operates at a level of service "A", indicating little or no delay to Martinsburg Road traffic and to traffic turning left onto Martinsburg Road from MD 28. The left turning lane on westbound MD 28 has a capacity of about six passenger cars to allow for the formation of a queue without delaying through-traffic. The geometry of the intersection is not a true "T" due to the alignment of MD 28, which curves sharply to the right. As a result, vehicles behind the first vehicle in the left-turn queue cannot anticipate oncoming traffic and prepare to turn. On the other hand, the sharp curve on MD 28 forces through traffic to reduce its speed to 25 from 55 miles per hour, which effectively reduces the critical gap needed by left turning vehicles to clear oncoming traffic and increases intersection capacity.

Delays at the intersection of Martinsburg Road with MD 28 would be greatest in the morning peak period when construction workers traveling westbound on MD 28 attempt to turn onto Martinsburg Road against commuter traffic traveling eastbound. Left-turn queuing on MD 28 would also impede traffic attempting to turn left from Martinsburg Road onto MD 28. During the peak construction period, if traffic arrives predominantly from the east as postulated by Mirant, construction workers could experience long traffic delays turning left from MD 28 onto Martinsburg

Road. These delays could potentially affect other traffic movements in the intersection. Traffic on Martinsburg Road can expect even longer delays attempting to turn left onto MD 28 during this period. Although congestion at the intersection would be heavy at times, it would be of relatively short duration and can be managed if Mirant retains a Traffic Management Specialist to manually control vehicle movements in the intersection when construction workers are commuting to the site.

Mirant has suggested using an alternate entrance to the Dickerson site on Martinsburg Road near its intersection with Wasche Road to relieve congestion on MD 28 and Martinsburg Road. However, this alternative would divert construction worker traffic through Poolesville, congesting several intersections and increase traffic volume on town streets. Additionally, it would increase traffic on Martinsburg Road south of the main facility entrance. The segment of Martinsburg Road between the main entrance and Wasche Road is a Montgomery County rustic road and is typical of the early paved roads in the rural areas of the county, with a single-lane concrete surface between wide gravel shoulders. As a principal route for commuting construction workers, it is unsuitable due to its width. As an historical resource, it should be preserved. Mirant should instruct its contractors to advise employees to avoid Martinsburg Road as an alternate route to the construction site.

With increased concerns regarding security, long traffic queues could form on Martinsburg Road if Mirant controls access to the site by conducting identification checks on construction workers and searches entering vehicles. The existing site driveway is an unsuitable queuing zone because it is shared with the Montgomery County RRF. As a result, Mirant, may consider constructing a satellite parking facility with adequate capacity to accommodate construction worker vehicles. Building such a parking facility and conducting security checks on construction personnel between the satellite parking lot and construction areas would eliminate vehicle queues on Martinsburg Road and minimize disruptions to local traffic during the morning peak traffic period. A potential site for the satellite parking facility is located on Martinsburg Road slightly north of the existing site driveway.

Beyond the immediate area of Dickerson, construction worker traffic is not expected to impact the regional highway network, although construction traffic could contribute to congestion on MD 28 near I-270 and in Point of Rocks at certain times. MD 28 is currently being upgraded to a four-lane divided highway from Riffle Ford Road to Great Seneca Highway, a distance of 3.36 miles, to relieve existing congestion (Maryland State Highway Administration 2000). Construction of this roadway segment began in 2001 and will continue through 2003. To the extent that roadway construction temporarily or periodically worsens congestion associated with

existing traffic, additional construction worker traffic, particularly during peak construction periods, could exacerbate congestion further. To the west, Point of Rocks is a popular embarkation point for commuters using the MARC system. Parking demand regularly exceeds the existing supply of 276 spaces, leading to minor congestion in the morning and illegal parking along MD 28. Although a final configuration for additional parking has not been agreed upon, the Maryland Department of Transportation has budgeted for construction of additional parking facilities in 2003 and 2004. Additional construction traffic to Dickerson exiting from US 15 onto MD 28 would add to traffic during the morning peak commuter period, although only slightly.

Traffic volumes associated with facility operation are expected to be light. With a workforce of no more than 15 and no fuel deliveries by truck, the facility would generate few trips to and from the site during normal operations. As a result, traffic associated with the facility would not affect levels of service on Martinsburg Road or feeder highways during the operational life of the project.

5.5.4 Land Use

The proposed site is within the existing Dickerson site, an 800-acre parcel that currently contains Mirant's existing generating facilities and PEPCO-owned substations and transmission lines (about 200 of the 1,000 acres belong to PEPCO). The project is not located in a Priority Funding Area (PFA). The Dickerson property is in a Rural Legacy Area and is surrounded by lands in the Agricultural Reserve. Most of the property is zoned RDT (Rural Density Transfer), although land occupied by existing generation facilities is zoned I-2 (Heavy Industrial).

Neighboring land uses are primarily agriculture although the Montgomery County Resource Recovery Facility (RRF), a waste-to-energy plant, is adjacent to the property to the south. A PEPCO transmission corridor borders the site to the west and a storage facility for coal byproducts is on the south side of Martinsburg Road. The site is adjacent to the Potomac River and C&O Canal National Historic Park and the Dickerson Regional Park. The Monocacy Natural Resources Management Area is less than two miles to the north in Frederick County. There is one residence opposite the Dickerson site on Martinsburg Road between MD 28 and the plant gate. A second residence is on Martinsburg Road past the entrance to the Dickerson site. The closest community is the unincorporated community of Dickerson, which has both County and Rural Village PFA designations. The crossroads community of Beallsville is approximately three miles east on MD 28 at the intersection of MD 109.

New construction would occupy about 70 acres of the property, most of which has already been disturbed during construction of existing facilities. Use of the site would not be preemptive since the property was previously developed for other generation facilities. Development of the project would not accelerate the conversion of agricultural land in western Montgomery County. The construction workforce is expected to commute from surrounding labor markets in Washington, Baltimore, Frederick, and Leesburg, Virginia. Consequently, any population and housing dynamics would be independent of the project. Although operations and maintenance employment at the facility would be permanent, the projected number of O&M employees is insignificant in the context of population and land use.

Montgomery County will become increasingly developed as its population continues to grow. However, county growth policies recognize the Agricultural Reserve as an important asset and largely protect it from sprawl. To the extent to which they occur, development pressures would not be attributable to the Mirant facility.

5.5.5 Visual Quality

The landscape around Dickerson consists of gently rolling terrain, with most of the surrounding land in cropland or forest. The stacks of the existing coal-fired facility are visible from most directions, but rolling terrain affords only intermittent views of other facility structures. The regional landscape can be viewed from several recreational areas near the site including Dickerson Regional Park, the C&O Canal National Historic Park, and the Monocacy Natural Resources Area. However, views are obscured by terrain relief and foliage in summer months.

The Dickerson generating station is a prominent landscape feature looking southeast from the summit of Sugarloaf Mountain, where the tall stacks of the coal-fired units are clearly visible. Views from Sugarloaf tend to be directed toward the Dickerson site because the only sighting of the Potomac River lies in that direction. The composting shed of the Montgomery County RRF is also clearly visible from Sugarloaf, as is a large metal barn and outbuildings on MD 28 in the general direction of the Mirant facilities. The existing combustion turbine stacks can be seen from the summit of Sugarloaf, but are less visible than the RRF or the coal units.

Because the stacks and enclosures for the proposed combined cycle units are not as tall as some existing structures at the Dickerson site, the new facility would be visible from fewer locations and would often be shielded from view by vegetation. However, visibility would increase when foliage cover is reduced or when plumes form above the stacks. Where facility structures are visible, views would be affected by an increase in the number

of industrial structures on the horizon. From some perspectives, the impact on the viewer is considerable, although the existing combustion turbine structures are generally the least intrusive.

Views from Sugarloaf Mountain would probably be affected most since it attracts large numbers of visitors each year. Over time, views from Sugarloaf have been compromised from many directions in addition to Dickerson. To the west, the Eastalco facility in Buckeystown is clearly visible, as are quarrying operations in Lime Kiln. Views are also compromised by sprawling residential development around Buckeystown, Adamstown, and Frederick. Views to the east reveal rolling farmland containing some industrial structures such as communications and water towers, but mid-rise commercial office communities are also visible on the horizon. Expansion of the commercial and office corridor along MD 28 from Rockville is clearly evident from Sugarloaf Mountain.

That other views from Sugarloaf are being compromised does not mitigate visual impacts that would result from construction of the proposed facility. Stacks associated with the combined cycle operations would be 190 feet tall, about 60 feet higher than stacks of the existing combustion turbines. These would still be less prominent than the stacks of the coalfired units and the RRF, but visible from several perspectives nonetheless. Most new structures would be less than 50 feet high and would be seen only in a few views. Mitigation measures, such as painting structures a viewer-neutral color and utilizing minimal night lighting, may partially offset visual impacts. Mirant has already committed to installing plume abatement systems to reduce the visibility of water vapor released from the mechanical draft cooling towers.

An existing 10 million gallon oil storage tank associated with the existing combustion turbines is one of the closest structures to the Mirant property line and is clearly visible from Martinsburg Road in the vicinity of the main entrance. Construction of a second tank next to it would further compromise the view from this perspective. As the location of these structures within the Dickerson site also raises a potential concern about their vulnerability to sabotage from Martinsburg Road, Mirant should develop a landscaping plan that uses earthen berms and vegetation to screen the oil tanks from view.

5.5.6 Fiscal

During facility construction, fiscal impacts associated with the proposed facility would be mildly positive to Montgomery County and the State of Maryland. In this period, tax revenues would accrue mainly to the State through sales taxes levied upon the purchases of construction materials and services by Mirant and its contractors, and the consumption expenditures of

construction workers. State tax revenues would also be supplemented by income taxes levied upon construction worker earnings, which could be as high as $67 million over the construction period if 80 percent of construction jobs go to Maryland residents, and by income taxes on indirect earnings associated with the project. Furthermore, although most major generating components will be purchased out-of-state, up to $20 million of materials and services would be purchased in Maryland during facility construction.

Using an income tax rate of 4.75 percent, 80 percent of construction jobs going to Maryland residents, and assuming 80 percent of income is subject to tax, State tax revenues associated with construction of the Mirant facility could approach $9.5 million over the construction period, including $3.2 million from construction worker incomes and $950,000 from purchases of goods and services by contractors. Other revenues in this estimate are from taxes on incomes of residents whose jobs are indirectly attributable to construction, and sales tax revenues on purchases of goods and services from the added income flowing through the economy.

The primary source of revenues to Montgomery County from the project over this period would be from the county personal income tax, which is currently 2.92 percent. Income tax revenues would be highly dependent on the proportion of the construction and indirect labor residing in the County. If 50 percent of these laborers reside in Montgomery County, their incomes would generate nearly $1.5 million in tax revenues over the construction period.

Once operational, the facility would be a major revenue source for Montgomery County, and less of one for the State. Primary revenue sources for the State would be corporate income taxes, income taxes on O&M workforce incomes, sales taxes from the consumption expenditures of the O&M labor continent, and property taxes on real property. Mirant estimates that corporate income taxes would be about $1.7 million annually. Annual income tax revenues from an O&M workforce of 15 earning $750,000 would be approximately $29,000 plus $12,000 from indirect employment attributable to the facility. Mirant did not estimate sales tax revenues from O&M activities in its assessment, but purchases of goods would generate approximately $80,000 in direct and indirect sales tax revenues for every million dollars in direct purchases. Other sources such as sales taxes on direct and indirect employment consumption would generate an additional $16,000 annually.

The primary tax revenue source for Montgomery County would be from property taxes. Property tax revenues are based upon the unit value approach, which values an electric generator over its entire in-state and out-

of-state service area (Department of Assessments and Taxation 2000). To determine a market value, the Maryland Department of Assessments and Taxation first reconciles cost and income-based estimates of value. Real property and personal property components of the Maryland portion of the market value of the utility property are estimated using an allocation factor reconciled from estimates of the net book value of the utility and annual revenues. Assessments are allocated to Maryland jurisdictions hosting generation property using a cost-based estimate of value, to which local tax rates are applied. With the enactment of legislation restructuring the Maryland electric utility industry in 1999, electric utilities received a 50 percent exemption for personal property that is machinery or equipment used to generate electricity for sale, phased in over two years (Department of Legislative Services 1998). Most personal property associated with electric generation is classified under Category G assets, which have an allowable depreciation rate of 5 percent per year. All personal property is subject to a minimum assessment of 25 percent of the original cost.

Property tax revenues may be estimated from the sum of real and personal property tax components. The real property tax component is simply the product of the value of land per acre, total acres, and the real property tax rate, which is $2.68 per $100 valuation in Montgomery County (Department of Assessments and Taxation 2001). Since Mirant already pays taxes on the Dickerson property, the marginal real property tax revenues from the project would be zero.

The personal property tax component is based on Mirant's estimated original cost of $317,050,000 for electric generation machinery and equipment, depreciated at a rate of five percent annually; a 50 percent exemption applied after depreciation to a minimum assessment of 25 percent of the original cost; and a business personal property tax rate of $2.68 per $100 valuation. Using these assumptions, property taxes would be about $4 million in the first year of operations, declining to about $2.1 million annually after assets were fully depreciated.

Income tax revenues to the County would be relatively insignificant. Assuming one-half of O&M employees reside in Montgomery County, annual income tax revenues would be less than $10,000.

Revenue impacts from construction and operation of the facility must be taken in context with state and local government expenditures that would be needed to both service the facility and maintain services for the host community at acceptable levels. Here, the net impacts (marginal tax revenues minus public expenditures) would be favorable to both the State and Montgomery County. That fiscal benefits are favorable is due to the fact that no expenditures for public services would be required from state or

county governments if the project were developed as planned. Where county or state expenditures have been anticipated, such as for traffic control at the intersection of MD 28 and Martinsburg Road, Mirant would fund the expense or reimburse the appropriate agency.

Public expenditure impacts associated with the Mirant project are projected to be modest for two reasons. First, the project would not place excessive demands upon the existing physical and economic infrastructure of the State or Montgomery County. Second, the project would draw from existing labor and commercial resources in Montgomery and surrounding counties.

The Mirant facility would rely upon county emergency services, such as fire and police, during both construction and operation. Dickerson is part of the 5th District Station - Germantown of the Montgomery County Department of Police (Police Beat 5N3). The 5th District covers an area of 295 square miles. Combined with the 6th District, there are approximately 175 sworn officers in the department. During the day, between two and four officers patrol area 5N3 of the 5th District. The average countywide 911 response time is slightly less than four minutes (Montgomery County Department of Police 2001).

The Montgomery County Sheriff's Department is based in Rockville and maintains a Special Response Team that typically handles high-risk evictions and hostage situations. However, the team is available to supplement the Montgomery County Department of Police Special Response Team. In addition, the Sheriff's Department has two canines trained to detect explosives.

Maryland State Police serve Montgomery County out of Barrack "N", located on Montrose Road in Rockville. However, State Police responsibilities are primarily directed to the interstate highways in the county, although it provides support to the Montgomery County Department of Police. The Maryland State Police operates 15 medivac helicopters through the state. In the event of a medical emergency at Dickerson, either Helicopter 8, based in Norwood (Silver Spring), or Trooper 3 (Frederick County Airport) would respond.

Montgomery County maintains an Emergency Management Center where representatives from local government agencies would coordinate its activities in the event of an emergency. The County has developed contingency plans for perimeter establishment, evacuation, traffic control, identification of temporary shelters, deployment of mobile command posts, requesting aid from other jurisdictions, and requisitioning transportation vehicles as part of its emergency preparedness plan. An Integrated

Contingency Plan for the Mirant facility is on file with Montgomery County.

The Dickerson area is in the fire response area of the Upper Montgomery County Volunteer Fire Department (Station 14). The fire response area comprises 6,000 people living in an area of 88.7 square miles. The department has 20 paid and 20 volunteer professionals on staff and a fleet of 15 vehicles including an ambulance, medic unit, rescue engine, and EMS vehicle. The station is approximately three miles from the Dickerson property. The Montgomery County Fire and Rescue Commission uses several criteria to locate stations, apparatus, and personnel, including a six-minute goal for the arrival of engines and ambulances, eight minutes for medic units, nine minutes for a special service unit, and ten minutes for full assignment. Because of its large service area, more than half of the Dickerson area cannot be reached within prescribed response time goals (Montgomery County Fire and Rescue Commission 1999a). Montgomery County recently amended response time goals for the Rural Zone in its Fire, Rescue, and Emergency Medical Services Master Plan to provide a six-minute ambulance or engine response to 25 percent of the population, and an eight-minute medic unit response to 50 percent of the population (Fire and Rescue Commission 1999b).

The closest hospitals are Shady Grove Adventist Hospital in Rockville and Frederick Memorial Hospital in Frederick. Both provide comprehensive emergency services.

In summary, while service areas associated with emergency services serving the Dickerson site are typically the largest in Montgomery County due to the relatively low population density, existing county emergency services appear to be sufficient to service the proposed facility and community during construction and operation.

However, the community is concerned that the Dickerson facility could be a target for terrorism and that risk to the community would increase with the number of construction workers and service vehicles onsite. Federal government security standards for power plants have been developed only for nuclear facilities (10 CFR Part 73) and address plant security, controlled access, access authorization, and other measures to reduce threat (NEI 2000). Access to the Dickerson site is currently controlled by industrial level security at the main gate. Chain link fence protects part of the property's perimeter.

Mirant's application does not address plant security. Mirant has submitted that the construction site will have security fencing and a security patrol, and that contractors will be required to undertake criminal record checks on

construction workers. However, security identification measures for construction workers are unclear and federal guidelines for responding to heightened security alerts are still evolving. As a result, Mirant should prepare and implement a security plan for construction and operation of the facility that, at minimum, addresses community concerns about worker authentication and site access.

5.5.7 Cultural Impacts

The Dickerson site is visible from Sugarloaf Mountain (elevation 1,282 feet), a monadnock located about five miles northeast of the site. Sugarloaf stands more than 800 feet above the farmland below. During the Civil War, the mountain was used as an observation point and signal station, and was reportedly occupied by Confederate forces in 1862-63. Sugarloaf Mountain was apparently the first choice of Interior Secretary Harold Ickes for a Presidential retreat in the 1930s, and his failure to secure it led to the subsequent selection of "Shangri-La" (now Camp David) in the Catoctin Mountains at Thurmont. Stronghold, Inc. manages the mountain land through a trust fund set up by Gordon Strong in 1947. Sugarloaf Mountain is designated as a Registered National Natural Landmark because of its geologic, historic and scenic value, and is open to the general public.

A previous cultural resources investigation found 17 prehistoric and 11 historic sites on the Dickerson property (Karell Archeological Services 1989). In addition, there are five historic sites within one mile of the property and many within five miles. Most historical sites are residential structures that are still occupied and are not publicly accessible.

Three sites south of the property have been placed on the National Register of Historic Places. Hanover Farm House is located about four miles southeast on MD 28 in Beallsville. Annington is located about three miles southwest on Whites Ferry Road near Martinsburg. Chiswell's Inheritance is five miles southeast on MD 109 near Poolesville. The Alnutt Farm in Boyds has been designated a Maryland Century Farm. The C&O Canal National Historic Park lies between the Dickerson site and the Potomac River. After its designation as a National Historic Park in 1971, PEPCO restored a one-mile segment of the canal adjacent to the property. The canal is listed on the National Register of Historic Places.

The Town of Dickerson is designated an Historic District, and the Beallsville Historic District was placed under the county's Historic Preservation Ordinance in 1988. Five historical sites are within one mile of the Mirant property. No sites listed on the National Register of Historic Places or Locally Zoned Historic Districts are located within one mile of the property. A segment of Martinsburg Road between the entrance to the

Mirant property and Wasche Road is an historic concrete road typical of the early paved roads in the rural areas of Montgomery County. Many historic stone fences are found along the secondary roads of this part of Montgomery County.

Martinsburg Road, Wasche Road, and West Hunter Road are designated rustic roads. The Montgomery County Code (Sec. 49-76) establishes the Rustic Road Program to "preserve as rustic roads those historic and scenic roadways that reflect the agricultural character and rural origins of the County." Rustic roads are preserved through a permit review process that seeks to maintain certain physical features whenever any work is proposed within a rustic road right-of-way or adjacent properties.

There are two historic roadside markers along Maryland highways near the site. Less than a mile from the property on MD 28 is a marker for "Woodstock", a farm owned by George Washington from 1794 until his death in 1799. A marker for Whites Ford is located on Whites Ferry Road at Martinsburg Road, indicating a Potomac River crossing about two miles to the northwest used by Robert E. Lee to enter Maryland in 1862, and by J. E. B. Stuart and Jubal A. Early for their returns to Virginia in 1862 and 1864, respectively.

Whites Ferry is the only regularly operating ferry on the Potomac River and is the closest river crossing above the Capital Beltway in metropolitan Washington. The ferry has been operating in one form or another for almost 175 years. Vehicles are transported across the river on the General Jubal Early, which is the only cable-guided fresh water ferry along the East Coast.

Several recreational areas are located within five miles of the site. The C&O Canal National Historic Park contains a picnic area, boat ramp, and campsites north and south of the site. The Dickerson Whitewater Course is an artificial whitewater course in the existing outflow canal of the Dickerson Generating Station. Built in 1991 to simulate the 1992 Olympic course in La Seu d'Urgell, Spain, it is the only year-round, warm water artificial training course in the United States. The course is open to actively training and racing slalom competitors, who must register with the Bethesda Center of Excellence, a U.S. Whitewater Canoe & Kayak Team Training Center. The Dickerson Regional Park, owned by Montgomery County, is adjacent to the southern boundary of the Mirant property and provides access across the C&O Canal National Historic Park to warm water fishing areas in the Potomac River. The Dickerson property is one mile southeast of the Monocacy Natural Resources Management Area.

For its CPCN application for Station H, PEPCO conducted an extensive survey for cultural resources on the Dickerson property (Karell

Archeological Services 1989). No archaeological sites were found on the PEPCO property although one is adjacent to the property along the C&O Canal towpath. The survey identified eleven historic sites on the Dickerson property, of which only two are considered historically significant. One, the Benjamin and Charles Shreve Farm (18MO293), is a rectangular foundation built of fieldstone and is believed to date from the earliest occupation of the site, estimated to be the mid-19th century. The site is eligible for nomination to the National Register of Historic Places. The other site, Shreve House (18MO295), contains the ruins of a stone residence and other structures from an early 19th-century farm, possibly built around 1835. The site contains artifacts from the 19th to mid-20th century and has been recorded as a Montgomery County historic site. It has been recommended for nomination to the National Register of Historic Places.

Construction and staging areas associated with the new facilities would not disturb the two properties of historic significance on the Dickerson site. No construction activities are expected to occur in the vicinity of the Benjamin and Charles Shreve Farm ruins. Cooling towers and other support facilities would extend in the direction of Shreve House; however, the closest facility structures would still be approximately 400 feet from this resource and should not result in the disturbance of any artifacts. Plans show that construction parking area would be located more than 800 feet from Shreve House.

Mirant should establish protection zones for both historic sites by erecting temporary protective fencing during construction and should otherwise prohibit contractors from using this zone for any purpose. In addition, Mirant should submit to Maryland Historical Trust (MHT) a copy of training programs or guidelines provided to Mirant inspectors or contractors to identify and/or protect unforeseen archeological sites that may be revealed during construction of the power plant and associated facilities. If such archeological sites or relics are identified in the project area, Mirant, in consultation with and as approved by MHT, should develop and implement a plan for avoidance and protection, data recovery, or destruction without recovery of the properties adversely affected by the project.

Area archaeological and historical resources will not be directly impacted by project construction, although aesthetic values associated with properties near roads used by construction workers and delivery vehicles would be periodically diminished by externalities associated with increased traffic volume. The most severe impacts will occur during the peak construction period when construction activity at the site would be most intense.

On-site historic resources and historic properties in the immediate vicinity of the facility will not be disturbed by facility operations. Based on a review of Maryland Historical Trust records and site inspections, given the topography and level of existing development at the site, the undertaking would not diminish the qualities that qualified historic standing structures for the National Register of Historic Places. Further architectural investigations are not warranted (Cole 2002).

5.6 NOISE IMPACTS

5.6.1 Summary of Regulatory Requirements

Maryland State noise regulations specify maximum allowable noise levels, detailed in COMAR 26.02.03. The maximum allowable noise levels specified in the regulations vary with zoning designation and time of day. Maximum allowable noise levels for residential areas are 55 dBA (A-weighted decibel scale) for nighttime hours and 65 dBA for daytime hours. Montgomery County also has a noise ordinance with similar numerical limits, but which is more restrictive than the State regulation in terms of the applicability of daytime versus nighttime standards. In the County ordinance (County Code Chapter 31B), the lower nighttime standard of 55 dBA for residential areas applies from 9 p.m. to 7 a.m. on weekdays and from 9 p.m. to 9 a.m. on weekends and holidays.

For noise during construction, the County noise ordinance allows for a higher limit during weekdays from 7 a.m. to 5 p.m. – 75 dBA (or 85 dBA with the approval of a written noise suppression plan). From 5 p.m. to 9 p.m., the normal daytime limit of 65 dBA would apply at residential receptors, and during nighttime hours the 55 dBA limit must be met.

5.6.2 Noise Impacts from Construction

PPRP concurs with Mirant's conclusion that noise from construction will meet the County's limitations, provided that major construction activities are limited to the hours between 7 a.m. and 5 p.m. on weekdays. The majority of construction activities will take place in the area of the power block, which is located centrally in the site. The nearest property boundary is about 1800 feet from the power block of the combined cycle facility. Assuming a maximum construction noise level of 100 dBA (measured at 50 feet), the sound pressure level at the nearest receiving property boundary would be about 70 dBA, which complies with the County limitation. PPRP also evaluated the potential noise impact from a single piece of construction equipment (88 dBA) operating in the vicinity of the fuel oil storage tanks,

which are located only 1200 feet from the property boundary. This noise source would produce approximately 60 dBA at the receiving property.

Mirant notes in its CPCN application that steam pipe blowing and steam venting will be required during startup activities at the plant. The maximum sound levels from these activities could approach 100 dBA at 100 feet, which could produce a sound level of about 75 dBA at the nearest site boundary. These will be brief events that will occur only during daytime hours for several days. As proposed in its application, Mirant should notify nearby residents of the expected schedule for steam venting prior to such events.

5.6.3 Noise Impacts from Operation

The applicant provided PPRP with source noise data from the major components of the proposed facility. For the proposed combined cycle units (combustion turbines plus HRSGs), Mirant used actual measured data from similarly configured power plants already in operation. For the proposed mechanical draft cooling towers, Mirant provided vendor-supplied sound power level data. We verified the reasonableness of the data by comparing them with data from previous combined cycle power plant licensing cases, and determined that Mirant's source data are reasonable and, in fact, are conservatively high.

The source data assume standard acoustical enclosures and stack silencing packages that a vendor would be expected to provide for the major noise generating equipment. Sound power levels for the proposed units, expressed in dB, are included in Table 5-4.

Using the source noise information, PPRP estimated the sound pressure levels that would result at various receptors surrounding the Dickerson site with the proposed units operating at full load. The objective of this analysis was to verify the results that the applicant had presented. Sound pressure levels at varying distances were calculated using the following formula (Kurze and Beranek 1980):

$L_p = L_w + DI - 20 \log(r) - A_e - 11$ where:

L_w is the source sound power level in dB

DI is a source directivity factor (we assumed hemispherical spreading, DI = 3)

r is the distance from the source to the receptor location in meters

A_e is the excess attenuation due to absorption in air (we conservatively assumed no excess attenuation, $A_e = 0$)

PPRP selected three critical receptor locations, shown on Figure 5-1. These locations represent the property boundaries closest to potentially sensitive receptor areas – nearby residences and public lands.

- Receptor 1, on the Mirant property that lies between the C&O Canal Historic Park and the Potomac River (Site 2 in Mirant's monitoring)
- Receptor 2, on the southern property boundary where Martinsburg Road takes a turn southbound away from the plant site (near Mirant's Site 4, the nearest residence to the proposed new units)
- Receptor 3, at the northern property boundary closest to the power block (near Mirant's Site 5)

To be conservative, we assumed that all noise from the new equipment emanated from the edge of the proposed facility closest to each receptor location.

Table 5-4 summarizes the results of these calculations. The projection methodology does not take into account the shielding that will occur from facility structures that lie between each noise source and a given receptor. Furthermore, these estimates only consider distance spreading; the calculations do not take into account the atmospheric absorption of sound energy, or any effect of natural barriers between the noise sources and the receptors. Vegetative cover and terrain between the plant components and the receptor locations may have some noise reduction benefits, which are not reflected in this analysis.

Based on these results, the proposed combined cycle facility is expected to have a moderate noise impact on nearby receptors, although it will not exceed the numerical standards established by Montgomery County and the State of Maryland. At Receptor 1, adjacent to the C&O Canal Historic Park and the Potomac River, ambient noise levels are currently dominated by the intake pumps for the existing Dickerson cooling system. Noise from the new units will not be perceptible in the vicinity of the existing station, when those coal-fired units and their cooling system are operating.

At receptors along the northern and southern property boundaries, nighttime minimum noise levels are now extremely low (34 dBA). The combined cycle facility is expected to operate 24 hours a day during periods of high electrical demand, typically in the hottest summer periods. Although the facility noise will not exceed the nighttime standard of 55 dBA, PPRP's noise calculations indicate that, under worst-case conservative assumptions, there could be a significant increase (18 dBA) in the "noise floor", the background noise level that is heard in between intermittent automobile traffic or other similar nighttime noises.

Figure 5-1 Approximate Receptor Locations Used in Noise Analysis

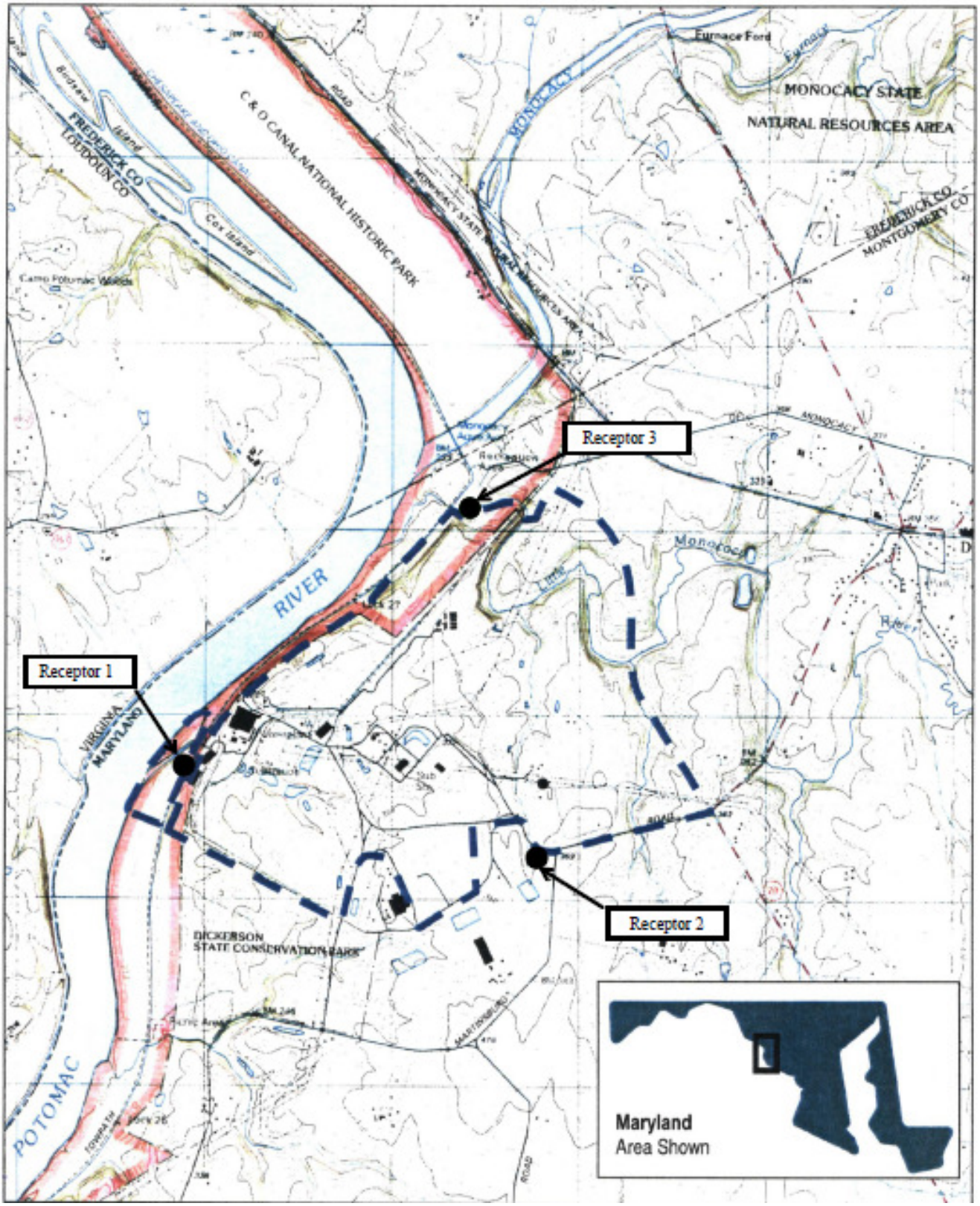


Table 5-4 Calculated Sound Pressure Levels (in dBA) Resulting from Operation of Generating Components, Projected to Receptor Locations

Component	**Component's Sound Power Level (dB)**	**Receptor 1** (3250 feet)	**Receptor 2** (2750 feet)	**Receptor 3** (3100 feet)
Unit 4 (turbines, turbine inlets, stacks, HRSGs	122	45.0	46.5	45.5
Unit 5 (turbines, turbine inlets, stacks, HRSGs	125	48.1	49.5	48.5
Cooling towers (2)	123	45.7	47.1	46.1
TOTAL		**51.5**	**52.9**	**51.9**
Measured ambient noise levels, daytime		50.9 to 61.1 Leq = 53.7	40.9 to 73.4 Leq = 55.3	36.9 to 67.9 Leq = 47.0
Measured ambient noise levels, nighttime		55.7 to 66.7 Leq = 57.7	34.3 to 60.5 Leq = 39.8	34.3 to 63.6 Leq = 46.8

The combined cycle facility will generate a fairly constant sound pressure level during its hours of operation, representing a constant increase in the noise floor. It should be noted that nighttime operation will occur only during periods of high electricity demand, typically during summer months, and will not generally extend throughout the year.

As discussed earlier, these projections of future noise from the proposed units are conservatively high. We expect that actual sound pressure levels caused by the facility will be lower, and the corresponding impacts (increases over ambient) will be less.

If any change in equipment configuration occurs during detailed design, the applicant should update the analysis of noise impacts before the plant begins operation. The applicant will be required to conduct noise monitoring after the facility begins operation, to verify that the facility is operating in compliance with applicable State and local noise regulations.

6.0 WATER SUPPLY

6.1 WATER REQUIREMENTS

The proposed combined cycle facility will need water primarily for makeup in the wet cooling tower system. Re-circulating water will be used in mechanical draft cooling towers to provide cooling for condensing the steam turbine exhaust. Water lost from the cooling system will be replenished using makeup water pumped from a new intake structure located on the existing discharge canal for the Units 1, 2, and 3 oncethrough cooling system. The existing units use a once-through cooling system, and have an annual average daily water demand of 400 million gallons per day (MGD).

Additional process water uses will include injection for NO_x control and power augmentation, general plant service water, evaporative cooling water for the turbine inlet foggers, HRSG makeup water, and fire protection water. These water demands will also be supplied from the existing discharge canal. Sanitary water uses (potable water and toilet facilities) are currently supplied by an on-site ground water well, which will be sufficient to supply the additional sanitary needs for the proposed expansion.

Figure 6-1 indicates that Mirant calculated two water supply flow rates for use in the water appropriation process.

- **Maximum Daily Use.** The maximum water use of 10,081,000 gallons per day is representative of the average ambient conditions during the warmest month of the year. Water use is higher during periods of increased ambient temperature and/or decreased relative humidity, and when inlet chilling is being used to maximize output during peak demand periods. The maximum water use estimate also assumes that the plant is operating at full load for 24 hours per day, and that five cycles of concentration can be achieved in the cooling tower.
- **Average Daily Use.** The annual average water requirement is 8,065,000 gallons per day. The average annual water use estimate is based on duct firing during summer months only, and variations in monthly ambient temperatures, which affect the need for inlet chillers. The average annual water use estimate also assumes that the plant is operating at full load for 24 hours per day, and that five cycles of concentration can be achieved in the cooling tower.

Discharges consist principally of cooling tower blowdown – a portion of the circulating cooling water that is removed to prevent buildup of dissolved solids in the towers. The difference between the amount of water withdrawn and the amount of water returned to the source represents the proposed facility's "consumptive" use of water, which is the water that exits the cooling tower through evaporation or drift or is used within the facility and evaporated. Following the installation of the HRSGs, the average consumptive use for the proposed facility will be 6.6 MGD, with a maximum consumptive use of 8.3 MGD.

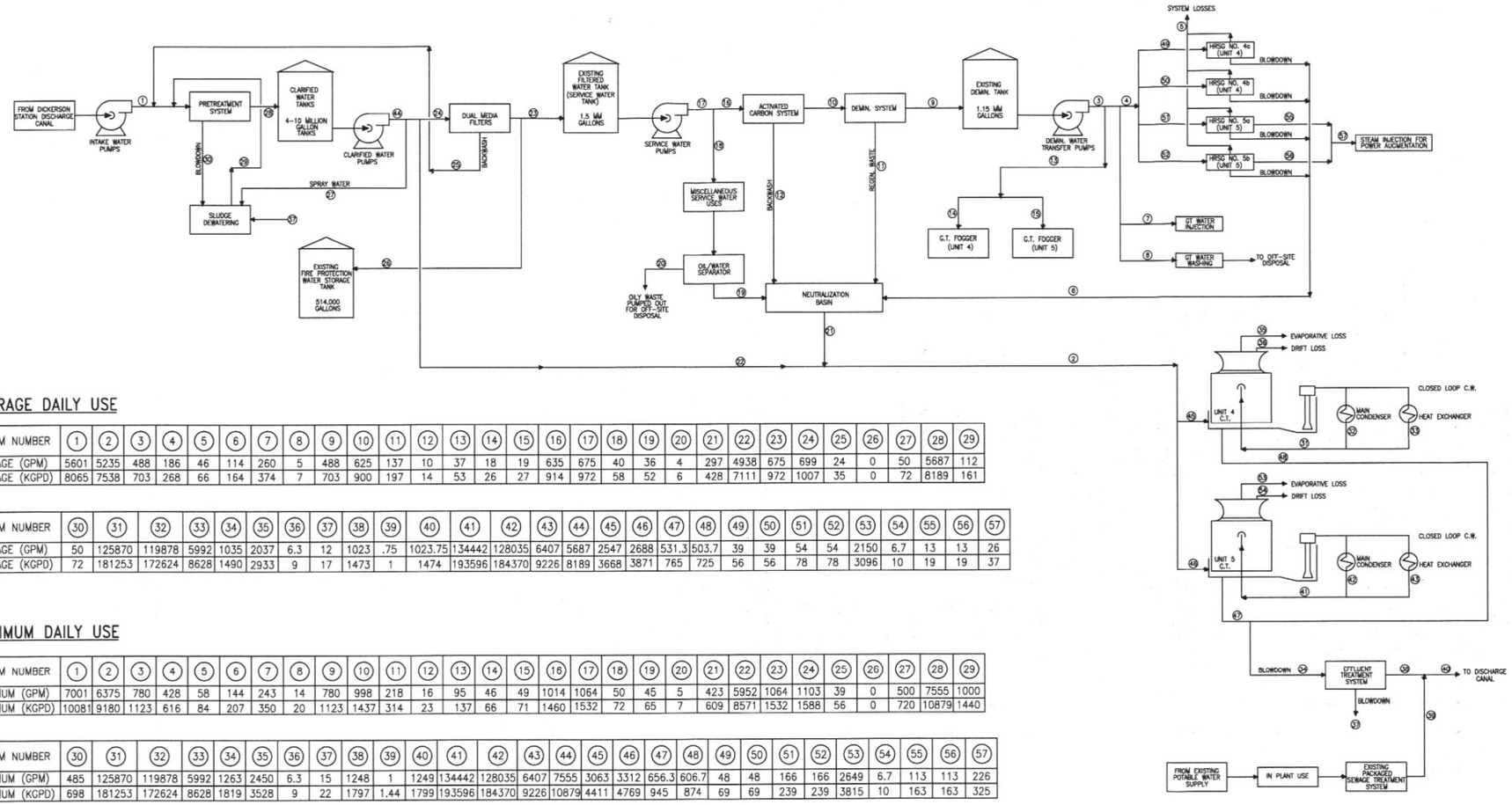
Mirant has indicated that it expects to commence simple cycle operation for Unit 5 in 2006 or 2007. At that time, current water use will increase by a maximum of about 370,000 gallons per day. Mirant expects to add the HRSGs to both Units 4 and 5 in 2009, at which time both units will operate primarily in combined cycle mode.

6.2 MARYLAND APPROPRIATIONS

River water will be withdrawn from an intake structure constructed in the existing discharge canal, which discharges the once-through cooling water from the existing coal-fired units. There would be no new intake on the Potomac River, and no increase in the amount of water withdrawn from the river. However, there will be an increase in the consumptive use of the river water. Therefore, the withdrawal of water from the Potomac River to support the proposed combined cycle facility requires a new appropriation issued by the Maryland PSC through this CPCN proceeding. The appropriation would be in accordance with MDE's regulations in COMAR 26.17.

The State of Maryland has a statutory requirement to conserve and protect the water resources of the State and to control the appropriation and use of surface and ground water. Although the PSC is the actual permitting authority for the facility's water appropriations, MDE's statutes and regulations, as administered by the Water Management Administration (WMA), are used to guide the State's decision regarding water appropriations. The Potomac River is located wholly within the boundaries of Maryland's state line with Virginia, and therefore Maryland controls the appropriations from the river.

Maryland water allocations are guided by the common law doctrine of reasonable use. This doctrine provides all landowners the opportunity to make reasonable use of the water associated with their property, limited



AVERAGE DAILY USE

STREAM NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
AVERAGE (GPM)	5601	5235	488	186	46	114	260	5	488	625	137	10	37	18	19	635	675	40	36	4	297	4938	675	699	24	0	50	5687	112
AVERAGE (KGPD)	8065	7538	703	268	66	164	374	7	703	900	197	14	53	26	27	914	972	58	52	6	428	7111	972	1007	35	0	72	8189	161

STREAM NUMBER	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57
AVERAGE (GPM)	50	125870	119878	5992	1035	2037	6.3	12	1023	.75	1023.75	134442	128035	6407	5687	2547	2688	531.3	503.7	39	39	54	54	2150	6.7	13	13	26
AVERAGE (KGPD)	72	181253	172624	8628	1490	2933	9	17	1473	1	1474	193596	184370	9226	8189	3668	3871	765	725	56	56	78	78	3096	10	19	19	37

MAXIMUM DAILY USE

STREAM NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
MAXIMUM (GPM)	7001	6375	780	428	58	144	243	14	780	998	218	16	95	46	49	1014	1064	50	45	5	423	5952	1064	1103	39	0	500	7555	1000
MAXIMUM (KGPD)	10081	9180	1123	616	84	207	350	20	1123	1437	314	23	137	66	71	1460	1532	72	65	7	609	8571	1532	1588	56	0	720	10879	1440

STREAM NUMBER	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57
MAXIMUM (GPM)	485	125870	119878	5992	1263	2450	6.3	15	1248	1	1249	134442	128035	6407	7555	3063	3312	656.3	606.7	48	48	166	166	2649	6.7	113	113	226
MAXIMUM (KGPD)	698	181253	172624	8628	1819	3528	9	22	1797	1.44	1799	193596	184370	9226	10879	4411	4769	945	874	69	69	239	239	3815	10	163	163	325

NOTES:

1. WATER BALANCE IS BASED ON FIRING COMBUSTION TURBINES WITH FUEL GAS.
2. AVERAGE FLOWS ARE BASED ON AVERAGE AMBIENT CONDITIONS WITH DUCT FIRING AND POWER AUGMENTATION DURING SUMMER MONTHS ONLY.
   AVERAGE AMBIENT CONDITION: 48 DEGREES F, 65% RH
   SUMMER CONDITION: 89 DEGREES F, 70% RH
3. ANNUAL MAXIMUM DAILY USE IS BASED ON:
   - AMBIENT CONDITIONS: 89 DEGREES F, 70% RH
   - 100% DUCT FIRING (640 MMBTU/HR U5, 524 MMBTU/HR U4, LHV)
   - INLET FOGGERS ON
   - POWER AUGMENTATION 113,000 LBS/HR U5 ONLY
   - NOx WATER INJECTION U4 ONLY
4. COOLING TOWER BLOWDOWN IS BASED ON 5 CYCLES OF CONCENTRATION.
5. QUANTITIES SHOWN REPRESENT ACTUAL MAXIMUM DAILY USAGE. MAXIMUM INSTANTANEOUS FLOWS FOR EQUIPMENT SIZING CRITERIA MAY BE HIGHER THAN THE VALUES STATED.

Figure 6-1
DICKERSON STATION
COMBINED CYCLE PLANT
WATER BALANCE

Source: Mirant Dickerson Development LLC Units 4 and 5 Dickerson, MD
Application for Certification of Public Convenience and Necessity (May 2001)

only by the rights of other landowners and the assurance that the use will not harm the water resources of the State. Additionally, the use of the water needs to be beneficial, which means that the use of water is: 1) necessary; 2) non-wasteful; 3) reasonably non-damaging to the resource and other users; and 4) in the best interest of the public.

COMAR 26.17.06.05A states that MDE WMA will grant an appropriation for a beneficial use if three conditions are met:

1. The requested appropriation is reasonable in relation to the anticipated level of use;
2. The requested appropriation does not have an unreasonable impact on the State's water resources; and
3. The requested appropriation or use does not have an unreasonable impact on other users of the resource.

Maryland has also promulgated regulations governing consumptive use of surface water resources in the Potomac River Basin (COMAR 26.17.07). Consumptive use is defined in COMAR 26.17.07.01.B. as "that portion of a water withdrawal which, as a result of evaporation, interbasin diversions, or other means, is not returned to the source to be available for subsequent use." Under these requirements, new nonresidential users consuming more than 1 MGD must provide upstream storage to augment the river flow during low-flow conditions (i.e., "certain periods" specified by MDE), or reduce their consumptive water use to levels of 1 MGD or less during those times. The regulations also specify the amount of augmentation storage that must be secured to avoid the potential for curtailment of water withdrawals during low-flow periods, depending upon the size and location of the withdrawal. Mirant has proposed not to construct upstream augmentation storage, and instead has elected to reduce their consumptive water use to levels of 1 MGD when necessary.

The consumptive use regulations are intended to implement water use limitations mandated under the Potomac River Low Flow Allocation Agreement. These water use restrictions are to be implemented when the U.S. Army Corps of Engineers declares a "restriction stage," and mandatory restrictions are implemented for the Washington metropolitan area.

6.3 AVAILABILITY OF WATER SUPPLY

6.3.1 Potomac River Flow

The U.S. Geological Survey (USGS) operates a gauging station near the U.S.

Highway 15 Bridge at Point of Rocks. Although upstream of Dickerson site, this is the nearest gauging station located on the Potomac. There are 107 years of river stage data for this location. The USGS has reported the following key statistics relative to flow at the Point of Rocks gauging station:

- The lowest 7-day average flow for a 10 year recurrence interval (which corresponds to 10 % chance of occurring for a given year; 7q10) for the gauging station was 556 MGD (860 cfs) (based on flows from 1895 to 1979);
- The mean flows for this location were 6,050 MGD (9,362 cfs) for the 1895-1979 reporting period, and 6,380 MGD (9,870 cfs) from 1979 to 1999; and
- The historic minimum discharge at Point of Rocks was 342 MGD (530 cfs) measured on September 11 and 12, 1966.

Note that the Monocacy River discharges to the Potomac between the Point of Rocks gauging station and Dickerson. The annual mean stream low in the Monocacy River, as measured at the USGS Jug Bridge gauging station near Frederick, has ranged from 220 to 1,400 MGD between 1929 and 2001. Therefore, flows at Dickerson are somewhat higher than at Point of Rocks.

6.3.2 Potomac River Water Use

Frederick County relies on a withdrawal of water from the Potomac River to meet a portion of the water supply needs within the county. Frederick County is authorized by MDE (Permit FR68S005 (05)) to withdraw a daily average of 10 MGD and a maximum daily amount of 16 MGD from the County's pump house at the end of New Design Road. Frederick County's river intake will be upstream of Mirant's proposed intake structure and thus Mirant's withdrawal will have no effect on the County's intake.

Most of the residents of the Washington, D.C., metropolitan area rely on the Potomac River as their primary source of drinking water. Generally, water supply withdrawals from the Potomac River are a small fraction of the river's flow. Average flow of the river at Little Falls over a year is about 7,000 MGD; average summer demand by the Washington area water suppliers that withdraw from the River is about 500 MGD (7 percent of the average daily river flow) (ICPRB, 2000).

The majority (approximately 90 percent) of the metropolitan area's population relies on water furnished by the three Washington metropolitan area water suppliers:

- The Washington Aqueduct Division of the U.S. Army Corps of Engineers (Aqueduct) serving the District of Columbia and portions of Virginia;

- The Fairfax County Water Authority (FCWA) serving parts of northern Virginia; and
- The Washington Suburban Sanitary Commission (WSSC) serving the Maryland suburbs.

The three Washington water suppliers provide treated water either directly to customers or through wholesale suppliers. The natural flow in the Potomac River supplies approximately 75 to 80 percent of the water supply withdrawals in the metropolitan area, with the remainder supplied by FCWA's Occoquan Reservoir and WSSC's Patuxent reservoirs. The Potomac is the sole source of supply for the Aqueduct.

The three water suppliers cooperate on water supply operations in the Potomac, essentially operating as one entity in sharing water across the Potomac, Patuxent, and Occoquan basins in periods of low flow. This cooperative work is coordinated by a special section of the Interstate Commission on the Potomac River Basin (ICPRB), called the Section for Cooperative Water Supply Operations (CO-OP).

The Washington metropolitan area water suppliers maintain a portion of the water stored within Jennings Randolph Reservoir, as well as water impounded within Little Seneca Reservoir in Montgomery County, to provide for low flow augmentation. Together, these sources can furnish over 17 billion gallons to augment naturally occurring flows in the Potomac. The three water suppliers have paid the capital (at an original cost of more than $96 million) plus operating costs to maintain a portion of the water stored within Jennings Randolph Reservoir.

Jennings Randolph Reservoir holds 13.4 billion gallons as water supply storage and 16.6 billion gallons as water quality storage. Water supply releases are directed by CO-OP based on existing and projected utility demand, status of other reservoirs, and weather conditions. The U.S. Army Corp of Engineers controls all water quality releases. The reservoir is almost 200 miles upstream of the water utilities' intakes, and releases take more than a week to travel to them during times of low flow.

Little Seneca Reservoir stores 3.8 billion gallons and is used to augment larger releases from Jennings Randolph. Located in Montgomery County, releases take less than a day to reach the utilities' intakes.

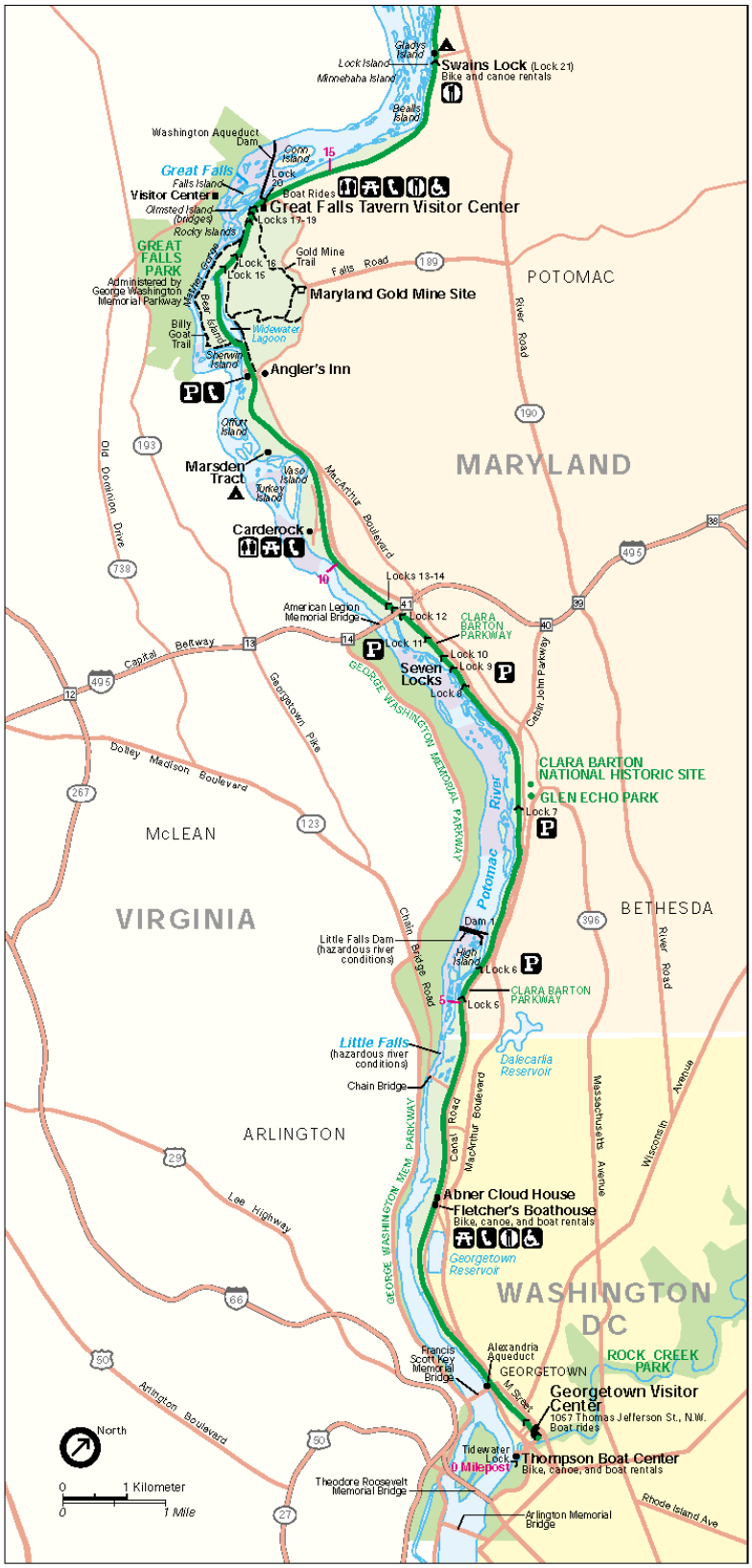
The summer of 1999 marked the first year that releases of water storage were required to augment the natural flow of the Potomac River for water supply purposes. Releases from the reservoir system also occurred in the

summer of 2002. MDE commissioned a study by ICPRB to assess the ability of the Potomac River to meet water supply demands through the year 2030. The study includes demands from the Washington metropolitan area and upstream users on the Potomac River, and compares future demand with available water resources (ICPRB 2000b). In this report, ICPRB concluded that reservoir resources will be adequate to meet expected demands in the year 2030 under a repeat of the historical drought of record (1931), but that resources would be strained -- the reservoir would be depleted to 14 percent of its initial volume allocated for water supply. Under an aggressively high-growth scenario, the current resources met 2030 levels of demand with only about 1 percent reserve storage in the reservoirs.

6.3.3 Environmental Flow-by

A drought and associated low flow conditions in the Potomac River can also have detrimental effects on the environment and wildlife. Consequently, water suppliers using surface water sources must ensure that sufficient flow remains in the rivers to meet other environmental needs. The residual quantity of water remaining in a stream channel downstream of withdrawals is referred to as the flow-by. In 1981, DNR and the other state, federal, and local agencies with an interest in the river agreed upon a set of provisions which apply to the Potomac River in the stretch between Great Falls and Little Falls (shown in Figure 6-2), the locations of the two Washington Aqueduct intakes. This stretch is just upstream of the fall line where the Potomac becomes increasingly tidal. The other major utilities (FCWA and WSSC) have their intakes upstream of the Aqueduct intakes. The flow-by provisions recommend a minimum flow of 300 MGD to be maintained at Great Falls, and require a minimum of 100 MGD to be maintained at Little Falls. DNR is currently studying the potential effects on aquatic habitats of changing the flow-by requirement.

Figure 6-2 Location of Little Falls and Great Falls on the Potomac River



Source: National Park Service

6.4 ASSESSMENT OF IMPACTS

6.4.1 Impact on Potomac River Water Users

Reduction in River Flow

Mirant's proposed withdrawal will have a minimal effect on the amount of water in the Potomac River. A comparison of Mirant's maximum daily consumptive withdrawal of 8.3 MGD to the mean and low daily flows at the Point of Rocks gauging station is shown in the table below.

Table 6-1 Mirant's Maximum Daily Consumptive Withdrawal Compared to River Flow at Point of Rocks

Flow Conditions at the Point of Rocks Gauging Station	River Flow (MGD)	Mirant Maximum Consumptive Withdrawal (MGD)	Percent of River Flow
7Q10	556	8.3	1.5
1895-1979 Mean Flow	6,050	8.3	0.1
1979-1999 Mean Flow	6,380	8.3	0.1
Historic Minimum Flow	342	8.3	2.4
Minimum Daily Mean Flow in 2002	498	8.3	1.7

Section 8.2 discusses the impacts of water withdrawal on river stage in this portion of the Potomac River. Figure 8-2, illustrates the relationship between Mirant's maximum withdrawal and the water level in the Potomac River at Point of Rocks during the 7Q10. The figure indicates that the consumptive use (i.e. the amount of river water used in the facility and not returned to the river) during the 7Q10 flow will lower the water level in the river by 2 millimeters. As discussed previously, river flow at Dickerson is higher than at Point of Rocks, due to the contribution from the Monocacy River. Also, Mirant will be required to reduce consumptive use to 1 MGD during low flow periods and, therefore, the percentage of river flow during low flow periods will be less than shown in Table 6-1. The withdrawal of 1 MGD is 0.18 percent of the 7Q10 of 556 MGD and 0.29 percent of the historic low flow of 342 MGD.

Impact to the Washington Metropolitan Area Water Suppliers

Mirant's proposed withdrawal would have no measurable effect on the amount of water available to downstream users of the Potomac River during normal flows. During low flow conditions, Mirant must meet regulatory requirements under COMAR 26.17.07 regarding consumptive withdrawals from the Potomac River. Under these regulations, Potomac River users that choose not to provide a specified quantity of augmentation storage are required to reduce consumptive use to less than 1 MGD during certain low-flow periods, as directed by MDE WMA. As part of the licensing conditions for this plant, MDE WMA is recommending that these conditions be met. Additionally, Mirant has voluntarily decided that their curtailments will begin when releases from the water supply storage portion of Jennings Randolph are made.

The above recommendation, coupled with Mirant's voluntary curtailment when releases from the reservoir are made, ensure that Mirant will not consume water that has been released from upstream reservoirs to meet demand in the Washington metropolitan area during a drought emergency period. This will further ensure that the proposed Mirant facility will have no significant adverse effect on the adequacy of the existing reservoir system to meet the water supplier's needs.

6.4.2 Impact on Aquatic Ecology

Operation of the reservoir system is designed to maintain a minimum environmental flow-by of 100 MGD at Little Falls. This environmental flow-by is assumed to be protective of the aquatic environment in the Potomac River estuary. Mirant will have a negligible effect on the ability of the water suppliers to maintain the minimum environmental flow-by because Mirant will only be withdrawing 1 MGD during low flow periods. By comparison, the Washington area suppliers withdraw a summertime average of 500 MGD.

6.5 POTENTIAL FOR FUTURE WATER USE CONFLICTS

The requirement to curtail consumptive use to only 1 MGD would result in Mirant being unable to operate for a full day without additional on-site water storage as backup supply. This has given rise to potential concerns about a future policy conflict between ensuring the availability of the full plant output to help meet regional peak demand for electricity and the curtailment of water withdrawals to protect downstream users. In response to these concerns, PPRP analyzed the overlap of drought periods in the

Potomac River basin with peak electricity demand periods to determine the potential impact of a prolonged drought on the availability of electricity from the proposed Mirant facility.

PPRP conducted a two-part analysis of the overlap of future drought periods in the Potomac River basin with the potential impact on the availability of electricity. First, the potential impact of the consumptive withdrawals from the Dickerson expansion was considered, and the results of this analysis are described in Section 6.5.1. Second, the potential impact of the consumptive withdrawals from the Dickerson expansion, coupled with future consumptive withdrawals from two additional power plants located in the Potomac River Basin, were evaluated. The results of the multi-plant analyses are described in Section 6.5.2.

6.5.1 Single Plant Analysis

Potomac River Flow Analysis

Flow in the Potomac has been measured since the beginning of this century. However, the historical flow is not the same flow that would be observed today under a repeat of identical hydrologic conditions. Instead, humans now have a significant impact on flow in the river, due to diversions, reservoir regulations, wastewater treatment plant return flows, and consumptive demand.

ICPRB has developed a basinwide model, PRRISM, to simulate water supply operations as they would occur for future demands given a repeat of historical meteorological conditions. The PRRISM model simulates withdrawals and releases from the two main reservoirs (Jennings Randolph and Little Seneca) and tracks streamflow and storage volumes given projected future levels of demand, assuming a repeat of hydrological conditions from the last 70 years (1929-1999). ICPRB has studied current human activities in the Potomac basin and documented how they might affect Potomac flow. PRRISM accounts for the flow effects of these upstream human activities. Therefore, the PRRISM model indicates the flow that would occur in the river today, given a repeat of historical hydrological conditions.

PPRP used the ICPRB PRRISM model to simulate the operation of the reservoir system based upon ICPRB's projected water supply demands for the years 2010, 2020, and 2030, plus the additional Mirant withdrawal. Under the proposed water appropriation conditions and associated regulatory requirements under COMAR 26.17.07 regarding consumptive withdrawals from the Potomac River, MDE WMA would potentially direct the Mirant facility to curtail consumptive water withdrawals from the river

to 1 MGD during days when releases are being made from water supply storage in upstream reservoirs. An increase in consumptive use as a result of the construction of the Mirant plant would increase the frequency of releases from the reservoirs to meet the demand of the Washington area water suppliers. Thus, the model was used to determine the expected frequency and duration of water supply releases to meet projected future water demands with and without the additional Mirant withdrawal.

Table 6-2 summarizes the expected occurrence of water supply releases from upstream reservoirs over a theoretical 70-year period, assuming a recurrence of the past 70 years of hydrologic conditions. On these water "release" days, it is expected that Mirant would be restricted to 1 MGD of consumptive use. Table 6-2 shows the number of water release days for 2010, 2020, and 2030 projected water demand. The column labeled "existing" is the ICPRB analysis that predicts future regional water demand, without any assumed increase in power plant withdrawals. The second column shows the effects of the Mirant facility's consumptive use of 8.3 MGD during this period (even though they would be reduced to 1 MGD during certain low flow periods).

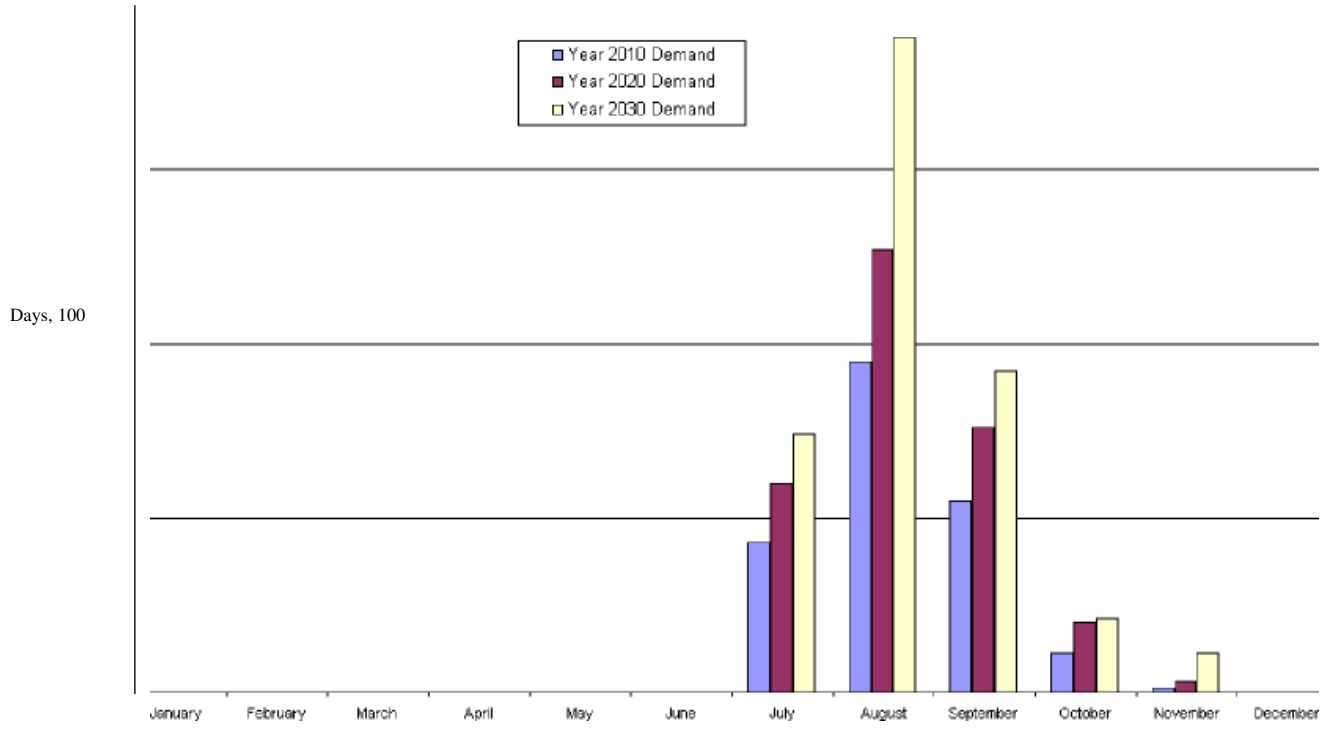
Table 6-2 Summary of Modeled Occurrence of Water Supply Release Days for the Mirant Plant

	2010		2020		2030	
	Existing	With Mirant	Existing	With Mirant	Existing	With Mirant
Days of Release	195	205	268	286	359	385
Years with Releases	7	9	11	12	13	15
Years with Releases in June through September						
June	0	0	0	0	0	0
July	4	4	6	6	6	6
August	5	5	8	10	11	12
September	6	6	8	8	10	10
Average Monthly No. of Release Days for Years with Releases						
June	0	0	0	0	0	0
July	10.8	10.8	9.5	10	12.3	12.3
August	18.2	19	15	12.7	15.5	15.7
September	8.5	9.2	8.6	9.5	9.1	9.2

Table 6-2 shows that with the Mirant expansion, an increase in the number of water release days is seen for the 2010, 2020, and 2030 projected water demand. The model results indicate that if the power plant were allowed to continue to withdrawal the full amount of the 8.3 MGD consumptive use during releases, there would be 26 more days of water releases assuming a repeat of the 70-year historical flow record and the 2030 demand. This represents a 7 percent increase in the expected frequency of releases.

Figure 6-3 shows that water supply releases from the upstream reservoir system are most likely to occur during June through September. During these "release" days, the operation of the plant could be limited by the need to reduce consumptive withdrawals from the river to 1 MGD, thus reducing the facility's generation output. As discussed further below, PJM hourly demand data show that annual peak electrical demand always occurs during the summer, and thus coincides with the expected occurrence of withdrawal curtailments. Because of the potential to reduce plant capacity during droughts, Mirant has proposed constructing on-site water storage tanks. The water stored on-site would be used to supplement the 1 MGD of consumptive use withdrawals, and allow the plant to operate during a period of curtailment of withdrawals.

Figure 6-3 Seasonal Distribution of Modeled Release Days for Years in Which Releases Occur



Loss of Generating Capacity

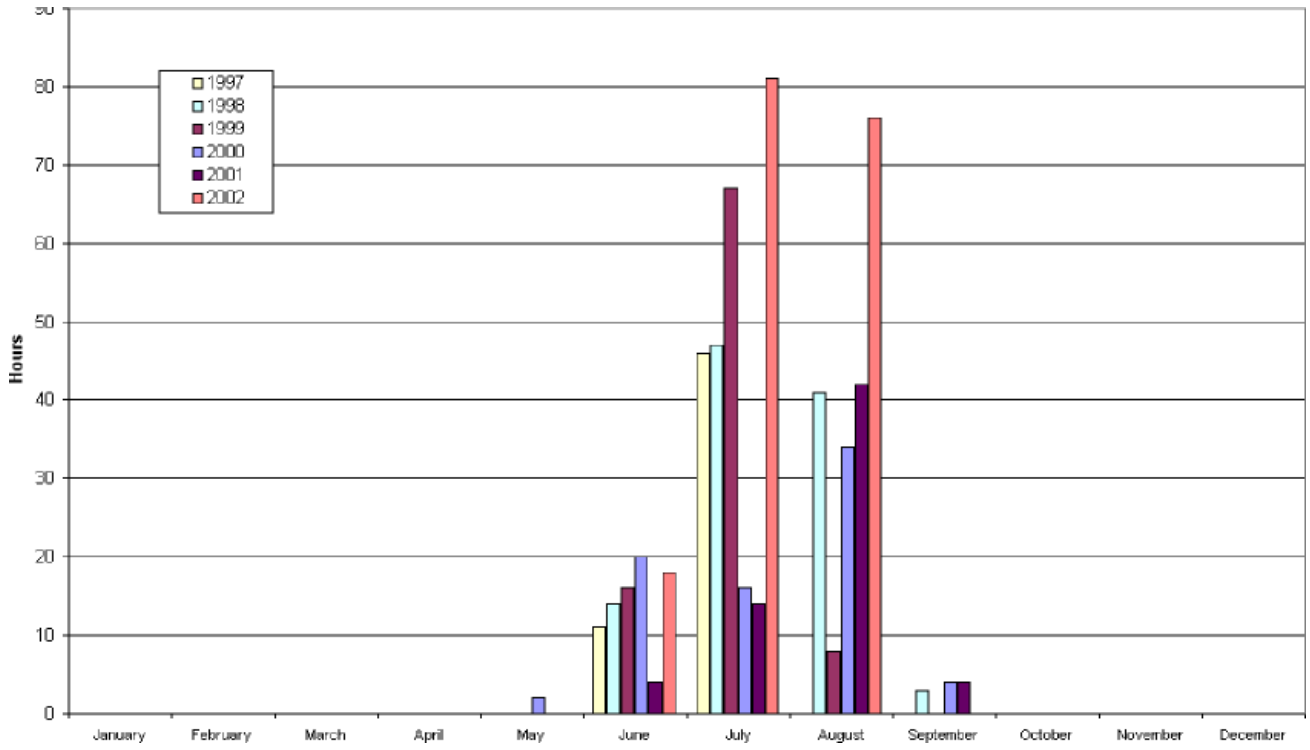
PPRP assessed the potential impact that loss of generating capacity during periods of curtailed water withdrawal that the Mirant facility might have on the PJM system, in comparison to the PJM peak demand periods. Table 6-3 presents PJM hourly load data for the years 1997 through 2002. The data were downloaded from the PJM website and all hours when load is 90 percent or more of the annual peak were identified and tabulated. The data were used as an indication of the number of hours that Mirant's full output may be needed to meet peak demand. The benchmark of 90 percent of the annual peak was used to account for the ramp up time required to bring the combined cycle units on-line. The peak load typically occurs for only a portion of the day. When loads exceed the 90 percent benchmark, it is typically for about 4 to 8 hours during the day, roughly 11 a.m. to 7 p.m. On rare occasions, it can extend to 9 or 10 p.m. The exceedance hours also tend to be clustered around 2 to 4 days, corresponding to weather systems.

Table 6-3 Peak Power Demand for Years 1997 to 2002

	PJM Declared Maximum Emergency Generation Events		90% of Peak Demand Events	
Year	**Number of Events**	**Number of Hours**	**Number of Events**	**Number of Hours**
1997	9	40	8	63
1998	7	30	18	112
1999	9	35	16	91
2000	3	19	13	82
2001	4	16	9	68
2002	9	6	24	175
Average	6	28	15	99

Figure 6-4 shows that the annual peak electrical demand has always occurred in the summer, and the electrical load has only reached 90 percent of the annual peak load in the months of June through September. It would be during these peak demand periods that the generating capacity from the Mirant facility would be most needed. As previously shown in Figure 6-3, Release Days occur more frequently in the months of July, August, and September, which overlaps with peak power demands for PJM. Based on this overlap, Mirant may be needed to operate during drought summers to meet the electrical demand, thus creating a potential conflict between the need for power and the management of the Potomac River.

Figure 6-4 Comparison of Monthly PJM 90% Peak Load Events for the Years 1997-2002



Mitigation Option

On-site storage of water can provide assurance that the Mirant combined cycle plant would be available to operate at full capacity to meet peak power demand, even during periods when the facility would be restricted from withdrawing water from the Potomac. Thus, on-site storage can mitigate the potential for future conflicts between the need for power and the consumptive use of the Potomac River. The amount of on-site storage required can be based upon an estimate of the number of hours of peak demand and the hourly consumptive water requirements, allowing for adequate ramp-up time for each peak event (i.e., 90 percent of the peak demand), and relying solely on a fixed 1 MGD withdrawal from the Potomac River. Note that Mirant's power plant expansion has the ability to operate in simple-cycle mode and thus would be capable of continuing to operate at a reduced capacity, although with higher air emission rates and higher power costs. Further, this analysis approach is based on the conservative assumption that the 90 percent of peak demand events directly overlap with release days.

PPRP estimated the number of hours that the Mirant combined cycle plant may need to operate based on PJM data from the last six years, as

previously shown in Table 6-3. The average data from the period 1997-2002 were used to calculate the total amount of water needed to operate during the peak demand events during a drought year. Between 1997 and 2002, there were an average of 15 events with a total of 99 hours when demand exceeded 90 percent of the annual peak. Storage calculations assume that the 1 MGD consumptive use withdrawal allowed during water restrictions is utilized prior to any use of stored water to limit the amount of water needed in storage. Thus, the calculated storage was reduced by 1 million gallons for each of the 15 events. Storage calculations are based on a consumptive use of 8.3 million gallons per 24-hour period, or 0.345 million gallons per hour.

The storage calculation is as follows: the 99 hours of operation (i.e., the average over the 1997-2002 period) is multiplied by the consumption rate of 0.345 million gallons per hour, less the 15 million gallons available from the river withdrawal, provides for an on-site storage of just under 20 million gallons. Therefore, PPRP recommends that Mirant provide for a minimum of 20 million gallons of water storage, which equates to two 10 million-gallon storage tanks. Mirant may choose to phase in this storage requirement by installing the first 10 million gallons coincident with the first combined cycle unit and installing the second storage tank when the second combined cycle unit is constructed. No water storage will be required during the initial phase of simple cycle operation, before the steam cycle is constructed.

Further, PPRP recommends that additional tanks be installed in the event that 90 percent peak demand events coincide with releases from the reservoir frequently enough to cause the plant to be taken off-line due to depletion of the 20 million gallons of on-site storage. Given the natural variability of flow conditions and expected increases in future power demands, it is possible that additional water storage volume may be required eventually. To determine a reasonable worst-case scenario, we ran through the same water storage calculations described above, using the 2002 peak demand data instead of the 5-year average. As shown in Table 6-3, there were 24 events in 2002 that reached 90 percent of the annual peak demand, for a total of 175 hours. Following the storage calculation methodology described earlier, for a water use of 0.345 million gallons per hour (less the 24 million gallons from allowable river withdrawals), a total of 36.4 million gallons of storage would be required to ensure that the plant's full capacity is available during a persistent drought. Based on this analysis, and incorporating a margin of safety, PPRP recommends that Mirant be required to provide an additional one to two water storage tanks up to a maximum of 40 million gallons if, in the future, 90 percent peak demand events coincide with releases from the reservoir frequently enough to cause the plant to be taken off-line for 40 hours or more during a year.

7.0 COMPARATIVE ASSESSMENT

As discussed earlier in Section 1 of this document, the State agencies have developed guidelines for comparing proposed new generating capacity that is located within a relatively small area (defined as a distance of 10 miles unless a greater or smaller distance is appropriate). In the present case, the Mirant project is the only active application in the region so a comparative analysis, as envisioned by the guidelines, is not strictly required. Nonetheless, an application from Sempra Energy, LLC for a major generating facility to be located on the Eastalco property is expected to be filed soon. Although the Eastalco site is more than 10 miles from Dickerson, it is the closest potential plant and it provides an opportunity to "pilot" the recently developed comparative analysis guidelines from the State agencies.

7.1 PROJECT DESCRIPTIONS

In addition to the Mirant proposal, described in detail in Section 2 of this document, DNR's comparative assessment considered a possible future power plant to be located at the Eastalco aluminum plant in Frederick County (see Figure 8-1). Because the potential developer has not officially filed an application for the generating units at Eastalco, detailed project information is not available. For purposes of this assessment, DNR assumed that the characteristics would be similar to those of the Duke Energy plant, which had been proposed for a site near Point of Rocks in southern Frederick County. (Duke filed a CPCN application with the PSC but withdrew it in early 2003.)

The plant characteristics assumed for this potential facility are listed below:

- Natural gas-fired combined cycle generating technology (no oil backup);
- 640 MW nominal capacity;
- Potomac River water used for cooling system (possibly using treated wastewater effluent in the future);
- Consumptive water use of approximately 7 mgd; and
- Facility footprint of approximately 100 acres.

7.2 DISCUSSION OF COMPARATIVE FACTORS

The table below summarizes the comparative assessment with respect to each of the factors specified in the State agency guidelines.

Table 7-1 Comparative Assessment Results

Assessment Factors	Comments
Adequacy and reliability of electric supply	
Fuel mix diversity	Mirant proposes to use natural gas as primary fuel, with fuel oil as back up. Eastalco uses only natural gas. The Mirant plant, therefore, provides a modest advantage in terms of fuel mix diversity relative to the Eastalco plant.
% of electricity supplied to MD customers	No significant difference. Merchant developers are constructing both plants and the generation will be sold to the PJM market. However, the power plant developer at the Eastalco site may opt to sell directly to Eastalco, in which case the majority of the energy generated at the facility would supply Maryland customers (i.e., the on-site industrial user).
Capacity resource	No significant difference. Both facilities are anticipated to provide capacity to PJM under the assumption that the Eastalco site developer commits to the required transmission system upgrades.
Stability/reliability of electric power system while avoiding/relieving overloads	No significant difference expected; however, detailed information on the potential plant at Eastalco is not yet available to allow for complete evaluation.
Environmental and Resource Issues	
Consumptive use of ground water/non-tidal off-site surface water	No significant difference; on a per-megawatt-hour basis, the two facilities are expected to have similar consumptive use requirements.
Use of waste or other reclaimed water	Eastalco site developer may use reclaimed wastewater from Frederick County; however, this still represents a consumptive loss of water to evaporation in the cooling system.

Table 7-1 (continued)

Assessment Factors	Comments
On-site water storage during low flow periods	No significant difference; it is assumed that both facilities will provide some on-site storage.
% of renewable fuel use	No significant difference; neither facility will use renewable fuel sources.
Generation efficiency	No significant difference; facilities are using similar generating technologies.
Local NO_x offsets	Mirant is installing control equipment on existing facilities, effectively providing local offsets.
NO_x credits achieved through overcontrol	Mirant is installing control equipment on existing facilities.
Reduction of greenhouse gases	No significant difference; both facilities are expected to have similar greenhouse gas emissions on a per-MW basis, given the fact that generating technologies (and efficiencies) are similar.
Plan proposed for mitigating greenhouse gases	No significant difference; it is assumed that neither proposal will include substantial mitigation measures.
Impact on visibility in a Class I area	Mirant, when burning fuel oil, has a potential impact on visibility, if allowed to burn fuel oil during summer months. For this reason, a CPCN condition is recommended that would prohibit summertime firing of fuel oil.
Hazardous pollutants emitted	No significant difference, given the similarity of generation technology and of predominant fuel.

Table 7-1 (continued)

Assessment Factors	Comments
Reduction of nitrogen loadings to the Chesapeake Bay	No significant difference. The proposed expansion units at Mirant are projected to release ~840 tons of nitrogen per year, nearly all of which will be offset by reductions in NOx from control of existing sources at the facility. Eastalco may release ~165 tons of nitrogen per year; again, nearly all of which will need to be offset through reductions in NOx emissions at other nearby facilities. Both are expected to use state-of-the-art equipment to keep nitrogen emissions to a minimum. Both are in relatively similar locations in the Bay air/watershed. Given their location and because new potential NOx emissions will be offset in both cases the net effect of each project's NOx emissions that reach the Bay will be similar.
Plan proposed for mitigating nitrogen loadings to the Chesapeake Bay	No significant difference. DNR is recommending a CPCN condition that requires Mirant to work closely with DNR to prepare and execute a program of land preservation and/or reforestation to achieve this objective. A similar condition is expected to be applicable to Eastalco as well.
Enhancing habitat for living resources	No significant difference. Both Mirant and Eastalco would be constructed on existing developed sites with little or no impacts to living resources or opportunities for habitat enhancement.
Corridors needed to connect to fuel sources and the electric transmission line grid	Mirant has adequate auxiliary facilities on site to accommodate this expansion. Eastalco may require construction of substation, additional transmission lines, water lines, and gas lines; however, the distances are unknown at this time.
Clean coal combustion technology (if coal-burning plant proposal)	Not applicable.
Land Use and Smart Growth	
Compatibility with State land use policies	No significant difference. Both are consistent with State's Smart Growth program.

Table 7-1 (continued)

Assessment Factors	Comments
Nearby land uses with which it is incompatible	No significant difference. Many nearby properties support agricultural or recreational uses, although industrial facilities (Eastalco in Frederick County and a Resource Recovery Facility in Montgomery County) are adjacent to both sites.
Compatibility with local land use planning and zoning	No significant difference. Both sites are zoned industrial. Eastalco site is within a designated industrial park that is currently used for crop agriculture. Mirant property is within Montgomery County Agricultural Reserve, a designation that post-dates the Dickerson generating facility.
Socioeconomic Issues	
Local and State tax revenue generated	Mirant will contribute more to the local tax base because business personal property is taxed in Montgomery County but not in Frederick County
Effect on transportation systems and traffic	No significant difference. Construction traffic would temporarily congest nearby roads around both sites. Operational traffic would be negligible.
Benefits to the local community	No significant difference, with no major benefits to local community.
Visual impact	Eastalco will be built adjacent to an existing, large industrial facility. Mirant facility would be constructed within the perimeter of an existing generation station. Both facilities would be visible from Sugarloaf Mountain.
Noise impact	No significant difference; both facilities will generate similar noise emissions, and are located adjacent to existing industrial noise sources that influence the ambient acoustic environment.
Local jobs created	No significant difference. Both sites share the same labor market area.

Table 7-1 (continued)

Assessment Factors	Comments
Effect on historic and archaeological resources	Mirant has no additional impact; Eastalco impact unknown at this time. Historic structures within viewshed of both facilities.
Community support	The Mirant proposal has mixed community support and organized opposition. It is not yet known whether there will be community support for the Eastalco proposal.
Environmental equity issues	No significant difference.

In addition to the environmental characteristics discussed in the table, the two plants in this comparison have slightly different air quality impacts in terms of their effects on PSD increment and NAAQS compliance. When evaluating air quality impacts in accordance with PSD regulations, we first compare impacts from a new project to the "significant impact levels" or SILs. Impacts greater than the SILs are not unacceptable but do require further analysis, and the SIL thresholds provide a quantitative basis for making relative comparisons between plants. The Mirant project (on fuel oil) has significant ambient impacts for SO2 and PM10; however, based on further analysis, these impacts do not interfere with attainment or maintenance of the increments and NAAQS. Eastalco is expected to have insignificant impacts for all pollutants and averaging periods.

In summary, some differences exist between Mirant's proposed plant and the potential future generating units at the Eastalco site. Many of the plant characteristics for the potential Eastalco development are currently speculative and therefore a definitive comparison is not feasible. However, at this time, there are no significant factors that can be identified that would cause one project to be clearly superior to the other.

8.0 CUMULATIVE IMPACTS

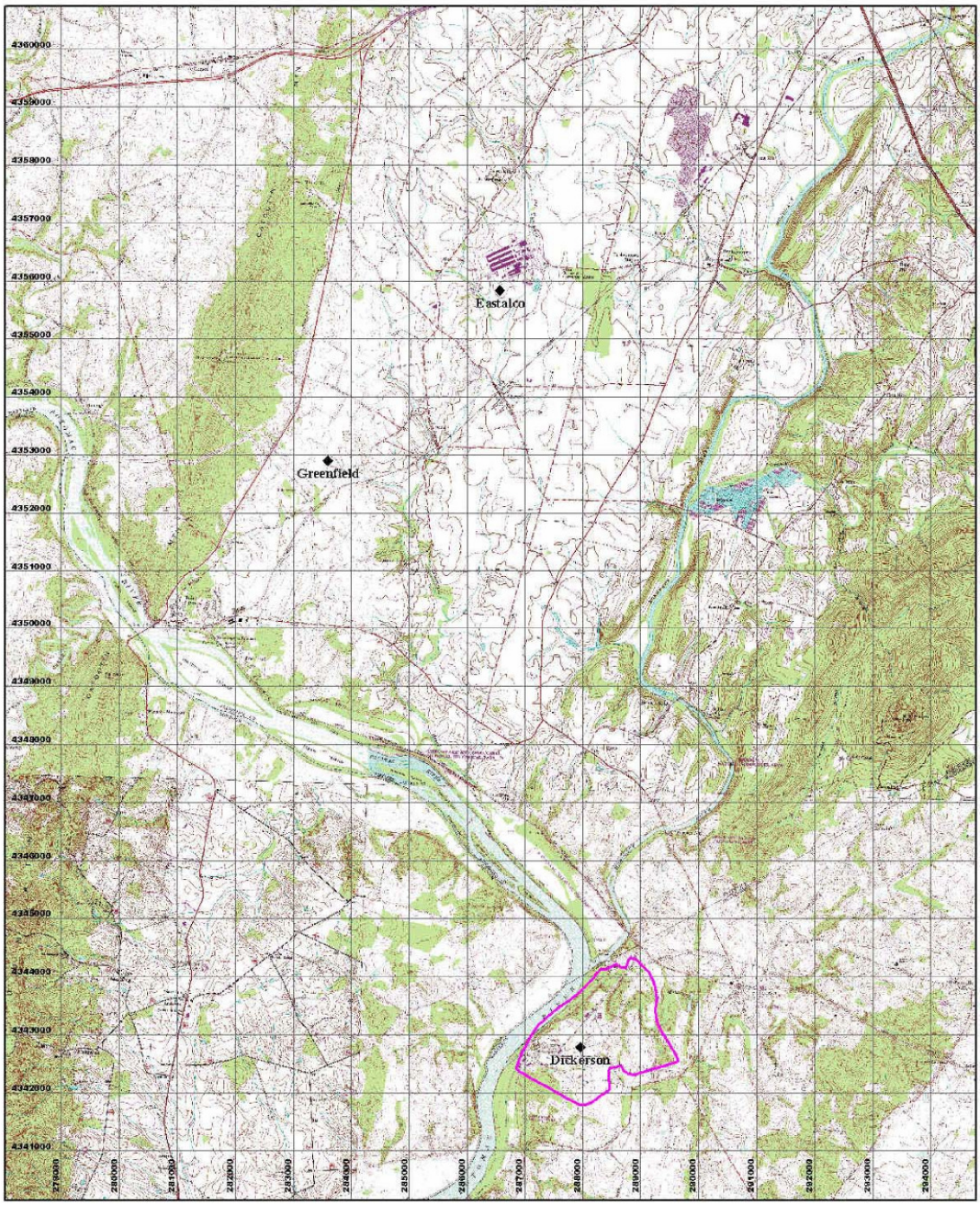
In addition to the comparative analysis discussed in Section 7, the State's Task Force on multiple plant evaluations recommended that PPRP conduct a cumulative impact analysis to assist in the licensing process. This section discusses those impacts that have the potential to be significant on a cumulative basis, if other power plants were to be sited in close proximity to the Mirant site.

In accordance with the task force guidelines, PPRP has considered three facilities in the cumulative analysis (see locations in Figure 8-1):

1. The Mirant Dickerson expansion in Montgomery County that is the subject of this ERD. The cumulative analysis considered several operating scenarios for the Dickerson expansion, including simple cycle and combined cycle modes and firing natural gas or No. 2 fuel oil. We based the analysis on emission estimates and other plant characteristics described in the CPCN application and additional information obtained through data requests and supplemental filings.
2. A potential future combined cycle plant, fired by natural gas, that would be sited at a greenfield location adjacent to the Doubs substation just north of Point of Rocks in Frederick County. For the characteristics of this speculative greenfield plant, we used information contained in the June, 2001 CPCN application (and subsequent December, 2001 revision) filed by Duke Energy for a project which the applicant subsequently cancelled.
3. A natural gas-fired combined cycle plant to be located at the existing Eastalco aluminum production facility in Frederick County. For the Eastalco site, we assumed a power plant with characteristics similar to the Duke project, with the generating units located within Eastalco's existing property boundary.

Based on the Task Force guidelines from the State Task Force, PPRP has evaluated cumulative impacts of these three plants on air quality (from releases from three plants), water supply resources, aquatic resources (from water withdrawals and wastewater discharges), terrestrial watershed resources (from construction and operation of the plants and their support facilities), and socioeconomic resources in the Montgomery-Frederick County region. An overview of the evaluations and a summary of results of the State’s evaluations are presented in this chapter.

Figure 8-1 Location of Potential Plants Evaluated in Comparative and Cumulative Analyses



8.1 AIR QUALITY

8.1.1 Overview of the Air Quality Cumulative Impact Assessment

To evaluate potential air quality impacts from construction and operation of the three new power plants in relatively close proximity, PPRP conducted detailed dispersion modeling studies. In general, we used the same techniques that were used to assess air quality impacts from the Dickerson expansion itself (see Section 4), with some modifications, and expanded the analysis to cover all three power plants.

The primary issue addressed by this analysis is whether the potential location of multiple new power plants in a small geographic area (within a few miles of each other) would result in cumulative air quality impacts that are significantly different than individual plant impacts. The analysis further addresses whether the cumulative impacts would result in a different outcome for the licensing process, one that may not be fully examined in the proceedings for individual plants.

The air evaluation examined the following types of potential air quality impacts that may result from emissions from power plants:

- **NAAQS and PSD Increment Evaluations** —In this evaluation, PPRP compared model-predicted concentrations of pollutants from the three power plants relative to National Ambient Air Quality Standards (NAAQS) and Prevention of Significant Deterioration (PSD) "increments." As described in Section 4.3.3 of this ERD, NAAQS are concentrations in the ambient air established by EPA at levels to protect human health and welfare. PSD increments are established by EPA as allowable incremental increases in ambient air concentrations due to major new air emissions sources and are set at levels substantially lower than the NAAQS. Emissions of NO_x, SO_2 and PM10 were modeled using EPA's AERMOD modeling system for this evaluation.
- **Class I Area Evaluations** —In this evaluation, PPRP used EPA's CALPUFF modeling system to predict concentrations, deposition rates, and assess visibility impacts in PSD Class I Areas, which (as described in Section 4) are pristine areas of the country designated as requiring special protection from the effects of pollutants emitted by major air sources. SO_2, NO_2 and PM10, as well as "secondary" pollutants including sulfates (SO4) and nitrate (NO3) were considered to evaluate impacts to air quality in the three nearby Class I Areas: Shenandoah National Park in Virginia, and Dolly Sods and Otter Creek Wilderness Areas in West Virginia.

Some background information, a summary of the methods used to conduct these evaluations, and the results of the review of the potential cumulative air impacts are presented in the following sections. A full description of PPRP's assessment of cumulative impacts to air quality is presented in Appendix C.

8.1.2 Evaluation of NAAQS and PSD Increments

NAAQS and PSD increment evaluations even for a single power plant project can involve "multi-source" modeling, depending on the level of predicted impacts. For example, Mirant was required to consider emissions from large "significant" sources in the region in its evaluation of the Dickerson expansion. We took the Dickerson multi-source modeling a step further here to evaluate the potential impacts to the NAAQS and PSD increments of adding two additional power plants.

Emissions of NO_x, SO_2 and PM10 were modeled. CO emissions were not, since CO impacts from stationary sources are typically much lower than the EPA's significant impact levels (SILs). Modeling for Mirant Dickerson supported this conclusion (see Section 4.3.3.1), as did the modeling submitted with the Duke CPCN application. To simplify the modeling, emissions were modeled as though originating from one stack at each plant.

The modeling results show that, for the annual averaging period, impacts of all plants and scenarios are insignificant for all pollutants. Furthermore, the "all-plant" scenario with Dickerson on oil produces similar results to the Dickerson-only modeling (significant impacts for the same pollutants and averaging times as with Dickerson alone, with only slightly higher maximum impacts). Detailed results of the modeling are presented in Appendix C.

Review of the modeling results indicates that "combined" impacts of these three plants are not significantly different than individual impacts. There appears to be no significant interaction between plants (i.e., the maximum concentrations due to one plant are not increased significantly by the addition of the impacts of other plants). An explanation for this is that, for short-term standards, impacts from an individual plant occur at a limited number of receptors directly downwind of the sources being modeled. The meteorological conditions that contribute to impacts at those specific receptors are frequently not the conditions that are associated with high impacts from other plants at the same receptors. Annual average impacts have more of a tendency to overlap; however, the maximum annual average impacts from individual plants and from all combined scenarios are less than the SILs.

In conclusion, cumulative air quality impacts relative to the attainment of PSD increments and NAAQS do not appear to be significantly different than individual plant impacts. Furthermore, this analysis indicates that no additional license conditions are needed in this CPCN proceeding to address potential cumulative air impacts from the Dickerson expansion and other potential future power plants.

8.1.3 Class I Area Analysis

8.1.3.1 Background

Because of their special status, and based on guidance from the Federal Land Managers (FLMs) who oversee some Class I Areas, the evaluation of air quality in Class I Areas covers several types of potential impacts. Using guidance from the FLM in a document known as the FLAG guidance, the State evaluated the following types of potential cumulative impacts to Class I areas: concentration impacts (including a comparison of model-predicted concentrations to SILs), deposition impacts, and impacts to visibility.

The methodology followed in this cumulative impact analysis is similar to the methodology used for analyzing the impacts of the Dickerson expansion project (Section 4.3.4.3), expanded to cover additional power plants and a larger modeling domain. Meteorological data prepared by EPA, the National Park Service, and the National Weather Service (NWS), and precipitation data from surface stations and from the National Climatic Data Center (NCDC) were used as input to the CALPUFF modeling system.

The CALPUFF model was configured to generate concentration estimates for the primary pollutants SO_2, NO_2, and PM10, and secondary particulate pollutants including sulfates (SO_4) and nitrates (NO_3). It was also configured to generate wet and dry deposition estimates for SO_2, SO_4, NO_3, and HNO_3, and to create the relative humidity file required for estimating visibility impacts. The model generated combined plant scenarios and calculated and summarized concentration, deposition, and visibility impacts for the appropriate averaging periods.

The net impacts to all three Class I Areas due to simple cycle operation of the Dickerson expansion were shown to be negligible; therefore, the focus of the Class I cumulative impact evaluation is on the combined cycle mode for Dickerson.

8.1.3.2 *Results and Discussion*

Concentrations

This impact assessment modeling shows that maximum concentrations estimated in the Dolly Sods and Otter Creek Class I areas are all less than the Class I SILs for all individual and combined plant scenarios. The same is true for the majority of the cases estimated for Shenandoah, with some exceptions (short-term averages only). For individual power plants, maximum predicted concentrations for all gas scenarios are less than the SILs, while the Dickerson oil-fired scenario is slightly greater than the PM10 24-hr SIL. Combined plant maximum impacts (gas-firing) are greater than the SIL for PM10, 24-hr averages, as are combined plant maximum impacts for oil firing. The combined plant maximum impacts for oil firing are also slightly greater than the SIL for SO_2, 24-hr averages.

An impact greater than a SIL does not signify that the impact is unacceptable, but rather that a full increment analysis, including all increment-consuming sources, should be conducted to determine total increment consumption. Although PM10 impacts are slightly greater than the 24-hr SIL for Dickerson, a full increment analysis was not conducted since the impact occurs for a limited use backup fuel, and furthermore the Dickerson air quality impact evaluation (described in Section 4 of this ERD) already incorporates modeling to determine increment consumption. Maximum concentration impacts based on operation of all three power plants are substantially less than the Class I increments.

Deposition

Deposition is a term that is used to describe the result of the interaction of pollutants with the ground surface, where some of the pollutant mass is deposited on the ground or is absorbed by vegetation. Deposition can occur as a dry process (interaction with the ground surface, uptake by plants) or a wet process (where precipitation essentially "washes out" the pollutant mass from the atmosphere). Wet and dry deposition fluxes were calculated by CALPUFF in all three Class I areas for SO_2, SO_4, NO_3, and HNO_3 and were found to be approximately three orders of magnitude lower than currently monitored deposition rates. The predicted deposition rates are also less than the Deposition Analysis Threshold, established by the National Park Service, of 10 grams per hectare per year for both sulfur and nitrogen. Thus, expected deposition impacts on Class I areas from the three proposed plants are insignificant.

Visibility

The model generates estimates of visibility impacts by calculating an extinction coefficient based on CALPUFF-predicted concentrations of particulates, sulfates, and nitrates. The value of the calculated extinction coefficient is then compared to natural conditions at the Class I area under consideration, and a percent degradation is calculated. For the three Class I areas examined in this study, the natural background was set equal to a value corresponding to a visual range of approximately 200 kilometers. The high background visual range makes the percent degradation test quite conservative—very small concentrations of sulfates and nitrates can result in large values of calculated degradation.

The estimates of visibility impairment reflect the maximum daily average predicted values over the course of a year. A review of predicted daily average visibility impairment as a function of time of year for Shenandoah, for the "all plant" scenarios shows that high visibility impacts tend to occur most frequently in the summer months, although some peaks can occur at other times.

The impairment thresholds recommended by the FLAG guidance document are 5% for individual plants and 10% for the cumulative impact of all PSD plants. These levels are not as prescriptive as the SILs for other PSD pollutant modeling, and the FLMs can consider factors such as frequency, duration, and spatial extent of the predicted impacts in determining whether additional analyses are necessary. The visibility impacts for all of the individual power plants pass the individual source threshold, and all of the combined scenario impacts pass the multiple source threshold. The "all source" scenario for oil firing is shown to have lower impacts than the "all source" scenario for gas firing. This finding may seem unexpected, given the fact that emissions of many pollutants are typically greater from oil firing compared to gas. However, Mirant intends to switch to lower sulfur fuel oil for its *existing* units when the proposed new units begin operating. The reduction in emissions resulting from this fuel sulfur reduction is sufficient to offset some of the emissions from burning oil at the new units.

The conclusion of this visibility impact analysis for multiple power plants is that both individual and multi-source thresholds are met for the three Class I areas under consideration. The cumulative impacts of these three power plants represent only a limited set of the sources (i.e., all increment-consuming sources) that would have to be considered in a full multisource analysis. They are, however, the most likely sources to result in combined short-term impacts due to their proximity, and the combined impacts are substantially below multi-source thresholds. Since the combined impacts do, however, trigger some of the thresholds established

for single PSD sources, Class I area analyses for future plants should be reviewed carefully (once final parameters and locations are established) to determine if it would be appropriate at that time to expand the analysis to all increment-consuming sources. Moreover, power plants proposed in the future may not have the same opportunity that Mirant has to reduce fuel sulfur content to offset its oil firing emissions. Conditions should be considered in the licensing proceedings for each future power plant to restrict oil firing during the summer.

8.2 WATER SUPPLY

The potential exists for new power plants that are consumptive users of the river to be built in the Potomac River basin. PPRP was interested in evaluating the potential consumptive effect of new plants on the availability of water in the river. Therefore, the potential impact of the consumptive withdrawals from the Dickerson expansion, coupled with future consumptive withdrawals from two additional power plants located in the Potomac River Basin, were evaluated using the ICPRB PRRISM model (described in Section 6 of this report).

A baseline scenario (no new power plants in the Potomac River basin) and three potential power plant construction scenarios were evaluated to assess the range of potential impacts. The assumptions regarding power plant construction and corresponding water usage for each of the three scenarios are provided in Table 8-1. The first scenario was the expansion of the Dickerson plant with a maximum 8.3 MGD withdrawal. The results of this scenario were presented in Section 6.5.1 in the water supply chapter of this document. The second scenario included the Dickerson expansion and the construction of a second plant with a maximum consumptive withdrawal of 6.0 MGD (a total of 14.3 MGD). The third scenario incorporated the first two scenarios and the construction of a third plant in the region with a maximum consumptive withdrawal of 7.0 MGD (a total of 21.3 MGD). The consumptive use for each of the three power plant scenarios was added to the ICPRB's base case Potomac River water demand for the years 2010, 2020, and 2030.

Table 8-1 Power Plant Consumptive Use Scenarios Evaluated

	Total Consumptive Use (MGD)	Proposed Facilities Evaluated
Scenario 1	8.3	Dickerson expansion
Scenario	14.3	Scenario 1 plus a second power plant with a 6.0 MGD consumptive withdrawal
Scenario 3	21.3	Scenario 2 plus a third power plant with a 7.0 MGD consumptive withdrawal

Table 8-2 provides a summary of estimated impacts caused by an increase in consumptive use associated with the three potential power plants. The table summarizes the expected occurrence of water supply releases from upstream reservoirs over a theoretical 70-year period, assuming a recurrence of the past 70 years of hydrologic conditions, and the number of water release days for 2010, 2020, and 2030 projected water demand. The column labeled "existing" is the ICPRB analysis that predicts future regional water demand, without any assumed increase in power plant withdrawals. The second column shows the effects of the Mirant facility's consumptive use of 8.3 MGD during this period. The third and fourth columns show the cumulative effects of adding a second and third plant, respectively.

Table 8-2 indicates that the operation of all three power plants, assuming the worst-case of no curtailment of withdrawals during low-flow periods, would cause 58 more days of water supply releases over the 70-year period, about a 16 percent increase in the expected frequency of releases. However, this analysis is very conservative because under the MDE consumptive use regulation, withdrawals from the Potomac for each power plant would be limited to less than 1 MGD during periods of water supply releases. Under this limitation, the expected impact of one power plant would be negligible and the combined impact of three power plants, curtailed to 1 MGD of withdrawal each during low-flow periods, would be less than the impacts described above for one power plant not subject to curtailment of withdrawals during low-flow periods. Therefore, given the limitations imposed by the consumptive use regulations, the impact of three power plants on downstream Potomac River users is not expected to affect the ability of the water suppliers to meet regional water demands.

Table 8-2 Summary of Modeled Occurrence of Water Supply Release Days for Three Plants

	2010				2020				2030			
	Existing	**With Mirant**	**Mirant, Plus 1 Plant**	**Mirant, Plus 2 Plants**	**Existing**	**With Mirant**	**Mirant, Plus 1 Plant**	**Mirant, Plus 2 Plants**	**Existing**	**With Mirant**	**Mirant, Plus 1 Plant**	**Mirant, Plus 2 Plants**
Days of Release	195	205	217	230	268	286	297	309	359	385	405	417
Years with Releases	7	9	9	9	11	12	12	12	13	15	16	16
Years with Releases in June through September												
June	0	0	0	0	0	0	0	0	0	0	0	0
July	4	4	4	4	6	6	6	6	6	6	6	6
August	5	5	6	6	8	10	10	10	11	12	12	12
September	6	6	7	7	8	8	8	8	10	10	10	10
Average Monthly No. of Release Days for Years with Restrictions												
June	0	0	0	0	0	0	0	0	0	0	0	0
July	10.8	10.8	10.8	12	9.5	10.2	10.2	10.3	12.3	12.3	12.7	13
August	18.2	19	16.3	17.2	15	12.7	13.3	13.8	15.5	15.7	16.2	16.8
September	8.5	9.2	8.3	8.6	8.6	9.5	9.8	10.3	9.1	9.2	9.8	9.8

Since proposed and potential future power plants may rely on water withdrawals from the river to operate at full capacity, there is a risk that water supply interruptions could affect the ability of these facilities to meet maximum power demands. Therefore, each plant should be required to maintain a minimum amount of on-site water storage sufficient to assure the availability of full generation capacity for, at least, the maximum historic annual duration of peak electrical demand events, assuming that withdrawals from the Potomac are limited to 1 MGD during drought conditions.

8.3 AQUATIC IMPACTS

The impacts considered in this analysis that could potentially have cumulative significance include thermal impacts from heated water discharge and physical impacts to river stage and habitat as a result of water withdrawals. Entrainment and impingement impacts to aquatic organisms would not increase significantly over existing impacts, even if all three potential facilities are built. This is because the proposed Dickerson expansion will withdraw water from the existing plant's discharge canal rather than from the Potomac River directly, and the two other potential plants (Eastalco and the greenfield facility) would represent a new combined withdrawal of less than 20 mgd. At maximum, this would increase withdrawals in that stretch of the river by less than 1 percent. The incremental increase in entrainment and impingement associated with this small increased withdrawal is expected to be insignificant.

8.3.1 Thermal Impacts

To evaluate potential cumulative impacts from thermal (heated) discharges, PPRP compared the worst-case temperature increases and thermal loading from the proposed new power plants to water temperature conditions associated with the existing Dickerson station. Table 8-3 lists these existing and potential new thermal discharges to the Potomac. The calculations for potential facilities assume a 2-MGD discharge from each, for a total of 4 MGD. The Dickerson expansion is assumed to withdraw water from the Dickerson discharge canal at a rate of 10 MGD, of which 8 MGD is consumed (lost to evaporation in the cooling tower), resulting in a net decrease in thermal loading from the Dickerson discharge canal back to the river. The estimated withdrawal rate for Dickerson is 400 MGD, of which 4 MGD is consumed prior to discharge back to the river.

Table 8-3 Cumulative Thermal Discharges to the Freshwater Potomac River in Central Maryland from Existing and Potential Future Power Plants

Facility combination	Thermal load, BTU/day	Temperature Increase
Dickerson (existing)	8.3×10^{10} (permit limit) 7.257×10^{10} (calculated)	permit limits of 22 °F (summer), 32°F (winter)
Dickerson expansion (proposed in this current licensing case)	0.0533×10^{10}	32 °F (maximum assumed for worst-case analysis)
Dickerson + expansion	7.074×10^{10}	22.05
Two additional facilities with closed-cycle cooling (Eastalco and greenfield facility)	0.110×10^{10}	32 °F (maximum assumed for worst-case analysis)
Dickerson + expansion + 2 additional facilities	7.181×10^{10}	22.15

These results show that the combined addition of the Mirant Dickerson expansion and two additional facilities in the vicinity of Point of Rocks would result in a net decrease in the thermal load of about 760 MBTU per day, a reduction of approximately 0.1 percent of the existing (calculated) thermal load at Dickerson. The combined maximum temperature of all of the combined discharges would increase from 22°F to 22.2°F, assuming as a worst case that they all occurred at the same location.

Calculations show that the thermal mixing zone for Dickerson would not change with the addition of the discharge from the combined cycle expansion. Although the thermal load would decrease and the temperature would increase very slightly, the thermal plume from the Dickerson discharge canal would not change.

We also modeled the mixing zone for a theoretical new discharge of 2 MGD with the expected thermal characteristics of either Eastalco or the speculative greenfield plant. Assuming a discharge with a 17°C (30.6°F) differential compared to ambient stream temperature, during low flow (7-day, 10-year) conditions the 2°C thermal limit would occur at a distance of 14 feet in summer and 22 feet in winter, downstream from the point of discharge. Assuming two facilities discharged at the same location under the same conditions but with twice the discharge rate, the 2°C thermal limit would be reached at a distance of 18 and 23 feet in summer and winter, respectively. This very small area would have little adverse effect on the Potomac River ecosystem.

8.3.2 *Water Quality Impacts from Discharges*

The existing NPDES permit for Dickerson, issued by MDE, only require specific monitoring of copper and chlorine. A review of a recent six months of Discharge Monitoring Reports did not list levels of these chemicals greater than the permitted level. Any impacts of chlorine from new or expanded facilities are expected to be short-term in nature and the chlorine would be consumed by natural processes relatively quickly beyond the point of discharge. Closed-cycle cooling facilities are not expected to discharge any toxic contaminants other than chlorine and then only for short periods. Chlorine dissipates quickly in the receiving water and there would be no cumulative impact from additional facilities that discharge chlorine intermittently and within regulatory criteria.

8.3.3 *Water Consumption Impacts on River Stage and Habitat*

The relative effect on river stage and habitat of additional water withdrawals from the Potomac River was evaluated by estimating the changes that would result from an additional 24 MGD consumption along the river. This volume was used as a conservatively high estimate of the cumulative consumptive losses from the three potential plants under consideration.

Changes in river stage due to this additional potential withdrawal are based on the stage-discharge relationships established by the U.S. Geological Survey for the gaging stations on the river at Point of Rocks and at Little Falls Dam at the lower end of the nontidal freshwater reach of the river. Table 8-4 shows the change in stage that would result from a 24 MGD (37 cubic feet per second, cfs) decrease in flow at each of these gaging stations. These changes were calculated for the lower end of the rating curve where the decrease in flow would be the greatest percentage drop in flow, as would occur during a drought condition.

Table 8-4 Change in River Stage from 3 Additional Closed-Cycle Power Plants Consuming 24 MGD (37 cfs) of Water Upstream from these Gaging Stations during a Drought Condition

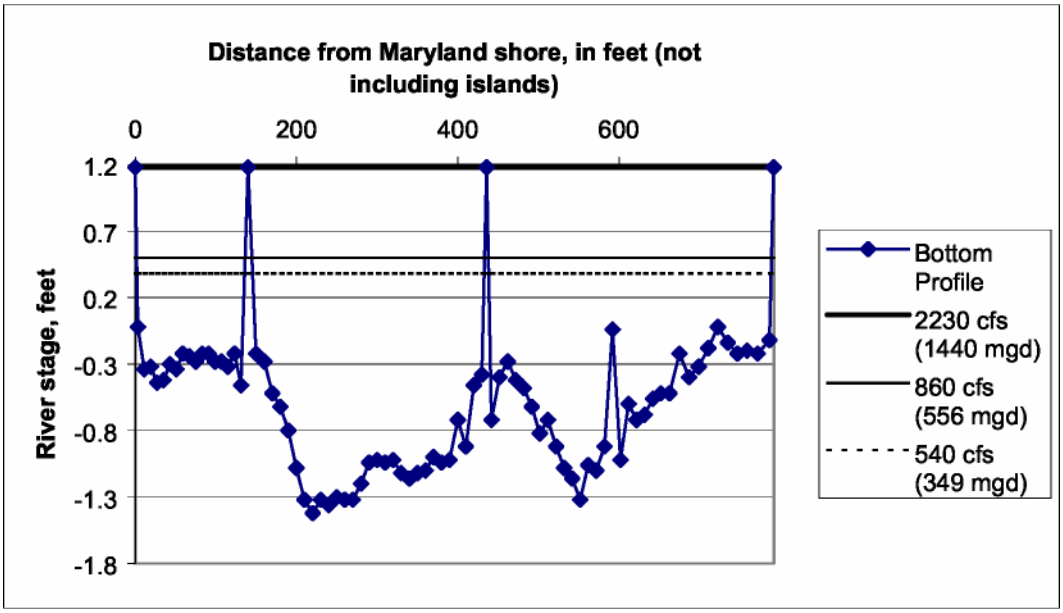
Parameter	Gaging Station					
	Point of Rocks (USGS 01638500) - Rating Table No. 24			Little Falls Dam (USGS 01646500) - Rating Table No. 8		
	Before withdrawal	After withdrawal	Reduction	Before withdrawal	After withdrawal	Reduction
Flow, cfs	842	805	37	458	421	37
Stage, feet	0.49	0.47	0.024	2.40	2.38	0.02
Stage, in.	5.88	5.59	0.29	28.80	28.58	0.22

These results show that even under a drought scenario, the change in river stage would be less than one-third inch at Point of Rocks and less than one-quarter inch at Little Falls, assuming withdrawals were not curtailed during this scenario. Under higher flow conditions, the change in stage would be less than during these worst-case low flow conditions.

A river cross-section made by the USGS at Point of Rocks is illustrated in Figure 8-2. The highest water surface in this illustration is shown at a stage on the USGS gage of 1.2 feet, which occurred for the flow at which these measurements were made (2230 cfs or 1440 MGD). Also shown are the river stages at the 7-day, low flow which occurs, on average, once in ten years (7Q10 – 860 cfs or 556 MGD) and for the lowest flow in the period of record, 540 cfs (349 MGD)[i]. The change in stage from an additional loss of 37cfs (24 MGD) due to consumptive use by new power plants would be negligible – if plotted on the graph in Figure 8-1, the difference would be undetectable from the dashed line indicating the stage at the lowest recorded flow, 540 cfs.

[i]Note that a stage of zero feet on this gage is an arbitrary water depth and river stages less than zero feet do not indicate zero flow.

Figure 8-2 Cross-section Profile of the Potomac River at Point of Rocks during Low-Flow Periods



Reduction in habitat resulting from potential additional water consumption from the Potomac River is expected to be greatest in the Great Falls reach of the river, due to the large water supply withdrawals which already occur in that area. The only available flow-related habitat information from that area was collected in the late 1970s and is reported in DNR's 1981 study of environmental flow-by (DNR 1981). In that study, several transects were measured for depth and velocity at several flows and model simulations were made to estimate habitat area at various flow levels. The best habitat in the Great Falls to Little Falls reach was determined to be in the Carderock area. Estimated habitat from this section was therefore used to calculate the change in habitat in this entire reach, as an environmentally conservative estimate, assuming a river length of 10 miles to represent this reach. Table 8-5 shows the results of these calculations and indicates that even at very low (drought) flow, wetted area would be reduced by only 0.8 percent of the total. This is a very conservative estimate since it assumes ideal habitat occurs for the entire length of the reach and that flow reduction measures would not be imposed during a drought scenario.

Table 8-5 ***Habitat Reduction in the Lower Freshwater Potomac River Due to Potential Closed-Cycle Cooling Water Withdrawals from 3 Facilities in Central Maryland, Based on Historical Habitat Model Results Presented in MDNR (1981) for Transects in the Carderock Area***

Q, cfs	Wetted Area, sq. ft. per 1000 ft. of river length	Wetted Area per unit flow (sq.ft. per cfs)	Wetted Area Loss from 37 cfs (24 MGD), sq. ft.	Percent change in wetted area due to loss of 37 cfs (24 MGD)
465	890,000	187	6900	0.78%
775	949,000	59	2100	0.22%

8.4 TERRESTRIAL/WATERSHED IMPACTS

The potential Eastalco and greenfield power plants are located in the Tuscarora and Point of Rocks watersheds, respectively, in Frederick County. Mirant's Dickerson plant is in a separate watershed geographically removed from these other plants, and therefore there is no potential for cumulative watershed impacts. Specifically, watershed impacts resulting from changes in vegetation and runoff patterns do not accumulate across drainage boundaries.

Other terrestrial impacts, such as habitat fragmentation that could cross watershed ridgelines, are possible, but are not likely to result in the case of Mirant Dickerson facility. Specifically, the loss of 7 acres of forest at Dickerson involves an isolated area of low habitat value confined to the perimeter of the wooded parcel; it would not fragment the existing forest at the site. In addition, the forest losses projected for the two potential plants in Frederick County (likely between 10 and 20 acres) are expected to be of fairly low wildlife quality. The high-quality Catoctin Ridge and C&O Canal forest would be unaffected, except potentially by linear facility construction. Therefore, the loss of forest that would be cleared for the cooling towers and construction laydown area at the Mirant Dickerson facility would not combine with habitat loss from other potential plants to produce a significant adverse cumulative impact. It should be noted that the CPCN for Mirant Dickerson includes a condition for mitigating the loss of forest by establishing 7 new acres of forest.

8.5 CUMULATIVE SOCIOECONOMIC IMPACTS

8.5.1 Employment and Population

Construction and operation of up to three new electric generating facilities would minimally affect the local economies and populations of western Montgomery and southern Frederick counties. Construction employment in the host counties would increase slightly, and construction traffic might periodically congest local roads and intersections, particularly during peak construction periods. In no case is construction employment demand expected to cause workers to permanently migrate into the area. In the absence of employment migration, population and housing trends would be unaffected by construction activities. Employment effects from operation of the proposed facilities are expected to be minimal since the operational employment requirements are relatively small in the context of the economies of Montgomery and Frederick counties.

Construction and operation of the generating facilities would place new demands upon certain community services, primarily emergency and protective service, although these services are affected more by population than employment distributions. A large-scale emergency at any of these facilities would require a coordinated response from local, state and federal agencies for which they must prepare, just as they prepare for potential emergencies at other businesses in the region.

8.5.2 Traffic

Power plants are minor traffic generators when they are operational, particularly when the primary fuel is supplied by pipeline. As a result, traffic congestion, to the extent it occurred in southern Frederick and western Montgomery counties, would not be attributable to the proposed generation facilities. During construction, power plants can be major traffic generators from commuting construction workers and service vehicles delivering materials to the site. During peak construction periods, the additional traffic can cause congestion on local roads and nearby intersection, which affects the flow of vehicles that normally use the road system. These impacts, however, can be handled by specific conditions associated with individual project CPCNs.

Cumulative traffic impacts would depend upon the construction schedules of the proposed facilities, but in any event, would be mitigated by distance since traffic congestion associated with major construction projects tends to be localized. As distance from the traffic generator increases, vehicles tend to disperse simply because there are more route choices available. Even if peak construction schedules coincided, congestion would be distributed to

different parts of the county.

Point of Rocks in Frederick County could experience higher traffic loads over extended periods due to its strategic location at the termination of MD 28 at US 15, which is a major north-south route into northern Virginia, Frederick, and points east and west along I-70. MD 28 in Point of Rocks would probably experience westbound construction worker traffic from the Mirant project at Dickerson and development in the vicinity of Doubs. Construction of the Eastalco facility would affect traffic in Point of Rocks less because alternative routes to US 15 exist. Whether the additional traffic would create congestion or increase safety concerns cannot yet be determined because of the uncertainty of construction schedules. However, traffic mitigation and safety would be addressed by specific conditions within CPCNs.

8.5.3 Cultural Resources and Visual Impacts

On-site historical and archaeological resources would be protected by CPCN conditions. Although views of or from nearby historical properties could potentially be impacted by individual facilities, mitigation would offset most visual effects. There are few perspectives that have been identified from which more than one facility would be visible, so in this context there would be few cumulative effects on specific historical properties.

That Montgomery and Frederick counties might host up to three additional power plants would add industry to the economic and visual landscape, but the predominant agricultural character of the area would remain intact. Industry is already present in the region, yet the area is still perceived to be agricultural and rural. Landscape buffering around the facilities and distance between the proposed sites and would also diminish the perception of industry. In other words, most views would be of one facility only, not several. Visual impacts of all proposed generation facilities would be cumulative only from unique locations such as Sugarloaf Mountain, where the viewer has a broad perspective of the landscape.

There are few guidelines for evaluating how the landscape would be perceived with the introduction of the proposed power plants into views from Sugarloaf Mountain. Clearly, the facilities would increase the number of industrial structures that are visible. On the other hand, existing generation facilities at Dickerson would mask the visual effects from the Dickerson expansion, while the potential facility at Eastalco would be located adjacent to the existing aluminum manufacturing facility, which has a dominant visual presence. Because of its relatively low profile, the Doubs substation would only partially offset visual intrusion from any proposed

greenfield generation facility located in the immediate vicinity of Doubs. With relatively low profiles, none would dominate the landscape from Sugarloaf Mountain.

In summary, cumulative visual impacts from the development of the proposed generation facilities would not be perceived from most perspectives. From highly selective locations, views would contain more than one facility, although the views of industrial structures would not be highly prominent. That the cultural landscape is not intact suggests that associated values are less likely to be compromised by view modifications resulting from the physical presence of the proposed facilities.

Adding up to three power plants to western Montgomery and southern Frederick counties would increase the number of sky glow sources in an area that is primarily rural. This could decrease visibility of objects in the night sky from some locations. However, the relatively small footprints of the facilities make them less of a threat to visibility than suburban sprawl, which is particularly acute in southern Frederick County. The facilities could also be sources of light trespass onto neighboring properties, although light trespass can be effectively mitigated by the adoption of appropriate lighting practices and systems. It is unlikely that the sky glow from the proposed generation facilities would be strictly additive since distance would separate light sources. Light trespass is localized so that impacts, to the extent they occurred, would not be cumulative.

8.5.4 Property Values

Given the industrial nature of the land containing the Mirant and Eastalco properties, their influence on nearby property values may be insignificant, if only because surrounding properties have already been devalued. The Doubs site would be surrounded by farms and scattered residences, where property values have been less affected, in a negative way, by development. This project may therefore have a higher potential for affecting nearby property values. Mitigation in the form of buffering has been shown to be an effective method of protecting surrounding property values from devaluation.

Empirical research has failed to yield a consistent relationship between property values and distance from noxious facilities. This does not mean that property value effects from new generation facilities in southern Frederick and western Montgomery counties could not occur. The literature generally concurs that increased perceived risk around hazardous facilities lowers property values and that media coverage and high prior risk perception increase current perceived risk (McCluskey and Rausser 2001). Gas-fired generation carries lower risk than many other electric generation

technologies. As such, property values may be less affected than currently perceived.

8.5.5 Land Use

Land use is perhaps the most complex socioeconomic issue. In Montgomery County, the facility would be sited in an industrialized area within the county's Agricultural Reserve. Though zoned RDT (Rural Density Transfer), Montgomery County has traditionally rezoned as Industrial the footprints of facilities built within the Dickerson property. In Frederick County, the Eastalco facility would be a consistent use for the land on which it is proposed, but development of a greenfield facility at Doubs would displace at least part of the acquired properties from productive agricultural use and would locate an industrial facility outside the Growth Limit for Point of Rocks. It is uncertain whether the Frederick County Board of Appeals would grant special exceptions to permit construction and operation of a power plant on agriculturally zoned land in the absence of a CPCN.

While the CPCN process preempts county zoning, it is not intended to contradict the visions for these areas, as articulated in local comprehensive land use plans and state programs such as Smart Growth. In Montgomery County, the proposed Mirant project would be located adjacent to existing generation facilities and completes a project for which a CPCN was originally granted in the early 1990s. Although the facility is not within a Priority Funding Area (PFA), the property that would be developed is clearly industrial in nature. This does not suggest that Montgomery County's Agricultural Reserve is an appropriate location for electric generation facilities, but it is important to note that the county has developed resource recovery and composting facilities adjacent to the Dickerson site, has permitted a landfill nearby and plans to develop a major equestrian recreation facility in the area with the help of State funding. These county-initiated projects are as likely to shape the character of western Montgomery County as the proposed expansion of the Dickerson generating facility.

In Frederick County, the Eastalco facility would be located in industrially zoned land and would be consistent with the county's Comprehensive Plan. In contrast, a greenfield facility at Doubs would be outside the Growth Limit and PFA for Point of Rocks. Even so, construction and operation of the greenfield facility would require no growth-related funds from the State, and probably would not violate County level-of-service standards for public facilities.

No projects are within areas identified with Maryland's Rural Legacy Program, nor are they located within green hubs or green links associated

with Maryland's GreenPrint Program. The Dickerson and Eastalco properties contain prime farmland that could potentially be lost if the facilities are constructed, and some land near Doubs is also considered prime farmland. It is not known whether any prime soils would actually be consumed by these projects.

In summary, developing new electric generating facilities western Montgomery and southern Frederick counties would have an uncertain long-term effect on local land use. Many issues are project-specific and will be addressed during formal application proceedings for each facility. Cumulative ones relate to the conversion of land and transformation of the landscape in mid-Maryland from agricultural to industrial. The proposed facilities would consume relatively few acres and, in the case of Mirant and Eastalco, would be adjacent to existing industrial facilities. In the absence of agglomeration economies and within a strong regulatory framework for controlling land use, there is little to suggest that development of these facilities would encourage additional industrial development in the area without local sanction.

8.6 SUMMARY OF CUMULATIVE IMPACTS

A range of environmental and socioeconomic factors were evaluated to determine the potential for adverse impacts from Mirant's proposed expansion, in combination with additional power plants that may be proposed for the region in the foreseeable future. Conclusions within each of these topic areas are summarized below. It should be noted that the cumulative impact analyses described in this section were based on speculative information and assumptions regarding the plant characteristics of facilities that may be proposed in the general vicinity of Dickerson; any conclusions regarding impacts will need to be thoroughly re-evaluated as part of future CPCN licensing cases.

Air Quality – The air quality modeling showed potential cumulative impacts to visibility in Class I areas as a result of oil firing. Conditions should be considered in the licensing proceedings for each potential future plant to restrict oil firing during the summer. This is included in the State's recommended licensing conditions for the current Mirant case.

Water Supply – As a result of existing limitations on water use during low-flow periods imposed under the Potomac River consumptive water use regulations, the addition of up to three power plants is not expected to result in a significant change in the ability to meet water demands for downstream users. However, power plants that rely on Potomac River

water for cooling may be vulnerable to possible restrictions on their generation output during extreme low-flow events. Therefore, these plants should be required to maintain a minimum amount of on-site water storage sufficient to assure the availability of full generation capacity for, at least, the maximum historic annual duration of peak electrical demand events, assuming that withdrawals from the Potomac are limited to 1 MGD during drought conditions. This is addressed in the State's recommended licensing conditions for Mirant's proposed expansion.

Aquatic Biota – With the use of improved water intake technologies required under EPA's proposed 316(b) regulations, the entrainment and impingement impacts at each new intake on the Potomac will be minimal and cumulative effects will be negligible. Temperature increases in the river due to thermal discharges from Mirant and up to two new power plants on the Potomac would be negligible. No cumulative thermal or discharge effects would be expected.

Terrestrial Life/Watersheds – Cumulative impacts on terrestrial and watershed assets would be very unlikely unless multiple facilities affected a common watershed. No other plant within the cumulative assessment study region addressed in this report is located in the same watershed as the Dickerson site, and therefore cumulative impacts are not expected. Given the fact that Mirant will be required to plant 7 acres of trees to compensate for the loss of on-site forest, the company's proposed expansion will have no significant adverse impact on terrestrial resources. However, for future power plant proposals in nearby watersheds that may be highly degraded, licensing conditions should be considered to help improve habitats and vegetation.

Socioeconomic Factors – Individual power plant facilities affect the surrounding community to some degree, for instance by increasing traffic volume (especially during construction) and precluding the use of land for other uses. The combined effects of up to three power plants in southern Frederick and western Montgomery counties are not expected to be significant, assuming that CPCN conditions are crafted to address site-specific concerns in each case.

9.0 SUMMARY AND RECOMMENDATIONS

PPRP has conducted a thorough review of the potential environmental and socioeconomic impacts from the proposed expansion of Mirant's Dickerson power plant. In consultation with other State agencies, PPRP has developed recommendations to the PSC for licensing conditions that should be imposed upon the facility to address those potential impacts. This section summarizes the key elements of PPRP's analyses and describes the findings. The initial recommendations to the PSC are included as Appendix A to this report.

9.1 AIR QUALITY

9.1.1 Source Characterization and Control Technology

The proposed project will result in a net emissions increase of 22.8 tons per year of volatile organic compounds (VOCs). The project results in a reduction in nitrogen oxides (NO_x) emissions of approximately 0.5 tons per year, taking into account NO_x reductions that are planned for the existing coal-fired Units 1, 2, and 3. Because the project will not exceed the 25 tons per year threshold to be considered a major new source, the new units are not subject to nonattainment new source review and therefore are not required to meet the Lowest Achievable Emission Rate (LAER) for NO_x or VOCs. Nevertheless, the units will be equipped with selective catalytic reduction (SCR) to achieve NO_x emission rates of 4.5 parts per million (ppm) from Unit 4 and 3.5 ppm from Unit 5 when firing natural gas. Other important emission control measures include the use of an oxidation catalyst to remove carbon monoxide, and use of low sulfur (0.05 percent) fuel oil during periods of oil firing.

9.1.2 Compliance with Air Quality Standards

Mirant performed dispersion modeling intended to determine compliance with applicable ambient air quality standards for each criteria pollutant with a significant emissions increase from the proposed Dickerson expansion -- namely sulfur dioxide, particulates, and carbon monoxide. The modeling considered the impacts of the proposed new units combined with other air emission sources in the area, as appropriate. Based on the information provided by the applicant, supplemented with a significant level of independent analysis conducted by PPRP and ARMA,
PPRP and ARMA conclude that criteria pollutant impacts will comply with air quality standards.

9.1.3 *Impacts of Netting*

Annual NO_x emissions from the proposed Mirant expansion will be a maximum of approximately 840 tons per year, mostly from the CT/HRSG units. A decrease in emissions from the coal-fired Units 1-3 is proposed to provide enough of a reduction in NO_x emissions to "net out" of certain air quality regulatory programs. In order to be creditable for use in netting, federal and state regulations require that the emissions decrease must create approximately the same level of benefits to public health as those impacts attributed to the proposed emissions increase. PPRP and ARMA evaluated the impact of decreasing NO_x emissions from the coal-fired units and compared that with the impact of the new units' NO_x emissions. Of the four types of impacts examined -- nitrogen deposition, air quality standards, ozone levels, and visibility in Shenandoah National Park --only visibility showed a significant degree of difference. Visibility modeling showed that, under some meteorological conditions, short-term impacts on the park from the proposed new Mirant units (when burning oil) are somewhat greater than the corresponding benefits derived from reducing the coal-fired units' NO_x emissions.

PPRP and ARMA conclude from this analysis that the following conditions should be included in the CPCN:

- During the months of May through September -- when ozone levels are highest -- Unit 5 is prohibited from oil firing during simple cycle operation; and
- Emissions from the coal units must meet the NO_x emission limit of 0.36 lbs/MMBtu for an averaging period not less than 3 hours, to ensure that beneficial effects are achieved.

9.2 *SURFACE WATER QUALITY AND AQUATIC BIOTA*

The proposed combined cycle plant will remove some of the heated water from the discharge canal at the existing once-through cooling system for Dickerson, and evaporate the water in cooling towers. The combined maximum temperature of the combined discharge would increase from 22°F to 22.05°F, using worst-case assumptions of temperature increase. Since cooling water withdrawals and discharges will be made from the existing Dickerson discharge canal, there will be no entrainment, impingement, or thermal impacts associated with the new project. Cooling tower blowdown constituents are not expected to significantly change the characteristics of the Dickerson discharge to the Potomac River. The slight increase in consumptive water use is not expected to significantly change

the amount of aquatic habitat or biota dependent on that habitat even during low flow conditions. With proper design and placement of stormwater management features, impacts to surface waters will be minimal.

Mirant will be required to obtain from MDE a modified discharge permit for the Dickerson facility prior to operation of the new units. The permit will require Mirant to monitor the concentration of residual chlorine in the cooling tower blowdown and to ensure compliance with the State limit on residual chlorine in the blowdown.

9.3 TERRESTRIAL RESOURCES

The new construction of Units 4 and 5 of the Dickerson facility will affect about 70 acres of land, the majority of which have been affected by previous activities. About 55 acres will be used for permanent facilities associated with Units 4 and 5, while about 12 acres are associated with construction laydown and parking. Large areas of ecologically significant habitat have already been preserved on the 1,015-acre Dickerson site. These areas will remain unchanged as a result of the addition of Units 4 and 5.

Site construction will involve the clearing of approximate 20 acres of ruderal grasslands and 7 acres of mixed deciduous forest for the cooling towers and construction laydown. No wetlands will be affected by the proposed construction. Under Montgomery County's forest conservation plan, Mirant will be required to replace the 7 acres of forest to be cleared. Planting of new trees will likely be done on the Mirant site itself.

Although two rare invertebrate species are known to occur on the project site and four species of concern have occurred in the vicinity of the Dickerson site, none of the areas to be disturbed by construction contain appropriate habitat (i.e., habitat expected to be located near the Little Monocacy, its tributaries, or the C&O Canal) for those species. Therefore no impacts to those species are expected.

9.4 ACCIDENTAL RELEASES AND GROUND WATER IMPACTS

Mirant will have to prepare an updated Spill Prevention, Control and Countermeasures (SPCC) Plan and obtain a modified Oil Operations Permit from MDE to cover new oil storage tanks and transfer facilities associated with the proposed project. New facilities will also be constructed for aqueous ammonia used in the emissions control system. Mirant has not specified the concentration of ammonia in the aqueous ammonia solution;

however, if the concentration is 20 percent or greater, the company must prepare a Risk Management Program for the U.S. Environmental Protection Agency to address accidental release prevention.

Prevention of accidental releases will protect ground water resources underlying the site. Mirant will collect and manage stormwater from the developed portions of the property, preventing runoff or infiltration of potentially contaminated stormwater. The existing on-site well can supply the potable water needs of the expanded facility within its existing appropriation limit.

9.5 SOCIOECONOMIC AND CULTURAL IMPACTS

9.5.1 Traffic

Mirant estimates that, on average, 250 construction workers will be employed on-site, although the number could be as high as 350 during peak construction periods. Since some degree of car-pooling can be expected, the number of vehicle-trips generated by construction activities will probably be less than the number of workers. Vehicles delivering goods and services throughout the day would generate additional traffic. Thus, the number of vehicle-trips to and from the plant could exceed 700 during peak construction (up to 350 inbound and 350 outbound plus delivery vehicles).

Despite this additional traffic, major road segments that service the Dickerson site are expected to provide acceptable levels of service, even during peak commuting hours. This conclusion is based upon review of traffic impact estimates provided by Mirant and from PPRP's independent analysis using Mirant's construction traffic distribution assumptions. Most of the additional traffic would flow in the opposite direction to existing rush hour traffic if the labor force originates primarily from the Washington metropolitan area, as expected. As a result, levels of service on local highway segments are expected decline, but not to unacceptable levels.

For MD 28 eastbound, which will carry most of the construction traffic leaving the Dickerson site, the level of service on the segment between Martinsburg Road and MD 109 is projected to decline from "B" to "C". This means that for a short period during the afternoon rush hour, speeds on MD 28 will likely be slightly lower because of the higher volume and less opportunity for vehicles to pass. MD 109 from Beallsville to Barnesville Road will also be affected for a brief period in the afternoon by northbound traffic from MD 28 comprised of construction traffic arriving from the west and commuters returning to the area from the east. However, the increased

traffic volume and inconvenience it would cause would occupy only a small part of the peak traffic period in the area.

Much of the increased traffic volume would flow through the intersection of MD 28 and MD 109 in Beallsville. This is a simple four-leg signalized intersection with both highways having one lane in each direction. Mirant should monitor the performance of the intersection during the period when construction traffic volume is greatest and work with the State Highway Administration to take appropriate steps for reducing congestion at this intersection. These steps might include extending the cycle length of the signal and allocating additional green time to MD 28 traffic, or staggering shift schedules to moderate construction worker traffic leaving the Dickerson site in the afternoon.

The intersection of Martinsburg Road with MD 28 is the major access point for traffic to and from the plant site. Mirant will position a Traffic Management Specialist to help minimize excessive delays due to queuing at that intersection during morning and evening shift changes in the peak construction period.

9.5.2 Land Use

Most of the Dickerson property is zoned RDT (Rural Density Transfer), although land occupied by existing generation facilities is zoned I-2 (Heavy Industrial). Neighboring land uses are primarily agricultural, although the Montgomery County Resource Recovery Facility (RRF) is adjacent to the south. New construction for the proposed expansion would occupy about 70 acres of the Dickerson site, most of which had already been disturbed during the construction of existing facilities. Development of the project would not accelerate the conversion of agricultural land in western Montgomery County.

9.5.3 Visual Quality

The Dickerson generating station is a prominent landscape feature looking southeast from the summit of Sugarloaf Mountain, where the tall stacks of the coal-fired units are clearly visible. Views from Sugarloaf tend to be directed toward the Dickerson site because the only sighting of the Potomac River lies in that direction. The composting shed of the Montgomery County RRF is also clearly visible from Sugarloaf, as is a large metal barn and outbuildings on MD 28 in the general direction of the Mirant facilities. The existing combustion turbine stacks can be seen from the summit of Sugarloaf, but are less visible than the RRF or the coal units. From some perspectives, the visual impact of the Dickerson facility is considerable, although the combustion turbine structures are generally the least intrusive.

Stacks associated with the new combined cycle operations will be 190 feet tall, about 60 feet higher than the existing combustion turbine stacks. These would still be less prominent than the stacks of the coal-fired units and the RRF, but visible from several perspectives nonetheless. Most new structures would be less than 50 feet high and would be seen only in a few views. Mitigation measures, such as painting structures a viewer-neutral color and utilizing minimal night lighting, may partially offset visual impacts. Mirant has already committed to installing plume abatement systems to reduce the visibility of water vapor released from the mechanical draft cooling towers.

9.6 NOISE IMPACTS

Based on projection of noise to potential receptor locations around the property boundary, construction noise will meet relevant regulatory standards, provided that major construction activities are limited to the hours between 7 a.m. and 5 p.m. on weekdays. The majority of construction activities will take place in the area of the power block, which is located centrally in the site. The nearest property boundary is about 1800 feet from the power block of the combined cycle facility.

Mirant should direct its contractors to use alternatives to audible warning devices (back-up beepers) outside the weekday hours of 7 a.m. to 5 p.m. as recommended by the Montgomery County Department of Environmental Protection. As proposed in the CPCN application, Mirant should also notify nearby residents of the expected schedule for steam venting, which will produce high-intensity sound for brief periods, prior to such events.

The proposed combined cycle facility is expected to have a moderate noise impact on nearby receptors, although it will not exceed the numerical standards established by Montgomery County and the State of Maryland. At Receptor 1, adjacent to the C&O Canal Historic Park and the Potomac River, ambient noise levels are currently dominated by the intake pumps for the existing Dickerson cooling system. Noise from the new units will not be perceptible in the vicinity of the existing station, when those coalfired units and their cooling system are operating. At receptors along the northern and southern property boundaries, nighttime minimum noise levels are now extremely low (34 dBA). Although the facility noise will not exceed the nighttime standard of 55 dBA, it may cause a significant increase (up to 15 dBA) in the “noise floor”, the background noise level that is heard in between intermittent automobile traffic or other similar nighttime noises.

Because the calculation methodology does not take into account atmospheric and ground absorption, these projections of future noise from the proposed units are conservatively high. We expect that actual sound

pressure levels caused by the facility will be somewhat lower, and the corresponding impacts (increases over ambient) will be less.

The applicant should update the analysis of noise impacts before the plant begins operation. This updated analysis should take into account the actual vendor specifications for all major noise-generating plant components (turbines, stacks, fans, transformers, etc.), as well as all noise control measures that have been incorporated into the design. The applicant will further be required to conduct noise monitoring after the facility begins operation, to verify that the facility is operating in compliance with applicable State and local noise regulations.

9.7 WATER SUPPLY

9.7.1 Water Requirements

The proposed combined cycle facility will need water primarily for condenser cooling in the steam cycle. Recirculating water will be used in mechanical draft cooling towers to remove heat from the system. Water lost from the cooling system through evaporation will be replenished using makeup water pumped from a new intake structure located on the existing discharge canal for the Units 1, 2, and 3 once-through cooling system. Additional process water uses will include injection for NO_x control and power augmentation, general plant service water, evaporative cooling water for the turbine inlet foggers, HRSG makeup water, and fire protection water. These water demands will also be supplied from the existing discharge canal.

Discharges will consist principally of cooling tower blowdown – a portion of the circulating cooling water that is removed to prevent buildup of dissolved solids in the towers. The difference between the amount of water withdrawn and the amount of water returned to the source represents the proposed facility's "consumptive" use of water. Over the course of a year, the average consumptive use for the proposed facility will be 6.6 million gallons per day (MGD), with a maximum daily and consumptive use of 8.3 MGD.

9.7.2 Impact Assessment

Maryland has promulgated regulations governing consumptive use of water resources in the Potomac River basin (COMAR 26.17.07). Under these requirements, new sources consuming more than 1 MGD must provide upstream storage to augment the river flow during low flow conditions, or

reduce consumptive use to less than 1 MGD during lowflow periods. PPRP has evaluated the impacts from an additional 1 MGD consumptive use on the river during low-flow conditions, and concluded that there will be minimal impact to downstream water users. The new consumptive use also will have no significant effect on the ability of the downstream water suppliers to maintain the minimum environmental flowby established for protection of the aquatic environment in the Potomac River estuary.

During low-flow periods when Mirant is required to reduce consumptive use to less than 1 MGD, Mirant would be able to operate Units 4 and 5 in simple cycle mode only, representing a decrease of about 400 MW in generating capacity. Mirant has also proposed to provide on-site water storage to assure the availability of the full generating capacity of the proposed plant for peak electrical demand hours that may occur during low-flow events. It was calculated in Chapter 6 that just under 20 million gallons of water storage on site would be sufficient to ensure that the plant would be available at full capacity to meet the historic maximum annual number of hours of peak electrical demand events, even if the consumption of water from the Potomac River were limited to 1 MGD through an entire year.

The recommended licensing conditions included in Appendix A would require that Mirant provide on-site water storage by the time the combined cycle units begin operating, with at least one 10-million-gallon storage tank constructed along with the first combined cycle unit and the second storage tank available by the on-line date of the second combined cycle unit. Further, PPRP recommends that additional tanks be installed in the event that 90 percent peak demand events coincide with low-flow events frequently enough to cause the plant to be unavailable when needed.

9.8 COMPARATIVE AND CUMULATIVE ANALYSES

Following the December 2002 recommendations of a State agencies' task force, DNR has conducted two supplementary studies regarding the proposed Mirant Dickerson expansion:

- An evaluation of the environmental and socioeconomic issues associated with the Mirant proposal, as compared with a preliminary proposal for a generating station at the Eastalco aluminum facility about 25 miles northwest of Dickerson; and
- An analysis of the potential for cumulative adverse impacts from construction and operation of the Mirant expansion, the proposed plant at Eastalco, and a speculative third generating facility near Point of Rocks in Frederick County.

In general, the comparative analysis indicates that, while there are some differences between the two, neither the Mirant proposal nor the potential future plant at Eastalco can be deemed clearly superior to the other based on currently available information.

With respect to cumulative impacts, DNR evaluated those impact areas that were deemed to have the potential for cumulative effects: air emissions, water withdrawals, water discharges, terrestrial impacts, and socioeconomic impacts (e.g., traffic and land use). These evaluations concluded that the combined impacts of Mirant's proposed expansion plus two potential facilities in Frederick County are not significant in a cumulative sense, with the exception of potential impacts on visibility and water supply as discussed above. These issues are addressed in the State's recommended licensing conditions for Mirant's proposed expansion. The comprehensive CPCN licensing review of future power plants should continue to evaluate cumulative impacts to visibility and water resources and should incorporate licensing conditions as necessary to minimize those impacts going forward.

10.0 REFERENCES

Allegheny Energy. 1999. Initial Consultation Package: Allegheny Power Dam 4 Hydroelectric Project FERC Project No. 2516.

California Environmental Protection Agency Air Resources Board (CARB). 1999. Guidance for Power Plant Siting: Best Available Control Technology, July 22, 1999.

CASNET 2000. Clean Air Status: Trends Network Website http: // www. epa. gov/ acidrain/ castnet

Chesapeake Bay Program. 1986 to 2000. Water Quality Data for Potomac River.

Cole, Elizabeth J. 2002.

Department of Assessments and Taxation. 2000. Electric Generation Property Return. Form 17G. Public Utility Section, Baltimore, MD. 20000.

Department of Assessments and Taxation. 2001. Property Tax Rates. Baltimore, MD. http://www.dat.state.md.us/sdatweb/taxrate.html

Department of Legislative Services. 1999. Fiscal Note, Revised. Electric and Gas Utility Reform. Maryland General Assembly, 1999 Session, HB 366. Annapolis, MD.

Department of Legislative Services. 1999. Fiscal Note, Revised. Electric and Gas Utility Reform. Maryland General Assembly, 1999 Session, HB 366. Annapolis, MD.

Environmental Protection Agency (EPA). 1990. Office of Air Quality: Planning Standards. New Source Review Workshop Manual. Draft. October 1990.

Environmental Protection Agency (EPA). 1996. QAQPS Control Cost Manual. 5th Edition. EPA 453/B-96-011, February 1996.

Environmental Protection Agency (EPA). 2000b. 40 CFR Part 63. National Emission Standards for Hazardous Air Pollutants for Source Categories; Final Rules. May 25, 2000.

Environmental Protection Agency (EPA). 2001. Office of Air Quality: Planning Standards. Alternative Emission Limits.

Goal Line. 1998. Goal line Environmental Technologies, LLC, "Formal Comments of Goal Line Environmental Technologies, LLC on the Draft Permit for the Milford Power Project."

Interstate Commission on the Potomac River Basin (ICPRB). 2000. Year 2000 Twenty-Year Demand Forecast and Resource Availablity Analysis for the Washington Metropolitan Area. Rockville, MD. Report No. 00-6. October 2000.

Interstate Commission on the Potomac River Basin (ICPRB). 2000b. Water Supply Demands and Resources Analysis in the Potomac River Basin. Prepared for the Maryland Department of the Environment. Rockville, MD. Report No. 00-5. November 2000.

Karell Archeological Services. 1989. Cultural Resources Baseline Study for Station "H". Phase II Study. Washington, DC.

Khartchenko, Nikolai V. 1998. Advanced Energy Systems. Taylor: Francis, Washington, DC.

Kurze and Beranek. 1980. Noise and Vibration Control.

Loos, J.L. and E.S. Perry. 2001. Dickerson station: Graphical analysis of fish distribution relative to the Dickerson station thermal discharge 1979-2000. Environmental Compliance Support, Mirant Mid-Atlantic LLC, Upper Marlboro, MD.

Maryland Department of Natural Resources. 1981. Potomac River Environmental Flow-by Study. Available on the PPRP Program Activities web page at http://esm.versar.com/pprp/Potomac.

Maryland Department of Natural Resources. 2001. Potomac River 1996-2000. Unpublished report prepared by Ed Enamait, Division of Fisheries.

Maryland Department of Planning. 2001. Montgomery County. Demographic and Socio-Economic Outlook. Planning Data Services, September, 2001. http://www.op.state.md.us/

Maryland Department of Transportation. 2000. Highway Location Reference. Montgomery County. State Highway Administration. Highway Information Services Division. BWI Airport, Maryland, December 31, 2000.

Maryland Office of Planning. 1998. Atlas of Agricultural Land Preservation in Maryland: Location, Protection, Threat, and Opportunities for the Future. Publication 98-04. Baltimore, Maryland, 1998.

Maryland State Highway Administration. 2000a. Consolidated Transportation Program. 2000 State Report on Transportation FY 2000 – 2005. BWI Airport, Maryland.

Maryland State Highway Administration. 2000b. AADT's from Station History for the Years 1995 – 2000. Office of Planning and Preliminary Engineering, Highway Information Services Division.

McCluskey, J.J. and G.C. Rausser. 2001. Estimation of Perceived Risk and its Effects on Property Values. Land Economics 77: 42-55.

Mirant Dickerson Development, LLC. 2001. Application for Certification of Public Convenience and Necessity. Units 4 and 5, Dickerson, Maryland.

Montgomery County Department of Environmental Protection. 2001. Construction Noise Control. Available at: www.montgomerycountymd.gov/mc/services/dep/Noise/construction.htm

Montgomery County Department of Park and Planning. 1997. Commuting Patterns: Workers By Place of Residence And Place of Work, 1997. 1997 Census Update Survey. Research and Technology Center.

Montgomery County Department of Park and Planning. 1995. Building and Land Area of Industrial/R&D and Office/Retail Buildings by Planning Area as of January 1, 1995. Research and Technology Center, June 14, 1995.

Montgomery County Department of Police. 2001.

Montgomery County Fire and Rescue Commission. 1999a. Need for Upcounty Fire-Rescue Resource Enhancement. Phase I Report. Rockville, MD. October 14, 1999.

Montgomery County Fire and Rescue Commission. 1999b. Proposed Amendments to the Fire, Rescue and Emergency Medical Services master Plan. Adopted October 14, 1999.

M-NCPPC (2001b) Montgomery County Profile. Maryland – National Capital Park and Planning Commission, Montgomery County Planning Board Online.

M-NCPPC (2001a) Poolesville and Vicinity. Maryland – National Capital Park and Planning Commission, Montgomery County Planning Board Online.

National Acid Deposition Program (NADP). 2000. http://nadpsws.uiuc.edu/ nadpdata

National Park Service. 1999. Chesapeake & Ohio Canal National Historical Park. Detail Map. Available at http://www.nps.gov/choh/pphtml/maps.html

Nuclear Energy Institute (NEI). 2000. Nuclear Plant Security. Fact Sheet. Washington, DC. November 2000.

Otton, E.O. 1981. The availability of ground water in western Montgomery County, Maryland. Maryland Geological Survey, Report of Investigations No. 34, 74 pp.

Power Plant Research Program (PPRP). 1987. Preliminary Site Evaluation Report on Potomac Electric Power Company's Proposed Station H. Maryland Department of Natural Resources, Annapolis, MD. PPSE-SH-1.

Ryerson, et al., 2001. Observations in Ozone Formation in Power Plant Plumes: Implications for Ozone Control Strategies. Science, 292: 719-723.

U.S. Census Bureau (2001) State and County Quick Facts: Montgomery County, Maryland. U.S. Department of Commerce, Washington, DC. http://quickfacts.census.gov/qfd/states/24/24031.html

U.S. Department of Transportation. 2001. Toolbox for Regional Policy Analysis. Case Study. Montgomery County, Maryland. Federal Highway Administration. http://www.fhwa.dot.gov/planning/toolbox/montgomery_context.htm

U.S. Geological Survey (USGS). 1983. Characteristics of Stream Flow in Maryland. Report of Investigations No. 35.

U.S. Geological Survey (USGS). 1998. Water Quality in the Potomac River Basin, Maryland, Pennsylvania, Virginia, West Virginia, and the District of Columbia, 1992-1996. U.S. Geological Survey Circular 1166.

Versar, Inc. 1992. Long-Term Benthic Monitoring Studies in the Freshwater Portion of the Potomac River.

Appendix A
Letter of Recommendation and Initial Recommended Licensing Conditions
PSC Case No. 8888

STATE OF MARYLAND

June 30, 2004

The Honorable Kenneth Schisler
Chairman
Public Service Commission
6 St. Paul Center
Baltimore, Maryland 21202

RE: Case No. 8888, In the Matter of the Application of Mirant Dickerson Development, LLC for a Certificate of Public Convenience and Necessity to Modify its Existing Generating Station H in Dickerson, Montgomery County, Maryland.

Dear Chairman Schisler:

In accordance with requirements of the Power Plant Siting Act of 1971, codified in Section 3-306 of the Natural Resources Article and the process described in Sections 7-207 and 7-208 of the Public Utility Companies Article, we are enclosing our final recommendations in Case Number 8888 on behalf of the Departments of Natural Resources, Environment, Agriculture, Transportation, Business and Economic Development, Planning, and the Maryland Energy Administration. Our recommendations and proposed conditions relate to the application for a Certificate of Public Convenience and Necessity (CPCN) for Mirant Dickerson Development, LLC to Modify its existing Generating Station H in Dickerson, Montgomery County, Maryland.

The Dickerson power plant consists of three 182 megawatt (MW) coal-fired units, two 147 megawatt gas- and oil-fired simple cycle combustion turbines (CTs), and one small emergency/peaking CT. Mirant is proposing to convert the existing simple cycle units to a combined cycle unit by adding heat recovery steam generators and a steam turbine-generator, and to construct a second combined cycle unit. The primary fuel for this operation will be natural gas with distillate oil as backup. The proposed changes will increase the electrical generating capacity of the facility by 740 megawatts. Mechanical draft cooling towers will be used for condenser cooling. Auxiliary systems will include a new water treatment system, expansion of the existing stormwater management system, an auxiliary boiler, an additional oil storage tank, new water storage tanks, and new rail spurs and unloading facilities to supply distillate fuel oil and ammonia. This expansion has been the subject of lengthy negotiations between Maryland, Mirant and the Federal Environmental Protection Agency. These outstanding issues have now been resolved and the State is prepared to move forward to conclude this case.

Our evaluation of the environmental impacts of the proposed power plant is described and evaluated in the document entitled "Environmental Review of the Proposed Combined Cycle Facility at Mirant's Dickerson Site", which has been filed with the Commission as an exhibit in this proceeding. Based on our review of the application and associated environmental information we have concluded that the proposed Dickerson site is suitable for expansion and that the plant can be constructed and operated in accordance with all applicable environmental regulations, provided the certificate incorporates the attached updated recommendations as conditions to the CPCN.

Sincerely,

Lewis R. Riley
Department of Agriculture

Aris Melissaratos
Department of Business and
Economic Development

Audrey E. Scott
Department of Planning

Robert L. Flanagan
Department of Transportation

Michael Richard
Maryland Energy Administration

Kendl P. Philbrick
Department of the Environment

C. Ronald Franks
Department of Natural Resources

Recommended Licensing Conditions
PSC Case No. 8888
Mirant Dickerson Development, LLC

Air Quality

I. General Air Quality Requirements

1. Except as otherwise provided for in the following provisions, the application for the Certificate of Public Convenience and Necessity (CPCN) is considered to be part of this CPCN for the Mirant Dickerson Development, LLC (Mirant) Dickerson Generating Station Expansion. The application consists of the original application received by the Maryland Public Service Commission (PSC) on 23 May 2001 and subsequent amendments. Construction of the facility shall be undertaken in accordance with the CPCN application and subsequent amendments. If there are any inconsistencies between the conditions specified below and the application, the conditions in this CPCN shall take precedence. In the application, estimates of dimensions, volumes, emission rates, operating rates, feed rates and hours of operation are not deemed to constitute enforceable numeric limits except to the extent that they are necessary to make a determination of compliance with applicable regulations.

2. The application for a CPCN includes the application for Prevention of Significant Deterioration (PSD) approval and air quality construction permits. The CPCN serves as the construction permit.

3. For air permitting purposes, the Dickerson Generating Expansion Project shall include the addition of: heat recovery steam generators (HRSGs) to two (2) existing GE 7F combustion turbines, referred to as Unit 4; two (2) GE 7FA combustion turbines with heat recovery steam generators, referred to as Unit 5; one (1) auxiliary steam boiler with a heat input of 60 million British thermal units per hour (MMBtu/hr); one (1) additional 10,000,000-gallon aboveground distillate fuel oil storage tank; and two (2) cooling towers. The Unit 4 and Unit 5 combustion turbines will be equipped with selective catalytic reduction (SCR) systems for control of nitrogen oxides (NO_x), and oxidation catalyst systems for control of carbon monoxide (CO) and volatile organic compound (VOCs) during combined cycle operation. The existing Dickerson facility includes three nominal 180 megawatt (MW) coal-fired boilers, identified as Units 1, 2 and 3, and support facilities. Units 1, 2 and 3 will be equipped with separated overfire air (SOFA) systems as part of this project to reduce NO_x emissions.

4. Definitions:

   a) "Commence" as applied to the construction of the Dickerson Generating Expansion Project means that the owner or operator either has:

i) Begun, or caused to begin, a continuous program of actual on-site construction of the source, to be completed within a reasonable time; or

ii) Entered into binding agreements or contractual obligations which cannot be canceled or modified without substantial loss to the owner or operator, to undertake a continuous program of actual construction or modification of the source to be completed within a reasonable time.

5. Mirant shall construct exhaust stacks for the Unit 5 construction turbines at a minimum height of 130 feet above ground level for use during simple cycle operation.

6. Mirant shall construct exhaust stacks for Unit 4 and 5 at a minimum height of 190 feet above ground level for use during combined cycle operations.

7. If any provision of this CPCN shall be held invalid for any reason, the remaining provisions shall remain in full force and effect and such invalid provision shall be considered severed and deleted from this CPCN.

8. Representatives of the Maryland Department of the Environment (MDE) and the Montgomery County Health Department shall be afforded access to the Dickerson property at any reasonable time to conduct inspections and evaluations necessary to assure compliance with the CPCN. Mirant shall provide such assistance as may be necessary to conduct such inspections and evaluations by such representatives of MDE effectively and safely, which may include but need not be limited to the following:

   a) inspecting construction authorized under this CPCN;

   b) sampling any materials stored or processed on site, or any waste, or discharge into the environment;

   c) inspecting any monitoring or recording equipment required by this CPCN or applicable regulations;

   d) having access to or copying any records required to be kept by Mirant pursuant to this CPCN or applicable regulations;

   e) obtaining any photographic documentation and evidence; and

   f) determining compliance with the conditions and regulations specified in the CPCN.

9. This CPCN constitutes the PSD approval and air quality construction permit for the Dickerson Generating Station Expansion project. In accordance with COMAR 26.11.02.04B, the air quality provisions expire if, as determined by MDE, Air and Radiation Management Administration (ARMA):

a) Construction is not commenced within 18 months after the date of issuance of a final CPCN;

b) Construction is substantially discontinued for a period of 18 months or more after it has commenced; or

c) Construction is not completed within a reasonable period of time after the issuance of a final CPCN.

10. At least 60 days prior to the anticipated date of start-up of Unit 4 and Unit 5, Mirant shall submit to ARMA an application for a temporary permit to operate.

11. All requirements pertaining to air quality that apply to Mirant shall apply to all subsequent owners and/or operators of the facility. In the event of any change in control or ownership, Mirant shall notify the succeeding owner/operator of the existence of the requirements of this CPCN pertaining to air quality by letter and shall send a copy of that letter to MDE ARMA.

II. Applicable Air Quality Regulations

12. Mirant is subject to all applicable federally enforceable State air quality requirements including, but not limited to, the following regulations:

a) COMAR 26.11.01.04A which requires Mirant to follow test methods described in §C to determine compliance;

b) COMAR 26.11.01.05-1 which requires Mirant to submit to MDE by April 1 of each year an emissions statement for the previous calendar year that meets the requirements of this regulation;

c) COMAR 26.11.01.07C which requires Mirant to report excess emissions that are expected to last or actually last for one hour or more;

d) COMAR 26.11.06.02C(2) which prohibits the discharge of emissions from any installation, other than water in an uncombined form, which is visible to human observers;

Exception: Does not apply to emissions during start-up and process modifications or adjustments, or occasional cleaning of control equipment if:

i) The visible emissions are not greater than 40 percent opacity; and

ii) The visible emissions do not occur for more than 6 consecutive minutes in any 60 minute period.

e) COMAR 26.11.06.03D which requires reasonable precautions to prevent any particulate matter from becoming airborne as a result of material being handled, transported, or stored;

f) COMAR 26.11.09.05A(2) which prohibits Mirant from discharging emissions, other than water in an uncombined form, which is visible to human observers from fuel burning equipment;

Exception: Does not apply to emissions during load changing, soot blowing, startup, or adjustments or occasional cleaning of control equipment if:

i) The visible emissions are not greater than 40 percent opacity; and

ii) The visible emissions do not occur for more than 6 consecutive minutes in any 60 minute period.

g) For Units 4 and 5, and the auxiliary boiler: COMAR 26.11.09.07A(1)(c) which prohibits Mirant from burning fuel with a sulfur content by weight in excess of or which otherwise exceeds 0.3 percent;

h) For Unit 4 and Unit 5, COMAR 26.11.09.08B(1)(c): which requires the control of NO_x emissions to 0.25 lb/MMBtu which satisfies Reasonably Available Control Technology (RACT);

i) For the auxiliary boiler: COMAR 26.11.09.08E, which contains reporting, recordkeeping, maintenance, and training requirements for fuel burning sources with a rated heat input capacity of 100 MMBtu per hour or less;

j) COMAR 26.11.09.08B(2)(a)(i) and (ii) which require Mirant to demonstrate compliance with the NO_x emission standard for Units 4 and 5 through continuous emissions monitoring (CEM) data or stack tests using Method 7 or Method 7E of the test methods referenced in COMAR 26.11.01.04C(1) or other test methods approved by MDE and the U.S. Environmental Protection Agency (EPA);

k) COMAR 26.11.29 and .30 which require that Mirant hold an allowance for each ton of NO_x emissions from Units 1-5 by the reconciliation date of November 30 of each calendar year;

l) COMAR 26.11.30 which requires that Mirant follow the policies and procedures relating to Maryland's NO_x Reduction and Trading Program; and

m) COMAR 26.11.06.14 which prohibits the construction, modification, or operation of a source in violation of the requirements of 40 CFR 52.21: Prevention of Significant Deterioration.

13. The Mirant Dickerson Expansion Project is subject to all applicable State-only enforceable air quality requirements including, but not limited to, the following regulations:

    a) COMAR 26.11.02.13A(2) which requires Mirant to have in current effect a State Permit to Operate from the Department prior to the commencement of operations of the Units 4 and 5 Expansion Project;

    b) COMAR 26.11.02.19C which requires Mirant to maintain records necessary to support the emission certification;

    c) COMAR 26.11.02.19D which requires Mirant to certify the actual emissions of the regulated pollutants from the entire Dickerson facility; and

    d) COMAR 26.11.06.08 and .09 which generally prohibit the discharge of emissions beyond the property line in such a manner that a nuisance or air pollution is created.

14. The Units 4 and 5 combustion turbines are subject to 40 CFR Subpart GG – Standards of Performance for Stationary Gas Turbines, related provisions of 40 CFR §60.7 and §60.8, which contain various provisions for emission limitations, monitoring, testing, recordkeeping, and reporting, including but not limited to the following:

    a) Standard for Nitrogen Oxides (40 CFR §60.332)
    On or after the completion of performance testing conducted under §60.8, Mirant shall not cause to be discharged into the atmosphere from any stationary gas turbine any gases which contain nitrogen oxides in excess of:

    $STD = (0.0075 \times (14.4/Y)) + F$

    Where:

    STD = allowable NO_x emissions (percent by volume at 15 percent oxygen and on a dry basis)
    Y = manufacturer's rated heat rate at manufacturer's rated load (kilojoules per watt hour) or, actual measured heat rate based on lower heating value of fuel as measured at actual peak load for the facility. The value of Y shall not exceed 14.4 kilojoules per watt hour.
    F = NO_x emission allowance for fuel-bound nitrogen as defined in 40 CFR §60.332(a)(3):

Fuel-Bound Nitrogen (percent by weight)	F (NO_x percent by volume)
$N < 0.015$	0
$0.015 < N < 0.1$	0.04(N)
$0.1 < N < 0.25$	0.004 + 0.0067(N – 0.1)
$N > 0.25$	0.005

Therefore:

For Unit 4, NO_x shall not exceed 99 parts per million by volume at 15% oxygen on a dry weight basis (ppmvd @15%), based on a 1-hour average, when firing natural gas, or 98 ppmvd @15%, based on a 1-hour average, when firing fuel oil.

For Unit 5, NO_x shall not exceed 110 parts per million by volume at 15% oxygen on a dry weight basis (ppmvd @15%), based on a 1-hour average, when firing natural gas, or 101 ppmvd @15%, based on a 1-hour average, when firing fuel oil.

b) Standard for Sulfur Oxides (40 CFR §60.333)
On or after the completion of performance testing conducted under §60.8, Mirant shall comply with one or the other of the following conditions:

i) Mirant shall not cause to be discharged into the atmosphere from any stationary gas turbine any gases which contain sulfur dioxide in excess of 0.015 percent by volume at 15 percent oxygen and on a dry basis.

ii) Mirant shall not burn in any stationary gas turbine any fuel which contains sulfur in excess of 0.8 percent by weight.

c) Monitoring of Operations (40 CFR §60.334)

i) Mirant shall monitor sulfur content and nitrogen content of the fuel being fired in the turbines. The frequency of determination of these values shall be as follows:

(A) If the turbine is supplied its fuel from a bulk storage tank, the values shall be determined on each occasion that fuel is transferred to the storage tank from any other source.

(B) If the turbine is supplied its fuel without intermediate bulk storage, the values shall be determined and recorded daily. Owners, operators or fuel vendors may develop custom schedules for determination of the values based on the design and operation of the affected facility and the characteristics of the fuel supply. These custom schedules shall be substantiated with data and must be approved by the EPA Administrator before they can be used to comply with Paragraph (b) of 40 CFR §60.334.

ii) For the purpose of reports required under §60.7(c), periods of excess emissions that shall be reported are defined as follows:

(A) Nitrogen oxides. Any one-hour period during which the average water-to fuel ratio, as measured by the continuous monitoring system, falls below the water-to-fuel ratio determined to demonstrate compliance with §60.332 by the performance test required in §60.8 or any period during which the fuel-bound nitrogen of the fuel is greater than the maximum nitrogen content allowed by the fuel-bound nitrogen allowance used during the performance test required in §60.8. Each report shall include the average water-to-fuel ratio, average fuel consumption, ambient conditions, gas turbine load, and nitrogen content of the fuel during the period of excess emissions, and the graphs or figures developed under §60.335(a).

(B) Sulfur dioxide. Any daily period during which the sulfur content of the fuel being fired in the gas turbine exceeds 0.8 percent.

d) Test Methods (40 CFR §60.335)

i) To compute the nitrogen oxides emissions, Mirant shall use analytical methods and procedures that are accurate to within 5 percent and are approved by the EPA Administrator to determine the nitrogen content of the fuel being fired.

ii) In conducting the performance tests required in §60.8, Mirant shall use as reference methods and procedures the test methods in Appendix A of 40 CFR Part 60, or other methods and procedures as specified in this Subpart GG, except as provided for in §60.8(b). Acceptable alternative methods and procedures are given in paragraph (f) of §60.335.

iii) Mirant shall determine compliance with the nitrogen oxides and sulfur dioxide standards in §§60.332 and 60.333(a) as follows:

(A) The nitrogen oxides (NO_x) emission rate shall be computed for each run using the following equation:

$$NO_x = (NO_{xo})(P_r/P_o)^{0.5}\, e^{19(Ho\ --\ 0.00633)}(288°K/T_a)^{1.53}$$

where:

NO_x = emission rate of NO_x at 15 percent O_2 and ISO standard ambient conditions, ppm by volume.

NO_{xo} = observed NO_x concentration, ppm by volume at 15 percent O_2.
P_r = reference combustor inlet absolute pressure at 101.3 kilopascals ambient pressure, mm Hg.

P_o = observed combustor inlet absolute pressure at test, mm Hg.
H_o = observed humidity of ambient air, g H_2O/g air.
e = transcendental constant, 2.718.
T_a = ambient temperature, K.

(B) The monitoring device of §60.334(a) shall be used to determine the fuel consumption and the water-to-fuel ratio necessary to comply with §60.332 at 30, 50, 75, and 100 percent of peak load or at four points in the normal operating range of the gas turbine, including the minimum point in the range and peak load. All loads shall be corrected to ISO conditions using the appropriate equations supplied by the manufacturer.

(C) Method 20 shall be used to determine the nitrogen oxides, sulfur dioxide, and oxygen concentrations. The span values shall be 300 ppm of nitrogen oxide and 21 percent oxygen. The NO_x emissions shall be determined at each of the load conditions specified in paragraph (c)(2) of 40 CFR §60.335.

iv) Mirant shall determine compliance with the sulfur content standard in §60.333(b) (herein as Condition 14(b)(ii) as follows: ASTM D 2880-71, 78, or 96 shall be used to determine the sulfur content of liquid fuels and ASTM D 1072-80 or 90 (Reapproved 1994), D 3031-81, D 4084-82 or 94, or D 3246-81, 92, or 96 shall be used for the sulfur content of gaseous fuels (incorporated by reference-see §60.17). The applicable ranges of some ASTM methods mentioned above are not adequate to measure the levels of sulfur in some fuel gases. Dilution of samples before analysis (with verification of the dilution ratio) may be used, subject to the approval of the EPA Administrator.

v) To meet the requirements of §60.334(b) (herein as Condition 14(c)(i)), Mirant shall use the methods specified in paragraphs (a) and (d) of 40 CFR §60.335 (herein Conditions 14(d)(i) and 14(d)(iv)) to determine the nitrogen and sulfur contents of the fuel being burned. The analysis may be performed by the owner or operator, a service contractor retained by the owner or operator, the fuel vendor, or any other qualified agency.

vi) Mirant may use the following as alternatives to the reference methods and procedures specified in this section:

(A) Instead of using the equation in 40 CFR §60.335(c)(1), manufacturers may develop ambient condition correction factors to adjust the nitrogen oxides emission level measured by the performance test as provided in §60.8 to ISO standard day conditions. These factors are developed for each gas turbine model they manufacture in terms of combustion inlet pressure, ambient air

pressure, ambient air humidity, and ambient air temperature. They shall be substantiated with data and must be approved for use by the EPA Administrator before the initial performance test required by §60.8. Notices of approval of custom ambient condition correction factors will be published in the Federal Register.

15. The duct burners associated with Units 4 and 5 are subject to 40 CFR Subpart Da – Standards of Performance for Electric Utility Steam Generating Units for which Construction is Commenced after September 18, 1978, including, but not limited to:

    a) Subpart Da 60.42a(a) which limits particulate matter emissions to 0.03 lb per MMBtu (13 ng/J);

    b) Subpart Da 60.42a(b) which limits Mirant to 20 percent opacity (6-minute average), except for one 6-minute period per hour of not more than 27 percent opacity;

    c) Subpart Da 60.43a(b)(2) which limits SO_2 emissions to 0.20 lb per MMBtu (86 ng/J) with zero percent reduction;

    d) Subpart Da 60.44a(d)(1) which limits NO_x emissions to 1.6 lb per megawatt-hour (200 ng/J);

    e) Subpart Da 60.46a(c) which states that the PM and NO_x emission limits listed above apply at all times except during periods of startup, shutdown, or malfunction, and the SO_2 emission limits apply at all times except during periods of startup, shutdown, or when emergency conditions exist;

    f) Subpart Da 60.46a(e) which requires that after the initial performance test, compliance with the sulfur dioxide emission limitations and percentage reduction requirements under Sec. 60.43a and the nitrogen oxides emission limitations under Sec. 60.44a be based on the average emission rate for 30 successive duct burner operating days. A separate performance test is to be completed at the end of each duct burner operating day after the initial performance test, and a new 30 day average emission rate for both sulfur dioxide and nitrogen oxides and a new percent reduction for sulfur dioxide are to be calculated to show compliance with the standards;

    g) Subpart Da 60.46a(f) which requires that for the initial performance test required under Sec. 60.8, compliance with the sulfur dioxide emission limitations and percent reduction requirements and the nitrogen oxides emission limitation is based on the average emission rates for sulfur dioxide, nitrogen oxides, and percent reduction for sulfur dioxide for the first 30 successive duct burner operating days. The initial performance test is the only test in which at least 30 days prior notice is required unless otherwise specified by the EPA Administrator. The initial performance test is to be scheduled so that the first duct burner operating day of the 30 successive duct burner operating days is completed within 60 days after achieving the maximum production rate at which the

affected facility will be operated, but not later than 180 days after initial startup of the facility;

h) Subpart Da 60.46a(g) which requires that compliance is determined by calculating the arithmetic average of all hourly emission rates for SO_2 and NO_x for the 30 successive duct burner operating days, except for data obtained during startup, shutdown, malfunction (NO_x only), or emergency conditions (SO_2 only). Compliance with the percentage reduction requirement for SO_2 is determined based on the average inlet and average outlet SO_2 emission rates for the 30 successive duct burner operating days;

i) Subpart Da 60.46a(i) which requires that Mirant calculate NO_x emissions by multiplying the average hourly NO_x output concentration by the average hourly flow rate, and divided by the average hourly gross energy output. Compliance with the emissions limits for NO_x, is to be determined using either of the procedures described in paragraphs 60.46a(k)(1) and (2);

j) Subpart Da 60.47a(o), which states that Mirant is not required to install or operate a continuous emissions monitoring system to measure NO_X emissions; a wattmeter to measure gross electrical output; meters to measure steam flow, temperature, and pressure; and a continuous flow monitoring system to measure the flow of exhaust gases discharged to the atmosphere;

k) Subpart Da 60.48a(a) which requires that in conducting the performance tests required in Sec. 60.8, Mirant use as reference methods and procedures the methods in appendix A of this part or the methods and procedures as specified in this section, except as provided in Section 60.8(b);

l) Subpart Da 60.48a which requires that Mirant determine compliance with the particulate matter, SO_2, and NO_x standards through methods and procedures as spelled out in sections 60.48a(b), (c) and (d);

m) Subpart Da 60.49a which requires Mirant to submit to the EPA Administrator the performance test data for sulfur dioxide, nitrogen oxides, and particulate matter emissions to the Administrator, according to the specifications in this subsection; and

n) Subpart Da 60.49a(f) which requires that, for any periods for which opacity, sulfur dioxide or nitrogen oxides emissions data are not available, Mirant must submit a signed statement indicating if any changes were made in operation of the emission control system during the period of data unavailability. Operations of the control system and affected facility during periods of data unavailability are to be compared with operation of the control system and affected facility before and following the period of data unavailability.

16. The auxiliary boiler is subject to 40 CFR Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units, which contains various

provisions for emission limitations, monitoring, testing, recordkeeping, and reporting, including, but not limited to:

a) Mirant shall submit notification of the date of construction or reconstruction, anticipated startup, and actual startup, as provided by 40 CFR 60.7. This notification shall include:

   i) The design heat input capacity of the affected facility and identification of fuels to be combusted in the affected facility;

   ii) If applicable, a copy of any federally enforceable requirement that limits the annual capacity factor for any fuel or mixture of fuels under 40 CFR 60.42c, or 40 CFR 60.43c; and

   iii) The annual capacity factor at which the owner or operator anticipates operating the affected facility based on all fuels fired and based on each individual fuel fired.

17. Units 4 and 5 are subject to all applicable Acid Rain provisions under 40 CFR Part 72, including, but not limited to:

    a) Subpart A 72.9(b)(1) which requires Mirant, to the extent applicable, to comply with monitoring requirements in Part 75;

    b) Subpart A 72.9(c) which requires Mirant to hold allowances in the unit's compliance subaccount not less than the total annual emissions of sulfur dioxide (SO_2) for the previous year and comply with applicable Acid Rain limits for SO_2;

    c) Subpart A 72.9(e) which requires Mirant to submit a proposed offset plan if emission limitations are exceeded; and

    d) Subpart A 72.9(f) which requires Mirant, unless otherwise provided, to retain required documents for a period of 5 years from the date that the document was created. Documents may include, but are not limited to, certificates of representation, emissions monitoring information, copies of reports, compliance certifications, and other documentation pertaining to the Acid Rain program.

18. Units 4 and 5 are subject to all applicable monitoring provisions of the Acid Rain program under 40 CFR Part 75, including, but not limited to:

    a) Subpart A 75.4(b) which requires Mirant, in accordance with Sec. 75.20, to ensure that all applicable monitoring systems for SO_2, NO_x, carbon dioxide (CO_2), and volumetric flow required under this part to be installed and all certification tests completed not later than 90 days after the date the unit commences commercial operation;
    b) Subpart B 75.10 which generally requires Mirant to measure, as applicable, opacity, SO_2, NO_x, and CO_2 emissions; and to ensure that continuous emission monitoring systems required by this part meet the equipment, installation, and performance specifications in

this part; and are maintained according to the quality assurance and quality control procedures in this part;

c) Subpart F 75.53(a) which requires Mirant to prepare a monitoring plan with sufficient information on applicable continuous opacity or emissions monitoring systems to demonstrate that all SO_2, NO_x, CO_2 emissions and opacity, as required, are monitored and reported;

d) Subpart F 75.57(a) which requires Mirant to keep a file for each affected unit of all measurements, data, reports, and other information required by this part in a form suitable for inspection for at least 3 years from the date of each record;

e) Subpart F 75.57(b)-(f) which require Mirant to record various operations, emissions, and other information, as specified; and

f) Subpart G 75.60(a) and (b) which generally require Mirant to comply with all reporting requirements, with all signatory requirements of §72.21 of this chapter for all submissions, and with all required certifications and reports.

III. BACT Requirements

19. Mirant shall employ Best Available Control Technology (BACT) to control emissions of sulfur dioxide (SO_2), sulfuric acid mist (H_2SO_4), carbon monoxide (CO), and particulate matter (PM10) from the Dickerson Expansion Project as follows:

a) BACT for Unit 5 prior to the heat recovery steam generator becoming operational shall be the use of natural gas fuel with limited operation on low sulfur (0.05% sulfur content by weight or less) distillate fuel oil, and application of good combustion practices to ensure that emissions do not exceed the levels identified in Table 1.

b) BACT on Units 4 and 5 after the heat recovery steam generators become operational, shall be the use of natural gas fuel with operation on low sulfur (0.05% sulfur content by weight or less) distillate fuel oil limited to 250 hours during simple cycle operation and 720 hours during combined cycle operation, operation of an oxidation catalyst, and application of good combustion practices, to ensure that emissions do not exceed the levels identified in Table 2.

c) BACT for the auxiliary boiler shall be the use of distillate fuel oil with a sulfur content of 0.05% or less, use of distillate fuel oil for no more than 970 hours per year, and application of good combustion controls to achieve emissions rates that do not exceed the following on a 3-hour average basis:

CO: 9 lb/hr when firing both natural gas and distillate fuel
PM10: 0.6 lb/hr when firing natural gas and 3 lb/hr when firing distillate fuel
SO_2: 0.34 lb/hr when firing natural gas and 3.1 lb/hr when firing distillate fuel

d) BACT for all installed cooling towers shall be the installation and operation of mist eliminators designed to meet a PM10 emission rate of 0.001 percent of the cooling tower recirculating water flow.

20. Short term emission limits contained in Condition 19 do not apply during periods of startup, shutdown, or malfunction as defined in 40 CFR 60.2.

IV. National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines Requirements

21. The Mirant Unit 5 combustion turbines are subject to 40 CFR 63 Subpart YYYY– "National Emissions Standards for Hazardous Air Pollutants for Stationary Combustion Turbines" and related General Provisions in 40 CFR §63.1 through §63.15. These requirements include, but are not limited to the following:

a) Emissions and Operating Limitations [40 CFR §63.6100]:

i) The concentration of formaldehyde shall not exceed 91 parts per billion by volume dry basis (ppbvd) at 15 percent oxygen.

ii) During periods when the combustion turbines are using an oxidation catalyst, Mirant shall maintain the four-hour rolling average of the catalyst inlet temperature within the range suggested by the catalyst manufacturer.

iii) During periods when the combustion turbines are not using an oxidation catalyst, Mirant must maintain all operating limitations approved by the U.S. EPA Administrator.

iv) Mirant shall be in compliance with the emissions and operating limitations at all times except during startup, shutdown and malfunctions (§63.6104(a)).

v) Mirant shall operate and maintain the combustion turbines, oxidation catalysts or other air pollution control equipment, and monitoring equipment in a manner consistent with good air pollution control practices for minimizing emissions at all times including during startup, shutdown, and malfunction (§63.6105(b)).

b) Performance Testing Requirements [40 CFR §63.6110]:

i) Mirant shall conduct an initial performance test, as specified in §63.6110(a), to demonstrate compliance with the formaldehyde limitation in Condition 21.a.i within 180 calendar days after startup of the affected source (as specified in §63.6095(a)(2)).

ii) Mirant shall conduct annual performance tests, as specified in §63.6115, to demonstrate compliance with the formaldehyde limitation in Condition 21.a.i.

iii) Initial and annual performance tests shall be conducted according to the requirements of the General Provisions at §63.7(e)(1) and other applicable provisions.

iv) As stated in Table 3 to Subpart YYYY of Part 63:

(A) Mirant shall use Test Method 320 of 40 CFR Part 63, Appendix A, or other methods approved by the Administrator to conduct the initial and annual formaldehyde performance tests.

(B) The formaldehyde concentration must be corrected to 15 percent oxygen, dry basis.

(C) Results of the test shall consist of the average of three, 1-hour runs.

(D) Tests must be conducted within 10 percent of 100 percent load.

(E) Select sampling port locations and number of traverse points, and determine oxygen concentration and moisture content as specified in Table 3 to Subpart YYYY.

(F) Mirant shall petition the Administrator for operating limitations which shall be monitored to demonstrate compliance with the formaldehyde limitation in Condition 21.a.i. These operating parameters shall be monitored during the initial performance test and continuously thereafter (under §63.6120(e)). Alternatively, Mirant may petition the Administrator for approval of no additional operating limitations, as outlined in §S63.6120(g).

c) Monitoring Requirements [§63.6125]

i) When operating the oxidation catalyst, Mirant shall monitor on a continuous basis the catalyst inlet temperature to demonstrate that the unit is maintaining the 4-hour rolling average of the inlet temperature within the range suggested by the catalyst manufacturer.

ii) When operating without an oxidation catalyst, Mirant shall continuously monitor any parameters specified in Mirant's approved petition to the Administrator.

iii) Mirant shall monitor and record distillate oil usage rates daily for all new and existing stationary combustion turbines (Dickerson Units 4 and 5) with a non-resettable hour meter to measure the number of hours that distillate oil is fired.

d) Continuous Compliance Requirements [§63.6135]

i) Except for monitor malfunctions, associated repairs, and required quality assurance or quality control activities (including, as applicable, calibration checks and required zero and span adjustments of the monitoring system), Mirant shall conduct all parametric monitoring at all times that the combustion turbines are operating.

e) Notifications, Reports, Records [§63.6145]

i) Mirant shall submit all of the notifications in §§63.7(b) and (c), 63.8(3), 63.8(f)(4), and 63.9(b) and (h) that apply to Dickerson.

ii) Mirant shall submit an Initial Notification no later than 120 days after startup [§S63.6145(c)].

iii) Mirant shall submit a notification of intent to conduct an initial performance test at least 60 calendar days before the initial performance test is scheduled to begin as required in §63.7(b)(1) [§63.6145(e)].

iv) Mirant shall submit the Notification of Compliance Status according to the requirements of §63.9(h)(2)(ii), including the performance test results, before the close of business on the 60th calendar day following completion of the performance test [§63.6145(f)].

v) Mirant shall submit a semi-annual compliance report according to Table 6 of §63 Subpart YYYY according the schedules outlined in §63.6150.

vi) Mirant shall submit an annual report under §63.6150(e) describing the number of hours of distillate oil firing by each new or existing stationary combustion turbine at the Dickerson Station; operating limits provided in the federally enforceable permit; any deviations from these limits; and any problems or errors suspected with the meters.

vii) Mirant shall report each instance in which the units did not meet any emissions or operating limitation, and each instance in which the Company did not meet the General Provision requirements in Table 7 of §63 Subpart YYYY [§63.6140(b)].

viii) Mirant shall maintain the following records under §63.6155; the records shall be kept, according to §63.6160 in such a manner that they can be readily accessed and are suitable for inspection according to §63.10(b)(1); The records must be

maintained for five years following the date of each occurrence, measurement, maintenance, correction action, report or record; Mirant shall maintain the most recent 2 years of records on site or the records must be accessible on site:

(A) A copy of each notification and report submitted by Mirant to comply with this subpart;

(B) Records of performance tests and performance evaluations as required in §63.10(b)(2)(viii);

(C) Records of the occurrence and duration of each startup, shutdown, or malfunction as required in §63.10(b)(2)(i);

(D) Records of the occurrence and duration of each malfunction of the air pollution control equipment, if application, as required in §63.10(b)(2)(ii);

(E) Records of all maintenance on the air pollution control equipment as required in §63.10(b)(iii).

f) Other Requirements [§63.6165]

i) Mirant shall meet all applicable General Provisions of §63.1 through §63.15, as outlined in Table 7 of §63 Subpart YYYY, including but limited to performance testing requirements; monitoring, recordkeeping, and notification requirements; requirements related to Startup, Shutdown, and Malfunction (SSM) Plans; and notification requirements.

V. Other Emissions and Operating Restrictions

22. Until such time as the heat recovery steam generator becomes operational on Unit 4, Mirant shall continue to operate the Station H CTs under conditions established under the CPCN issued in 1988 under PSC Case 8063 or subsequent permitting or regulatory requirements.

23. Unit 4 shall be limited to the following after the heat recovery steam generator becomes operational:

a) Operation of a selective catalytic reduction (SCR) system, resulting in a maximum NO_x emission rate not to exceed 4.5 parts per million at 15 percent oxygen on a 3-hour rolling average basis based on valid 40 CFR Part 75 CEM data from the outlet of the device

during natural gas combined cycle firing. The 3-hour rolling average NO_x limit does not apply during periods of startup, shutdown, or malfunctions as defined in 40 CFR 60.2.

b) Operation in simple cycle mode for no more than 500 hours during any consecutive on a 12-month period, of which no more than 250 hours of operation is firing distillate fuel oil;

c) Operation in combined cycle mode while firing distillate fuel oil of no more than 720 hours during any consecutive 12-month period;

d) Operation in simple cycle mode when firing distillate fuel oil shall be limited as follows:

   i) Subject to condition 23(b), the CTs can generate electricity using distillate fuel oil during the ozone season (May 1 through September 30) when natural gas fuel delivery service is interrupted or curtailed by the supplier due to shortages;

   ii) Subject to condition 23(b), the CTs can generate electricity using distillate fuel oil during the ozone season (May 1 through September 30) when PJM declares an emergency, as defined below, or when PJM dispatches the CTs to stabilize the transmission system;

   iii) For the purposes of condition 23(d)(ii), a PJM system emergency is operation during reserve shortages and refers to Maximum Emergency Generation as defined in PJM Manual M-13, Emergency Operations, Section 2 dated May 1, 2003, and subsequent versions. Any changes affecting the definition of emergency conditions for the purposes of this permit must have the prior approval of ARMA, if the change can affect allowable emissions. Mirant shall submit annual reports to ARMA that describe the times, durations, and circumstances of any operations under emergency conditions, including dispatch of the CTs to stabilize the transmission system, and identify whether each declared emergency condition applied to Mirant alone or to any other part of the PJM Interconnection; and

   iv) Mirant shall provide MDE with written verification from its natural gas supplier in each instance where natural gas service to Dickerson is interrupted. Such verification shall be provided to MDE no later than 30 days after the end of the calendar year.

e) Operation of the duct burners shall be limited to periods when Unit 4 is operated in combined cycle mode and firing natural gas; and

f) Operation of each duct burner shall not exceed 688,800 MMBtu during any consecutive 12-month period.

24. Unit 5 shall be limited to the following prior to the heat recovery steam generator becoming operational:

a) Operating for no more than 1,500 hours during any consecutive 12-month rolling period, of which no more than 500 hours of operation is firing distillate fuel oil; and

b) Operation in simple cycle mode when firing distillate fuel oil shall be limited as follows:

i) Subject to condition 24(a), the CTs can generate electricity using distillate fuel oil during the ozone season (May 1 through September 30) when natural gas fuel delivery service is interrupted or curtailed by the supplier due to shortages;

ii) Subject to condition 24(a), the CTs can generate electricity using distillate fuel oil during the ozone season (May 1 through September 30) when PJM declares a system emergency, as defined below, or when PJM dispatches the CTs to stabilize the transmission system;

iii) For the purposes of condition 24(b)(ii), a PJM system emergency is operation during reserve shortages and refers to Maximum Emergency Generation as defined in PJM Manual M-13, Emergency Operations, Section 2 dated May 1, 2003, and subsequent versions. Any changes affecting the definition of emergency conditions for the purposes of this permit must have the prior approval of ARMA, if the change can affect allowable emissions. Mirant shall submit annual reports to ARMA that describe the times, durations, and circumstances of any operations under emergency conditions, including dispatch of the CTs to stabilize the transmission system, and identify whether each declared emergency condition applied to Mirant alone or to any other part of the PJM Interconnection; and

iv) Mirant shall provide MDE with written verification from its natural gas supplier in each instance where natural gas service to Dickerson is interrupted. Such verification shall be provided to MDE no later than 30 days after the end of the calendar year.

25. Pollutant emissions from Unit 5 shall not exceed the following for any consecutive 12-month period prior to the heat recovery steam generator becoming operational:

Pollutant	**Emission Limit**
Nitrogen Oxides (NO_x)	215 tons per year
Volatile Organic Compounds (VOC)	<25 tons per year
Sulfur Dioxide (SO_2)	59 tons per year
Particulate Matter (PM10)	18 tons per year
Carbon Monoxide (CO)	62 tons per year

26. Unit 5 shall be limited to the following after the heat recovery steam generator becomes operational:

a) Operation of a selective catalytic reduction (SCR) system, resulting in a maximum NO_x emission rate not to exceed 3.5 parts per million at 15 percent oxygen on a 3-hour rolling average basis based on valid 40 CFR Part 75 CEM data from the outlet of the device

during natural gas combined cycle firing. The 3-hour rolling average NO_x limit does not apply during periods of startup, shutdown, or malfunctions as defined in 40 CFR 60.2.

b) Operation in simple cycle mode for no more than 500 hours during any consecutive 12-month period, of which no more than 250 hours of operation is firing distillate fuel oil;

c) Operation in simple cycle mode when firing distillate fuel oil shall be limited as follows:

   i) Subject to condition 26(b), the CTs can generate electricity using distillate fuel oil during the ozone season (May 1 through September 30) when natural gas fuel delivery service is interrupted or curtailed by the supplier due to shortages;

   ii) Subject to condition 26(b), the CTs can generate electricity using distillate fuel oil during the ozone season (May 1 through September 30) when PJM declares a system emergency, as defined below, or when PJM dispatches the CTs to stabilize the transmission system;

   iii) For the purposes of condition 26(c)(ii), a PJM system emergency is operation during reserve shortages and refers to Maximum Emergency Generation as defined in PJM Manual M-13, Emergency Operations, Section 2 dated May 1, 2003, and subsequent versions. Any changes affecting the definition of emergency conditions for the purposes of this permit must have prior approval from ARMA. Mirant shall submit annual reports to ARMA that describe the times, duration, and circumstances of any operations under emergency conditions and identify whether each declared emergency condition applied to Mirant alone or to any other part of the PJM Interconnection; and

   iv) Mirant shall provide MDE with written verification from its natural gas supplier in each instance where natural gas service to Dickerson is interrupted. Such verification shall be provided to MDE no later than 30 days after the end of the calendar year.

d) Operation in combined cycle mode while firing distillate fuel oil for no more than 720 hours for any consecutive 12-month period;

e) Operation of the duct burners shall be limited to periods when Unit 5 is operated in combined cycle mode and firing natural gas; and

f) Operation of each duct burner shall not exceed 688,800 MMBtu for any consecutive 12-month rolling period.

27. Once the heat recovery steam generators become operational, emissions from Unit 4 and Unit 5, and the auxiliary boiler and the cooling tower combined in tons per year shall not exceed the following for any consecutive 12-month period:

Pollutant	Emission Limit
Nitrogen Oxides (NO_x)	841 tons per year
Volatile Organic Compounds (VOC)	<25 tons per year
Sulfur Dioxide (SO_2)	332 tons per year
Particulate Matter (PM10)	347 tons per year
Carbon Monoxide (CO)	205 tons per year

28. Short-term emission limits contained in Tables 1 and 2 do not apply during periods of start-up, shutdown, or malfunction as defined in 40 CFR 60.2.

29. Mirant shall implement control measures on existing Units 1, 2, and 3 such that there will be no net increase of NO_x emissions from the Dickerson source. For the purposes of this condition, net emission increase is defined in accordance with 40 CFR 52.21(b)(3).

30. To avoid triggering Nonattainment Area New Source Review for NO_x emissions, Mirant shall install and operate separated overfire air (SOFA) systems on existing Dickerson coal-fired boilers Unit 1, Unit 2, and Unit 3 prior to commencing operation of equipment covered by this CPCN. Emissions of NO_x from each of the these units individually shall not exceed 0.36 pounds per MMBtu on a 30-day rolling average basis once SOFA systems become operational.

VI. Testing

31. At least 30 days prior to conducting any compliance stack test, Mirant shall submit a test protocol to ARMA for review and approval. Compliance stack testing shall be conducted in accordance with ARMA Technical Memorandum (TM) 91-01, "Test Methods and Equipment Specifications for Stationary Sources" (January 1991), as amended by Supplement 1 (1 July 1991), 40 CFR 51, 40 CFR 60, or subsequent test protocols approved by ARMA. Test ports shall be located in accordance with TM 91-01 (January 1991), or subsequent or alternative measures approved by ARMA.

32. Mirant shall install the SOFA system on either existing Units 1, 2 and/or 3 and shall demonstrate, by a method approved by ARMA, that the unit is achieving the maximum emission rate of 0.36 pounds per MMBtu at least 60 days prior to operation of the Unit 5 combustion turbines in simple cycle mode.

33. Mirant shall install the SOFA systems on the remaining two Units, and shall demonstrate, by a method approved by ARMA, that the units are in compliance with the emission rate of 0.36 pounds per MMBtu at least 60 days prior to commencement of operation of the heat recovery steam generators on Units 4 and 5.

34. Compliance stack testing of Unit 5 in simple cycle mode shall be conducted within 180 days of initial start-up of the unit to quantify pollutant emissions and demonstrate compliance with the emission limits specified in the CPCN for the following pollutants: NO_x, SO_2, PM10, and CO.

35. Compliance stack testing of Units 4 and 5 in combined cycle mode shall be conducted within 180 days of initial start-up of the heat recovery steam generators to quantify pollutant emissions and demonstrate compliance with the emission limits specified in the CPCN for the following pollutants: NO_x, SO_2, PM10, and CO.

36. Compliance stack testing of the auxiliary boiler shall be conducted within 180 days of initial start-up to quantify pollutant emissions and demonstrate compliance with the emission limits specified in the CPCN for the following pollutants: NO_x, SO_2, PM10, and CO.

VII. Recordkeeping and Reporting

37. Within 45 days of the end of each calendar quarter, Mirant shall submit to ARMA quarterly reports that contain for each combustion turbine, the auxiliary boiler, the distillate fuel oil storage tanks, and the cooling towers, monthly summaries of construction progress.

38. Testing of NO_x from Dickerson Units 1, 2 and 3 shall be performed when operating at a minimum of 90% of the design load. If testing cannot be performed at the minimum load, then the actual load during testing shall become the allowable permitted load.

39. Testing of Units 4 and 5 shall be performed when operating at a minimum of 90% of the design turbine load for compressor inlet conditions. If testing cannot be performed at the minimum turbine load, then the actual turbine load during testing shall become the allowable permitted turbine load.

40. Within 60 days of completing the initial stack tests, Mirant shall provide ARMA copies of the testing results.

41. In accordance with COMAR 26.11.01.04A, Mirant may be required to conduct additional stack tests at any time as may be prescribed by ARMA.

42. Final results of each compliance stack test must be submitted to ARMA within 60 days of completion of the test. Analytical data shall be submitted to ARMA directly from the emission testing company.

43. Mirant shall furnish written notification to ARMA, and EPA of the following events:

a) the date construction commenced within 30 days after such date;

b) the anticipated start-up date, not more than 60 or less than 30 days prior to such date;

c) the actual start-up date within 15 days after such date; and

d) the anticipated date of compliance stack testing at least 30 days prior to such date.

44. Mirant shall certify the actual emissions of regulated pollutants from the facility.

a) Certification shall be on a form obtained from ARMA and shall be submitted to ARMA no later than April 1 of the year following the year for which certification is required.

b) The individual making the certification shall certify that the information is accurate to the individual's best knowledge. The certifying individual shall be:

i) familiar with each source for which the certification form is submitted; and

ii) responsible for the accuracy of the emission information.

45. All records and logs shall be maintained at the facility for at least 5 years after the completion of the calendar year in which they were collected. These data shall be readily available for inspection by representatives of ARMA.

46. All air quality notifications and reports required by this CPCN shall be submitted to:

Administrator, Compliance Program
Air and Radiation Management Administration
1800 Washington Blvd.
Baltimore, Maryland 21230

47. All notifications and reports required by 40 CFR 60 and Subpart GG, Subpart Da, Subpart Dc, and Acid Rain provisions, unless specified otherwise, shall be submitted to:

Regional Administrator, US Environmental Protection Agency
Region III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

Table 1
BACT Emission Limitations for Condition 19(a)

Air Emission Source	Fuel	Duct Firing	Emission Rate (lb/hr) PM10	SO_2	H_2SO_4	CO
Unit 5						
Simple Cycle	Natural Gas	No	9	12	1.5	32.2
Simple Cycle	Fuel Oil	No	17	106	5.4	72.4

Emission limitations are based on a 3-hour average.

Table 2
BACT Emission Limitations for Condition 19(b)

Air Emission Source	Fuel	Duct Firing	Emission Rate per CT (lb/hr) PM10	SO_2	H_2SO_4	CO
Unit 4						
Combined Cycle	Natural Gas	No	23	11	1.4	8.4
Combined Cycle	Natural Gas	Yes	26	11	1.7	11.5
Combined Cycle	Fuel Oil	No	41	92	4.4	8.5
Simple Cycle	Natural Gas	No	21	11	1.4	84.2
Simple Cycle	Fuel Oil	No	22	92	4.4	85.3
Unit 5						
Combined Cycle	Natural Gas	No	11	12	1.5	3.2
Combined Cycle	Natural Gas	Yes	15	12	1.8	7.6
Combined Cycle	Fuel Oil	No	39	106	5.4	7.2
Simple Cycle	Natural Gas	No	9	12	1.5	32.2
Simple Cycle	Fuel Oil	No	17	106	5.4	72.4

Emission limitations are based on a 3-hour average.

Water Appropriation

48. This CPCN authorizes Mirant to appropriate and use surface waters of the State. Appropriation means a withdrawal, movement, or diversion of water from its source of natural occurrence. The appropriation will be tracked under MDE WMA permit number MO19668017(07). The surface water appropriation will be subject to the following conditions:

    a) *Allocation*. The surface water withdrawal granted by this appropriation is limited to a daily average of 8.1 million gallons on a yearly basis and a maximum daily withdrawal of 10.1 million gallons. Consumptive use is limited to a daily average of 6.6 million gallons on a yearly basis and a maximum daily consumptive use of 8.3 million gallons.

    b) *Use*. The water is to be used for wet cooling of steam condensers, makeup to the heat recovery steam generators (HRSGs), makeup water for air inlet chillers, fire protection water, potable water, construction support, and plant service water for equipment cleaning and maintenance and general plant washdown.

    c) *Source*. The water shall be withdrawn from the Potomac River.

    d) *Location*. The point of withdrawal shall be on the existing discharge canal of the once-through cooling system at the Dickerson Generating Station in Montgomery County, Maryland.

49. *Initiation of Withdrawal*. Mirant shall notify MDE WMA by certified mail when withdrawals for the uses specified in this appropriation have been initiated. This appropriation shall expire if water withdrawal is not commenced within two years after the effective date of issuance of the CPCN. The time limit may be extended for good cause, at the discretion of MDE WMA, upon written request to MDE WMA prior to the expiration of the two-year period. Withdrawal associated with plant construction qualifies as initiation.

50. *Change of Operations*. Mirant shall report any anticipated change in appropriation, which may result in a new or different withdrawal, quantity, source, or place of use of water, to MDE WMA by submission of a new application.

51. *Triennial Review*. MDE WMA shall review the appropriation every three years (triennial review). Mirant will be queried every three years regarding water withdrawal under the terms and conditions of this appropriation. Failure to return the triennial review query will result in suspension or revocation of this appropriation.

52. *Appropriation Renewal.* This appropriation will expire twelve years from the date that the CPCN was issued. In order to renew the appropriation, Mirant shall file a renewal application with MDE WMA no later than 45 days prior to the expiration. MDE WMA may at any time (including triennial review or when a change application is submitted) revise any condition of this appropriation or add additional conditions concerning the character,

amount, means and manner of the appropriation, which may be necessary to properly protect, control and manage the water resources of the state. Condition revisions and additions will be accompanied by issuance of a revised appropriation.

53. *Right of Entry*. Mirant shall allow authorized representatives of MDE WMA and the Public Service Commission staff access to the facility to conduct inspections and evaluations necessary to assure compliance with the conditions of this appropriation. Mirant shall provide such assistance as may be necessary to effectively and safely conduct such inspections and evaluations.

54. *Appropriation Suspension or Revocation*. MDE WMA may suspend or revoke this appropriation upon violation of the conditions of this appropriation, or upon violation of any regulation promulgated pursuant to Title 5 of the Environment Article, Annotated Code of Maryland (1996 replacement volume) as amended.

55. *Non-Transferable*. This appropriation is only transferable to a new owner if the new owner acquires prior authorization to continue this appropriation by filing a new application with MDE WMA. Authorization will be accomplished by issuance of a new appropriation permit by MDE WMA.

56. *Drought Period Emergency Restrictions*. If MDE WMA determines that a drought period or emergency exists, Mirant may be required under MDE WMA's direction to stop or reduce water withdrawal from the Potomac River. Any cessation or reduction of water withdrawal must continue for the duration of the drought period or emergency, or until MDE WMA directs Mirant that water withdrawal under standard appropriation conditions may be resumed.

57. *Consumptive Use Restrictions*. When directed by MDE WMA, Mirant shall reduce maximum daily consumptive use to 1 million gallons per day or less to comply with the provisions of COMAR 26.07.02B.

58. Mirant shall conduct the following monitoring activities in support of the surface water appropriation:

    a) *Flow Measurement*. Measure all water withdrawn under this appropriation by a method approved by MDE WMA.

    b) *Withdrawal Reports*. Submit to MDE WMA, semi-annually (July-December, no later than January 31 and January-June, no later than July 31), water withdrawal records. These records shall show the total quantity of water withdrawn each month under this appropriation, and the total quantity of water consumed.

Terrestrial and Aquatic Ecology

59. Construction and operation of the power facility and transmission line shall be undertaken in accordance with this CPCN and shall comply with all applicable local, State, and Federal regulations, including but not limited to the following:

    a) Nontidal Wetlands - COMAR 08.05.04 applies to activities conducted in nontidal wetlands.

    b) Water Quality and Water Pollution Control - COMAR 26.08.01 through COMAR 26.08.04 applies to discharges to surface water and maintenance of surface water quality.

    c) Erosion and Sediment Control - COMAR 26.09.01 applies to the preparation, submittal, review, approval, and enforcement of erosion and sediment control plans.

60. All portions of the power plant and rights-of-way disturbed during construction shall be stabilized immediately after the cessation of construction activities within that portion of the right-of-way, followed by seed application, except in actively cultivated lands, in accordance with the best management practices presented in the MDE document 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control, and as approved by Montgomery County. In wetlands and wetland buffers, seed application shall consist of the following species: annual ryegrass (*Lolium multiflorum*), millet (*Setaria italica*), barley (*Horedum* spp.), oats (*Uniola* spp.), and/or rye (*Secale cereale*). Other non-persistent vegetation may be acceptable, but must be approved by MDE Water Management Administration. Kentucky 31 fescue shall not be used in wetlands or buffers.

61. Mirant shall work closely with DNR PPRP, DNR Division of Forestry, and Montgomery County to prepare a forest conservation plan to mitigate for forest losses caused by the proposed construction. The plan will detail methods and specifications for establishment of a total of 7 acres of forest. A draft forest conservation plan shall be submitted to DNR PPRP, DNR Division of Forestry, and Montgomery County for review and approval. Plan implementation shall commence before the facility begins commercial operation.

62. This CPCN is not an authorization to discharge wastewater to waters of the State. Mirant shall obtain a modification to its discharge permit under the National Pollutant Discharge Elimination System (NPDES) for the Dickerson Generating Station. As directed by MDE WMA, Mirant shall prepare a Stormwater Pollution Prevention Plan, incorporating best management practices to prevent runoff of contaminated stormwater.

Emergency Preparedness

63. Mirant shall prepare an updated Spill Prevention, Control and Countermeasures Plan and obtain an Oil Operations Permit from MDE to cover the increased amount of fuel oil storage and handling at the Dickerson site.

64. If the concentration of aqueous ammonia solution used for emissions control is 20 percent or greater and ammonia storage capacity exceeds 10,000 pounds, Mirant shall prepare a Risk Management Program (RMP) to address accidental release prevention as required by 40 CFR Part 68. All reports and notifications required by 40 CFR Part 68 must be submitted electronically to: RMP*Submit, RMP Reporting Center, P.O. Box 3346, Merrifield, VA 22116-3346.

65. Mirant shall provide to PPRP and the PSC copies of its security procedures, in particular those procedures to ensure site and plant safety and security during construction and operation of the power plant. The procedures should address issues such as how Mirant plans to control vehicle and construction worker access to the site and to protect any vulnerable assets from being threatened from outside the perimeter of the property. The procedures should also identify how local, state, and federal agencies would be coordinated in the event of a large-scale emergency. Security procedures should consider the effects of any proposed measures on the surrounding community and mitigate adverse effects to the maximum extent possible.

Cultural Resources

66. Mirant shall establish Archeological Protection Zones for the Benjamin and Charles Shreve Farm and the Shreve House in order to protect these historic resources from inadvertent damage from construction activities. Mirant shall erect temporary protective fencing around the sites during construction.

67. Mirant shall submit to Maryland Historical Trust (MHT) a copy of training programs, or guidelines provided to inspectors or contractors, to identify and/or protect unforeseen archeological sites that may be revealed during construction of the power plant and associated facilities. If such archeological sites or relics are identified in the project area, Mirant, in consultation with and as approved by MHT, shall develop and implement a plan for avoidance and protection, data recovery, or destruction without recovery of the properties adversely affected by the project.

Traffic

68. During construction, Mirant shall retain a Traffic Management Specialist to manually control vehicle movements at the intersection of Martinsburg Road with MD 28.

69. Mirant shall monitor the performance of the intersection of MD 28 and MD 109 to determine whether significant delays are occurring when construction traffic volumes are greatest. If significant delays are observed, Mirant shall take appropriate steps to reduce congestion at this intersection, such as working with State Highway Administration to adjust the timing of the traffic signal or staggering shift schedules to reduce the peak number of construction workers leaving the site in the afternoon.

70. Mirant shall instruct its contractors and employees to use MD 28 to Martinsburg Road as the

primary means of access to the site, and to avoid using the portion of Martinsburg Road to the south of the main plant entrance as an alternate route to the facility.

Noise Levels

71. Mirant shall design, construct, and operate the facility so as to comply with applicable Montgomery County and State of Maryland noise regulations. Before construction begins, Mirant shall verify that the analysis of noise impacts presented in the CPCN application adequately represents the predicted noise impacts of the actual equipment to be installed at the Dickerson site. If changes in configuration or equipment type occur during the detailed facility design, and these changes materially alter the facility's predicted noise characteristics, then Mirant shall provide an updated noise impact analysis.

72. Mirant shall monitor noise levels at the boundaries of the facility, after the plant is operational, to verify results of the predictive analysis. The scope of work for the noise monitoring shall be provided to MDE's Noise Control Program and to Montgomery County for review and approval, within one year after the issuance of this CPCN. The noise study shall include monitoring at facility site boundaries near residential properties. Measurements will be taken while the plant is operating at full load, to represent maximum noise emissions. Results shall be provided within six months after Units 4 and 5 begin commercial operation.

73. If the results of the noise monitoring conducted in Condition 71 indicate that the operation of Units 4 and 5 is creating an exceedance of the Maryland or Montgomery County noise standards, Mirant shall take corrective action in consultation with MDE's Noise Control Program and Montgomery County.

Visual Quality

74. Mirant shall develop a detailed visual impact mitigation plan and submit it to PPRP and the PSC for review and approval prior to commencing construction of the facility. The plan shall address, at a minimum, specific steps that will be taken to minimize visual impact of the proposed facility. The plan shall specifically address the visibility of Mirant's oil storage tanks from Martinsburg Road and consider the use of earthen berms and vegetation to screen them from view. The plan shall also discuss how intrusive night lighting will be minimized.

75. Mirant shall install plume abated mechanical draft cooling towers for the combined cycle portions of Units 4 and 5.

Other

76. Mirant shall work closely with PPRP to prepare and execute a program of land preservation and/or reforestation to reflect a partial mitigation of the environmental impact from the project. The mitigation project will achieve one or more of the following objectives: 1) provide a nutrient reduction benefit to the Chesapeake Bay, 2) result in a net reduction of greenhouse gases leading to the establishment of potential carbon credits, or 3) protect important State terrestrial ecological assets.

77. Mirant will provide a minimum of 20 million gallons of water storage, the first 10 million gallons to be available when the Unit 4 HRSG and steam turbine commence commercial operation. The second 10 million gallons will be available when the Unit 5 HRSG and steam turbine commence commercial operation.

    After the Unit 5 HRSG and steam turbine commence commercial operation, Mirant will provide an additional 10 million gallons of water storage, not to exceed a total of 40 million gallons for the project, if, due to Potomac River water limitations, Mirant experiences a loss of 40 hours of generating availability when the PJM East hourly integrated load is more than 90% of the PJM East annual peak demand during any one year.

78. Informational copies of the reports required regarding change of ownership, major milestones, stack test protocols, stack testing, water withdrawals, archeological recovery guidelines, and noise studies as described in Conditions 11, 31, 40, 43, 49, 50, 52, 58, 67, 71, and 72 shall be sent to the Power Plant Research Program at:

    Power Plant Assessment Division
    Department of Natural Resources
    Tawes State Office Building, B-3
    580 Taylor Avenue
    Annapolis, Maryland 21401

Appendix B
Search of RBLC Database

POLLUTANT	FACILITY	CITY	STATE	PERMIT DATE	LAST UPDATE	PROCESS	THROUGH-PUT	UNIT	EMISSION RATE	UNIT	DESCRIPTION OF CONTROL TECHNOLOGY	BASIS
CO	AES-PRCP	GUAYAMA	PR	10/29/01	4/2/03	LIMESTONE DRYER	13	MMBTU/HR				
CO	DUKE ENERGY MILL CREEK COMBUSTION TURBINE STATION	CHEROKEE	SC	11/8/01	3/10/03	8 SIMPLE CYCLE TURBINES	81.7	MW	60	LB/HR NG	COMBUSTION CONTROLS	BACT-PSD
CO	HOT SPRINGS POWER PROJECT	HOT SPRINGS	AR	11/9/01	12/20/02	COMBUSTION TURBINE, HRSG, DUCT BURNER	700	MW	12	PPMVD @ 15% O2	CATALYTIC OXIDIZER	BACT-PSD
CO	LSP-BATESVILLE GENERATION FACILITY	PANOLA	MS	11/13/01	11/19/02	COMBINED CYCLE COMBUSTION TURBINE GENERATION (CTG)	2100	MMBTU/H	2.5	PPMVD @ 15% O2	NA	BACT-PSD
CO	SOUTHERN INDIANA-AB BROWN GENERATING STATION	POSEY	IN	11/16/01	11/14/02	ONE SIMPLE CYCLE COMBUSTION TURBINE GE TFA	1145.8	MMBTU/H	25	PPM @ 15% O2	GOOD COMBUSTION PRACTICES	BACT-PSD
CO	SOUTHERN INDIANA GAS & ELECTRIC COMPANY	POSEY	IN	11/16/01	11/14/02	ONE SIMPLE CYCLE COMBUSTION TURBINE GE TFA	1145.8	MMBTU	25	PPM @ 15% O2	GOOD COMBUSTION PRACTICES	BACT-PSD
CO	INDECK-NILES, LLC	CASS	MI	12/2/01	12/4/02	GAS TURBINES, 4 EACH, SIMPLE CYCLE	163	MW	5	PPMDV @ 15% O2	FOUR X 113.8 TONS PER YEAR (12-MO ROLLING) LIMIT APPLICABLE WITH OR WITHOUT DUCT BURNER FIRING. 5 PPM W/O DUCT BURNER FIRING; 7.5 PPM WITH DUCT FIRING.	BACT-PSD
CO	ALLEGHENY ENERGY SUPPLY CO	ST JOSEPH	IN	12/7/01	4/2/03	TWO SIMPLE CYCLE COMBUSTION TURBINES	469	MMBTU/H	25	PPM @ 15% O2	GOOD COMBUSTION PRACTICES	BACT-PSD
CO	DUKE ENERGY DALE, LLC	DALE	AL	12/11/01	12/2/02	2 GE 7FA GAS FIRED COMB. CYCLE W/ 568 MMBTU	170	MW	0.033	LB/MMBTU	EFFICIENT COMBUSTION	BACT-PSD
CO	PANDA CULLODEN GENERATING STATION	CABELL	WV	12/18/01	5/23/02	COMBUSTION TURBINE	300	MW	8.2	PPM	USE OF STATE OF THE ART COMBUSTER DESIGN ALONG WITH GOOD OPERATING PRACTICES TO MINIMIZE INCOMPLETE COMBUSTION IS THE APPROPRIATE CO AND VOC BACT FOR THE GE CT/HRSG UNITS	BACT-PSD
CO	EI DUPONT SPRUANCE PLANT	CHESTERFIELD	VA	1/8/02	3/10/03	PLASTICS AND RESINS			51	LBS/HR	GOOD COMBUSTION OPERATING	BACT-OTHER
CO	EDINBURG ENERGY LIMITED PARTNERSHIP	HIDALGO	TX	1/8/02	4/2/03	COMBINED CYCLE GAS TURBINE, ABB MODEL GT24	180	MW	43	LB/H AT FULL LOAD	CO EMISSIONS SHALL NOT EXCEED 10 WHEN CORRECTED TO 15% O2 AT FULL LOAD, WITH OUR WITHOUT EVAPORATIVE COOLERS, EXCEPT DURING START-UP/SHUTDOWN	BACT-PSD
CO	TENASKA FLUVANNA	FLUVANNA	VA	1/11/02	3/13/03	TURBINES, COMBINED CYCLE, (3), DISTILLATE	32	MMGAL/YR	69	LB/H	(N)	BACT-PSD
CO	CPV CANA	ST. LUCIE COUNTY	FL	1/17/02	3/26/03	TURBINE, COMBINED CYCLE, NATURAL GAS	1680	MMBTU/H	8	PPMVD @ 15% O2	COMBUSTION CONTROLS	BACT-PSD
CO	DUKE ENERGY FIELD SERVICES-MINDEN	WEBSTER PARISH	LA	1/24/02	3/19/03	Y-GRADE TRUCK LOADING AND UNLOADING	22	MM GAL/YR	0.26	LB/H	BACT NOT REQUIRED FOR MINOR MODIFICATION. BACT ANALYSIS FROM LAST PERMIT MODIFICATION DETERMINED TO BE ADEQUATE	BACT-PSD
CO	BUCHANA GENERATION	BUCHANAN	VA	1/31/02	3/18/03	ELECTRICITY GENERATION	424.6	MMBTU/HR	51	LB/HR	GOOD COMBUSTION PRACTICES	BACT-OTHER
CO	ACADIA POWER STATION, ACADIA POWER PARTNERS LLC		LA	1/31/02	4/2/03	GAS TURBINE UNITS 1, 2, 3, 4	183	MW	244	T/YR	GOOD DESIGN, PROPER OPERATING AND MAINTENANCE PRACTICES, AND USE OF CLEAN NATURAL GAS	BACT-PSD
CO	HORSESHOE ENERGY PROJECT	LINCOLN	OK	2/12/02	10/21/02	TURBINES AND DUCT BURNERS	310	MW	40	PPM @15% O2	GOOD COMBUSTION CONTROL	BACT-PSD
CO	MUSTANG ENERGY PROJECT	CANADIAN	OK	2/12/02	10/17/02	COMBUSTION TURBINES W/ DUCT BURNERS	0		40	PPM @15% O2	COMBUSTION CONTROLS STANDARD ONLY APPLIES IF GE CT IS SELECTED, THE ABB CT WAS LESS THAN SIGNIFICANT EMIS. INCR FOR CO	BACT-PSD
CO	THOMAS B. FITZHUGH GENERATION STATION	FRANKLIN	AR	2/15/02	1/27/03	TURBINE, COMBINED CYCLE, FUEL OIL	170.6	MW	90	PPM @15% O2	GOOD COMBUSTION PRACTICE	BACT-PSD
CO	PERRYVILLE POWER STATION	OUACHTA PARISH	LA	3/8/02	3/24/03	GAS TURBINES			0.08	LB/MMBTU	GOOD OPERATING PRACTICES AND USE OF NATURAL GAS AS FUEL. BACT FOR NOX, LOW NOX BURNERS AND SCR, IS ALSO BACT FOR CO	BACT-PSD
CO	JEA/BRANDY BRANCH	DUVAL	FL	3/27/02	3/26/03	TURBINES, COMBINED CYCLE, (2)	1911	MMBTU/H	12.21	PPMVD	GOOD COMBUSTION	BACT-PSD
CO	LIBERTY GENERATING STATION	UNION	NJ	3/28/02	11/19/02	COMBINED CYCLE TURBINE (3)	2964	MMBTU/H	2	PPMVD @ 15% O2	CO CATALYST	OTHER

POLLUTANT	FACILITY	CITY	STATE	PERMIT DATE	LAST UPDATE	PROCESS	THROUGH-PUT	UNIT	EMISSION RATE	UNIT	DESCRIPTION OF CONTROL TECHNOLOGY	BASIS
CO	DUKE ENERGY-JACKSON FACILITY	JACKSON	AR	4/1/02	1/24/03	TURBINES, COMBINED CYCLE, NATURAL GAS, (2)	170	MW	23.6	PPM @ 15% O2	GOOD OPERATING PRACTICE	BACT-PSD
CO	GREATER DES MOINES ENERGY CENTER	POLK	IA	4/10/02	12/4/02	COMBUSTION TURBINES - SIMPLE CYCLE	0		0.023	LB/MMBTU @15% O2	(N)	BACT-PSD
CO	CALPINE/AUBURNDALE COGENERATION FACILITY	POLK	FL	4/25/02	3/26/03	TURBINE, SIMPLE CYCLE, NATURAL GAS	1591	MMBTU/H	10	PPM	GOOD COMBUSTION	OTHER
CO	TENASKA BEAR GARDEN STATION	BUCKINGHAM	VA	4/30/02	2/3/02	GE 7 FA FUAL FUEL COMBUSTION TURBINES	1887	MMBTU	222	T/YR 3 HR BLOCK	GOOD COMBUSTION CONTROL PRACTICES AND CONTINUOUS EMISSION MONITORING DEVICES	BACT-PSD
CO	REDBUD POWER PLANT	OKLAHOMA	OK	5/6/02	10/17/02	COMBUSTION TURBINES	1832	MMBTU/H	17.2	PPM@ 15% O2	GOOD COMBUSTION PRACTICES AND DESIGN	BACT-PSD
CO	SCE&G - JASPER COUNTY GENERATING FACILITY	JASPER	SC	5/23/02	1/13/03	TANK, FUEL OIL STORAGE, 3 EACH	1.2	MM GAL (EACH)	15.8	LB/H	(N)	BACT-PSD
CO	GENOVA OK I POWER PROJECT	GRADY	OK	6/13/02	9/23/02	GE COMBUSTION TURBINE & DUCT BURNERS	1705	MMBTU/H	8.2	PPM@ 15% O2	COMBUSTION CONTROL	BACT-PSD
CO	CLOVIS ENERGY FACILITY	CURRY	NM	6/27/02	4/8/03	AUXILIARY BOILERS (AUX-1 AND AUX-2)	33	MMBTU/HR	4.9	LB/HR	DRY LOW NOX (DLN) TECHNOLOGY, GOOD COMBUSTION PRACTICES	BACT-PSD
CO	EL PASO MERCHANT ENERGY CO	WASHTENAW	MI	7/1/02	12/12/02	TURBINE, SIMPLE-CYCLE, NATURAL GAS, (3)	170	MW	7.9	PPMVD @ 15% O2	GOOD COMBUSTION	BACT-PSD
CO	BARTON SHOALS ENERGY	COLBERT	AL	7/12/02	12/3/02	FOUR (4) COMBINED CYCLE COMBUSTION TURBINE	173	MW	0.041	LB/MMBTU	GOOD COMBUSTION PRACTICES	BACT-PSD
CO	HAWKEYE GENERATING, LLC	ADAIR	IA	7/23/02	1/13/03	COMBUSTION TURBINE	33.77	BILLION CF/YR	5	PPMVD	CATAYTIC OXIDATION COMBINED CYCLE	BACT-PSD
CO	ROCKY MOUNTAIN ENERGY CENTER, LLC	WELD	CO	8/11/02	4/2/03	TWO (2) NATURAL GAS FIRED, COMBINED-CYCLE	2311	MMBTU/H	9	PPMVD	GOOD COMBUSTION CONTROL PRACTICES (PREVENTION) AND OXIDATION CATALYST (CONTROL)	BACT-PSD
CO	WHITE OAK POWER	PITTSYLVANIA	VA	8/29/02	4/1/03	TURBINE, SIMPLE CYCLE, NATURAL GAS, (4)	1731	MMBTU/H	8	PPMVD @15% O2 GAS	GOOD COMBUSTION PRACTICE	BACT-PSD
CO	CPV CUNNINGHAM CREEK	FLUVANNA	VA	9/6/02	3/20/03	TURBINE, COMBINED CYCLE, (2)	2132	MMBTU/H	10	LB/H	GOOD COMBUSTION PRACTICES	BACT-PSD
CO	VA POWER - POSSUM POINT	PRINCE WILLIAM	VA	11/18/02	3/26/03	TURBINE, COMBINED CYCLE, NATURAL GAS	1937	MMBTU/H	2.3	LB/H	GOOD AIR POLLUTION CONTROL PRACTICES FOR MINIMIZING EMISSIONS	BACT-PSD
CO	HENRY COUNTY POWER	HENRY	VA	11/21/02	3/20/03	TURBINE, COMBINED CYCLE, (4), 100% LOAD	171	MW	8	PPMVD@ 15% O2	CLEAN FUEL, GOOD COMBUSTION AND DESIGN	BACT-PSD
CO	MIRANT AIRSIDE INDUSTRIAL PARK	PITTSYLVANIA	VA	12/6/02	3/20/03	TURBINE, SIMPLE CYCLE, (2)	84	MW	25	PPMVD @ 15% O2	GOOD COMBUSTION PRACTICES	BACT-PSD
CO	POWER IOWA ENERGY CENTER	CERRO GORDO	IA	12/20/02	1/13/03	TURBINE, SIMPLE CYCLE, (2)	170	MW	9	PPMV @ 15% O2	GOOD COMBUSTION PRACTICES	BACT-OTHER
CO	CHICKAHOMINY POWER	CHARLES CITY	VA	1/10/03	3/21/03	TURBINE, SIMPLE CYCLE, (4), NATURAL GAS	1862	MMBTU/H	2	PPMVD@ 15% 02	CLEAN BURNING FUELS AND GOOD COMBUSTION PRACTICES	BACT-PSD
CO	ODEC - MARSH RUN FACILITY	FAUQUIER	VA	2/14/03	3/25/03	TURBINE, SIMPLE CYCLE, (4), NATURAL GAS	1624	MMBTU/H	9	PPMVD @ 15% O2	GOOD COMBUSTION PRACTICES AND CLEAN BURNING FUEL	NSPS
CO	ODEC - LOUISA FACILITY	LOUISA	VA	3/11/03	3/20/03	TURBINE, SIMPLE CYCLE, (1), NATURAL GAS	1624	MMBTU/H	9	PPMVD @ 15% O2	GOOD COMBUSTION PRACTICES AND CONTINUOUS EMISSION MONITORING SYSTEM	NSPS
CO	GENERAL ELECTRIC PLASTICS	BURKVILLE	AL	05/27/1998	07/02/1998	COMBINED CYCLE	0		.08	LBS/MMBTU	PROPER COMBUSTION	BACT-PSD
CO	PANDA-KATHLEEN, L.P.	LAKELAND	FL	06/01/1995	05/20/1996	COMBINED CYCLE COMBUSTION TURBINE (TOTAL 115 MW)	75	MW	25	PPM @ 15% O2	COMBUSTION CONTROLS STANDARD ONLY APPLIES IF GE CT IS SELECTED, THE ABB CT WAS LESS THAN SIGNIFICANT EMIS. INCR FOR CO	BACT-PSD
CO	MEAD COATED BOARD, INC.	PHENIX CITY	AL	03/12/1997	05/31/1997	COMBINED CYCLE TURBINE (25 MW)	568	MMBTU/HR	28	PPMVD@15% O2 (GAS)	PROPER DESIGN AND GOOD COMBUSTION PRACTICES	BACT-PSD
CO	SOUTHERN ENERGY, INC.	ZEELAND	MI	03/16/2000	08/22/2000	COMBINED CYCLE TURBINE ELECTRICAL GENERATING UNITS	9000	GIGAJOULES	.042	LB/MMBTU	CEM. GOOD COMBUSTION PRACTIVE REQUIRED. RATE PER TURBINE (CT).	BACT-PSD
CO	PUBLIC SERVICE OF COLO.-FORT ST VRAIN	PLATTEVILLE	CO	05/01/1996	05/19/1998	COMBINED CYCLE TURBINES (2), NATURAL	471	MW	15	PPMVD, SMPL CY	GOOD COMBUSTION CONTROL PRACTICES. COMMITMENT TO APATTERN OF OPERATION (LOAD VARIATIONS, ETC.) TO MINIMIZE OPERATION AT HIGH EMISSIONS.	BACT-PSD
CO	MID-GEORGIA COGEN.	KATHLEEN	GA	04/03/1996	08/19/1996	COMBUSTION TURBINE (2), FUEL OIL	116	MW	30	PPMVD	COMPLETE COMBUSTION	BACT-PSD
CO	MID-GEORGIA COGEN.	KATHLEEN	GA	04/03/1996	08/19/1996	COMBUSTION TURBINE (2), NATURAL GAS	116	MW	10	PPMVD	COMPLETE COMBUSTION	BACT-PSD
CO	OCCIDENTAL CHEMICAL CORPORATION	HAHNVILLE	LA	03/19/1999	03/19/2001	GAS TURBINES (3 UNITS)	170	MW	25	PPMV	DRY LOW NOX (DLN) OR DLN IN COMBINATION WITH OTHER TECHNOLOGIES	BACT-PSD
CO	CIMARRON CHEMICAL	JOHNSTOWN	CO	03/25/1991	07/20/1994	TURBINE #2, GE FRAME 6	33	MW	250	T/YR, LESS THAN	CO CATALYST	OTHER
CO	AIR LIQUIDE AMERICA CORPORATION	GEISMAR	LA	02/13/1998	01/20/1999	TURBINE GAS, GE, 7ME 7	966	MMBTU/H	25	PPMV	GOOD EQUIPMENT DESIGN, PROPER COMBUSTION TECHNIQUEAND MIN. 2% EXCESS O2	BACT-PSD
CO	RUMFORD POWER ASSOCIATES	RUMFORD	ME	05/01/1998	2/10/99	TURBINE GENERATOR, COMBUSTION, NATURAL GAS	1906	MMBTU/H	15	PPM @ 15% O2	GE DRY LOW-NOX COMBUSTOR DESIGN. GOOD COMBUSTION CONTROL.	BACT-PSD
CO	FLORIDA POWER AND LIGHT	NORTH PALM BEACH	FL	06/05/1991	03/24/1995	TURBINE, CG, 4 EACH	400	MW	33	PPM @ 15% O2	COMBUSTION CONTROL	BACT-PSD
CO	CHAMPION INTERNATL CORP. & CHAMP. CLEAN ENERGY	BUCKSPORT	ME	09/14/1998	04/19/1999	TURBINE, COMBINED CYCLE, NATURAL GAS	175	MW	9	PPMVD @15% O2 GAS		BACT-OTHER
CO	CASCO RAY ENERGY CO	VEAZIE	ME	07/13/1998	04/19/1999	TURBINE, COMBINED CYCLE, NATURAL GAS, TWO	170	MW EACH	20	PPM @ 15% O2	15% EXCESS AIR	BACT-PSD
CO	WYANDOTTE ENERGY	WYANDOTTE	MI	02/08/1999	04/19/1999	TURBINE, COMBINED CYCLE, POWER PLANT	500	MW	3	PPM	CATALYTIC OXIDIZER	LAER

POLLUTANT	FACILITY	CITY	STATE	PERMIT DATE	LAST UPDATE	PROCESS	THROUGH-PUT	UNIT	EMISSION RATE	UNIT	DESCRIPTION OF CONTROL TECHNOLOGY	BASIS
CO	WESTBROOK POWER LLC	WESTBROOK	ME	12/04/1998	04/19/1999	TURBINE, COMBINED CYCLE, TWO	528	MW TOTAL	15	PPM @15% O2	USING 15 % EXCESS AIR.	BACT-PSD
CO	DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION	LOWESVILLE	NC	12/20/1991	03/24/1995	TURBINE, COMBUSTION	1313	MM BTU/HR	59	LB/HR	COMBUSTION CONTROL	BACT-PSD
CO	DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION	LOWESVILLE	NC	12/20/1991	03/24/1995	TURBINE, COMBUSTION	1247	MM BTU/HR	60	LB/HR	COMBUSTION CONTROL	BACT-PSD
CO	WRIGHTSVILLE POWER FACILITY	WRIGHTSVILLE	AR	02/28/2000	06/15/2000	TURBINE, COMBUSTION, 7EA FRAME, 1	80	MW	50	PPM @ 15% O2	DRY LOW NOX/GOOD COMBUSTION	BACT-PSD
CO	PDC EL PASO MILFORD LLC	MILFORD	CT	04/16/1999	06/17/1999	TURBINE, COMBUSTION, ABB GT-24, #1 WITH 2 CHILLERS	1.97	MMCF/H	13	LB/H NAT GAS	OXIDATION CATALYST	BACT-PSD
CO	PDC EL PASO MILFORD LLC	MILFORD	CT	04/16/1999	06/17/1999	TURBINE, COMBUSTION, ABB GT-24E,#2 WITH 2 CHILLERS	1.97	MMCF/H	13	LB/H NAT GAS	OXIDATION CATALYST	BACT-PSD
CO	DIGHTON POWER ASSOCIATE, LP	DIGHTON	MA	10/06/1997	04/19/1999	TURBINE, COMBUSTION, ABB GT11N2	1327	MMBTU/H	5.97	LB/H	DRY LOW NOX COMBUSTION TECHNOLOGY WITH SCR ADD-ON NOX CONTROL.	BACT-PSD
CO	BERKSHIRE POWER DEVELOPMENT, INC.	AGAWAM	MA	09/22/1997	04/19/1999	TURBINE, COMBUSTION, ABB GT24	1792	MMBTU/H	14.3	LB/H	DRY LOW NOX COMBUSTION TECHNOLOGY WITH SCR ADD-ON NOX CONTROL.	BACT-PSD
CO	SANTA ROSA ENERGY LLC	NORTHBROOK	FL	12/04/1998	04/16/1999	TURBINE, COMBUSTION, NATURAL GAS	241	MW	0		DRY LOW NOX BURNER GOOD COMBUSTION PRACTICE	BACT-PSD
CO	TENUSKA GEORGIA PARTNERS, L.P.	FRANKLIN	GA	12/18/1998	06/23/1999	TURBINE, COMBUSTION, SIMPLE CYCLE, 6	160	MW EA	33	PPMVD	CO EMISSION IS BECAUSE OF FUEL OIL. WHEN OUTPUT ISBELOW 123 MW LIMIT IS 33 PPMVD AND ABOVE 123 MW LIMIT IS 20 PPMVD.	BACT-PSD
CO	TENUSKA GEORGIA PARTNERS, L.P.	FRANKLIN	GA	12/18/1998	06/23/1999	TURBINE, COMBUSTION, SIMPLE CYCLE, 6	160	MW EA	15	PPMVD @ 15% O2	USING 15% EXCESS AIR. CO EMISSION IS BECAUSE OF NATURAL GAS.	BACT-PSD
CO	KEY WEST CITY ELECTRIC SYSTEM	KEY WEST	FL	09/28/1995	05/31/1996	TURBINE, EXISTING CT RELOCATION TO A NEW PLANT	23	MW	20	PPM @ 15% O2 FULL LD	GOOD COMBUSTION	BACT-PSD
CO	KISSIMMEE UTILITY AUTHORITY	INTERCESSION CITY	FL	04/07/1993	02/21/2000	TURBINE, FUEL OIL	371	MMBTU/H	76	LB/H	GOOD COMBUSTION PRACTICES	BACT-PSD
CO	KISSIMMEE UTILITY AUTHORITY	INTERCESSION CITY	FL	04/07/1993	02/21/2000	TURBINE, FUEL OIL	928	MMBTU/H	65	LB/H	GOOD COMBUSTION PRACTICES	BACT-PSD
CO	FLORIDA POWER CORPORATION POLK COUNTY SITE	BARTOW	FL	02/25/1994	01/13/1995	TURBINE, FUEL OIL (2)	1730	MMBTU/H	30	PPMVD	GOOD COMBUSTION PRACTICES	BACT-PSD
CO	TIGER BAY LP	FT. MEADE	FL	05/17/1993	01/13/1995	TURBINE, GAS	1614.8	MMBTU/H	49	LB/H	GOOD COMBUSTION PRACTICES	BACT-PSD
CO	HARTWELL ENERGY LIMITED PARTNERSHIP	HARTWELL	GA	07/28/1992	03/24/1995	TURBINE, GAS FIRED (2 EACH)	1817	M BTU/HR	25	PPMVD@FULL LOADLH	SPEC: CLEAN BURNING FUELS	BACT-PSD
CO	THERMO INDUSTRIES, LTD.	FT. LUPTON	CO	02/19/1992	03/24/1995	TURBINE, GAS FIRED, 5 EACH	246	MMBTU/H	25	PPM @ 15% O2	COMBUSTION CONTROL	BACT-PSD
CO	SOUTHERN CALIFORNIA GAS	WHEELER RIDGE	CA	10/29/1991	05/31/1992	TURBINE, GAS FIRED, SOLAR MODEL H	5500	HP	7.74	PPM @ 15% O2	HIGH TEMP OXIDATION CATALYST	BACT-PSD
CO	CHARLES LARSEN POWER PLANT	CITY OF LAKELAND	FL	07/25/1991	03/24/1995	TURBINE, GAS, 1 EACH	80	MW	25	PPM @ 15% O2	COMBUSTION CONTROL	BACT-PSD
CO	ENRON LOUISIANA ENERGY COMPANY	EUNICE	LA	08/05/1991	10/30/1991	TURBINE, GAS, 2	39.1	MMBTU/H	60	PPM @ 15% O2	BASE CASE, NO ADDITIONAL CONTROLS	BACT-PSD
CO	LAKE COGEN LIMITED	UMATILLA	FL	11/20/1991	03/24/1995	TURBINE, GAS, 2 EACH	42	MW	42	PPM @ 15% O2	COMBUSTION CONTROL	BACT-PSD
CO	FLORIDA POWER AND LIGHT	NORTH PALM BEACH	FL	06/05/1991	03/24/1995	TURBINE, GAS, 4 EACH	400	MW	30	PPM @ 15% O2	COMBUSTION CONTROL	BACT-PSD
CO	ORLANDO UTILITIES COMMISSION	TITUSVILLE	FL	11/05/1991	05/14/1993	TURBINE, GAS, 4 EACH	35	MW	10	PPM @ 15% O2	COMBUSTION CONTROL	BACT-PSD
CO	FLORIDA POWER AND LIGHT	LAVOGROME REPOWERING STATION	FL	03/14/1991	03/24/1995	TURBINE, GAS, 4 EACH	240	MW	30	PPM @ 15% O2	COMBUSTION CONTROL	BACT-PSD
CO	CROCKETT COGENERATION - C&H SUGAR	CROCKETT	CA	10/05/1993	04/19/1999	TURBINE, GAS, GENERAL ELECTRIC MODEL PG7221(FA)	240	MW	5.9	PPMVD @ 15% O2	ENGELHARD OXIDATION CATALYST	BACT-OTHER
CO	EL PASO NATURAL GAS		AZ	10/25/1991	03/24/1995	TURBINE, GAS, SOLAR CENTAUR H	5500	HP	10.5	PPM @ 15% O2	FUEL SPEC: LEAN FUEL MIX	BACT-PSD
CO			AZ	10/25/1991	03/24/1995	TURBINE, GAS, SOLAR CENTAUR H	5500	HP	10.5	PPM @ 15% O2	FUEL SPEC: LEAN FUEL MIX	BACT-PSD
CO	SOUTHERN CALIFORNIA GAS	WHEELER RIDGE	CA	10/29/1991	08/04/1993	TURBINE, GAS-FIRED	47.64	MMBTU/H	7.74	PPM @ 15% O2	HIGH TEMPERATURE OXIDATION CATALYST	BACT-PSD
CO	KALAMAZOO POWER LIMITED	COMSTOCK	MI	12/03/1991	03/23/1994	TURBINE, GAS-FIRED, 2, W/ WASTE HEAT BOILERS	1805.9	MMBTU/H	20	PPMV	DRY LOW NOX TURBINES	BACT-PSD
CO	BEAR MOUNTAIN LIMITED	BAKERSFIELD	CA	08/19/1994	09/28/1999	TURBINE, GE, COGENERATION, 48 MW	48	MW	252.6	LB/D	OXIDATION CATALYST	BACT-OTHER
CO	EL PASO NATURAL GAS		AZ	10/18/1991	07/20/1994	TURBINE, NAT. GAS TRANSM., GE FRAME 3	12000	HP	60	PPM @ 15% O2	LEAN BURN	BACT-PSD
CO	KISSIMMEE UTILITY AUTHORITY	INTERCESSION CITY	FL	04/07/1993	02/21/2000	TURBINE, NATURAL GAS	869	MMBTU/H	54	LB/H	GOOD COMBUSTION PRACTICES	BACT-PSD
CO	KISSIMMEE UTILITY AUTHORITY	INTERCESSION CITY	FL	04/07/1993	02/21/2000	TURBINE, NATURAL GAS	367	MMBTU/H	40	LB/H	GOOD COMBUSTION PRACTICES	BACT-PSD
CO	FLORIDA GAS TRANSMISSION COMPANY	MOBILE	AL	08/05/1993	05/12/1994	TURBINE, NATURAL GAS	12600	BHP	.42	GM/HP HR	AIR-TO-FUEL RATIO CONTROL, DRY COMBUSTION CONTROLS	BACT-PSD
CO	FLORIDA POWER CORPORATION POLK COUNTY SITE	BARTOW	FL	02/25/1994	01/13/1995	TURBINE, NATURAL GAS (2)	1510	MMBTU/H	25	PPMVD	GOOD COMBUSTION PRACTICES	BACT-PSD
CO	TPS - DELL, LLC	DELL	AR	08/08/2000	10/29/2001	TURBINE, NATURAL GAS FIRED 2	640	MW	7	PPM @ 15% 02	DRY LOW NOX/GOOD COMBUSTION.	BACT-PSD

POLLUTANT	FACILITY	CITY	STATE	PERMIT DATE	LAST UPDATE	PROCESS	THROUGH-PUT	UNIT	EMISSION RATE	UNIT	DESCRIPTION OF CONTROL TECHNOLOGY	BASIS
CO	GENPOWER - KEO, LLC	KEO	AR	05/04/2001	10/29/2001	TURBINE, NATURAL GAS FIRED, 2	590	MW	7	PPM @ 15% 02	DRY LOW NOX/GOOD COMBUSTION.	BACT-PSD
	ORANGE COGENERATION LP	BARTOW	FL	12/30/1993	01/13/1995	TURBINE, NATURAL GAS, 2	368.3	MMBTU/H	30	PPMVD	GOOD COMBUSTION	BACT-PSD
	TIGER BAY LP	FT. MEADE	FL	05/17/1993	01/13/1995	TURBINE, OIL	1849.9	MMBTU/H	98.4	LB/H	GOOD COMBUSTION PRACTICES	BACT-PSD
	AUBURNDALE POWER PARTNERS, LP	AUBURNDALE	FL	12/14/1992	01/13/1995	TURBINE, OIL	1170	MMBTU/H	25	PPMVD	GOOD COMBUSTION PRACTICES	BACT-PSD
CO	HARTWELL ENERGY LIMITED PARTNERSHIP	HARTWELL	GA	07/28/1992	03/24/1995	TURBINE, OIL FIRED (2 EACH)	1840	M BTU/HR	25	PPMVD@FULL LOAD ELT	SPEC: CLEAN BURNING FUELS	BACT-PSD
CO	CHARLES LARSEN POWER PLANT	CITY OF LAKELAND	FL	07/25/1991	03/24/1995	TURBINE, OIL, 1 EACH	80	MW	25	PPM @ 15% O2	COMBUSTION CONTROL	BACT-PSD
CO	FLORIDA POWER AND LIGHT	NORTH PALM BEACH	FL	06/05/1991	03/24/1995	TURBINE, OIL, 2 EACH	400	MW	33	PPM @ 15% O2	COMBUSTION CONTROL	BACT-PSD
CO	LAKE COGEN LIMITED	UMATILLA	FL	11/20/1991	03/24/1995	TURBINE, OIL, 2 EACH	42	MW	78	PPM @ 15% O2	COMBUSTION CONTROL	BACT-PSD
CO	ORLANDO UTILITIES COMMISSION	TITUSVILLE	FL	11/05/1991	05/14/1993	TURBINE, OIL, 4 EACH	35	MW	10	PPM @ 15% O2	COMBUSTION CONTROL	BACT-PSD
CO	PANDA - KATHLEEN	LAKELAND	FL	01/05/1995	03/26/2001	TURBINE, STEAM	115	MW	25	PPMVD @ 15% O2 NG		BACT-PSD
CO	ALABAMA POWER COMPANY - THEODORE COGENERATION	THEODORE	AL	03/16/1999	06/23/1999	TURBINE, WITH DUCT BURNER	170	MW	.086	LB/MMBTU	EFFICIENT COMBUSTION	BACT-PSD
CO	AUBURNDALE POWER PARTNERS, LP	AUBURNDALE	FL	12/14/1992	01/13/1995	TURBINE,GAS	1214	MMBTU/H	15	PPMVD	GOOD COMBUSTION PRACTICES	BACT-PSD
CO	DUKE ENERGY NEW SOMYRNA BEACH POWER CO. LIMITED PARTNERS	CHARLOTTE NC	FL	10/15/1999	11/11/1999	TURBINE-GAS, COMBINED CYCLE	500	MW (2 UNITS)	12	PPM	GOOD COMBUSTION	BACT-PSD
CO	FLORIDA POWER CORP. - UF COGENERATION FACILITY	GAINESVILLE	FL	08/17/1992	03/26/2001	TURBINE/GENERATOR	43	MW	42	PPMD		BACT-PSD
CO	INTERNATIONAL PAPER	MANSFIELD	LA	02/24/1994	04/17/1995	TURBINE/HRSG, GAS COGEN	338	MM BTU/HR TURBINE	165.9	LB/HR	COMBUSTION CONTROL	BACT
CO	FORMOSA PLASTICS CORPORATION, LOUISIANA	BATON ROUGE	LA	03/02/1995	04/17/1995	TURBINE/HRSG, GAS COGENERATION	450	MM BTU/HR	25.8	LB/HR	PROPER OPERATION	BACT-PSD
CO	FORMOSA PLASTICS CORPORATION, BATON ROUGE PLANT	BATON ROUGE	LA	03/07/1997	04/28/1997	TURBINE/HSRG, GAS COGENERATION	450	MM BTU/HR	70	LB/HR	COMBUSTION DESIGN AND CONSTRUCTION.	BACT-PSD
CO	LAKEWOOD COGENERATION, L.P.	LAKEWOOD TOWNSHIP	NJ	04/01/1991	05/29/1995	TURBINES (#2 FUEL OIL) (2)	1190	MMBTU/HR (EACH)	.06	LB/MMBTU	TURBINE DESIGN	BACT-OTHER
CO	LAKEWOOD COGENERATION, L.P.	LAKEWOOD TOWNSHIP	NJ	04/01/1991	05/29/1995	TURBINES (NATURAL GAS) (2)	1190	MMBTU/HR (EACH)	.026	LB/MMBTU	TURBINE DESIGN	BACT-OTHER
CO	SAVANNAH ELECTRIC AND POWER CO.		GA	02/12/1992	03/24/1995	TURBINES, 8	1032	MMBTU/H, NAT GAS	9	PPM @ 15% O2	FUEL SPEC: LOW SULFUR FUEL OIL	BACT-PSD
CO	SAVANNAH ELECTRIC AND POWER CO.		GA	02/12/1992	03/24/1995	TURBINES, 8	972	MMBTU/H, #2 OIL	9	PPM @ 15% O2	FUEL SPEC: LOW SULFUR FUEL OIL	BACT-PSD
CO	BRIDGEPORT ENERGY, LLC	BRIDGEPORT	CT	06/29/1998	01/21/1999	TURBINES, COMBUSTION MODEL V84.3A, 2 SIEMES	260	MW/HRSG PER TURBINE	10	PPM GAS & OIL	PRE-MIX FUEL FAIR TO OPTIMIZE EFFICIENCY ACTUAL EMISSIONS EXPECTED BETWEEN 5-7PPM	BACT-PSD
CO	NEWARK BAY COGENERATION PARTNERSHIP, L.P.	NEWARK	NJ	06/09/1993	05/29/1995	TURBINES, COMBUSTION, KEROSENE-FIRED (2)	640	MMBTU/H (EACH)	2.6	PPMDV	OXIDATION CATALYST	OTHER
CO	NEWARK BAY COGENERATION PARTNERSHIP, L.P.	NEWARK	NJ	06/09/1993	05/29/1995	TURBINES, COMBUSTION, NATURAL GAS-FIRED (2)	617	MMBTU/HR (EACH)	1.8	PPMDV	OXIDATION CATALYST	OTHER
CO	PORTSIDE ENERGY CORP.	PORTAGE	IN	05/13/1996	05/31/1997	TURBINE, NATURAL GAS-FIRED63		MEGAWATT	12	LBS/HR	GOOD COMBUSTION AND EMISSIONS NOT TO EXCEED 10 PPMVD AT 15% OXYGEN.	BACT-PSD
CO	PORTSIDE ENERGY CORP.	PORTAGE	IN	05/13/1996	05/31/1997	TURBINE, NATURAL GAS-FIRED63		MEGAWATT	40	LBS/HR	GOOD COMBUSTION AND EMISSIONS NOT TO EXCEED 40 PPMVD AT 15% OXYGEN.	BACT-PSD
PM	DUKE ENERGY MILL CREEK COMBUSTION TURBINE STATION	CHEROKEE	SC	11/8/01	3/10/03	8 SIMPLE CYCLE TURBINES	81.7	MW	5	LB/HR	COMBUSTION CONTROLS	BACT-PSD
PM	HOT SPRINGS POWER PROJECT	HOT SPRINGS	AR	11/9/01	12/20/02	COMBUSTION TURBINE, HRSG, DUCT BURNER	700	MW	0.013	LB/MMBTU	CLEAN FUELS	BACT-PSD
PM	LSP-BATESVILLE GENERATION FACILITY	PANOLA	MS	11/13/01	11/19/02	COMBINED CYCLE COMBUSTION TURBINE GENERATION (CTG)	2100	MMBTU/H	40	LB/H	USE OF NATURAL GAS AS FUEL	BACT-PSD
PM	SOUTHERN INDIANA-AB BROWN GENERATING STATION	POSEY	IN	11/16/01	11/14/02	ONE SIMPLE CYCLE COMBUSTION TURBINE GE TFA	1145.8	MMBTU/H	0.005	LB/MMBTU	GOOD COMBUSTION PRACTICES	BACT-PSD
PM	SOUTHERN INDIANA GAS & ELECTRIC COMPANY	POSEY	IN	11/16/01	11/14/02	ONE SIMPLE CYCLE COMBUSTION TURBINE GE TFA	1145.8	MMBTU	0.005	LB/MMBTU	GOOD COMBUSTION PRACTICES	BACT-PSD
PM	INDECK-NILES, LLC	CASS	MI	12/2/01	12/4/02	GAS TURBINES, 4 EACH, SIMPLE CYCLE	163	MW	6	LB/H	(N)	BACT-PSD

POLLUTANT	FACILITY	CITY	STATE	PERMIT DATE	LAST UPDATE	PROCESS	THROUGH-PUT	UNIT	EMISSION RATE	UNIT	DESCRIPTION OF CONTROL TECHNOLOGY	BASIS
PM	ALLEGHENY ENERGY SUPPLY CO	ST JOSEPH	IN	12/7/01	4/2/03	TWO SIMPLE CYCLE COMBUSTION TURBINES	469	MMBTU/H	0.0068	LB/MMBTU	GOOD COMBUSTION PRACTICES	BACT-PSD
PM	DUKE ENERGY DALE, LLC	DALE	AL	12/11/01	12/2/02	2 GE 7FA GAS FIRED COMB. CYCLE W/ 568 MMBTU	170	MW	0.0072	LB/MMBTU	NATURAL GAS AS EXCLUSIVE FUEL	BACT-PSD
PM	PANDA CULLODEN GENERATING STATION	CABELL	WV	12/18/01	5/23/02	COMBUSTION TURBINE	300	MW	18	LB/H	USE OF LOW-ASH FUEL - NATURAL GAS	BACT-OTHER
PM	PLAQUEMINE, IBERVILLE PARISH		LA	12/26/01	3/24/03	GAS TURBINE/DUCT BURNER	2876	MMBTU/H	2.7	LB/H	GOOD OPERATING PRACTICES	BACT-PSD
PM	EI DUPONT SPRUANCE PLANT	CHESTERFIELD	VA	1/8/02	3/10/03	PLASTICS AND RESINS			3	LB/HR	GOOD COMBUSTION PRACTICES	BACT-OTHER
PM	EDINBURG ENERGY LIMITED PARTNERSHIP	HIDALGO	TX	1/8/02	4/2/03	COMBINED CYCLE GAS TURBINE, ABB MODEL GT24	180	MW	18	LB/H AT FULL LOAD	(N)	BACT-PSD
PM	TENASKA FLUVANNA	FLUVANNA	VA	1/11/02	3/13/03	TURBINES, COMBINED CYCLE, (3), DISTILLATE	32	MMGAL/YR	21.8	LB/H	USE OF DRIFT ELIMINATORS	BACT-PSD
PM	CPV CANA	ST. LUCIE COUNTY	FL	1/17/02	3/26/03	TURBINE, COMBINED CYCLE, NATURAL GAS	1680	MMBTU/H	11	LB/H	CLEAN FUELS GOOD COMBUSTION	BACT-PSD
PM	BUCHANA GENERATION	BUCHANAN	VA	1/31/02	3/18/03	ELECTRICITY GENERATION	424.6	MMBTU/HR	3	LBS/HR	GOOD COMBUSTION PRACTICES	BACT-OTHER
PM	ACADIA POWER STATION, ACADIA POWER PARTNERS LLC		LA	1/31/02	4/2/03	GAS TURBINE UNITS 1, 2, 3, 4	183	MW	0.76	LB/H	INTEGRATED DRIFT ELIMINATORS	BACT-PSD
PM	HORSESHOE ENERGY PROJECT	LINCOLN	OK	2/12/02	10/21/02	TURBINES AND DUCT BURNERS	510	MW	0.0117	LB/MMBTU	LOW ASH FUEL (NATURAL GAS)	BACT-PSD
PM	MUSTANG ENERGY PROJECT	CANADIAN	OK	2/12/02	10/17/02	COMBUSTION TURBINES W/ DUCT BURNERS	0		0.007	LB/MMBTU	USE OF NO-ASH FUEL AND EFFICIENT COMBUSTION	BACT-PSD
PM	THOMAS B. FITZHUGH GENERATION STATION	FRANKLIN	AR	2/15/02	1/27/03	TURBINE, COMBINED CYCLE, FUEL OIL	170.6	MW	49.8	LB/H	NO. 2 FUEL OIL - LOW ASH FUEL, GOOD COMBUSTION PRACTICE	BACT-PSD
PM	TRANSALTA CENTRALIA GENERATION LLC	LEWIS	WA	2/22/02	3/10/03	BLACK STOP GENERATOR	32.2	LB/HR	0.94	LB/HR	(N)	BACT-OTHER
PM	PERRYVILLE POWER STATION	OUACHTA PARISH	LA	3/8/02	3/24/03	GAS TURBINES			0.01	LB/MMBTU	GOOD OPERATING PRACTICES AND USE OF NATURAL GAS AS FUEL	BACT-PSD
PM	JEA/BRANDY BRANCH	DUVAL	FL	3/27/02	3/26/03	TURBINES, COMBINED CYCLE, (2)	1911	MMBTU/H	10	% OPACITY	CLEAN FUELS, GOOD COMBUSTION	BACT-PSD
PM	LIBERTY GENERATING STATION	UNION	NJ	3/28/02	11/19/02	COMBINED CYCLE TURBINE (3)	2964	MMBTU/H	35.8	LB/H	NONE LISTED	BACT-PSD
PM	DUKE ENERGY-JACKSON FACILITY	JACKSON	AR	4/1/02	1/24/03	TURBINES, COMBINED CYCLE, NATURAL GAS, (2)	170	MW	32.2	LB/H	GOOD COMBUSTION CONTROL, CLEAN FUEL	BACT-PSD
PM	GREATER DES MOINES ENERGY CENTER	POLK	IA	4/10/02	12/4/02	COMBUSTION TURBINES - SIMPLE CYCLE	0		0.0094	LB/MMBTU	(N)	BACT-PSD
PM	REDBUD POWER PLANT	OKLAHOMA	OK	5/6/02	10/17/02	COMBUSTION TURBINES	1832	MMBTU/H	0.012	LB/MMBTU	USE OF NATURAL GAS	BACT-PSD
PM	SCE&G - JASPER COUNTY GENERATING FACILITY	JASPER	SC	5/23/02	1/13/03	TANK, FUEL OIL STORAGE, 3 EACH	1.2	MM GAL (EACH)	1.9	LB/H	CLEAN FUEL (LOW SULFUR DIESEL), GOOD COMBUSTION PRACTICES	BACT-PSD
PM	GENOVA OK I POWER PROJECT	GRADY	OK	6/13/02	9/23/02	GE COMBUSTION TURBINE & DUCT BURNERS	1705	MMBTU/H	0.019	LB/MMBTU	LOW SULFUR FUEL AND EFFICIENT COMBUSTION	BACT-PSD
PM	CLOVIS ENERGY FACILITY	CURRY	NM	6/27/02	4/8/03	AUXILIARY BOILERS (AUX-1 AND AUX-2)	33	MMBTU/HR	0.3	LB/HR	(A)	BACT-OTHER
PM	EL PASO MERCHANT ENERGY CO	WASHTENAW	MI	7/1/02	12/12/02	TURBINE, SIMPLE-CYCLE, NATURAL GAS, (3)	170	MW	18.4	LB/H	NATURAL GAS ONLY	BACT-PSD
PM	BARTON SHOALS ENERGY	COLBERT	AL	7/12/02	12/3/02	FOUR (4) COMBINED CYCLE COMBUSTION TURBINE	173	MW	0.006	LB/MMBTU	GOOD COMBUSTION PRACTICES	BACT-PSD
PM	HAWKEYE GENERATING, LLC	ADAIR	IA	7/23/02	1/13/03	COMBUSTION TURBINE	33.77	BILLION CF/YR	0.0051	LB/MMBTU	(B)	BACT-PSD
PM	ROCKY MOUNTAIN ENERGY CENTER, LLC	WELD	CO	8/11/02	4/2/03	TWO (2) NATURAL GAS FIRED, COMBINED-CYCLE	2311	MMBTU/H	6.53	LB/MMBTU	USE OF PIPELINE QUALITY NATURAL	BACT-PSD
PM	WHITE OAK POWER	PITTSYLVANIA	VA	8/29/02	4/1/03	TURBINE, SIMPLE CYCLE, NATURAL GAS, (4)	1731	MMBTU/H	13.8	LB/H	(N)	BACT-PSD
PM	CPV CUNNINGHAM CREEK	FLUVANNA	VA	9/6/02	3/20/03	TURBINE, COMBINED CYCLE, (2)	2132	MMBTU/H	0.0119	LB/MMBTU	(N)	BACT-PSD
PM	VA POWER - POSSUM POINT	PRINCE WILLIAM	VA	11/18/02	3/26/03	TURBINE, COMBINED CYCLE, NATURAL GAS	1937	MMBTU/H	22.2	LB/H	(N)	BACT-PSD
PM	HENRY COUNTY POWER	HENRY	VA	11/21/02	3/20/03	TURBINE, COMBINED CYCLE, (4), 100% LOAD	171	MW	25.3	LB/H	GOOD COMBUSTION DESIGN AND CLEAN FUEL	BACT-PSD
PM	MIRANT AIRSIDE INDUSTRIAL PARK	PITTSYLVANIA	VA	12/6/02	3/20/03	TURBINE, SIMPLE CYCLE, (2)	84	MW	10	LB/H	GOOD COMBUSTION PRACTICES. DRIFT ELIMINATORS	BACT-PSD
PM	POWER IOWA ENERGY CENTER	CERRO GORDO	IA	12/20/02	1/13/03	TURBINE, SIMPLE CYCLE, (2)	170	MW	0.0066	LB/MMBTU	USE OF LOW ASH FUEL, NATURAL GAS	BACT-OTHER
PM	CHICKAHOMINY POWER	CHARLES CITY	VA	1/10/03	3/21/03	TURBINE, SIMPLE CYCLE, (4), NATURAL GAS	1862	MMBTU/H	27	LB/H	CLEAN BURNING FUELS AND GOOD COMBUSTION PRACTICES	BACT-PSD
PM	ODEC - MARSH RUN FACILITY	FAUQUIER	VA	2/14/03	3/25/03	TURBINE, SIMPLE CYCLE, (4), NATURAL GAS	1624	MMBTU/H	18	LBS/HR	GOOD COMBUSTION PRACTICES AND CLEAN BURNING FUEL	NSPS

POLLUTANT	FACILITY	CITY	STATE	PERMIT DATE	LAST UPDATE	PROCESS	THROUGH-PUT	UNIT	EMISSION RATE	UNIT	DESCRIPTION OF CONTROL TECHNOLOGY	BASIS
PM	ODEC - LOUISA FACILITY	LOUISA	VA	3/11/03	3/20/03	TURBINE, SIMPLE CYCLE, (1), NATURAL GAS	1624	MMBTU/H	18	LB/HR	GOOD COMBUSTION PRACTICES	NSPS
PM	GENERAL ELECTRIC PLASTICS	BURKVILLE	AL	05/27/1998	07/02/1998	COMBINED CYCLE (TURBINE AND DUCT BURNER)	0		.01	LBS/MMBTU	CLEAN FUEL - NATURAL GAS/HYDROGEN	BACT-PSD
PM	MEAD COATED BOARD, INC.	PHENIX CITY	AL	03/12/1997	05/31/1997	COMBINED CYCLE TURBINE (25 MW)	568	MMBTU/HR	2.5	LBS/HR (GAS)	PRIMARY FUEL IS NATURAL GAS WITH BACKUP FUEL AS DISTILLATE OIL. EFFICIENT OPERATION OF THE COM-BUSTION TURBINE	BACT-PSD
PM	MID-GEORGIA COGEN.	KATHLEEN	GA	04/03/1996	08/19/1996	COMBUSTION TURBINE (2), FUEL OIL	116	MW	55	LB/HR	CLEAN FUEL	BACT-PSD
PM	MID-GEORGIA COGEN.	KATHLEEN	GA	04/03/1996	08/19/1996	COMBUSTION TURBINE (2), NATURAL GAS	116	MW	18	LB/HR	CLEAN FUEL	BACT-PSD
PM	OCCIDENTAL CHEMICAL CORPORATION	HAHNVILLE	LA	03/19/1999	03/19/2001	GAS TURBINES (3 UNITS)	170	MW	.0035	GR/DSCF	GOOD COMBUSTION PRACTICES AND USING CLEAN NATURAL GAS	BACT-PSD
PM	FLORIDA POWER AND LIGHT	NORTH PALM BEACH	FL	06/05/1991	03/24/1995	TURBINE, CG, 4 EACH	400	MW	19	LB/H	COMBUSTION CONTROL	BACT-PSD
PM	CHAMPION INTERNATL CORP. & CHAMP. CLEAN ENERGY	BUCKSPORT	ME	09/14/1998	04/19/1999	TURBINE, COMBINED CYCLE, NATURAL GAS	175	MW	.06	LB/MMBTU		BACT-OTHER
PM	CASCO RAY ENERGY CO	VEAZIE	ME	07/13/1998	04/19/1999	TURBINE, COMBINED CYCLE, NATURAL GAS, TWO	170	MW EACH	.06	LB/MMBTU		BACT-PSD
PM	WESTBROOK POWER LLC	WESTBROOK	ME	12/04/1998	04/19/1999	TURBINE, COMBINED CYCLE, TWO	528	MW TOTAL	.06	LB/MMBTU		BACT-PSD
PM	BERKSHIRE POWER DEVELOPMENT, INC.	AGAWAM	MA	09/22/1997	04/19/1999	TURBINE, COMBUSTION, ABB GT24	1792	MMBTU/H	17.4	LB/H	DRY LOW NOX COMBUSTION TECHNOLOGY WITH SCR ADD-ON NOX CONTROL.	BACT-PSD
PM	TENUSKA GEORGIA PARTNERS, L.P.	FRANKLIN	GA	12/18/1998	06/23/1999	TURBINE, COMBUSTION, SIMPLE CYCLE, 6	160	MW EA	.017	LB/MMBTU	PM IS BECAUSE OF FUEL OIL. WHEN GROSS OUTPUT IS BELOW 123 MW PM EMISSION LIMIT IS 0.017 LB/MMBTU AND ABOVE 123 MW IS 0.013 LB/MMBTU.	BACT-PSD
PM	TENUSKA GEORGIA PARTNERS, L.P.	FRANKLIN	GA	12/18/1998	06/23/1999	TURBINE, COMBUSTION, SIMPLE CYCLE, 6	160	MW EA	.01	LB/MMBTU	PM EMISSION IS BECAUSE OF NATURAL GAS.	BACT-PSD
PM	KISSIMMEE UTILITY AUTHORITY	INTERCESSION CITY	FL	04/07/1993	02/21/2000	TURBINE, FUEL OIL	371	MMBTU/H	10	LB/H	FUEL SPEC: LOW SULFUR FUEL	BACT-PSD
PM	KISSIMMEE UTILITY AUTHORITY	INTERCESSION CITY	FL	04/07/1993	02/21/2000	TURBINE, FUEL OIL	928	MMBTU/H	15	LB/H	FUEL SPEC: LOW SULFUR FUEL	BACT-PSD
PM	FLORIDA POWER CORPORATION POLK COUNTY SITE	BARTOW	FL	02/25/1994	01/13/1995	TURBINE, FUEL OIL (2)	1730	MMBTU/H	17	LB/H	GOOD COMBUSTION PRACTICES	BACT-PSD
PM	TIGER BAY LP	FT. MEADE	FL	05/17/1993	01/13/1995	TURBINE, GAS	1614.8	MMBTU/H	9	LB/H	GOOD COMBUSTION PRACTICES	BACT-PSD
PM	HARTWELL ENERGY LIMITED PARTNERSHIP	HARTWELL	GA	07/28/1992	03/24/1995	TURBINE, GAS FIRED (2 EACH)	1817	M BTU/HR	.0064	LB/M BTU	FUEL SPEC: CLEAN BURNING FUELS	BACT-PSD
PM	THERMO INDUSTRIES, LTD.	FT. LUPTON	CO	02/19/1992	03/24/1995	TURBINE, GAS FIRED, 5 EACH	246	MMBTU/H	25.8	LB/H	FUEL SPEC: NATURAL GAS FIRED	OTHER
PM	CHARLES LARSEN POWER PLANT	CITY OF LAKELAND	FL	07/25/1991	03/24/1995	TURBINE, GAS, 1 EACH	80	MW	.006	LB/MMBTU	COMBUSTION CONTROL	BACT-PSD
PM	LAKE COGEN LIMITED	UMATILLA	FL	11/20/1991	03/24/1995	TURBINE, GAS, 2 EACH	42	MW	.0065	LB/MMBTU	COMBUSTION CONTROL, FUEL SPEC: CLEAN FUEL	BACT-PSD
PM	FLORIDA POWER AND LIGHT	LAVOGROME REPOWERING STATION	FL	03/14/1991	03/24/1995	TURBINE, GAS, 4 EACH	240	MW	15.4	LB/H	COMBUSTION CONTROL	BACT-PSD
PM	FLORIDA POWER AND LIGHT	NORTH PALM BEACH	FL	06/05/1991	03/24/1995	TURBINE, GAS, 4 EACH	400	MW	18	LB/H	COMBUSTION CONTROL	BACT-PSD
PM	LINCOLN ELECTRIC SYSTEM	LINCOLN	NE	11/22/1999	08/24/2000	TURBINE, GAS-FIRED SIMPLE CYCLE	965	GIGAJOULES	.006	LB/MMBTU	LIMITS ESTABLISHED TO ENSURE THAT TOTAL PM CONDENSABLES AND NON CONDENSABLES IS CONTROLLED TO NO GREATER THAN 14.6 TPY.	OTHER
PM	KISSIMMEE UTILITY AUTHORITY	INTERCESSION CITY	FL	04/07/1993	02/21/2000	TURBINE, NATURAL GAS	869	MMBTU/H	7	LB/H	GOOD COMBUSTION PRACTICES	BACT-PSD
PM	KISSIMMEE UTILITY AUTHORITY	INTERCESSION CITY	FL	04/07/1993	02/21/2000	TURBINE, NATURAL GAS	367	MMBTU/H	9	LB/H	GOOD COMBUSTION PRACTICES	BACT-PSD
PM	FLORIDA POWER CORPORATION POLK COUNTY SITE	BARTOW	FL	02/25/1994	01/13/1995	TURBINE, NATURAL GAS (2)	1510	MMBTU/H	9	LB/H	GOOD COMBUSTION PRACTICES	BACT-PSD
PM	ORANGE COGENERATION LP	BARTOW	FL	12/30/1993	01/13/1995	TURBINE, NATURAL GAS, 2	368.3	MMBTU/H	5	LB/H	GOOD COMBUSTION	BACT-PSD
PM	TIGER BAY LP	FT. MEADE	FL	05/17/1993	01/13/1995	TURBINE, OIL	1849.9	MMBTU/H	17	LB/H	GOOD COMBUSTION PRACTICES	BACT-PSD
PM	AUBURNDALE POWER PARTNERS, LP	AUBURNDALE	FL	12/14/1992	01/13/1995	TURBINE, OIL	1170	MMBTU/H	.0472	LB/MMBTU	GOOD COMBUSTION PRACTICES	BACT-PSD
PM	HARTWELL ENERGY LIMITED PARTNERSHIP	HARTWELL	GA	07/28/1992	03/24/1995	TURBINE, OIL FIRED (2 EACH)	1840	M BTU/HR	.0156	LB/M BTU	FUEL SPEC: CLEAN BURNING FUELS	BACT-PSD
PM	CHARLES LARSEN POWER PLANT	CITY OF LAKELAND	FL	07/25/1991	03/24/1995	TURBINE, OIL, 1 EACH	80	MW	.025	LB/MMBTU	COMBUSTION CONTROL	BACT-PSD
PM	LAKE COGEN LIMITED	UMATILLA	FL	11/20/1991	03/24/1995	TURBINE, OIL, 2 EACH	42	MW	.026	LB/MMBTU	COMBUSTION CONTROL, FUEL SPEC: CLEAN FUEL	BACT-PSD
PM	FLORIDA POWER AND LIGHT	NORTH PALM BEACH	FL	06/05/1991	03/24/1995	TURBINE, OIL, 2 EACH	400	MW	60.6	LB/H	COMBUSTION CONTROL	BACT-PSD
PM	FLORIDA POWER AND LIGHT	LAVOGROME REPOWERING STATION	FL	03/14/1991	03/24/1995	TURBINE, OIL, 4 EACH	0		58	LB/H	COMBUSTION CONTROL	BACT-PSD
PM	ALABAMA POWER COMPANY - THEODORE COGENERATION	THEODORE	AL	03/16/1999	06/23/1999	TURBINE, WITH DUCT BURNER	170	MW	.012	LB/MMBTU	COMBUSTION OF NATURAL GAS ONLY	BACT-PSD
PM	AUBURNDALE POWER PARTNERS, LP	AUBURNDALE	FL	12/14/1992	01/13/1995	TURBINE,GAS	1214	MMBTU/H	.0136	LB/MMBTU	GOOD COMBUSTION PRACTICES	BACT-PSD
PM	LAKEWOOD COGENERATION, L.P.	LAKEWOOD TOWNSHIP	NJ	04/01/1991	05/29/1995	TURBINES (#2 FUEL OIL) (2)	1190	MMBTU/HR (EACH)	.026	LB/MMBTU	TURBINE DESIGN	BACT-OTHER

POLLUTANT	FACILITY	CITY	STATE	PERMIT DATE	LAST UPDATE	PROCESS	THROUGH-PUT	UNIT	EMISSION RATE	UNIT	DESCRIPTION OF CONTROL TECHNOLOGY	BASIS
PM	LAKEWOOD COGENERATION, L.P.	LAKEWOOD TOWNSHIP	NJ	04/01/1991	05/29/1995	TURBINES (NATURAL GAS) (2)	1190	MMBTU/HR (EACH)	.0023	LB/MMBTU	TURBINE DESIGN	BACT-OTHER
PM	SAVANNAH ELECTRIC AND POWER CO.		GA	02/12/1992	03/24/1995	TURBINES, 8	972	MMBTU/H, #2 OIL	.012	LB/MMBTU	FUEL SPEC: LOW SULFUR FUEL OIL	BACT-PSD
PM	SAVANNAH ELECTRIC AND POWER CO.		GA	02/12/1992	03/24/1995	TURBINES, 8	1032	MMBTU/H, NAT GAS	.006	LB/MMBTU	FUEL SPEC: LOW SULFUR FUEL OIL	BACT-PSD
PM	PORTSIDE ENERGY CORP.	PORTAGE	IN	05/13/1996	05/31/1997	TURBINE, NATURAL GAS-FIRED63		MEGAWATT	5	LBS/HR		BACT-PSD
PM	SOUTHERN ENERGY, INC.	ZEELAND	MI	03/16/2000	08/22/2000	COMBINED CYCLE TURBINE ELECTRICAL GENERATING UNITS	9000	GIGAJOULES	14.7	LB/H	EQUIVATENT TO 0.007 PPM@15% 02. RATE IS PER TURBINE. 10% OPACITY.	BACT-PSD
PM	PUBLIC SERVICE OF COLO.-FORT ST VRAIN	PLATTEVILLE	CO	05/01/1996	05/19/1998	COMBINED CYCLE TURBINES (2), NATURAL	471	MW	9	LBS/HR (EACH TURBINE	FUEL SPEC: COMBUSTION OF PIPE LINE QUALITY GAS. CLOSE MONITORING AND CONTROL OF THE COMBUSTION PROCESS.	BACT-PSD
PM	TEMPO PLASTICS	VISALIA	CA	12/31/1996	04/23/1998	GAS TURBINE COGENERATION UNIT	0		.012	LB/MMBTU	LUBE OIL VENT COALESCER. OPACITY LIMIT APPLIES TO LUBE OIL VENTS.	LAER
PM	AIR LIQUIDE AMERICA CORPORATION	GEISMAR	LA	02/13/1998	01/20/1999	TURBINE GAS, GE, 7ME 7	966	MMBTU/H	18.7	LB/H	GOOD COMBUSTION PRACTICES AND USE CLEAN NATURAL GAS AS FUEL.	BACT-PSD
PM	BASF CORPORATION	GEISMAR	LA	12/30/1997	01/21/1999	TURBINE, COGEN UNIT 2, GE FRAME 6	42.4	MW	5.4	LB/H	GOOD DESIGN, PROPER OPERATING PRACTICES, USE GASEOUS FUELS	BACT-PSD
PM	CHAMPION INTERNATL CORP. & CHAMP. CLEAN ENERGY	BUCKSPORT	ME	09/14/1998	04/19/1999	TURBINE, COMBINED CYCLE, NATURAL GAS	175	MW	9	LB/H GAS		BACT-OTHER
PM	WESTBROOK POWER LLC	WESTBROOK	ME	12/04/1998	04/19/1999	TURBINE, COMBINED CYCLE, TWO	528	MW TOTAL	.06	LB/MMBTU		BACT-PSD
PM	DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION	LOWESVILLE	NC	12/20/1991	03/24/1995	TURBINE, COMBUSTION	1313	MM BTU/HR	5	LB/HR	COMBUSTION CONTROL	BACT-PSD
PM	PDC EL PASO MILFORD LLC	MILFORD	CT	04/16/1999	06/17/1999	TURBINE, COMBUSTION, ABB GT-24, #1 WITH 2 CHILLERS	1.97	MMCF/H	.011	LB/MMBTU NAT GASAS	NAT GAS AS PRIMARY FUEL, LOW SULFUR (0.05%W) OIL BACK-UP	BACT-PSD
PM	PDC EL PASO MILFORD LLC	MILFORD	CT	04/16/1999	06/17/1999	TURBINE, COMBUSTION, ABB GT-24E,#2 WITH 2 CHILLERS	1.97	MMCF/H	.011	LB/MMBTU NAT GAS	NAT GAS AS PRIMARY FUEL, LOW SULFUR (0.05%W) OIL	BACT-PSD
PM	DIGHTON POWER ASSOCIATE, LP	DIGHTON	MA	10/06/1997	04/19/1999	TURBINE, COMBUSTION, ABB GT11N2	1327	MMBTU/H	12.5	LB/H	DRY LOW NOX COMBUSTION TECHNOLOGY WITH SCR ADD-ON NOX CONTROL.	BACT-PSD
PM	KUPARUK CENTRAL PRODUCTION FACILITY	ANCHORAGE	AK	02/13/1998	09/18/2001	TURBINE, GE FRAME 6, MODEL PG6551(B)	38.9	MW	.05	GR/DSCF		BACT-OTHER
PM	TPS - DELL, LLC	DELL	AR	08/08/2000	10/29/2001	TURBINE, NATURAL GAS FIRED 2	640	MW	.021	LB/MMBTU	GOOD COMBUSTION PRACTICES.	BACT-PSD
PM	GENPOWER - KEO, LLC	KEO	AR	05/04/2001	10/29/2001	TURBINE, NATURAL GAS FIRED, 2	590	MW	.021	LB/MMBTU	GOOD COMBUSTION PRACTICES.	BACT-PSD
PM	NEWARK BAY COGENERATION PARTNERSHIP, L.P.	NEWARK	NJ	06/09/1993	05/29/1995	TURBINES, COMBUSTION, KEROSENE-FIRED (2)	640	MMBTU/H (EACH)	.023	LB/MMBTU	TURBINE DESIGN	BACT-PSD
PM	NEWARK BAY COGENERATION PARTNERSHIP, L.P.	NEWARK	NJ	06/09/1993	05/29/1995	TURBINES, COMBUSTION, NATURAL GAS-FIRED (2)	617	MMBTU/HR (EACH)	.006	LB/MMBTU	TURBINE DESIGN	BACT-PSD
SO_x	DUKE ENERGY MILL CREEK COMBUSTION TURBINE STATION	CHEROKEE	SC	11/8/01	3/10/03	8 SIMPLE CYCLE TURBINES	81.7	MW	1.1	LB/HR NG	LOW SULFUR FUEL	BACT-PSD
SO_x	LSP-BATESVILLE GENERATION FACILITY	PANOLA	MS	11/13/01	11/19/02	COMBINED CYCLE COMBUSTION TURBINE GENERATION (CTG)	2100	MMBTU/H	15	LB/H	NATURAL GAS AS FUEL	BACT-PSD
SO_x	SOUTHERN INDIANA-AB BROWN GENERATING STATION	POSEY	IN	11/16/01	11/14/02	ONE SIMPLE CYCLE COMBUSTION TURBINE GE TFA	1145.8	MMBTU/H	0.005	LB/MMBTU	GOOD COMBUSTION PRACTICES	BACT-PSD
SO_x	ALLEGHENY ENERGY SUPPLY CO	ST JOSEPH	IN	12/7/01	4/2/03	TWO SIMPLE CYCLE COMBUSTION TURBINES	469	MMBTU/H	0.0035	LB/MMBTU	USE OF LOW SULFUR NATURAL GAS	BACT-PSD
SO_x	DUKE ENERGY DALE, LLC	DALE	AL	12/11/01	12/2/02	2 GE 7FA GAS FIRED COMB. CYCLE W/ 568 MMBTU	170	MW	0.0057	LB/MMBTU	NATURAL GAS AS EXCLUSIVE FUEL	BACT-PSD
SO_x	PANDA CULLODEN GENERATING STATION	CABELL	WV	12/18/01	5/23/02	COMBUSTION TURBINE	300	MW	5.4	LB/H	USE OF LOW-SULFUR FUEL - NATURAL GAS	BACT-PSD
SO_x	EI DUPONT SPRUANCE PLANT	CHESTERFIELD	VA	1/8/02	3/10/03	PLASTICS AND RESINS			2.5	LB/HR	GOOD COMBUSTION OPERATING	BACT-OTHER

POLLUTANT	FACILITY	CITY	STATE	PERMIT DATE	LAST UPDATE	PROCESS	THROUGH-PUT	UNIT	EMISSION RATE	UNIT	DESCRIPTION OF CONTROL TECHNOLOGY	BASIS
SOx	EDINBURG ENERGY LIMITED PARTNERSHIP	HIDALGO	TX	1/8/02	4/2/03	COMBINED CYCLE GAS TURBINE, ABB MODEL GT24	180	MW	4	LB/H AT FULL LOAD	(N)	BACT-PSD
SOx	TENASKA FLUVANNA	FLUVANNA	VA	1/11/02	3/13/03	TURBINES, COMBINED CYCLE, (3), DISTILLATE	32	MMGAL/YR	20.8	LB/H	USE OF LOW SULFUR FUELS	BACT-PSD
SOx	CPV CANA	ST. LUCIE COUNTY	FL	1/17/02	3/26/03	TURBINE, COMBINED CYCLE, NATURAL GAS	1680	MMBTU/H			LOW SULFUR FUEL	BACT-PSD
SOx	BUCHANA GENERATION	BUCHANAN	VA	1/31/02	3/18/03	ELECTRICITY GENERATION	424.6	MMBTU/HR	2.5	LBS/HR	GOOD COMBUSTION PRACTICES	BACT-OTHER
SOx	HORSESHOE ENERGY PROJECT	LINCOLN	OK	2/12/02	10/21/02	TURBINES AND DUCT BURNERS	310	MW	0.0056	LB/MMBTU	LOW SULFUR FUEL (NATURAL GAS)	BACT-PSD
SOx	THOMAS B. FITZHUGH GENERATION STATION	FRANKLIN	AR	2/15/02	1/27/03	TURBINE, COMBINED CYCLE, FUEL OIL	170.6	MW	85	PPM @15% O2	GOOD COMBUSTION PRACTICES, FUEL S LIMIT: <	BACT-PSD
SOx	LIBERTY GENERATING STATION	UNION	NJ	3/28/02	11/19/02	COMBINED CYCLE TURBINE (3)	2964	MMBTU/H	0.004	LB/MMBTU	NONE LISTED	OTHER
SOx	DUKE ENERGY-JACKSON FACILITY	JACKSON	AR	4/1/02	1/24/03	TURBINES, COMBINED CYCLE, NATURAL GAS, (2)	170	MW	---	---	CLEAN FUEL	BACT-PSD
SOx	CALPINE/AUBURNDALE COGENERATION FACILITY	POLK	FL	4/25/02	3/26/03	TURBINE, SIMPLE CYCLE, NATURAL GAS	1591	MMBTU/H	2	GR/100 SCF	FUEL S LIMIT	OTHER
SOx	TENASKA BEAR GARDEN STATION	BUCKINGHAM	VA	4/30/02	2/3/02	GE 7 FA FUAL FUEL COMBUSTION TURBINES	1887	MMBTU	0.6	GR/100 DSCF	LOW SULFUR FUELS AND CONTINUOUS EMISSION	BACT-PSD
SOx	REDBUD POWER PLANT	OKLAHOMA	OK	5/6/02	10/17/02	COMBUSTION TURBINES	1832	MMBTU/H	0.003	LB/MMBTU	USE OF PIPELINE QUALITY NATURAL GAS	BACT-PSD
SOx	SCE&G - JASPER COUNTY GENERATING FACILITY	JASPER	SC	5/23/02	1/13/03	TANK, FUEL OIL STORAGE, 3 EACH	1.2	MM GAL (EACH)	6.4	LB/H	CLEAN FUELS (NATURAL GAS)	BACT-PSD
SOx	CLOVIS ENERGY FACILITY	CURRY	NM	6/27/02	4/8/03	AUXILIARY BOILERS (AUX-1 AND AUX-2)	33	MMBTU/HR	0.1	LB/HR	(A)	BACT-PSD
SOx	BARTON SHOALS ENERGY	COLBERT	AL	7/12/02	12/3/02	FOUR (4) COMBINED CYCLE COMBUSTION TURBINE	173	MW	0.007	LB/MMBTU	NATURAL GAS ONLY	BACT-PSD
SOx	WHITE OAK POWER	PITTSYLVANIA	VA	8/29/02	4/1/03	TURBINE, SIMPLE CYCLE, NATURAL GAS, (4)	1731	MMBTU/H	0.77	PPMVD @ 15% O2	LOW SULFUR FUELS	BACT-PSD
SOx	CPV CUNNINGHAM CREEK	FLUVANNA	VA	9/6/02	3/20/03	TURBINE, COMBINED CYCLE, (2)	2132	MMBTU/H	0.0119	LB/MMBTU	(N)	BACT-PSD
SOx	VA POWER - POSSUM POINT	PRINCE WILLIAM	VA	11/18/02	3/26/03	TURBINE, COMBINED CYCLE, NATURAL GAS	1937	MMBTU/H	2.08	LB/H	(N)	BACT-PSD
SOx	HENRY COUNTY POWER	HENRY	VA	11/21/02	3/20/03	TURBINE, COMBINED CYCLE, (4), 100% LOAD	171	MW	0.006	LB/MMBTU	LOW SULFUR FUELS AND GOOD COMBUSTION DESIGN	BACT-PSD
SOx	MIRANT AIRSIDE INDUSTRIAL PARK	PITTSYLVANIA	VA	12/6/02	3/20/03	TURBINE, SIMPLE CYCLE, (2)	84	MW	0.8	GR/100 DSCF	LOW SULFUR FUELS AND GOOD COMBUSTION PRACTICES	BACT-PSD
SOx	POWER IOWA ENERGY CENTER	CERRO GORDO	IA	12/20/02	1/13/03	TURBINE, SIMPLE CYCLE, (2)	170	MW	0.0022	LB/MMBTU	LOW SULFUR NG	BACT-OTHER
SOx	CHICKAHOMINY POWER	CHARLES CITY	VA	1/10/03	3/21/03	TURBINE, SIMPLE CYCLE, (4), NATURAL GAS	1862	MMBTU/H	1.1	LB/H	LOW SULFUR FUELS AND GOOD COMBUSTION PRACTICES	BACT-PSD
SOx	MID-GEORGIA COGEN.	KATHLEEN	GA	04/03/1996	08/19/1996	COMBUSTION TURBINE (2), FUEL OIL	116	MW	.05	% SULFUR IN FUEL	FUEL SPEC: VERY LOW SULFUR IN FUEL	BACT-PSD
SOx	FLORIDA POWER AND LIGHT	NORTH PALM BEACH	FL	06/05/1991	03/24/1995	TURBINE, CG, 4 EACH	400	MW	.0834	LB/H	FUEL SPEC: COAL DERIVED GAS	BACT-PSD
SOx	CHAMPION INTERNATL CORP. & CHAMP. CLEAN ENERGY	BUCKSPORT	ME	09/14/1998	04/19/1999	TURBINE, COMBINED CYCLE, NATURAL GAS	175	MW	12	LB/H GAS		BACT-OTHER
SOx	CASCO RAY ENERGY CO	VEAZIE	ME	07/13/1998	04/19/1999	TURBINE, COMBINED CYCLE, NATURAL GAS, TWO	170	MW EACH	.006	LB/MMBTU		BACT-PSD
SOx	WESTBROOK POWER LLC	WESTBROOK	ME	12/04/1998	04/19/1999	TURBINE, COMBINED CYCLE, TWO	528	MW TOTAL	.006	LB/MMBTU		BACT-PSD
SOx	DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION	LOWESVILLE	NC	12/20/1991	03/24/1995	TURBINE, COMBUSTION	1313	MM BTU/HR	.7	LB/HR	COMBUSTION CONTROL	BACT-PSD
SOx	DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION	LOWESVILLE	NC	12/20/1991	03/24/1995	TURBINE, COMBUSTION	1247	MM BTU/HR	240.7	LB/HR	FUEL SPEC: 0.2% SULFUR FUEL OIL	BACT-PSD
SOx	DIGHTON POWER ASSOCIATE, LP	DIGHTON	MA	10/06/1997	04/19/1999	TURBINE, COMBUSTION, ABB GT11N2	1327	MMBTU/H	3.05	LB/H	DRY LOW NOX COMBUSTION TECHNOLOGY WITH SCR ADD-ON NOX CONTROL.	BACT-PSD
SOx	BERKSHIRE POWER DEVELOPMENT, INC.	AGAWAM	MA	09/22/1997	04/19/1999	TURBINE, COMBUSTION, ABB GT24	1792	MMBTU/H	4	LB/H	DRY LOW NOX COMBUSTION TECHNOLOGY WITH SCR ADD-ON NOX CONTROL.	BACT-PSD
SOx	GEORGIA POWER COMPANY, ROBINS TURBINE PROJECT	ROBINS AIR FORCE BASE	GA	05/13/1994	03/24/1995	TURBINE, COMBUSTION, NATURAL GAS	80	MW	56	PPM	FUEL SPEC: LOW SULFUR FUEL (.3% AVG) FUEL 0.1	BACT-PSD
SOx	TENUSKA GEORGIA PARTNERS, L.P.	FRANKLIN	GA	12/18/1998	06/23/1999	TURBINE, COMBUSTION, SIMPLE CYCLE, 6	160	MW EA	0	SEE P2 DESCRIP.	SO2 EMISSION IS BECAUSE OF NO.2 FUEL OIL. LOW SULFUR CONTENT FUEL OIL IS USED AND CANNOT EX-CEED 0.05 PERCENT BY WEIGHT.	BACT-PSD
SOx	KISSIMMEE UTILITY AUTHORITY	INTERCESSION CITY	FL	04/07/1993	02/21/2000	TURBINE, FUEL OIL	928	MMBTU/H	52	LB/H	FUEL SPEC: LOW SULFUR FUEL	BACT-PSD
SOx	KISSIMMEE UTILITY AUTHORITY	INTERCESSION CITY	FL	04/07/1993	02/21/2000	TURBINE, FUEL OIL	371	MMBTU/H	20	LB/H	FUEL SPEC: LOW SULFUR FUEL	BACT-PSD

POLLUTANT	FACILITY	CITY	STATE	PERMIT DATE	LAST UPDATE	PROCESS	THROUGH-PUT	UNIT	EMISSION RATE	UNIT	DESCRIPTION OF CONTROL TECHNOLOGY	BASIS
SOx	FLORIDA POWER CORPORATION POLK COUNTY SITE	BARTOW	FL	02/25/1994	01/13/1995	TURBINE, FUEL OIL (2)	1730	MMBTU/H	94	LB/H	FUEL SPEC: LOW SULFUR FUEL OIL (MAX 0.05 % SULFUR)	BACT-PSD
SOx	CHARLES LARSEN POWER PLANT	CITY OF LAKELAND	FL	07/25/1991	03/24/1995	TURBINE, GAS, 1 EACH	80	MW	0		FUEL SPEC: LIMIT FUEL SULFUR CONTENT	BACT-PSD
SOx	FLORIDA POWER AND LIGHT	LAVOGROME REPOWERING STATION	FL	03/14/1991	03/24/1995	TURBINE, GAS, 4 EACH	240	MW	0		FUEL SPEC: NATURAL GAS AS FUEL	BACT-PSD
SOx	FLORIDA POWER AND LIGHT	NORTH PALM BEACH	FL	06/05/1991	03/24/1995	TURBINE, GAS, 4 EACH	400	MW	91.5	LB/H	FUEL SPEC: NATURAL GAS AS FUEL	BACT-PSD
SOx	LINCOLN ELECTRIC SYSTEM	LINCOLN	NE	11/22/1999	08/24/2000	TURBINE, GAS-FIRED SIMPLE CYCLE	965	GIGAJOULES	9.5	PPM@ 15% O2	FUEL SPECIFICATIONS: PIPELINE QUALITY NATURAL GAS; LOW SULFUR (0.05% BY WEIGHT) NO. 2 FUEL OIL, ALSO GOOD COMBUSTION PRACTICES.	BACT-PSD
SOx	KUPARUK CENTRAL PRODUCTION FACILITY	ANCHORAGE	AK	02/13/1998	09/18/2001	TURBINE, GE FRAME 6, MODEL PG6551(B)	38.9	MW			NATURAL GAS FUEL. PERMIT LIMIT IS FUEL < 200 PPMV H2S.	BACT-OTHER
SOx	FLORIDA POWER CORPORATION POLK COUNTY SITE	BARTOW	FL	02/25/1994	01/13/1995	TURBINE, NATURAL GAS (2)	1510	MMBTU/H	.99	LB/H	FUEL SPEC: LOW SULFUR IN NATURAL GAS	BACT-PSD
SOx	TPS - DELL, LLC	DELL	AR	08/08/2000	10/29/2001	TURBINE, NATURAL GAS FIRED 2	640	MW	.002	LB/MMBTU	LOW SULFUR FUEL. SO2 EMISSION IN RBLC STANDARD UNIT (PPM @15% O2) IS NOT AVAILABLE FOR THIS PROCESS.	BACT-PSD
SOx	GENPOWER - KEO, LLC	KEO	AR	05/04/2001	10/29/2001	TURBINE, NATURAL GAS FIRED, 2	590	MW	.002	LB/MMBTU	LOW SULFUR FUEL. SO2 EMISSION IN RBLC STANDARD UNIT (PPM @15% O2) IS NOT AVAILABLE FOR THIS PROCESS.	BACT-PSD
SOx	AUBURNDALE POWER PARTNERS, LP	AUBURNDALE	FL	12/14/1992	01/13/1995	TURBINE, OIL	1170	MMBTU/H	70	LB/H	FUEL SPEC: LOW SULFUR FUEL OIL	BACT-PSD
SOx	HARTWELL ENERGY LIMITED PARTNERSHIP	HARTWELL	GA	07/28/1992	03/24/1995	TURBINE, OIL FIRED (2 EACH)	1840	M BTU/HR	.05	% S IN FUEL	FUEL SPEC: CLEAN BURNING FUELS	BACT-PSD
SOx	CHARLES LARSEN POWER PLANT	CITY OF LAKELAND	FL	07/25/1991	03/24/1995	TURBINE, OIL, 1 EACH	80	MW	0		FUEL SPEC: LIMIT FUEL SULFUR CONTENT	BACT-PSD
SOx	FLORIDA POWER AND LIGHT	NORTH PALM BEACH	FL	06/05/1991	03/24/1995	TURBINE, OIL, 2 EACH	400	MW	920	LB/H	FUEL SPEC: NO. 2 FUEL OIL	BACT-PSD
SOx	FLORIDA POWER AND LIGHT	LAVOGROME REPOWERING STATION	FL	03/14/1991	03/24/1995	TURBINE, OIL, 4 EACH	0		0		FUEL SPEC: NO. 2 FUEL OIL AS FUEL	BACT-PSD
SOx	AUBURNDALE POWER PARTNERS, LP	AUBURNDALE	FL	12/14/1992	01/13/1995	TURBINE,GAS	1214	MMBTU/H	40	LB/H	FUEL SPEC: LOW SULFUR IN NATURAL GAS	BACT-PSD
SOx	DUKE ENERGY NEW SOMYRNA BEACH POWER CO. LP(HEADQUARTERS)	CHARLOTTE NC	FL	10/15/1999	11/11/1999	TURBINE-GAS, COMBINED CYCLE	500	MW (2 UNITS)	.02	GR/DSCF GAS	NATURAL GAS ONLY	BACT-PSD
SOx	FLORIDA POWER CORP. - UF COGENERATION FACILITY	GAINESVILLE	FL	08/17/1992	03/26/2001	TURBINE/GENERATOR	43	MW			FUEL LIMITED TO 0.5% S MAX.	BACT-PSD
SOx	LAKEWOOD COGENERATION, L.P.	LAKEWOOD TOWNSHIP	NJ	04/01/1991	05/29/1995	TURBINES (#2 FUEL OIL) (2)	1190	MMBTU/HR (EACH)	.21	LB/MMBTU	FUEL SPEC: USE OF LOW SULFUR NO.2 OIL	BACT-OTHER
SOx	LAKEWOOD COGENERATION, L.P.	LAKEWOOD TOWNSHIP	NJ	04/01/1991	05/29/1995	TURBINES (NATURAL GAS) (2)	1190	MMBTU/HR (EACH)	.0069	LB/MMBTU	FUEL SPEC: NAT GAS/LOW SULFUR NO.2 OIL	BACT-OTHER
SOx	SAVANNAH ELECTRIC AND POWER CO.		GA	02/12/1992	03/24/1995	TURBINES, 8	972	MMBTU/H, #2 OIL	.5	% S MAX	FUEL SPEC: LOW SULFUR FUEL OIL	BACT-PSD
SOx	NEWARK BAY COGENERATION PARTNERSHIP, L.P.	NEWARK	NJ	06/09/1993	05/29/1995	TURBINES, COMBUSTION, KEROSENE-FIRED (2)	640	MMBTU/H (EACH)	.04	LB/MMBTU	FUEL SPEC: USE OF LOW SULFUR OIL	BACT-PSD
SOx	NEWARK BAY COGENERATION PARTNERSHIP, L.P.	NEWARK	NJ	06/09/1993	05/29/1995	TURBINES, COMBUSTION, NATURAL GAS-FIRED (2)	617	MMBTU/HR (EACH)	.0026	LB/MMBTU	FUEL SPEC: USE OF NATURAL GAS	BACT-PSD
SOx	PDC EL PASO MILFORD LLC	MILFORD	CT	04/16/1999	06/17/1999	TURBINE, COMBUSTION, ABB GT-24, #1 WITH 2 CHILLERS	1.97	MMCF/H	.0022	LB/MMBTU NAT GASOIL	NAT GAS AS PRIMARY FUEL, 0.8 GR/100 SCF, LOW SULFUR (0.05%W)	BACT-PSD
SOx	PDC EL PASO MILFORD LLC	MILFORD	CT	04/16/1999	06/17/1999	TURBINE, COMBUSTION, ABB GT-24E,#2 WITH 2 CHILLERS	1.97	MMCF/H	.0022	LB/MMBTU NAT GASOIL	NAT GAS AS PRIMARY FUEL, 0.8 GR/100 SCF, LOW SULFUR (0.05%W)	BACT-PSD
SOx	THERMO INDUSTRIES, LTD.	FT. LUPTON	CO	02/19/1992	03/24/1995	TURBINE, GAS FIRED, 5 EACH	246	MMBTU/H	1.5	LB/H		OTHER

Appendix C
Cumulative Air Quality Impact Analysis

Emissions and stack characteristics for the analyses described in this section were derived from several sources.

- For Mirant Dickerson, we used the CPCN application and additional information obtained through data requests and supplemental filings.
- For the Greenfield generating station, we used information contained in the June, 2001 CPCN application (and subsequent December, 2001 revision) filed by Duke Energy for a project which the applicant subsequently cancelled;
- For the Eastalco generating station, a power plant with characteristics similiar to the Duke project was used as a surrogate, with the combustion turbines located on the grounds of the existing Eastalco plant.

It is important to note that in the case of NO_x emissions, all plants analyzed in this study have either "netted out" of PSD and Nonattainment New Source Review, or will have to secure offsets at a ratio of greater than 1:1 prior to operation. No credit, in terms of reduced impacts, was assumed for the plants that will require offsets in this analysis, in large part because the sources of the offsets have not yet been identified. The present study provides an assessment of the impacts of the new plants as they are projected to be built, and can be used as a baseline against which to evaluate the beneficial effect of offsets at a future date. For Dickerson, NO_x was not analyzed since the project "netted out" of new source review. Furthermore, based on the staged construction analysis discussed throughout Section 4.3.3, the cumulative impacts evaluated in this section include the full project (Units 4 and 5), since impacts from the full project were shown to be greater than impacts from Unit 5 simple cycle only.

The stack characteristics and emission rates of all power plants modeled for this cumulative impact assessment are shown in Table C-1. Emission rates are shown for gas and oil firing scenarios, as well as annual average rates. Figure 8-1 of this ERD shows the location of each power plant modeled for this cumulative impact analysis, and also shows the area that was modeled.

The cumulative air quality evaluation examines the following types of potential air quality impacts that may result from emissions from power plants:

- Concentrations of pollutants relative to National Ambient Air Quality Standards (NAAQS) and PSD increments; and
- Concentration, deposition, and visibility impacts in PSD Class I Areas.

Some background information, a summary of the methods used to conduct these evaluations, and the results of the review of the potential cumulative air impacts are presented in the following sections.

Compliance with NAAQS and PSD Increments

Background

The methods and techniques used to assess impacts from multiple power plants on NAAQS and PSD increments are based on the methodology that was used to evaluate the Dickerson expansion project itself (see Section 4.3.3). Modeled emissions from Dickerson produce impacts greater than EPA's significant impact levels (SILs), which therefore required "multi-source modeling"—modeling of all other sources that affect air quality in the area of impact of the new sources (existing sources to assess NAAQS compliance, and other PSD sources to assess increment compliance). The area in which other sources are considered for this additional modeling extends 50 kilometers from the area of significant impact of the new source. No sources outside of this larger area are modeled for NAAQS and increment compliance. This 50-kilometer limitation is in contrast to modeling conducted to assess Class I effects (see Class I discussion below).

The primary issue addressed by this analysis is whether the potential location of multiple new power plants in a small geographic area (within a few miles of each other) would result in cumulative air quality impacts that are significantly different than individual plant impacts. The analysis further addresses whether the cumulative impacts would result in a different outcome for the licensing process, one that may not be fully examined in the proceedings for individual plants.

Methodology - AERMOD

The air quality analysis that is conducted for an individual plant is required to consider emissions of other facilities (new and existing) if its individual impacts exceed the SILs (other new plants need to be considered only if they have filed a complete permit application). Because of this requirement, there is a built-in safeguard that new plants must demonstrate that impacts are acceptable considering all other sources. The present analysis conducted by PPRP is intended to provide an additional measure of protection of air

quality, given the rapid pace of power plant development and given, in particular, the close proximity of proposed plants in or near Frederick County. PPRP has conducted air quality modeling to investigate the cumulative impacts of three proposed or potentially proposed facilities: Mirant Dickerson in Montgomery County, and the Greenfield and Eastalco plants in Frederick County. PPRP used EPA's AERMOD model for this analysis (see Section 4.3.3.1 for a description of AERMOD). The modeling methodology was similar to the methodology employed for the Dickerson expansion project itself (as described in Section 4.3.3.1) with the exception of the meteorological inputs. For this analysis, PPRP used data collected at a 90-meter tower located at the Dickerson site for the time period July 1, 1987 through June 30, 1998. Surface and upper air data from Dulles Airport (located approximately 27 kilometers south of Dickerson) was obtained for the same time period, and the AERMET preprocessor was used to create the surface and profile files for input to AERMOD (see Section 4.3.3.1 for more information regarding this on-site data set).

Different emissions scenarios were modeled, including each plant individually and all plants operating together. Two fuel options were considered for Dickerson, oil and natural gas – as proposed in the CPCN and discussed elsewhere in this ERD. For the purpose of this analysis, the Greenfield and Eastalco plants were modeled assuming natural gas only with no oil backup (the Duke application included a commitment to using natural gas only). The Greenfield and Eastalco plants were modeled with the units in combined cycle mode only (again, consistent with the Duke application), while the Dickerson plant was modeled with a simple cycle option.

Emissions of NO_x, SO_2 and PM10 were modeled. CO emissions were not, since CO impacts from stationary sources are typically much lower than the SILs. Modeling for Mirant Dickerson supported this conclusion (see Section 4.3.3.1), as did the modeling submitted with the Duke CPCN application. Stack parameters for the Dickerson project were obtained from Mirant's CPCN application for the project. Stack parameters for the Greenfield and Eastalco projects were obtained from the Duke CPCN application. To simplify the modeling, emissions were modeled as though originating from one stack at each plant.

A new set of receptors was developed for this modeling effort. Receptors were arranged in a polar orientation in the vicinity of each plant, and a cartesian grid was used in other areas with spacing between receptors ranging from 240 to 480 meters. Receptors were excluded from the Dickerson property, but no receptors were excluded for the other two plants since it is not known where the property boundary will be. Terrain

elevations and the hill scale required by AERMOD were developed from USGS 7.5-minute digital elevation model (DEM) data files through the use of the AERMAP program.

Results and Discussion

The results of the modeling are presented in Tables C-2 and C-3. These tables summarize the maximum impacts predicted for each plant, and also present the results of all three plants operating simultaneously. Table C-2 summarizes the impacts of the new plants alone, without additional background concentrations or emissions from other sources. Tables C-3a and C-3b summarize the total air quality impact (for comparison to the NAAQS and PSD increments) by including monitored background concentrations (NAAQS analysis only) and the maximum impacts of other, existing background (or PSD) sources. The impacts of other sources that are displayed in Table C-3 were derived from the modeling that was conducted for the individual Mirant Dickerson and Duke applications, and includes all applicable NAAQS and PSD sources located within the significant impact areas defined for these two proposed plants. The "other source" concentration values in Table C-3 represent the maximum modeled concentrations, which are then conservatively added to the maximum predictions for the new plants independent of receptor location and time of occurrence. Modeling results for the new plants are also presented in Figure C-1. This figure reflects the maximum 24-hr average predicted concentrations of SO_2, which occurred for the oil-firing scenario in which the new Dickerson units utilize low-sulfur oil while the other two plants remain on natural gas.

The following summary addresses the modeling results as they relate to the primary issues of this analysis (i.e., significance and outcome).

1. For the annual averaging period, impacts of all plants and scenarios are insignificant for all pollutants.
2. For gas-firing, all three plants have insignificant impacts for all pollutants and averaging times, except for PM10 - 24-hr averages. For PM10 - 24-hr averages, two plants are slightly significant (Dickerson and Greenfield), and the third (Eastalco) is slightly greater than the SIL.
3. With all plants operating on natural gas, maximum modeled concentrations increase slightly and one additional averaging period (3-hr) is significant, but not by much.
4. Oil-firing at Dickerson produces much higher impacts for short-term averaging periods, with significant impacts for SO_2 (3-hr and 24-hr) and PM10 (24-hr). Operation in the simple cycle mode results in significant impacts for SO_2, but with a smaller magnitude than for the combined

cycle mode. It should be noted that oil is proposed as a backup fuel for the Dickerson expansion project, and will be limited by CPCN conditions to no more than 720 hours per year.

5. The "all-plant" scenario with Dickerson on oil produces similar results to the Dickerson-only modeling – significant impacts for the same pollutants and averaging times as with Dickerson alone, with only slightly higher maximum impacts.
6. Review of Figure C-1 reveals two different areas where higher modeled concentrations occur: in the immediate vicinity of Dickerson, and on elevated terrain (Sugarloaf Mountain and the Catoctin ridge).
7. If the Dickerson expansion project had been proposed without oil backup, it is possible that multi-source modeling would not have been required as part of the CPCN process. This could have raised questions regarding subsequent CPCN applications, if individual impacts remained less than the SILs (as this preliminary analysis suggests they would); however, since the Dickerson CPCN application addressed the additional modeling, the outcome suggested by this cumulative analysis does not change.

Further review of Figure 8-1, and a review of the results presented in Table C-2, indicate that "combined" impacts of these three plants are not significantly different than individual impacts. There appears to be no significant interaction between plants, i.e. the maximum concentrations due to one plant are not increased significantly by the addition of the impacts of other plants. An explanation for this is that, for short-term standards, impacts from an individual plant occur at a limited number of receptors directly downwind of the source(s) being modeled. The meteorological conditions that contribute to impacts at those specific receptors are frequently not the conditions that are associated with high impacts from other plants at the same receptors. Annual average impacts have more of a tendency to overlap; however, the maximum annual average impacts from individual plants and from all combined scenarios are less than the SILs.

In conclusion, cumulative air quality impacts relative to the attainment of PSD increments and NAAQS do not appear to be significantly different than individual plant impacts. Furthermore, this analysis indicates that cumulative impacts would not result in a different outcome for the licensing process for Dickerson.

PSD Class I Area Analysis

Background

Similar to the Class I area analysis conducted for the Dickerson project (see Section 4.3.4.3), PPRP conducted an evaluation of the potential impacts from the three study plants on Class I areas. The Class I area that were analyzed include the Shenandoah National Park (SNP) in Virginia, managed by the National Park Service, and the Dolly Sods and Otter Creek Wilderness Areas (DSWA and OCWA) in West Virginia, managed by the U.S. Forest Service. PPRP has conducted modeling for all three Class I areas for this analysis.

Requirements for PSD Class I Areas

The means of providing additional protection for Class I areas include limits to increases in air quality impacts based on Class I air quality increments. These increments are considerably more stringent than the corresponding Class II increments. In addition to demonstrating compliance with the Class I increments, PSD applicants are required to show that new emissions will not have an adverse impact on the air quality related values (AQRVs) of the Class I areas under consideration. A discussion of AQRVs, and the guidelines developed to assess AQRV impacts (the FLAG guidance), can be found in Section 4.3.4.3.

Methodology

The methodology followed in this cumulative impact analysis is similar to the methodology used for analyzing the impacts of the Dickerson expansion project (Section 4.3.4.3), with a meteorological data set developed for a different domain. The meteorological domain used in the present analysis is consistent with a larger area that PPRP is using to determine the relative impacts in Class I areas of power plants in Maryland and in the eastern U.S. This larger domain was used for the present analysis in order to ensure consistency and comparability with PPRP efforts related to Maryland and regional power plants. The threedimensional data set used in the present modeling contains hourly meteorology for 1990, and was developed using the MM4 data set prepared by EPA and the National Park Service. National Weather Service (NWS) upper air and surface stations were used to supplement the MM4 winds. Precipitation data from the surface stations, supplemented with additional data obtained from the National Climatic Data Center (NCDC) were also used as input to CALMET. The domain of this data set covers an area approximately 1600 kilometers east-west and 1200 kilometers north-south, with a 40-km grid spacing and ten vertical layers.

CALPUFF was configured to generate concentration estimates for the primary pollutants SO_2, NO_2, and PM10, and secondary particulate pollutants including sulfates (SO_4) and nitrates (NO_3). It was also configured to generate wet and dry deposition estimates for SO_2, SO_4, NO_3, and HNO_3, and to create the relative humidity file required for estimating visibility impacts. CALPUFF was run for each of the power plants (gas or oil firing where applicable). The CALSUM and CALPOST processors, companion programs to CALPUFF, were used to generate combined plant scenarios and to calculate and summarize concentration, deposition, and visibility impacts for the appropriate averaging periods.

For the Dickerson expansion project, the model runs were configured to estimate the "crediting" impacts resulting from a decrease in the sulfur content of oil combusted in Unit 4 from 0.3% to 0.05%. As demonstrated in Section 4.3.4.3, including Figure 4-15, generally the reduction in impacts due to this decrease are larger than the increase in impacts from the new combined cycle units. Due to differences in plume height, however, between combined cycle and simple cycle operation, some increases are predicted for certain meteorological conditions. These increases are reflected in the modeling conducted for this cumulative impact analysis. In all three Class I areas, the net impacts due to simple cycle operation were negligible and therefore the focus of the Class I cumulative impact evaluation is on the combined cycle mode for Dickerson.

Results and Discussion

Concentrations

A summary of the results of modeling for concentration impacts in all three Class I areas are presented in Table C-4. The values shown in this table represent the maximum modeled concentrations, over all receptors and (for short-term averages) over all time periods. Maximum concentrations estimated in the Dolly Sods and Otter Creek Class I areas are all less than the Class I SILs, for all individual and combined plant scenarios. The same is true for the majority of the cases estimated for Shenandoah, with some exceptions (short-term averages only). For individual power plants, maximum predicted concentrations for all gas scenarios are less than the SILs while the Dickerson oil-fired scenario is slightly greater than the PM10 24-hr SIL. Combined plant maximum impacts (gas-firing) are greater than the SIL for PM10, 24-hr averages, as are combined plant maximum impacts for oil firing. The combined plant maximum impacts for oil firing are also slightly greater than the SIL for SO_2, 24-hr averages.

An impact greater than a SIL does not signify that the impact is unacceptable, but that a full increment analysis, including all increment-consuming sources, should be conducted to determine total increment consumption. Although PM10 impacts are slightly greater than the 24-hr SIL for Dickerson, a full increment analysis was not conducted since the impact occurs for a limited use backup fuel, and furthermore other potential PSD sources close to Dickerson are being modeled (in this cumulative impact assessment) to provide an evaluation of increment consumption. These sources – nearby power plants – are likely to produced worst-case combined impacts for short-term averaging periods. Maximum concentration impacts based on operation of all three power plants are substantially less than the Class I increments, as shown in Table C-4.

Deposition

Deposition is a term that is used to describe the result of the interaction of pollutants with the ground surface, where some of the pollutant mass is deposited on the ground or is absorbed by vegetation. Deposition occurs through physical and biological processes, and is generally thought of as a secondary pollution problem – i.e., pollutants that are directly emitted by combustion sources must undergo chemical transformation in the atmosphere before deposition becomes a significant factor. Deposition can occur as a dry process (interaction with the ground surface, uptake by plants) or a wet process (where precipitation essentially "washes out" the pollutant mass from the atmosphere). Wet and dry deposition fluxes were calculated by CALPUFF in all three Class I areas for SO_2, SO_4, NO_3, and HNO_3.

The annual average deposition rates (maximum over all receptors) as predicted by CALPUFF are presented in Tables C-6 (sulfur) and C-7 (nitrogen). Wet and dry deposition rates for the individual species (SO_2, SO_4, NO_3, and HNO_3) were scaled to yield the sulfur or nitrogen equivalent value, and sums over species and wet and dry processes were created as shown in the tables. Deposition flux is expressed in terms of grams per hectare (10,000 m^2, or approximately 2.5 acres) per year. Predicted deposition rates in Shenandoah were much higher than in Dolly Sods or Otter Creek. The total sulfur deposition rates ranged from approximately 0.87 to 2.33 g/ha/yr (individual plant scenarios) and was 3.97 g/ha/yr for all three power plants combined. The total nitrogen deposition rates ranged from approximately 0.27 to 0.28 g/ha/yr (individual plant scenarios) and was 0.60 g/ha/yr for all three power plants combined.

It is useful to compare the predicted deposition rates from new power plants to existing deposition rates as measured in the Class I area. Deposition rates have been estimated from data collected at the Shenandoah National Park, Big Meadows monitoring station for several years. For the past two to three years, average sulfur-equivalent deposition rates are approximately 5 kg/ha/yr (both wet and dry); average nitrogen-equivalent deposition rates are approximately 2.4 kg/ha/yr (wet) and 3.4 kg/ha/yr (dry) (Source: NADP, 2001; CASTNET, 2001). The predicted values for these new power plants are approximately three orders of magnitude lower than currently monitored deposition rates. The predicted deposition rates are also less than the Deposition Analysis Threshold (DAT), established by the National Park Service, of 10 g/ha/yr for both sulfur and nitrogen.

Visibility

The CALPOST processor generates estimates of visibility impacts by calculating an extinction coefficient based on CALPUFF-predicted concentrations of particulates, sulfates, and nitrates. The value of the calculated extinction coefficient is then compared to natural conditions at the Class I area under consideration, and a percent degradation is calculated. For the three Class I areas examined in this study, the natural background was set equal to a value corresponding to a visual range of approximately 200 kilometers. The high background visual range makes the percent degradation test quite conservative - very small concentrations of sulfates and nitrates can result in large values of calculated degradation.

Results for visibility impairment estimates in the three Class I areas are presented in Table C-7. Two sets of results are presented. The first reflects the use, within the CALPOST scheme for calculating visibility impairment, of hourly average relative humidity, and the second reflects the use of monthly average relative humidity. High relative humidity causes hygroscopic particles such as the secondary particles formed from SO_2 and NO_x emissions (i.e., sulfates and nitrates) to grow in size. Visibility impairment is correspondingly worse with higher relative humidity. Generally, the use of hourly average relative humidity values results in higher visibility impairment. The use of monthly average relative humidity values, however, is consistent with the approaches recommended in the regional haze rule focussed on existing power plants; these values are presented in Table C-7 to provide additional perspective on the predicted impacts.

The impairment thresholds recommended by the FLAG guidance document are 5% for individual plants and 10% for the cumulative impact

of all PSD plants. These levels are not as prescriptive as the SILs for PSD non-reactive pollutant modeling, and the FLMs can consider factors such as frequency, duration and spatial extent of the predicted impacts in determining whether additional analyses are necessary. The visibility impacts for all of the individual power plants shown in Table C-7 pass the individual source threshold, and all of the combined scenario impacts pass the multiple source threshold. The "all source" scenario for oil firing is shown to have lower impacts than the "all source" scenario for gas firing. The reason for this is that the "crediting" impacts due to the reduction in sulfur in the fuel oil for Unit 4 is included in this scenario, and the reduced impacts due to the sulfur-in-fuel reduction is enough to offset the impacts that would otherwise be much higher on oil.

The conclusion of this visibility impact analysis for multiple power plants is that both individual and multi-source thresholds are met for the three Class I areas under consideration. The cumulative impacts of these three power plants represent only a limited set of the sources (i.e., all increment-consuming sources) that would have to be considered in a full multisource analysis. They are, however, the most likely sources to result in combined short-term impacts due to their proximity - and the combined impacts are substantially below multi-source thresholds. Since the combined impacts do, however, trigger some of the thresholds established for single PSD sources, Class I area analyses for future plants should be reviewed carefully – once final parameters and locations are established - to determine if it would be appropriate at that time to expand the analysis to all increment consuming sources.

Figure C-1 Modeling Results

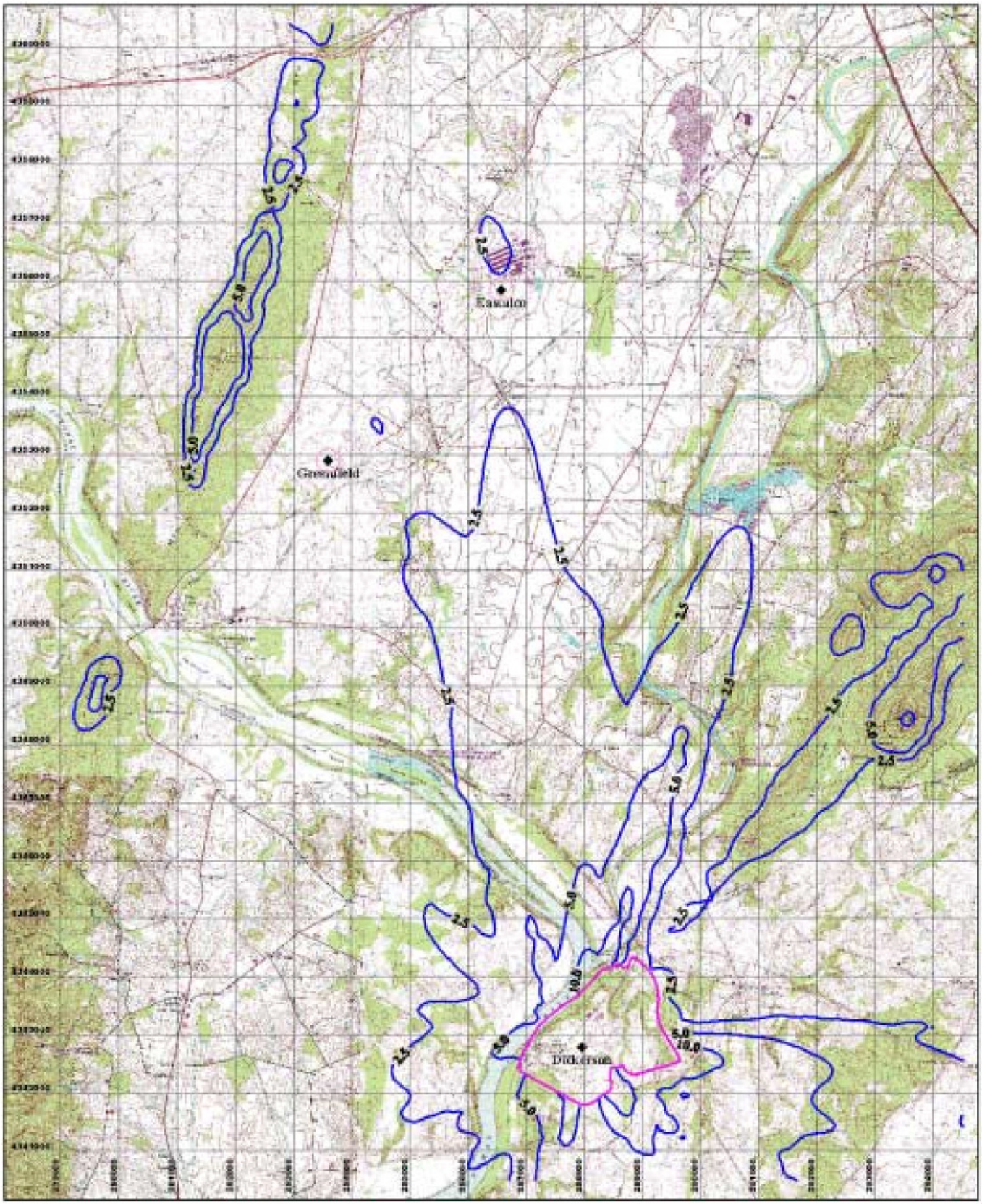


Table C-1 Stack and Emissions Data

English Units

Long. Deg.	Lat. Deg.	Location UTME m	UTMN m	LC-East km	LC-North km	Name	Fuel	Symbol	stack_ht ft	base_el ft	stk_dia ft	exit_vel fps	exit_temp F	SO2 lbs/hr	NOx lbs/hr	PM10 lbs/hr	Operating Mode
77.4557	39.2100	287970	4342780	256.391	-50.147	Dickerson	Gas	DCC_G	190	358	20.0	49.0	200.0	45.2	101.6	81.2	CC
77.4557	39.2100	287970	4342780	256.391	-50.147	Dickerson	Oil	DCC_O	190	358	20.0	52.0	250.0	396.2	418.8	159.8	CC
77.4557	39.2100	287970	4342780	256.391	-50.147	Dickerson	Ann	DCC_A	190	358	20.0	52.0	250.0	75.0	186.7	78.0	CC/SC
77.4557	39.2100	287970	4342780	256.391	-50.147	Dickerson	Oil	DSC_O	130	358	22.6	92.0	1036.0	396.2	1367.4	78.0	SC
77.4759	39.3273	286581	4355843	254.219	-37.555	Eastalco	Gas	EAS_G	161	330	18.0	67.2	216.0	28.2	46.8	48.6	CC
77.5095	39.3000	283600	4352900	251.524	-40.600	Greenfield	Gas	GRN_G	161	305	18.0	67.2	216.0	28.2	46.8	48.6	CC

Model Units

Long. Deg.	Lat. Deg.	Location UTME m	UTMN m	LC-East km	LC-North km	Name	Fuel	Symbol	stack_ht m	base_el ft	stk_dia m	exit_vel m/s	exit_temp K	SO2 g/s	NOx g/s	PM10 g/s	Operating Mode
77.4557	39.2100	287970	4342780	256.391	-50.147	Dickerson	Gas	DCC_G	57.91	358	6.096	14.935	366.48	5.695	12.802	10.231	CC
77.4557	39.2100	287970	4342780	256.391	-50.147	Dickerson	Oil	DCC_O	57.91	358	6.096	15.850	394.26	49.921	52.769	20.135	CC
77.4557	39.2100	287970	4342780	256.391	-50.147	Dickerson	Ann	DCC_A	57.91	358	6.096	15.850	394.26	9.456	23.523	9.824	CC/SC
77.4557	39.2100	287970	4342780	256.391	-50.147	Dickerson	Oil	DSC_O	39.62	358	6.879	28.042	830.93	49.921	172.292	9.828	SC
77.4759	39.3273	286581	4355843	254.219	-37.555	Eastalco	Gas	EAS_G	49.07	330	5.486	20.483	375.37	3.553	5.897	6.124	CC
77.5095	39.3000	283600	4352900	251.524	-40.600	Greenfield	Gas	GRN_G	49.07	305	5.486	20.483	375.37	3.553	5.897	6.124	CC

Table C-2 AERMOD Results: New Plants Only

Pollutant	Averaging Period	SIL	PSD Increment	NAAQS	Dickerson CC - Gas	Dickerson CC - Oil	Dickerson SC - Oil	Greenfield Gas	Eastalco Gas	All Gas	All Oil
SO2	3-hr	25	512	1300	9.12	60.21	34.35	22.98	9.22	26.12	60.36
	24-hr	5	91	365	2.85	19.24	8.69	3.28	2.47	3.64	19.30
	Annual	1	20	80	0.43	n/a	n/a	0.19	0.19	0.43	n/a
PM10	24-hr	5	30	150	5.11	7.76	1.71	5.65	4.26	6.31	7.85
	Annual	1	17	50	0.45	n/a	n/a	0.33	0.32	0.45	n/a
NO2	Annual	1	25	100	0.80	n/a	n/a	0.24	0.23	0.80	n/a

NOTES: **CC = Combined Cycle, SC = Simple Cycle**
Annual results for all pollutants include oil firing for Dickerson
Concentrations are in ug/m3 (micrograms per cubic meter)
"All" scenarios include Dickerson, combined cycle, with fuel indicated

Table C-3a AERMOD Results for PSD Demonstration: New Plants Plus Other PSD Sources

Pollutant	Averaging Period	PSD Increment	Other Modeled PSD Sources	New Plants (Gas)	New Plants (Oil)	Total (Gas)	Total (Oil)
SO2	3-hr	512	21.03	26.12	60.36	73.28	107.51
	24-hr	91	7.47	3.64	19.30	14.76	30.41
	Annual	20	1.05	0.43	n/a	1.91	n/a
PM10	24-hr	30	1.30	6.31	7.85	13.92	15.47
	Annual	17	0.18	0.45	n/a	1.07	n/a

NOTES: **All concentrations are in ug/m3 (micrograms per cubic meter)**
Impacts for "other modeled sources" derived from Table 4-23
Totals created by conservatively adding maximum concentrations from other modeled sources and new plant impacts

Table C-3b AERMOD Results for NAAQS Demonstration: New Plants Plus Background and Other Sources

Pollutant	Averaging Period	NAAQS	Background	Other Modeled NAAQS Sources	New Plants (Gas)	New Plants (Oil)	Total (Gas)	Total (Oil)
SO2	3-hr	1300	149.3	655.36	26.12	60.36	830.78	865.02
	24-hr	365	96.9	165.25	3.64	19.30	265.79	281.45
	Annual	80	26.0	24.03	0.43	n/a	50.46	n/a
PM10	24-hr	150	9.70	9.70	6.31	7.85	80.01	81.55
	Annual	50	1.38	1.38	0.45	n/a	26.23	n/a

NOTES: **All concentrations are in ug/m3 (micrograms per cubic meter)**
Background concentrations and "other modeled sources" derived from Table 4-24 note that Dickerson sources are double-counted in this analysis
Totals created by conservatively adding maximum concentrations from other modeled sources, background, and new plant impacts

Table C-4 Class I Area Concentration Results

Pollutant	Averaging Period	SIL	Class I Increment	Dickerson CC - Gas	Dickerson CC - Oil	Greenfield Gas	Eastalco Gas	All Gas	All Oil
Shenandoah National Park									
SO2	3-hr	1.0	25.0	0.202	0.909	0.183	0.166	0.455	0.955
	24-hr	0.2	5.0	0.063	0.181	0.058	0.053	0.153	0.230
	Annual	0.1	2.0	0.002	n/a	0.001	0.001	0.004	n/a
PM 10 - Primary	24-hr			0.190	0.338	0.121	0.108	0.377	0.520
Nitrates	24-hr			n/a	n/a	0.014	0.014	0.028	0.028
Sulfates	24-hr			0.007	0.019	0.004	0.004	0.014	0.021
Total PM10	24-hr	0.3	8.0	0.197	0.357	0.140	0.126	0.420	0.570
PM 10 - Primary	Annual			0.004	0.006	0.003	0.003	0.008	n/a
Nitrates	Annual			n/a	n/a	0.0003	0.0003	0.0005	n/a
Sulfates	Annual			0.000	n/a	0.0001	0.0001	0.0005	n/a
Total PM10	Annual	0.2	4.0	0.004	0.006	0.003	0.003	0.009	n/a
NO2	Annual	0.2	2.5	n/a	n/a	0.001	0.001	0.003	n/a
Dolly Sods									
SO2	3-hr	1.0	25.0	0.030	0.023	0.021	0.020	0.071	0.028
	24-hr	0.2	5.0	0.014	0.005	0.009	0.009	0.031	0.005
	Annual	0.1	2.0	0.0003	n/a	0.0001	0.0001	0.0005	n/a
PM 10 - Primary	24-hr			0.053	0.082	0.032	0.030	0.114	0.143
Nitrates	24-hr			n/a	n/a	0.004	0.004	0.008	0.008
Sulfates	24-hr			0.003	0.001	0.002	0.002	0.007	0.002
Total PM10	24-hr	0.3	8.0	0.056	0.083	0.039	0.036	0.130	0.153
PM 10 - Primary	Annual			0.001	0.001	0.0005	0.0005	0.0017	n/a
Nitrates	Annual			n/a	n/a	0.00004	0.00004	0.0001	n/a
Sulfates	Annual			0.0001	n/a	0.00003	0.00003	0.0002	n/a
Total PM10	Annual	0.2	4.0	0.001	0.001	0.001	0.001	0.002	n/a
NO2	Annual	0.2	2.5	n/a	n/a	0.0001	0.0001	0.0002	n/a
Otter Creek									
SO2	3-hr	1.0	25.0	0.023	0.028	0.015	0.015	0.052	0.032
	24-hr	0.2	5.0	0.011	0.002	0.007	0.007	0.024	0.003
	Annual	0.1	2.0	0.0002	n/a	0.0001	0.0001	0.0003	n/a
PM 10 - Primary	24-hr			0.042	0.062	0.025	0.024	0.091	0.111
Nitrates	24-hr			n/a	n/a	0.003	0.003	0.006	0.006
Sulfates	24-hr			0.003	0.000	0.002	0.002	0.006	0.000
Total PM10	24-hr	0.3	8.0	0.045	0.062	0.030	0.029	0.103	0.117
PM 10 - Primary	Annual			0.001	0.001	0.000	0.000	0.001	n/a
Nitrates	Annual			n/a	n/a	0.000	0.000	0.000	n/a
Sulfates	Annual			0.000	n/a	0.000	0.000	0.000	n/a
Total PM10	Annual	0.2	4.0	0.001	0.001	0.000	0.000	0.002	n/a
NO2	Annual	0.2	2.5	n/a	n/a	0.000	0.000	0.000	n/a

NOTE: All concentrations are in ug/m3 (micrograms per cubic meter)

Table C-5 Class I Area Predicted Sulfur Deposition

Class I Area	Species	Wet/ Dry	Dickerson Annual	Greenfield Gas	Eastalco Gas	All Annual
Shenandoah National Park	SO2	Dry	1.508	0.635	0.614	2.637
	SO4	Dry	0.006	0.002	0.002	0.011
	TOTAL DRY		1.515	0.638	0.616	2.647
	SO2	Wet	0.689	0.212	0.201	1.102
	SO4	Wet	0.131	0.052	0.050	0.225
	TOTAL WET		0.820	0.264	0.251	1.327
	TOTAL WET PLUS DRY		2.334	0.902	0.867	3.974
Dolly Sods	SO2	Dry	0.221	0.093	0.093	0.405
	SO4	Dry	0.002	0.001	0.001	0.004
	TOTAL DRY		0.223	0.094	0.093	0.409
	SO2	Wet	0.150	0.055	0.051	0.256
	SO4	Wet	0.065	0.024	0.023	0.113
	TOTAL WET		0.216	0.080	0.074	0.369
	TOTAL WET PLUS DRY		0.439	0.173	0.167	0.778
Otter Creek	SO2	Dry	0.165	0.064	0.063	0.291
	SO4	Dry	0.002	0.001	0.001	0.003
	TOTAL DRY		0.167	0.064	0.063	0.295
	SO2	Wet	0.116	0.046	0.044	0.207
	SO4	Wet	0.056	0.022	0.021	0.099
	TOTAL WET		0.173	0.068	0.065	0.305
	TOTAL WET PLUS DRY		0.339	0.133	0.129	0.600

NOTES
All units are in g/ha/year, Sulfur equivalent
Emission rates modeled correspond to annual rates
The Deposition Analysis Threshold (DAT) for Sulfur is 10.0 g/ha

Table C-6 Class I Area Predicted Nitrogen Deposition

Class I Area	Species	Wet/ Dry	Greenfield Gas	Eastalco Gas	All Annual
Shenandoah National Park	HNO3	Dry	0.173	0.167	0.340
	NO3	Dry	0.005	0.005	0.010
	SO4(NH4)2	Dry	0.001	0.001	0.003
	TOTAL DRY		0.179	0.172	0.353
	HNO3	Wet	0.007	0.007	0.015
	NO3	Wet	0.081	0.076	0.156
	SO4(NH4)2	Wet	0.017	0.016	0.072
	TOTAL WET		0.104	0.099	0.242
	TOTAL WET PLUS DRY		0.283	0.271	0.595
Dolly Sods	HNO3	Dry	0.049	0.048	0.096
	NO3	Dry	0.001	0.001	0.002
	SO4(NH4)2	Dry	0.0003	0.0003	0.001
	TOTAL DRY		0.050	0.049	0.099
	HNO3	Wet	0.005	0.004	0.008
	NO3	Wet	0.028	0.026	0.054
	SO4(NH4)2	Wet	0.008	0.007	0.036
	TOTAL WET		0.040	0.037	0.098
	TOTAL WET PLUS DRY		0.090	0.087	0.197
Otter Creek	HNO3	Dry	0.037	0.036	0.074
	NO3	Dry	0.001	0.001	0.001
	SO4(NH4)2	Dry	0.0002	0.0002	0.001
	TOTAL DRY		0.038	0.037	0.076
	HNO3	Wet	0.004	0.003	0.007
	NO3	Wet	0.022	0.022	0.044
	SO4(NH4)2	Wet	0.007	0.007	0.031
	TOTAL WET		0.033	0.032	0.083
	TOTAL WET PLUS DRY		0.071	0.069	0.159

NOTES
All units are in g/ha/year, Nitrogen equivalent
Emission rates modeled correspond to annual rates
The Deposition Analysis Threshold (DAT) for Nitrogen is 10.0 g/ha

Table C-7 Class I Area Visibility Impairment Impacts

Based on hourly average relative humidity methodology

Class I Area		Dickerson CC - Gas	Dickerson CC - Oil	Greenfield Gas	Eastalco Gas	All Gas	All Oil
Shenandoah National Park	SO4:	0.29	1.08	0.20	0.20	0.51	1.55
	NO3:	n/a	n/a	2.46	2.39	4.69	0.87
	PMF:	0.79	1.33	0.51	0.45	1.25	1.83
	Total:	1.07	2.41	3.16	3.03	6.44	4.25
Dolly Sods	SO4:	0.29	0.24	0.19	0.18	0.65	0.28
	NO3:	n/a	n/a	0.60	0.54	1.13	0.05
	PMF:	0.22	0.07	0.13	0.12	0.46	0.10
	Total:	0.51	0.31	0.93	0.84	2.23	0.43
Otter Creek	SO4:	0.24	0.20	0.16	0.15	0.52	0.26
	NO3:	n/a	n/a	0.38	0.34	0.71	0.07
	PMF:	0.17	0.08	0.10	0.10	0.37	0.12
	Total:	0.41	0.28	0.64	0.59	1.61	0.46

Based on monthly average relative humidity methodology

Class I Area		Dickerson CC - Gas	Dickerson CC - Oil	Greenfield Gas	Eastalco Gas	All Gas	All Oil
Shenandoah National Park	SO4:	0.18	0.74	0.10	0.09	0.27	1.06
	NO3:	n/a	n/a	0.86	0.84	1.61	0.44
	PMF:	0.87	1.46	0.55	0.49	1.41	2.18
	Total:	1.06	2.20	1.51	1.42	3.29	3.67
Dolly Sods	SO4:	0.19	0.07	0.13	0.13	0.44	0.11
	NO3:	n/a	n/a	0.27	0.25	0.51	0.03
	PMF:	0.25	0.08	0.15	0.14	0.52	0.12
	Total:	0.44	0.15	0.55	0.51	1.47	0.25
Otter Creek	SO4:	0.19	-0.05	0.12	0.12	0.41	-0.02
	NO3:	n/a	n/a	0.20	0.19	0.38	0.03
	PMF:	0.19	0.09	0.12	0.11	0.42	0.14
	Total:	0.37	0.04	0.43	0.41	1.21	0.15

NOTES:

Values displayed are percent impairment over natural conditions Calculated in accordance with FLAG methodology

Shaded values indicate impact greater than 5% threshold Dickerson Oil scenario includes credit from Unit 4 reduction

Appendix D
PSC Order for the Mirant Certificate of Public Convenience and Necessity

ORDER NO. 79661

IN THE MATTER OF THE APPLICATION OF MIRANT DICKERSON DEVELOPMENT, LLC FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY TO MODIFY ITS EXISTING GENERATING STATION H IN DICKERSON, MONTGOMERY COUNTY.	* * * *	BEFORE THE PUBLIC SERVICE COMMISSION OF MARYLAND CASE NO. 8888

PROPOSED ORDER OF HEARING EXAMINER

Appearances:

Deborah E. Jennings, for Mirant Dickerson Development, LLC.

M. Brent Hare, for the Department of Natural Resources, Power Plant Research Program.

Megan Sperling, for the Staff of the Public Service Commission of Maryland.

Cynthia Green-Warren, for the Office of People's Counsel.

James R. Choukas-Bradley, for the Sugarloaf Citizens Association.

I. PROCEDURAL OVERVIEW

On May 23, 2001, Mirant Dickerson Development, LLC ("Mirant" or "Applicant") filed an application for a Certificate of Public Convenience and Necessity ("CPCN") to expand its Dickerson power generating facility in Montgomery County, Maryland. The

application proposes to modify the generating station at the Dickerson site by converting the existing simple-cycle combustion units to combined-cycle units and adding a new combined-cycle unit. The generator will be fueled by natural gas with distillate oil as backup, and pollution controls will be added to the existing coal-fired units. The completed project will add 740 megawatts of generating capacity to the Dickerson facility. The additional power is to be sold to the wholesale market with no requirement for additional transmission lines.

On June 13, 2001, the Commission, after consideration at its Administrative Meeting, delegated the matter to the Hearing Examiner Division for hearing. Thereafter, a procedural schedule was agreed to by the parties. The schedule established May 24, 2002 as the concluding date for the process leading to a decision on the application. However, subsequent to its development, on January 22, 2002, Mirant filed an amendment to its CPCN application and as a result, requested a postponement of the procedural schedule. The request for postponement was to allow the parties time to review the amended application. Thereafter, a new procedural schedule was developed and November 1, 2002 was set as the date to conclude these proceedings. A hearing for Mirant's amended application was held on June 12, 2002. This was followed by a further suspension of the proceedings, at the request of the Department of Natural Resources, to allow time for a Cabinet Level Task Force to develop guidelines for the siting of multiple power

plants. As a result of that request, the proceedings were suspended until December 1, 2002, when the Task Force Guidelines were filed. Upon resumption of the proceedings, concluding hearings were held on September 17, 2003. Following these hearings, a request was made by the United States Environmental Protection Agency ("EPA") to hold open the record of proceedings. This was done to allow time to resolve certain environmental issues raised by EPA with respect to Mirant's application. On October 18, 2004, the parties advised that the environmental issues had been resolved and as a result, the record of these proceedings could be closed.

II. DISCUSSION AND CONCLUSION

On November 5, 2001, a hearing was held at which Mirant presented and was cross-examined regarding testimony submitted in support of its application. The following persons testified for Mirant: William S. Bulpitt, Project Manager for the expansion of the Dickerson generating facility; Dr. Gregory M. Powell, environmental and water expert; Kennard F. Kosky, evaluation of air quality impacts; Carl Bullock, ecologist consultant; Richard A. Zwolak, evaluation of the socio-economic impact including the transportation and visual impact of the project; and David Bare, evaluation of the noise impact of the project.

Considered in its totality, the testimony and cross-examination of these witnesses provide a detailed description of

the expansion of the Dickerson generating facility along with an evaluation of the factors that must be considered to determine whether to grant Mirant's application. Several months following its presentation, Mirant amended its application. This resulted in a delay of the procedural schedule to allow the parties time to review the amended application.

On June 12, 2002, Mirant presented testimony of William S. Bulpitt and Kennard Kosky to support the amended application. According to Mr. Bulpitt, a change of economic conditions -- including the impact of 9/11 -- in the year since filing the original application required a change in the scope of the project. The original application had planned for a modification of the generating facility that would be totally completed in the summer of 2004. The amended application modifies the project so that its completion is sequenced in two phases. The first phase involves building out the first generating unit to operate in simple-cycle mode followed by construction of a new combined-cycle unit with completion of the total combined-cycle build out to occur in 2006. Mr. Kosky testified that the sequencing of construction will affect the air quality impacts as a result of the number of hours that the generating facility will operate in the simple-cycle mode. In addition, there will also be some air quality impact at the time of transition to combined-cycle operation. Mr. Kosky testified as to the conditions that should apply to regulate air

quality standards and he recommended the conditions should be contained in the CPCN.

On July 22, 2003, a hearing was held to receive the testimony of intervenors in this proceeding. Testimony was received from the following: Roland Steiner, for the Washington Suburban Sanitary Commission ("WSSC") and on behalf of three water suppliers[1] in the Washington metropolitan area; Craig Taborsky, Staff of the Public Service Commission; Sandra Patty, Project Manager for the Power Plant Research Program of the Department of Natural Resources; Richard Letty, evaluation of noise impacts on behalf of the Department of Natural Resources; Peter D. Hall, evaluation of the economic, land-use, visual and cultural resource impacts on behalf of the Department of Natural Resources; a panel of water resource experts on behalf of the Department of Natural Resources;[2] and a panel of environmental resource experts on behalf of the Department of Natural Resources.[3]

Mr. Steiner testified on behalf of the water suppliers in the Washington metropolitan area that an agreement had been reached with Mirant. The agreement resolved and settled issues that the water suppliers had regarding Mirant's use of water resources

---

[1] In addition to the WSSC, the other water suppliers include the Fairfax County (Virginia) Water Authority and Washington Aqueduct Division, a component of the U.S. Army Corps of Engineers.

[2] Members of the panel: Matthew Pajerowski, Chief of the Water Rights Division, Maryland Department of the Environment; Bob Keating, Consultant; and Stephen Schreiner, environmental scientist and consultant.

[3] Members of the panel: William Paul, Maryland Department of the Environment; Julia Ross, Consultant on air quality; and Mark Garrison, Consultant on air quality.

at the Dickerson facility. Mr. Steiner indicated that the terms of the settlement agreement should be incorporated into the CPCN. Mr. Taborsky, Staff Transmission Engineer, testified that based on his review, it was his determination that this project would not adversely impact the stability and reliability of the electric system in the State. In addition, Mr. Taborsky recommends that the CPCN contain conditions necessary to assure that Mirant is in compliance with PJM standards prior to any portion of the project becoming operational. Ms. Patty testified regarding the Department of Natural Resources' review of the environmental assessment and the project's economic impact. According to Ms. Patty, she coordinated the review of the project by the various State agencies that have responsibility for evaluating potential environmental and socioeconomic impacts of a new generating facility. The report of this review was endorsed by the various agencies and contains a number of conditions to be incorporated into the CPCN that assure the proposed project will not have an adverse impact on the economic, sociological and environmental resources within the State.

The overall testimony of the panel of water resource experts endorsed the settlement reached by the water suppliers. In the panel's view, the settlement adequately addressed the agencies' goal that water resources be managed in equitable fashion for all users and the conditions reflected in the agreement should be incorporated into the CPCN. The panel of environmental resource

experts testified regarding their review of the air quality impact of this project. Their testimony indicated that the impact of the proposed project, subject to the conditions established in the review, could be built and operated in a manner that would comply with all federal and state regulatory requirements.

On the evening of September 17, 2003, a hearing was held at Linden Farms in Dickerson, Maryland to receive public comment regarding Mirant's application. Only two persons provided public comment. The first, Reverend Douglas Moore, the Pastor of Elijah United Methodist Church in Poolesville, Maryland. Reverend Moore's church is located five miles from the generating facility and he expressed concern about a number of issues. However, none of the issues commented upon presented any information to refute evidence supporting the Mirant application. The second person presenting comment was a Mr. Tom Procter, a resident of Barnesville, Maryland. Mr. Procter's comments raised a general concern about what he considered to be the inefficiency of producing electricity by large facilities like Mirant's Dickerson facility. He suggested that future consideration be given to small facilities located closer to the electricity users that did not require sending electricity great distances over electric wires. Beside these remarks, there was nothing in Mr. Procter's comments, however, opposing any significant aspect of Mirant's application.

Subsequent to the concluding hearing in September 2003, there was a period of extended delay during which the parties

engaged in discussions to resolve certain environmental issues raised by the EPA. The result of these efforts led to the parties entering into an Agreement of Stipulation and Settlement ("the Settlement"). The Settlement incorporates within it terms and conditions reflected in agreements previously reached by Mirant with the water suppliers and the Sugarloaf Citizens Association, as well as the recommended licensing conditions by the DNR and the interested State agencies. The Settlement is viewed against the evidence in the record, and the conclusion is reached that Mirant's application is supported by evidence sufficient to meet the required statutory criteria. As a result, issuance of the Certificate of Public Convenience and Necessity to modify Mirant's Dickerson facility is in the public interest. Accordingly, the Certificate of Public Convenience and Necessity is hereby granted subject to the conditions set forth in Attachment 1, attached hereto. The terms and conditions of Attachment 1 shall be incorporated into the Certificate.

IT IS, THEREFORE, this 5th day of November, in the year Two Thousand Four,

ORDERED: (1) That the application of Mirant Dickerson Development, LLC for a Certificate of Public Convenience and Necessity to modify its existing generating facility in Dickerson, Montgomery County, Maryland, is hereby granted in accordance with the findings of this Order.

(2) That this Proposed Order will become a final Order of the Commission on December 7, 2004, unless before that date an appeal is noted with the Commission by any party to this proceeding as provided in Section 3-113(d)(2) of The Public Utility Companies Article, or the Commission modifies or reverses the Proposed Order or initiates further proceedings in this matter as provided in Section 3-114(c)(2) of The Public Utility Companies Article.

_____

David L. Moore
Hearing Examiner
Public Service Commission of Maryland

FILED

SEP 20 2004

PUBLIC SERVICE COMM.
OF MARYLAND

BEFORE THE
PUBLIC SERVICE COMMISSION
OF MARYLAND

IN THE MATTER OF THE APPLICATION OF	)	
MIRANT DICKERSON DEVELOPMENT, LLC	)	
FOR A CERTIFICATE OF PUBLIC CONVENIENCE	)	**PSC CASE NO. 8888**
AND NECESSITY TO MODIFY ITS EXISTING	)	
GENERATING STATION H IN	)	
MONTGOMERY COUNTY, MARYLAND	)	

AGREEMENT OF STIPULATION AND SETTLEMENT

Mirant Dickerson Development, LLC ("Mirant" or "Applicant"); the Power Plant Research Program of the Department of Natural Resources ("PPRP"), acting on behalf of a number of interested State agencies; the Staff of the Public Service Commission of Maryland; the Office of People's Counsel; the Fairfax County Water Authority, a public body established under the laws of the Commonwealth of Virginia, Washington Suburban Sanitary Commission, a public body established under the laws of the State of Maryland, and the Washington Aqueduct Division of the U.S. Army Corps of Engineers, an agency or instrumentality of the United States of America (collectively, the "Water Suppliers"); Sugarloaf Citizens Association, Jane S. Hunter, and Tina T. Brown (collectively, "Sugarloaf"); together constituting the "Settling Parties," by their undersigned counsel, agree as follows:

BACKGROUND

On May 23, 2001, Mirant filed with the Public Service Commission of Maryland (the "Commission") an Application for the modification of its generating facilities in Montgomery County, Maryland pursuant to Sections 7-207 and 7-208 of the Public Utility Companies Article of

the Maryland Code. The requested modification is to convert the existing Station H simple cycle combustion turbine at its Dickerson site located in Montgomery County, Maryland to a combined cycle unit ("new Unit 4") with the installation of heat recovery steam generators, a steam turbine, and electric generator, and to construct a new combined cycle unit ("new Unit 5") consisting of two combustion turbines with electric generators, associated heat recovery steam generators, and a steam turbine with an electric generator (the "Project"). The matter was docketed as Case No. 8888 and delegated to Hearing Examiner David L. Moore for hearing.

Following submission of Mirant's Application, PPRP and others made numerous data requests of Mirant. Mirant answered each of these data requests and supplemented its Application in response to these data requests, as necessary. Mirant also filed written testimony of its staff and subject matter experts in support of its application.

Mirant entered into a "Stipulation and Settlement Agreement" with the Water Suppliers concerning water use from the Potomac River and agreed to incorporate certain terms of that Agreement into the CPCN. Mirant also entered into an "Agreement of Stipulation and Settlement" with Sugarloaf concerning several environmental issues and agreed to incorporate certain terms of that Agreement into the CPCN.

In accordance with the Power Plant Siting Act (Chapter 31 of the Laws of 1971), PPRP,, acting in concert with the Maryland Department of the Environment and other interested State agencies, conducted an environmental review of the impacts of the proposed modification and developed a set of conditions necessary to ensure that the construction and operation of the proposed modification will meet or exceed applicable environmental statutes and regulations and pose no undue detrimental impacts on the surrounding community.

On July 13, 2004, PPRP, acting on behalf of the State agencies, filed the final Recommended Licensing Conditions for Mirant's Application for a CPCN (attached as Appendix A). In addition to the Recommended Licensing Conditions, as a result of the aforementioned agreements with Water Suppliers and Sugarloaf and discussions with the Office of People's Counsel, Mirant hereby agrees to Supplemental CPCN Conditions (attached as Appendix B). Together, Appendix A and Appendix B constitute all of the CPCN conditions ("CPCN Conditions").

The Applicant agrees to abide by those CPCN Conditions if adopted in the form attached and the Settling Parties agree not to seek further Commission review of those CPCN Conditions in these proceedings. All of the Settling Parties except Sugarloaf and the Water Suppliers are in agreement that the issuance of a CPCN for the Project, subject to the recommended CPCN Conditions, is in the public interest. Sugarloaf agrees not to oppose issuance of the CPCN and the Water Suppliers take no position on the issuance of a CPCN.

AGREEMENT

NOW, THEREFORE, the Settling Parties do hereby stipulate and agree as follows:

1. The Settling Parties except Sugarloaf and the Water Suppliers recommend that the Commission issue a CPCN for the Project, subject to the final CPCN Conditions set forth in Appendices A and B. Sugarloaf does not oppose issuance of the CPCN and the Water Suppliers take no position on issuance of a CPCN. The Settling Parties that recommend issuance of the CPCN have taken into account each and all of the factors and considerations listed in Section 7-207(e) of the Public Utility Companies Article of the Maryland Code and the information contained in PPRP's Environmental Review and supporting testimony. The Settling Parties that recommend issuance of the CPCN stipulate and agree that the construction and operation of the Project in accordance with the final CPCN Conditions would meet or exceed the requirements of all currently applicable

environmental laws and regulations, including those relating to noise abatement and the control of air and water pollution.

3. The Settling Parties recognize and agree that the final CPCN Conditions are interrelated and that those provisions should be taken as a whole. The final CPCN Conditions are interdependent, in that a change or addition made to address a concern in one aspect (*e.g.,* air pollution) could well have an unanticipated adverse effect or other unintended consequence with respect to another aspect (*e.g.,* water usage or pollution). The Settling Parties accordingly agree, and enter into this Agreement with the understanding, that the final CPCN Conditions should be accepted by the Commission without further change, addition, or other alteration of any kind.

4. The Settling Parties view the final CPCN Conditions and this Agreement as a package, with all of the parts interrelating to each other. If the final CPCN Conditions are changed, supplemented or rejected by the Commission, this Agreement shall be deemed withdrawn and shall not constitute any part of the record in this proceeding or be used for any other purpose whatsoever. In the event the Commission determines not to accept and approve the final CPCN Conditions and this Agreement in their entirety, the Settling Parties respectfully request that the Commission provide the Settling Parties an opportunity (i) to negotiate a modified Agreement to address the Commission's concerns or a contested settlement agreement representing the terms of settlement that remain acceptable to some of the Parties, or (ii) to withdraw their support for this Agreement, to prepare and file briefs, and to proceed with further litigation of these issues.

WHEREFORE, the Settling Parties have caused their signatures to be affixed to this Agreement through and by their respective counsel.

Respectfully submitted,

STAFF OF MARYLAND PUBLIC SERVICE COMMISSION

By: James Boone dej

MIRANT DICKERSON DEVELOPMENT, LLC

By: Deborah E. Jenn

MARYLAND DEPARTMENT OF NATURAL RESOURCES POWER PLANT RESEARCH PROGRAM

By: M. Brent Hare dej
Assistant Attorney General

MARYLAND OFFICE OF PEOPLE'S COUNSEL

By:_____
Assistant People's Counsel

FAIRFAX COUNTY WATER AUTHORITY

By: Michael C. Powell dej
WASHINGTON SUBURBAN SANITARY COMMISSION

By: Joel Kramer dej

Respectfully submitted,

STAFF OF MARYLAND PUBLIC SERVICE COMMISSION

By: _____

MIRANT DICKERSON DEVELOPMENT, LLC

By: _____

MARYLAND DEPARTMENT OF NATURAL RESOURCES POWER PLANT RESEARCH PROGRAM

By: _____
Assistant Attorney General

MARYLAND OFFICE OF PEOPLE'S COUNSEL

By: Cynthia Green-Warren
Assistant People's Counsel

FAIRFAX COUNTY WATER AUTHORITY

By: _____
WASHINGTON SUBURBAN SANITARY COMMISSION

By: _____

WASHINGTON AQUEDUCT DIVISION
U.S. ARMY CORPS OF ENGINEERS

By: Robert A. Stanton
COUNSEL, U.S. DOD
9/16/04

SUGARLOAF CITIZENS ASSOCIATION, INC.

By: _____
James R. Choukas-Bradley

_____
Jane S. Hunter, Pro Se

_____
Tina T. Brown, Pro Se

WASHINGTON AQUEDUCT DIVISION
U.S. ARMY CORPS OF ENGINEERS

By:_____

SUGARLOAF CITIZENS ASSOCIATION, INC.

By: James R. Choukas-Bradley
James R. Choukas-Bradley

Jane S. Hunter
Jane S. Hunter, Pro Se

Tina T. Brown
Tina T. Brown, Pro Se

APPENDIX A

RECOMMENDED CPCN CONDITIONS

PSC CASE NO. 8888

MIRANT DICKERSON DEVELOPMENT, LLC

Recommended Licensing Conditions
PSC Case No. 8888
Mirant Dickerson Development, LLC

Air Quality

I. General Air Quality Requirements

1. Except as otherwise provided for in the following provisions, the application for the Certificate of Public Convenience and Necessity (CPCN) is considered to be part of this CPCN for the Mirant Dickerson Development, LLC (Mirant) Dickerson Generating Station Expansion. The application consists of the original application received by the Maryland Public Service Commission (PSC) on 23 May 2001 and subsequent amendments. Construction of the facility shall be undertaken in accordance with the CPCN application and subsequent amendments. If there are any inconsistencies between the conditions specified below and the application, the conditions in this CPCN shall take precedence. In the application, estimates of dimensions, volumes, emission rates, operating rates, feed rates and hours of operation are not deemed to constitute enforceable numeric limits except to the extent that they are necessary to make a determination of compliance with applicable regulations.

2. The application for a CPCN includes the application for Prevention of Significant Deterioration (PSD) approval and air quality construction permits. The CPCN serves as the construction permit.

3. For air permitting purposes, the Dickerson Generating Expansion Project shall include the addition of: heat recovery steam generators (HRSGs) to two (2) existing GE 7F combustion turbines, referred to as Unit 4; two (2) GE 7FA combustion turbines with heat recovery steam generators, referred to as Unit 5; one (1) auxiliary steam boiler with a heat input of 60 million British thermal units per hour (MMBtu/hr); one (1) additional 10,000,000-gallon aboveground distillate fuel oil storage tank; and two (2) cooling towers. The Unit 4 and Unit 5 combustion turbines will be equipped with selective catalytic reduction (SCR) systems for control of nitrogen oxides (NO_x), and oxidation catalyst systems for control of carbon monoxide (CO) and volatile organic compound (VOCs) during combined cycle operation. The existing Dickerson facility includes three nominal 180 megawatt (MW) coal-fired boilers, identified as Units 1, 2 and 3, and support facilities. Units 1, 2 and 3 will be equipped with separated overfire air (SOFA) systems as part of this project to reduce NO_x emissions.

4. Definitions:

   a) "Commence" as applied to the construction of the Dickerson Generating Expansion Project means that the owner or operator either has:

i) Begun, or caused to begin, a continuous program of actual on-site construction of the source, to be completed within a reasonable time; or

ii) Entered into binding agreements or contractual obligations which cannot be canceled or modified without substantial loss to the owner or operator, to undertake a continuous program of actual construction or modification of the source to be completed within a reasonable time.

5. Mirant shall construct exhaust stacks for the Unit 5 construction turbines at a minimum height of 130 feet above ground level for use during simple cycle operation.

6. Mirant shall construct exhaust stacks for Unit 4 and 5 at a minimum height of 190 feet above ground level for use during combined cycle operations.

7. If any provision of this CPCN shall be held invalid for any reason, the remaining provisions shall remain in full force and effect and such invalid provision shall be considered severed and deleted from this CPCN.

8. Representatives of the Maryland Department of the Environment (MDE) and the Montgomery County Health Department shall be afforded access to the Dickerson property at any reasonable time to conduct inspections and evaluations necessary to assure compliance with the CPCN. Mirant shall provide such assistance as may be necessary to conduct such inspections and evaluations by such representatives of MDE effectively and safely, which may include but need not be limited to the following:

   a) inspecting construction authorized under this CPCN;

   b) sampling any materials stored or processed on site, or any waste, or discharge into the environment;

   c) inspecting any monitoring or recording equipment required by this CPCN or applicable regulations;

   d) having access to or copying any records required to be kept by Mirant pursuant to this CPCN or applicable regulations;

   e) obtaining any photographic documentation and evidence; and

   f) determining compliance with the conditions and regulations specified in the CPCN.

9. This CPCN constitutes the PSD approval and air quality construction permit for the Dickerson Generating Station Expansion project. In accordance with COMAR 26.11.02.04B, the air quality provisions expire if, as determined by MDE, Air and Radiation Management Administration (ARMA):

a) Construction is not commenced within 18 months after the date of issuance of a final CPCN;

b) Construction is substantially discontinued for a period of 18 months or more after it has commenced; or

c) Construction is not completed within a reasonable period of time after the issuance of a final CPCN.

10. At least 60 days prior to the anticipated date of start-up of Unit 4 and Unit 5, Mirant shall submit to ARMA an application for a temporary permit to operate.

11. All requirements pertaining to air quality that apply to Mirant shall apply to all subsequent owners and/or operators of the facility. In the event of any change in control or ownership, Mirant shall notify the succeeding owner/operator of the existence of the requirements of this CPCN pertaining to air quality by letter and shall send a copy of that letter to MDE ARMA.

II. Applicable Air Quality Regulations

12. Mirant is subject to all applicable federally enforceable State air quality requirements including, but not limited to, the following regulations:

a) COMAR 26.11.01.04A which requires Mirant to follow test methods described in §C to determine compliance;

b) COMAR 26.11.01.05-1 which requires Mirant to submit to MDE by April 1 of each year an emissions statement for the previous calendar year that meets the requirements of this regulation;

c) COMAR 26.11.01.07C which requires Mirant to report excess emissions that are expected to last or actually last for one hour or more;

d) COMAR 26.11.06.02C(2) which prohibits the discharge of emissions from any installation, other than water in an uncombined form, which is visible to human observers;

Exception: Does not apply to emissions during start-up and process modifications or adjustments, or occasional cleaning of control equipment if:

i) The visible emissions are not greater than 40 percent opacity; and

ii) The visible emissions do not occur for more than 6 consecutive minutes in any 60 minute period.

e) COMAR 26.11.06.03D which requires reasonable precautions to prevent any particulate matter from becoming airborne as a result of material being handled, transported, or stored;

f) COMAR 26.11.09.05A(2) which prohibits Mirant from discharging emissions, other than water in an uncombined form, which is visible to human observers from fuel burning equipment;

Exception: Does not apply to emissions during load changing, soot blowing, startup, or adjustments or occasional cleaning of control equipment if:

i) The visible emissions are not greater than 40 percent opacity; and

ii) The visible emissions do not occur for more than 6 consecutive minutes in any 60 minute period.

g) For Units 4 and 5, and the auxiliary boiler: COMAR 26.11.09.07A(1)(c) which prohibits Mirant from burning fuel with a sulfur content by weight in excess of or which otherwise exceeds 0.3 percent;

h) For Unit 4 and Unit 5, COMAR 26.11.09.08B(1)(c): which requires the control of NO_x emissions to 0.25 lb/MMBtu which satisfies Reasonably Available Control Technology (RACT);

i) For the auxiliary boiler: COMAR 26.11.09.08E, which contains reporting, recordkeeping, maintenance, and training requirements for fuel burning sources with a rated heat input capacity of 100 MMBtu per hour or less;

j) COMAR 26.11.09.08B(2)(a)(i) and (ii) which require Mirant to demonstrate compliance with the NO_x emission standard for Units 4 and 5 through continuous emissions monitoring (CEM) data or stack tests using Method 7 or Method 7E of the test methods referenced in COMAR 26.11.01.04C(1) or other test methods approved by MDE and the U.S. Environmental Protection Agency (EPA);

k) COMAR 26.11.29 and .30 which require that Mirant hold an allowance for each ton of NO_x emissions from Units 1-5 by the reconciliation date of November 30 of each calendar year;

l) COMAR 26.11.30 which requires that Mirant follow the policies and procedures relating to Maryland's NO_x Reduction and Trading Program; and

m) COMAR 26.11.06.14 which prohibits the construction, modification, or operation of a source in violation of the requirements of 40 CFR 52.21: Prevention of Significant Deterioration.

13. The Mirant Dickerson Expansion Project is subject to all applicable State-only enforceable air quality requirements including, but not limited to, the following regulations:

    a) COMAR 26.11.02.13A(2) which requires Mirant to have in current effect a State Permit to Operate from the Department prior to the commencement of operations of the Units 4 and 5 Expansion Project;

    b) COMAR 26.11.02.19C which requires Mirant to maintain records necessary to support the emission certification;

    c) COMAR 26.11.02.19D which requires Mirant to certify the actual emissions of the regulated pollutants from the entire Dickerson facility; and

    d) COMAR 26.11.06.08 and .09 which generally prohibit the discharge of emissions beyond the property line in such a manner that a nuisance or air pollution is created.

14. The Units 4 and 5 combustion turbines are subject to 40 CFR Subpart GG – Standards of Performance for Stationary Gas Turbines, related provisions of 40 CFR §60.7 and §60.8, which contain various provisions for emission limitations, monitoring, testing, recordkeeping, and reporting, including but not limited to the following:

    a) Standard for Nitrogen Oxides (40 CFR §60.332)
    On or after the completion of performance testing conducted under §60.8, Mirant shall not cause to be discharged into the atmosphere from any stationary gas turbine any gases which contain nitrogen oxides in excess of:

    $STD = (0.0075 \times (14.4/Y)) + F$

    Where:

    STD = allowable NO_x emissions (percent by volume at 15 percent oxygen and on a dry basis)
    Y = manufacturer's rated heat rate at manufacturer's rated load (kilojoules per watt hour) or, actual measured heat rate based on lower heating value of fuel as measured at actual peak load for the facility. The value of Y shall not exceed 14.4 kilojoules per watt hour.
    F = NO_x emission allowance for fuel-bound nitrogen as defined in 40 CFR §60.332(a)(3):

Fuel-Bound Nitrogen (percent by weight)	F (NO_x percent by volume)
$N < 0.015$	0
$0.015 < N < 0.1$	0.04(N)
$0.1 < N < 0.25$	0.004 + 0.0067(N – 0.1)
$N > 0.25$	0.005

Therefore:

For Unit 4, NO_x shall not exceed 99 parts per million by volume at 15% oxygen on a dry weight basis (ppmvd @15%), based on a 1-hour average, when firing natural gas, or 98 ppmvd @15%, based on a 1-hour average, when firing fuel oil.

For Unit 5, NO_x shall not exceed 110 parts per million by volume at 15% oxygen on a dry weight basis (ppmvd @15%), based on a 1-hour average, when firing natural gas, or 101 ppmvd @15%, based on a 1-hour average, when firing fuel oil.

b) Standard for Sulfur Oxides (40 CFR §60.333)
On or after the completion of performance testing conducted under §60.8, Mirant shall comply with one or the other of the following conditions:

i) Mirant shall not cause to be discharged into the atmosphere from any stationary gas turbine any gases which contain sulfur dioxide in excess of 0.015 percent by volume at 15 percent oxygen and on a dry basis.

ii) Mirant shall not burn in any stationary gas turbine any fuel which contains sulfur in excess of 0.8 percent by weight.

c) Monitoring of Operations (40 CFR §60.334)

i) Mirant shall monitor sulfur content and nitrogen content of the fuel being fired in the turbines. The frequency of determination of these values shall be as follows:

(A) If the turbine is supplied its fuel from a bulk storage tank, the values shall be determined on each occasion that fuel is transferred to the storage tank from any other source.

(B) If the turbine is supplied its fuel without intermediate bulk storage, the values shall be determined and recorded daily. Owners, operators or fuel vendors may develop custom schedules for determination of the values based on the design and operation of the affected facility and the characteristics of the fuel supply. These custom schedules shall be substantiated with data and must be approved by the EPA Administrator before they can be used to comply with Paragraph (b) of 40 CFR §60.334.

ii) For the purpose of reports required under §60.7(c), periods of excess emissions that shall be reported are defined as follows:

(A) Nitrogen oxides. Any one-hour period during which the average water-to fuel ratio, as measured by the continuous monitoring system, falls below the water-to-fuel ratio determined to demonstrate compliance with §60.332 by the performance test required in §60.8 or any period during which the fuel-bound nitrogen of the fuel is greater than the maximum nitrogen content allowed by the fuel-bound nitrogen allowance used during the performance test required in §60.8. Each report shall include the average water-to-fuel ratio, average fuel consumption, ambient conditions, gas turbine load, and nitrogen content of the fuel during the period of excess emissions, and the graphs or figures developed under §60.335(a).

(B) Sulfur dioxide. Any daily period during which the sulfur content of the fuel being fired in the gas turbine exceeds 0.8 percent.

d) Test Methods (40 CFR §60.335)

i) To compute the nitrogen oxides emissions, Mirant shall use analytical methods and procedures that are accurate to within 5 percent and are approved by the EPA Administrator to determine the nitrogen content of the fuel being fired.

ii) In conducting the performance tests required in §60.8, Mirant shall use as reference methods and procedures the test methods in Appendix A of 40 CFR Part 60, or other methods and procedures as specified in this Subpart GG, except as provided for in §60.8(b). Acceptable alternative methods and procedures are given in paragraph (f) of §60.335.

iii) Mirant shall determine compliance with the nitrogen oxides and sulfur dioxide standards in §§60.332 and 60.333(a) as follows:

(A) The nitrogen oxides (NO_x) emission rate shall be computed for each run using the following equation:

$$NO_x = (NO_{xo})(P_r/P_o)^{0.5}\, e^{19(Ho - 0.00633)}(288°K/T_a)^{1.53}$$

where:

NO_x = emission rate of NO_x at 15 percent O_2 and ISO standard ambient conditions, ppm by volume.

NO_{xo} = observed NO_x concentration, ppm by volume at 15 percent O_2.
P_r = reference combustor inlet absolute pressure at 101.3 kilopascals ambient pressure, mm Hg.

P_o = observed combustor inlet absolute pressure at test, mm Hg.
H_o = observed humidity of ambient air, g H_2O/g air.
e = transcendental constant, 2.718.
T_a = ambient temperature, K.

(B) The monitoring device of §60.334(a) shall be used to determine the fuel consumption and the water-to-fuel ratio necessary to comply with §60.332 at 30, 50, 75, and 100 percent of peak load or at four points in the normal operating range of the gas turbine, including the minimum point in the range and peak load. All loads shall be corrected to ISO conditions using the appropriate equations supplied by the manufacturer.

(C) Method 20 shall be used to determine the nitrogen oxides, sulfur dioxide, and oxygen concentrations. The span values shall be 300 ppm of nitrogen oxide and 21 percent oxygen. The NO_x emissions shall be determined at each of the load conditions specified in paragraph (c)(2) of 40 CFR §60.335.

iv) Mirant shall determine compliance with the sulfur content standard in §60.333(b) (herein as Condition 14(b)(ii) as follows: ASTM D 2880-71, 78, or 96 shall be used to determine the sulfur content of liquid fuels and ASTM D 1072-80 or 90 (Reapproved 1994), D 3031-81, D 4084-82 or 94, or D 3246-81, 92, or 96 shall be used for the sulfur content of gaseous fuels (incorporated by reference-see §60.17). The applicable ranges of some ASTM methods mentioned above are not adequate to measure the levels of sulfur in some fuel gases. Dilution of samples before analysis (with verification of the dilution ratio) may be used, subject to the approval of the EPA Administrator.

v) To meet the requirements of §60.334(b) (herein as Condition 14(c)(i)), Mirant shall use the methods specified in paragraphs (a) and (d) of 40 CFR §60.335 (herein Conditions 14(d)(i) and 14(d)(iv)) to determine the nitrogen and sulfur contents of the fuel being burned. The analysis may be performed by the owner or operator, a service contractor retained by the owner or operator, the fuel vendor, or any other qualified agency.

vi) Mirant may use the following as alternatives to the reference methods and procedures specified in this section:

(A) Instead of using the equation in 40 CFR §60.335(c)(1), manufacturers may develop ambient condition correction factors to adjust the nitrogen oxides emission level measured by the performance test as provided in §60.8 to ISO standard day conditions. These factors are developed for each gas turbine model they manufacture in terms of combustion inlet pressure, ambient air

pressure, ambient air humidity, and ambient air temperature. They shall be substantiated with data and must be approved for use by the EPA Administrator before the initial performance test required by §60.8. Notices of approval of custom ambient condition correction factors will be published in the Federal Register.

15. The duct burners associated with Units 4 and 5 are subject to 40 CFR Subpart Da – Standards of Performance for Electric Utility Steam Generating Units for which Construction is Commenced after September 18, 1978, including, but not limited to:

    a) Subpart Da 60.42a(a) which limits particulate matter emissions to 0.03 lb per MMBtu (13 ng/J);

    b) Subpart Da 60.42a(b) which limits Mirant to 20 percent opacity (6-minute average), except for one 6-minute period per hour of not more than 27 percent opacity;

    c) Subpart Da 60.43a(b)(2) which limits SO_2 emissions to 0.20 lb per MMBtu (86 ng/J) with zero percent reduction;

    d) Subpart Da 60.44a(d)(1) which limits NO_x emissions to 1.6 lb per megawatt-hour (200 ng/J);

    e) Subpart Da 60.46a(c) which states that the PM and NO_x emission limits listed above apply at all times except during periods of startup, shutdown, or malfunction, and the SO_2 emission limits apply at all times except during periods of startup, shutdown, or when emergency conditions exist;

    f) Subpart Da 60.46a(e) which requires that after the initial performance test, compliance with the sulfur dioxide emission limitations and percentage reduction requirements under Sec. 60.43a and the nitrogen oxides emission limitations under Sec. 60.44a be based on the average emission rate for 30 successive duct burner operating days. A separate performance test is to be completed at the end of each duct burner operating day after the initial performance test, and a new 30 day average emission rate for both sulfur dioxide and nitrogen oxides and a new percent reduction for sulfur dioxide are to be calculated to show compliance with the standards;

    g) Subpart Da 60.46a(f) which requires that for the initial performance test required under Sec. 60.8, compliance with the sulfur dioxide emission limitations and percent reduction requirements and the nitrogen oxides emission limitation is based on the average emission rates for sulfur dioxide, nitrogen oxides, and percent reduction for sulfur dioxide for the first 30 successive duct burner operating days. The initial performance test is the only test in which at least 30 days prior notice is required unless otherwise specified by the EPA Administrator. The initial performance test is to be scheduled so that the first duct burner operating day of the 30 successive duct burner operating days is completed within 60 days after achieving the maximum production rate at which the

affected facility will be operated, but not later than 180 days after initial startup of the facility;

h) Subpart Da 60.46a(g) which requires that compliance is determined by calculating the arithmetic average of all hourly emission rates for SO_2 and NO_x for the 30 successive duct burner operating days, except for data obtained during startup, shutdown, malfunction (NO_x only), or emergency conditions (SO_2 only). Compliance with the percentage reduction requirement for SO_2 is determined based on the average inlet and average outlet SO_2 emission rates for the 30 successive duct burner operating days;

i) Subpart Da 60.46a(i) which requires that Mirant calculate NO_x emissions by multiplying the average hourly NO_x output concentration by the average hourly flow rate, and divided by the average hourly gross energy output. Compliance with the emissions limits for NO_x, is to be determined using either of the procedures described in paragraphs 60.46a(k)(1) and (2);

j) Subpart Da 60.47a(o), which states that Mirant is not required to install or operate a continuous emissions monitoring system to measure NO_X emissions; a wattmeter to measure gross electrical output; meters to measure steam flow, temperature, and pressure; and a continuous flow monitoring system to measure the flow of exhaust gases discharged to the atmosphere;

k) Subpart Da 60.48a(a) which requires that in conducting the performance tests required in Sec. 60.8, Mirant use as reference methods and procedures the methods in appendix A of this part or the methods and procedures as specified in this section, except as provided in Section 60.8(b);

l) Subpart Da 60.48a which requires that Mirant determine compliance with the particulate matter, SO_2, and NO_x standards through methods and procedures as spelled out in sections 60.48a(b), (c) and (d);

m) Subpart Da 60.49a which requires Mirant to submit to the EPA Administrator the performance test data for sulfur dioxide, nitrogen oxides, and particulate matter emissions to the Administrator, according to the specifications in this subsection; and

n) Subpart Da 60.49a(f) which requires that, for any periods for which opacity, sulfur dioxide or nitrogen oxides emissions data are not available, Mirant must submit a signed statement indicating if any changes were made in operation of the emission control system during the period of data unavailability. Operations of the control system and affected facility during periods of data unavailability are to be compared with operation of the control system and affected facility before and following the period of data unavailability.

16. The auxiliary boiler is subject to 40 CFR Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units, which contains various

provisions for emission limitations, monitoring, testing, recordkeeping, and reporting, including, but not limited to:

a) Mirant shall submit notification of the date of construction or reconstruction, anticipated startup, and actual startup, as provided by 40 CFR 60.7. This notification shall include:

   i) The design heat input capacity of the affected facility and identification of fuels to be combusted in the affected facility;

   ii) If applicable, a copy of any federally enforceable requirement that limits the annual capacity factor for any fuel or mixture of fuels under 40 CFR 60.42c, or 40 CFR 60.43c; and

   iii) The annual capacity factor at which the owner or operator anticipates operating the affected facility based on all fuels fired and based on each individual fuel fired.

17. Units 4 and 5 are subject to all applicable Acid Rain provisions under 40 CFR Part 72, including, but not limited to:

    a) Subpart A 72.9(b)(1) which requires Mirant, to the extent applicable, to comply with monitoring requirements in Part 75;

    b) Subpart A 72.9(c) which requires Mirant to hold allowances in the unit's compliance subaccount not less than the total annual emissions of sulfur dioxide (SO_2) for the previous year and comply with applicable Acid Rain limits for SO_2;

    c) Subpart A 72.9(e) which requires Mirant to submit a proposed offset plan if emission limitations are exceeded; and

    d) Subpart A 72.9(f) which requires Mirant, unless otherwise provided, to retain required documents for a period of 5 years from the date that the document was created. Documents may include, but are not limited to, certificates of representation, emissions monitoring information, copies of reports, compliance certifications, and other documentation pertaining to the Acid Rain program.

18. Units 4 and 5 are subject to all applicable monitoring provisions of the Acid Rain program under 40 CFR Part 75, including, but not limited to:

    a) Subpart A 75.4(b) which requires Mirant, in accordance with Sec. 75.20, to ensure that all applicable monitoring systems for SO_2, NO_x, carbon dioxide (CO_2), and volumetric flow required under this part to be installed and all certification tests completed not later than 90 days after the date the unit commences commercial operation;
    b) Subpart B 75.10 which generally requires Mirant to measure, as applicable, opacity, SO_2, NO_x, and CO_2 emissions; and to ensure that continuous emission monitoring systems required by this part meet the equipment, installation, and performance specifications in

this part; and are maintained according to the quality assurance and quality control procedures in this part;

c) Subpart F 75.53(a) which requires Mirant to prepare a monitoring plan with sufficient information on applicable continuous opacity or emissions monitoring systems to demonstrate that all SO_2, NO_x, CO_2 emissions and opacity, as required, are monitored and reported;

d) Subpart F 75.57(a) which requires Mirant to keep a file for each affected unit of all measurements, data, reports, and other information required by this part in a form suitable for inspection for at least 3 years from the date of each record;

e) Subpart F 75.57(b)-(f) which require Mirant to record various operations, emissions, and other information, as specified; and

f) Subpart G 75.60(a) and (b) which generally require Mirant to comply with all reporting requirements, with all signatory requirements of §72.21 of this chapter for all submissions, and with all required certifications and reports.

III. BACT Requirements

19. Mirant shall employ Best Available Control Technology (BACT) to control emissions of sulfur dioxide (SO_2), sulfuric acid mist (H_2SO_4), carbon monoxide (CO), and particulate matter (PM10) from the Dickerson Expansion Project as follows:

    a) BACT for Unit 5 prior to the heat recovery steam generator becoming operational shall be the use of natural gas fuel with limited operation on low sulfur (0.05% sulfur content by weight or less) distillate fuel oil, and application of good combustion practices to ensure that emissions do not exceed the levels identified in Table 1.

    b) BACT on Units 4 and 5 after the heat recovery steam generators become operational, shall be the use of natural gas fuel with operation on low sulfur (0.05% sulfur content by weight or less) distillate fuel oil limited to 250 hours during simple cycle operation and 720 hours during combined cycle operation, operation of an oxidation catalyst, and application of good combustion practices, to ensure that emissions do not exceed the levels identified in Table 2.

c) BACT for the auxiliary boiler shall be the use of distillate fuel oil with a sulfur content of 0.05% or less, use of distillate fuel oil for no more than 970 hours per year, and application of good combustion controls to achieve emissions rates that do not exceed the following on a 3-hour average basis:

CO: 9 lb/hr when firing both natural gas and distillate fuel
PM10: 0.6 lb/hr when firing natural gas and 3 lb/hr when firing distillate fuel
SO_2: 0.34 lb/hr when firing natural gas and 3.1 lb/hr when firing distillate fuel

d) BACT for all installed cooling towers shall be the installation and operation of mist eliminators designed to meet a PM10 emission rate of 0.001 percent of the cooling tower recirculating water flow.

20. Short term emission limits contained in Condition 19 do not apply during periods of startup, shutdown, or malfunction as defined in 40 CFR 60.2.

IV. National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines Requirements

21. The Mirant Unit 5 combustion turbines are subject to 40 CFR 63 Subpart YYYY– "National Emissions Standards for Hazardous Air Pollutants for Stationary Combustion Turbines" and related General Provisions in 40 CFR §63.1 through §63.15. These requirements include, but are not limited to the following:

a) Emissions and Operating Limitations [40 CFR §63.6100]:

i) The concentration of formaldehyde shall not exceed 91 parts per billion by volume dry basis (ppbvd) at 15 percent oxygen.

ii) During periods when the combustion turbines are using an oxidation catalyst, Mirant shall maintain the four-hour rolling average of the catalyst inlet temperature within the range suggested by the catalyst manufacturer.

iii) During periods when the combustion turbines are not using an oxidation catalyst, Mirant must maintain all operating limitations approved by the U.S. EPA Administrator.

iv) Mirant shall be in compliance with the emissions and operating limitations at all times except during startup, shutdown and malfunctions (§63.6104(a)).

v) Mirant shall operate and maintain the combustion turbines, oxidation catalysts or other air pollution control equipment, and monitoring equipment in a manner consistent with good air pollution control practices for minimizing emissions at all times including during startup, shutdown, and malfunction (§63.6105(b)).

b) Performance Testing Requirements [40 CFR §63.6110]:

i) Mirant shall conduct an initial performance test, as specified in §63.6110(a), to demonstrate compliance with the formaldehyde limitation in Condition 21.a.i within 180 calendar days after startup of the affected source (as specified in §63.6095(a)(2)).

ii) Mirant shall conduct annual performance tests, as specified in §63.6115, to demonstrate compliance with the formaldehyde limitation in Condition 21.a.i.

iii) Initial and annual performance tests shall be conducted according to the requirements of the General Provisions at §63.7(e)(1) and other applicable provisions.

iv) As stated in Table 3 to Subpart YYYY of Part 63:

(A) Mirant shall use Test Method 320 of 40 CFR Part 63, Appendix A, or other methods approved by the Administrator to conduct the initial and annual formaldehyde performance tests.

(B) The formaldehyde concentration must be corrected to 15 percent oxygen, dry basis.

(C) Results of the test shall consist of the average of three, 1-hour runs.

(D) Tests must be conducted within 10 percent of 100 percent load.

(E) Select sampling port locations and number of traverse points, and determine oxygen concentration and moisture content as specified in Table 3 to Subpart YYYY.

(F) Mirant shall petition the Administrator for operating limitations which shall be monitored to demonstrate compliance with the formaldehyde limitation in Condition 21.a.i. These operating parameters shall be monitored during the initial performance test and continuously thereafter (under §63.6120(e)). Alternatively, Mirant may petition the Administrator for approval of no additional operating limitations, as outlined in §S63.6120(g).

c) Monitoring Requirements [§63.6125]

i) When operating the oxidation catalyst, Mirant shall monitor on a continuous basis the catalyst inlet temperature to demonstrate that the unit is maintaining the 4-hour rolling average of the inlet temperature within the range suggested by the catalyst manufacturer.

ii) When operating without an oxidation catalyst, Mirant shall continuously monitor any parameters specified in Mirant's approved petition to the Administrator.

iii) Mirant shall monitor and record distillate oil usage rates daily for all new and existing stationary combustion turbines (Dickerson Units 4 and 5) with a non-resettable hour meter to measure the number of hours that distillate oil is fired.

d) Continuous Compliance Requirements [§63.6135]

i) Except for monitor malfunctions, associated repairs, and required quality assurance or quality control activities (including, as applicable, calibration checks and required zero and span adjustments of the monitoring system), Mirant shall conduct all parametric monitoring at all times that the combustion turbines are operating.

e) Notifications, Reports, Records [§63.6145]

i) Mirant shall submit all of the notifications in §§63.7(b) and (c), 63.8(3), 63.8(f)(4), and 63.9(b) and (h) that apply to Dickerson.

ii) Mirant shall submit an Initial Notification no later than 120 days after startup [§S63.6145(c)].

iii) Mirant shall submit a notification of intent to conduct an initial performance test at least 60 calendar days before the initial performance test is scheduled to begin as required in §63.7(b)(1) [§63.6145(e)].

iv) Mirant shall submit the Notification of Compliance Status according to the requirements of §63.9(h)(2)(ii), including the performance test results, before the close of business on the 60th calendar day following completion of the performance test [§63.6145(f)].

v) Mirant shall submit a semi-annual compliance report according to Table 6 of §63 Subpart YYYY according the schedules outlined in §63.6150.

vi) Mirant shall submit an annual report under §63.6150(e) describing the number of hours of distillate oil firing by each new or existing stationary combustion turbine at the Dickerson Station; operating limits provided in the federally enforceable permit; any deviations from these limits; and any problems or errors suspected with the meters.

vii) Mirant shall report each instance in which the units did not meet any emissions or operating limitation, and each instance in which the Company did not meet the General Provision requirements in Table 7 of §63 Subpart YYYY [§63.6140(b)].

viii) Mirant shall maintain the following records under §63.6155; the records shall be kept, according to §63.6160 in such a manner that they can be readily accessed and are suitable for inspection according to §63.10(b)(1); The records must be

maintained for five years following the date of each occurrence, measurement, maintenance, correction action, report or record; Mirant shall maintain the most recent 2 years of records on site or the records must be accessible on site:

(A) A copy of each notification and report submitted by Mirant to comply with this subpart;

(B) Records of performance tests and performance evaluations as required in §63.10(b)(2)(viii);

(C) Records of the occurrence and duration of each startup, shutdown, or malfunction as required in §63.10(b)(2)(i);

(D) Records of the occurrence and duration of each malfunction of the air pollution control equipment, if application, as required in §63.10(b)(2)(ii);

(E) Records of all maintenance on the air pollution control equipment as required in §63.10(b)(iii).

f) Other Requirements [§63.6165]

i) Mirant shall meet all applicable General Provisions of §63.1 through §63.15, as outlined in Table 7 of §63 Subpart YYYY, including but limited to performance testing requirements; monitoring, recordkeeping, and notification requirements; requirements related to Startup, Shutdown, and Malfunction (SSM) Plans; and notification requirements.

V. Other Emissions and Operating Restrictions

22. Until such time as the heat recovery steam generator becomes operational on Unit 4, Mirant shall continue to operate the Station H CTs under conditions established under the CPCN issued in 1988 under PSC Case 8063 or subsequent permitting or regulatory requirements.

23. Unit 4 shall be limited to the following after the heat recovery steam generator becomes operational:

a) Operation of a selective catalytic reduction (SCR) system, resulting in a maximum NO_x emission rate not to exceed 4.5 parts per million at 15 percent oxygen on a 3-hour rolling average basis based on valid 40 CFR Part 75 CEM data from the outlet of the device

during natural gas combined cycle firing. The 3-hour rolling average NO_x limit does not apply during periods of startup, shutdown, or malfunctions as defined in 40 CFR 60.2.

b) Operation in simple cycle mode for no more than 500 hours during any consecutive on a 12-month period, of which no more than 250 hours of operation is firing distillate fuel oil;

c) Operation in combined cycle mode while firing distillate fuel oil of no more than 720 hours during any consecutive 12-month period;

d) Operation in simple cycle mode when firing distillate fuel oil shall be limited as follows:

   i) Subject to condition 23(b), the CTs can generate electricity using distillate fuel oil during the ozone season (May 1 through September 30) when natural gas fuel delivery service is interrupted or curtailed by the supplier due to shortages;

   ii) Subject to condition 23(b), the CTs can generate electricity using distillate fuel oil during the ozone season (May 1 through September 30) when PJM declares an emergency, as defined below, or when PJM dispatches the CTs to stabilize the transmission system;

   iii) For the purposes of condition 23(d)(ii), a PJM system emergency is operation during reserve shortages and refers to Maximum Emergency Generation as defined in PJM Manual M-13, Emergency Operations, Section 2 dated May 1, 2003, and subsequent versions. Any changes affecting the definition of emergency conditions for the purposes of this permit must have the prior approval of ARMA, if the change can affect allowable emissions. Mirant shall submit annual reports to ARMA that describe the times, durations, and circumstances of any operations under emergency conditions, including dispatch of the CTs to stabilize the transmission system, and identify whether each declared emergency condition applied to Mirant alone or to any other part of the PJM Interconnection; and

   iv) Mirant shall provide MDE with written verification from its natural gas supplier in each instance where natural gas service to Dickerson is interrupted. Such verification shall be provided to MDE no later than 30 days after the end of the calendar year.

e) Operation of the duct burners shall be limited to periods when Unit 4 is operated in combined cycle mode and firing natural gas; and

f) Operation of each duct burner shall not exceed 688,800 MMBtu during any consecutive 12-month period.

24. Unit 5 shall be limited to the following prior to the heat recovery steam generator becoming operational:

a) Operating for no more than 1,500 hours during any consecutive 12-month rolling period, of which no more than 500 hours of operation is firing distillate fuel oil; and

b) Operation in simple cycle mode when firing distillate fuel oil shall be limited as follows:

i) Subject to condition 24(a), the CTs can generate electricity using distillate fuel oil during the ozone season (May 1 through September 30) when natural gas fuel delivery service is interrupted or curtailed by the supplier due to shortages;

ii) Subject to condition 24(a), the CTs can generate electricity using distillate fuel oil during the ozone season (May 1 through September 30) when PJM declares a system emergency, as defined below, or when PJM dispatches the CTs to stabilize the transmission system;

iii) For the purposes of condition 24(b)(ii), a PJM system emergency is operation during reserve shortages and refers to Maximum Emergency Generation as defined in PJM Manual M-13, Emergency Operations, Section 2 dated May 1, 2003, and subsequent versions. Any changes affecting the definition of emergency conditions for the purposes of this permit must have the prior approval of ARMA, if the change can affect allowable emissions. Mirant shall submit annual reports to ARMA that describe the times, durations, and circumstances of any operations under emergency conditions, including dispatch of the CTs to stabilize the transmission system, and identify whether each declared emergency condition applied to Mirant alone or to any other part of the PJM Interconnection; and

iv) Mirant shall provide MDE with written verification from its natural gas supplier in each instance where natural gas service to Dickerson is interrupted. Such verification shall be provided to MDE no later than 30 days after the end of the calendar year.

25. Pollutant emissions from Unit 5 shall not exceed the following for any consecutive 12-month period prior to the heat recovery steam generator becoming operational:

Pollutant	Emission Limit
Nitrogen Oxides (NO_x)	215 tons per year
Volatile Organic Compounds (VOC)	<25 tons per year
Sulfur Dioxide (SO_2)	59 tons per year
Particulate Matter (PM10)	18 tons per year
Carbon Monoxide (CO)	62 tons per year

26. Unit 5 shall be limited to the following after the heat recovery steam generator becomes operational:

a) Operation of a selective catalytic reduction (SCR) system, resulting in a maximum NO_x emission rate not to exceed 3.5 parts per million at 15 percent oxygen on a 3-hour rolling average basis based on valid 40 CFR Part 75 CEM data from the outlet of the device

during natural gas combined cycle firing. The 3-hour rolling average NO_x limit does not apply during periods of startup, shutdown, or malfunctions as defined in 40 CFR 60.2.

b) Operation in simple cycle mode for no more than 500 hours during any consecutive 12-month period, of which no more than 250 hours of operation is firing distillate fuel oil;

c) Operation in simple cycle mode when firing distillate fuel oil shall be limited as follows:

   i) Subject to condition 26(b), the CTs can generate electricity using distillate fuel oil during the ozone season (May 1 through September 30) when natural gas fuel delivery service is interrupted or curtailed by the supplier due to shortages;

   ii) Subject to condition 26(b), the CTs can generate electricity using distillate fuel oil during the ozone season (May 1 through September 30) when PJM declares a system emergency, as defined below, or when PJM dispatches the CTs to stabilize the transmission system;

   iii) For the purposes of condition 26(c)(ii), a PJM system emergency is operation during reserve shortages and refers to Maximum Emergency Generation as defined in PJM Manual M-13, Emergency Operations, Section 2 dated May 1, 2003, and subsequent versions. Any changes affecting the definition of emergency conditions for the purposes of this permit must have prior approval from ARMA. Mirant shall submit annual reports to ARMA that describe the times, duration, and circumstances of any operations under emergency conditions and identify whether each declared emergency condition applied to Mirant alone or to any other part of the PJM Interconnection; and

   iv) Mirant shall provide MDE with written verification from its natural gas supplier in each instance where natural gas service to Dickerson is interrupted. Such verification shall be provided to MDE no later than 30 days after the end of the calendar year.

d) Operation in combined cycle mode while firing distillate fuel oil for no more than 720 hours for any consecutive 12-month period;

e) Operation of the duct burners shall be limited to periods when Unit 5 is operated in combined cycle mode and firing natural gas; and

f) Operation of each duct burner shall not exceed 688,800 MMBtu for any consecutive 12-month rolling period.

27. Once the heat recovery steam generators become operational, emissions from Unit 4 and Unit 5, and the auxiliary boiler and the cooling tower combined in tons per year shall not exceed the following for any consecutive 12-month period:

Pollutant	Emission Limit
Nitrogen Oxides (NO_x)	841 tons per year
Volatile Organic Compounds (VOC)	<25 tons per year
Sulfur Dioxide (SO_2)	332 tons per year
Particulate Matter (PM10)	347 tons per year
Carbon Monoxide (CO)	205 tons per year

28. Short-term emission limits contained in Tables 1 and 2 do not apply during periods of start-up, shutdown, or malfunction as defined in 40 CFR 60.2.

29. Mirant shall implement control measures on existing Units 1, 2, and 3 such that there will be no net increase of NO_x emissions from the Dickerson source. For the purposes of this condition, net emission increase is defined in accordance with 40 CFR 52.21(b)(3).

30. To avoid triggering Nonattainment Area New Source Review for NO_x emissions, Mirant shall install and operate separated overfire air (SOFA) systems on existing Dickerson coal-fired boilers Unit 1, Unit 2, and Unit 3 prior to commencing operation of equipment covered by this CPCN. Emissions of NO_x from each of the these units individually shall not exceed 0.36 pounds per MMBtu on a 30-day rolling average basis once SOFA systems become operational.

VI. Testing

31. At least 30 days prior to conducting any compliance stack test, Mirant shall submit a test protocol to ARMA for review and approval. Compliance stack testing shall be conducted in accordance with ARMA Technical Memorandum (TM) 91-01, "Test Methods and Equipment Specifications for Stationary Sources" (January 1991), as amended by Supplement 1 (1 July 1991), 40 CFR 51, 40 CFR 60, or subsequent test protocols approved by ARMA. Test ports shall be located in accordance with TM 91-01 (January 1991), or subsequent or alternative measures approved by ARMA.

32. Mirant shall install the SOFA system on either existing Units 1, 2 and/or 3 and shall demonstrate, by a method approved by ARMA, that the unit is achieving the maximum emission rate of 0.36 pounds per MMBtu at least 60 days prior to operation of the Unit 5 combustion turbines in simple cycle mode.

33. Mirant shall install the SOFA systems on the remaining two Units, and shall demonstrate, by a method approved by ARMA, that the units are in compliance with the emission rate of 0.36 pounds per MMBtu at least 60 days prior to commencement of operation of the heat recovery steam generators on Units 4 and 5.

34. Compliance stack testing of Unit 5 in simple cycle mode shall be conducted within 180 days of initial start-up of the unit to quantify pollutant emissions and demonstrate compliance with the emission limits specified in the CPCN for the following pollutants: NO_x, SO_2, PM10, and CO.

35. Compliance stack testing of Units 4 and 5 in combined cycle mode shall be conducted within 180 days of initial start-up of the heat recovery steam generators to quantify pollutant emissions and demonstrate compliance with the emission limits specified in the CPCN for the following pollutants: NO_x, SO_2, PM10, and CO.

36. Compliance stack testing of the auxiliary boiler shall be conducted within 180 days of initial start-up to quantify pollutant emissions and demonstrate compliance with the emission limits specified in the CPCN for the following pollutants: NO_x, SO_2, PM10, and CO.

VII. Recordkeeping and Reporting

37. Within 45 days of the end of each calendar quarter, Mirant shall submit to ARMA quarterly reports that contain for each combustion turbine, the auxiliary boiler, the distillate fuel oil storage tanks, and the cooling towers, monthly summaries of construction progress.

38. Testing of NO_x from Dickerson Units 1, 2 and 3 shall be performed when operating at a minimum of 90% of the design load. If testing cannot be performed at the minimum load, then the actual load during testing shall become the allowable permitted load.

39. Testing of Units 4 and 5 shall be performed when operating at a minimum of 90% of the design turbine load for compressor inlet conditions. If testing cannot be performed at the minimum turbine load, then the actual turbine load during testing shall become the allowable permitted turbine load.

40. Within 60 days of completing the initial stack tests, Mirant shall provide ARMA copies of the testing results.

41. In accordance with COMAR 26.11.01.04A, Mirant may be required to conduct additional stack tests at any time as may be prescribed by ARMA.

42. Final results of each compliance stack test must be submitted to ARMA within 60 days of completion of the test. Analytical data shall be submitted to ARMA directly from the emission testing company.

43. Mirant shall furnish written notification to ARMA, and EPA of the following events:

a) the date construction commenced within 30 days after such date;

b) the anticipated start-up date, not more than 60 or less than 30 days prior to such date;

c) the actual start-up date within 15 days after such date; and

d) the anticipated date of compliance stack testing at least 30 days prior to such date.

44. Mirant shall certify the actual emissions of regulated pollutants from the facility.

a) Certification shall be on a form obtained from ARMA and shall be submitted to ARMA no later than April 1 of the year following the year for which certification is required.

b) The individual making the certification shall certify that the information is accurate to the individual's best knowledge. The certifying individual shall be:

i) familiar with each source for which the certification form is submitted; and

ii) responsible for the accuracy of the emission information.

45. All records and logs shall be maintained at the facility for at least 5 years after the completion of the calendar year in which they were collected. These data shall be readily available for inspection by representatives of ARMA.

46. All air quality notifications and reports required by this CPCN shall be submitted to:

Administrator, Compliance Program
Air and Radiation Management Administration
1800 Washington Blvd.
Baltimore, Maryland 21230

47. All notifications and reports required by 40 CFR 60 and Subpart GG, Subpart Da, Subpart Dc, and Acid Rain provisions, unless specified otherwise, shall be submitted to:

Regional Administrator, US Environmental Protection Agency
Region III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

Table 1
BACT Emission Limitations for Condition 19(a)

Air Emission Source	Fuel	Duct Firing	Emission Rate (lb/hr) PM10	SO_2	H_2SO_4	CO
Unit 5						
Simple Cycle	Natural Gas	No	9	12	1.5	32.2
Simple Cycle	Fuel Oil	No	17	106	5.4	72.4

Emission limitations are based on a 3-hour average.

Table 2
BACT Emission Limitations for Condition 19(b)

Air Emission Source	Fuel	Duct Firing	Emission Rate per CT (lb/hr) PM10	SO_2	H_2SO_4	CO
Unit 4						
Combined Cycle	Natural Gas	No	23	11	1.4	8.4
Combined Cycle	Natural Gas	Yes	26	11	1.7	11.5
Combined Cycle	Fuel Oil	No	41	92	4.4	8.5
Simple Cycle	Natural Gas	No	21	11	1.4	84.2
Simple Cycle	Fuel Oil	No	22	92	4.4	85.3
Unit 5						
Combined Cycle	Natural Gas	No	11	12	1.5	3.2
Combined Cycle	Natural Gas	Yes	15	12	1.8	7.6
Combined Cycle	Fuel Oil	No	39	106	5.4	7.2
Simple Cycle	Natural Gas	No	9	12	1.5	32.2
Simple Cycle	Fuel Oil	No	17	106	5.4	72.4

Emission limitations are based on a 3-hour average.

Water Appropriation

48. This CPCN authorizes Mirant to appropriate and use surface waters of the State. Appropriation means a withdrawal, movement, or diversion of water from its source of natural occurrence. The appropriation will be tracked under MDE WMA permit number MO19668017(07). The surface water appropriation will be subject to the following conditions:

    a) *Allocation.* The surface water withdrawal granted by this appropriation is limited to a daily average of 8.1 million gallons on a yearly basis and a maximum daily withdrawal of 10.1 million gallons. Consumptive use is limited to a daily average of 6.6 million gallons on a yearly basis and a maximum daily consumptive use of 8.3 million gallons.

    b) *Use.* The water is to be used for wet cooling of steam condensers, makeup to the heat recovery steam generators (HRSGs), makeup water for air inlet chillers, fire protection water, potable water, construction support, and plant service water for equipment cleaning and maintenance and general plant washdown.

    c) *Source.* The water shall be withdrawn from the Potomac River.

    d) *Location.* The point of withdrawal shall be on the existing discharge canal of the once-through cooling system at the Dickerson Generating Station in Montgomery County, Maryland.

49. *Initiation of Withdrawal.* Mirant shall notify MDE WMA by certified mail when withdrawals for the uses specified in this appropriation have been initiated. This appropriation shall expire if water withdrawal is not commenced within two years after the effective date of issuance of the CPCN. The time limit may be extended for good cause, at the discretion of MDE WMA, upon written request to MDE WMA prior to the expiration of the two-year period. Withdrawal associated with plant construction qualifies as initiation.

50. *Change of Operations.* Mirant shall report any anticipated change in appropriation, which may result in a new or different withdrawal, quantity, source, or place of use of water, to MDE WMA by submission of a new application.

51. *Triennial Review.* MDE WMA shall review the appropriation every three years (triennial review). Mirant will be queried every three years regarding water withdrawal under the terms and conditions of this appropriation. Failure to return the triennial review query will result in suspension or revocation of this appropriation.

52. *Appropriation Renewal.* This appropriation will expire twelve years from the date that the CPCN was issued. In order to renew the appropriation, Mirant shall file a renewal application with MDE WMA no later than 45 days prior to the expiration. MDE WMA may at any time (including triennial review or when a change application is submitted) revise any condition of this appropriation or add additional conditions concerning the character,

amount, means and manner of the appropriation, which may be necessary to properly protect, control and manage the water resources of the state. Condition revisions and additions will be accompanied by issuance of a revised appropriation.

53. *Right of Entry.* Mirant shall allow authorized representatives of MDE WMA and the Public Service Commission staff access to the facility to conduct inspections and evaluations necessary to assure compliance with the conditions of this appropriation. Mirant shall provide such assistance as may be necessary to effectively and safely conduct such inspections and evaluations.

54. *Appropriation Suspension or Revocation.* MDE WMA may suspend or revoke this appropriation upon violation of the conditions of this appropriation, or upon violation of any regulation promulgated pursuant to Title 5 of the Environment Article, Annotated Code of Maryland (1996 replacement volume) as amended.

55. *Non-Transferable.* This appropriation is only transferable to a new owner if the new owner acquires prior authorization to continue this appropriation by filing a new application with MDE WMA. Authorization will be accomplished by issuance of a new appropriation permit by MDE WMA.

56. *Drought Period Emergency Restrictions.* If MDE WMA determines that a drought period or emergency exists, Mirant may be required under MDE WMA's direction to stop or reduce water withdrawal from the Potomac River. Any cessation or reduction of water withdrawal must continue for the duration of the drought period or emergency, or until MDE WMA directs Mirant that water withdrawal under standard appropriation conditions may be resumed.

57. *Consumptive Use Restrictions.* When directed by MDE WMA, Mirant shall reduce maximum daily consumptive use to 1 million gallons per day or less to comply with the provisions of COMAR 26.07.02B.

58. Mirant shall conduct the following monitoring activities in support of the surface water appropriation:

    a) *Flow Measurement.* Measure all water withdrawn under this appropriation by a method approved by MDE WMA.

    b) *Withdrawal Reports.* Submit to MDE WMA, semi-annually (July-December, no later than January 31 and January-June, no later than July 31), water withdrawal records. These records shall show the total quantity of water withdrawn each month under this appropriation, and the total quantity of water consumed.

Terrestrial and Aquatic Ecology

59. Construction and operation of the power facility and transmission line shall be undertaken in accordance with this CPCN and shall comply with all applicable local, State, and Federal regulations, including but not limited to the following:

    a) Nontidal Wetlands - COMAR 08.05.04 applies to activities conducted in nontidal wetlands.

    b) Water Quality and Water Pollution Control - COMAR 26.08.01 through COMAR 26.08.04 applies to discharges to surface water and maintenance of surface water quality.

    c) Erosion and Sediment Control - COMAR 26.09.01 applies to the preparation, submittal, review, approval, and enforcement of erosion and sediment control plans.

60. All portions of the power plant and rights-of-way disturbed during construction shall be stabilized immediately after the cessation of construction activities within that portion of the right-of-way, followed by seed application, except in actively cultivated lands, in accordance with the best management practices presented in the MDE document 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control, and as approved by Montgomery County. In wetlands and wetland buffers, seed application shall consist of the following species: annual ryegrass (*Lolium multiflorum*), millet (*Setaria italica*), barley (*Horedum* spp.), oats (*Uniola* spp.), and/or rye (*Secale cereale*). Other non-persistent vegetation may be acceptable, but must be approved by MDE Water Management Administration. Kentucky 31 fescue shall not be used in wetlands or buffers.

61. Mirant shall work closely with DNR PPRP, DNR Division of Forestry, and Montgomery County to prepare a forest conservation plan to mitigate for forest losses caused by the proposed construction. The plan will detail methods and specifications for establishment of a total of 7 acres of forest. A draft forest conservation plan shall be submitted to DNR PPRP, DNR Division of Forestry, and Montgomery County for review and approval. Plan implementation shall commence before the facility begins commercial operation.

62. This CPCN is not an authorization to discharge wastewater to waters of the State. Mirant shall obtain a modification to its discharge permit under the National Pollutant Discharge Elimination System (NPDES) for the Dickerson Generating Station. As directed by MDE WMA, Mirant shall prepare a Stormwater Pollution Prevention Plan, incorporating best management practices to prevent runoff of contaminated stormwater.

Emergency Preparedness

63. Mirant shall prepare an updated Spill Prevention, Control and Countermeasures Plan and obtain an Oil Operations Permit from MDE to cover the increased amount of fuel oil storage and handling at the Dickerson site.

64. If the concentration of aqueous ammonia solution used for emissions control is 20 percent or greater and ammonia storage capacity exceeds 10,000 pounds, Mirant shall prepare a Risk Management Program (RMP) to address accidental release prevention as required by 40 CFR Part 68. All reports and notifications required by 40 CFR Part 68 must be submitted electronically to: RMP*Submit, RMP Reporting Center, P.O. Box 3346, Merrifield, VA 22116-3346.

65. Mirant shall provide to PPRP and the PSC copies of its security procedures, in particular those procedures to ensure site and plant safety and security during construction and operation of the power plant. The procedures should address issues such as how Mirant plans to control vehicle and construction worker access to the site and to protect any vulnerable assets from being threatened from outside the perimeter of the property. The procedures should also identify how local, state, and federal agencies would be coordinated in the event of a large-scale emergency. Security procedures should consider the effects of any proposed measures on the surrounding community and mitigate adverse effects to the maximum extent possible.

Cultural Resources

66. Mirant shall establish Archeological Protection Zones for the Benjamin and Charles Shreve Farm and the Shreve House in order to protect these historic resources from inadvertent damage from construction activities. Mirant shall erect temporary protective fencing around the sites during construction.

67. Mirant shall submit to Maryland Historical Trust (MHT) a copy of training programs, or guidelines provided to inspectors or contractors, to identify and/or protect unforeseen archeological sites that may be revealed during construction of the power plant and associated facilities. If such archeological sites or relics are identified in the project area, Mirant, in consultation with and as approved by MHT, shall develop and implement a plan for avoidance and protection, data recovery, or destruction without recovery of the properties adversely affected by the project.

Traffic

68. During construction, Mirant shall retain a Traffic Management Specialist to manually control vehicle movements at the intersection of Martinsburg Road with MD 28.

69. Mirant shall monitor the performance of the intersection of MD 28 and MD 109 to determine whether significant delays are occurring when construction traffic volumes are greatest. If significant delays are observed, Mirant shall take appropriate steps to reduce congestion at this intersection, such as working with State Highway Administration to adjust the timing of the traffic signal or staggering shift schedules to reduce the peak number of construction workers leaving the site in the afternoon.

70. Mirant shall instruct its contractors and employees to use MD 28 to Martinsburg Road as the

primary means of access to the site, and to avoid using the portion of Martinsburg Road to the south of the main plant entrance as an alternate route to the facility.

Noise Levels

71. Mirant shall design, construct, and operate the facility so as to comply with applicable Montgomery County and State of Maryland noise regulations. Before construction begins, Mirant shall verify that the analysis of noise impacts presented in the CPCN application adequately represents the predicted noise impacts of the actual equipment to be installed at the Dickerson site. If changes in configuration or equipment type occur during the detailed facility design, and these changes materially alter the facility's predicted noise characteristics, then Mirant shall provide an updated noise impact analysis.

72. Mirant shall monitor noise levels at the boundaries of the facility, after the plant is operational, to verify results of the predictive analysis. The scope of work for the noise monitoring shall be provided to MDE's Noise Control Program and to Montgomery County for review and approval, within one year after the issuance of this CPCN. The noise study shall include monitoring at facility site boundaries near residential properties. Measurements will be taken while the plant is operating at full load, to represent maximum noise emissions. Results shall be provided within six months after Units 4 and 5 begin commercial operation.

73. If the results of the noise monitoring conducted in Condition 71 indicate that the operation of Units 4 and 5 is creating an exceedance of the Maryland or Montgomery County noise standards, Mirant shall take corrective action in consultation with MDE's Noise Control Program and Montgomery County.

Visual Quality

74. Mirant shall develop a detailed visual impact mitigation plan and submit it to PPRP and the PSC for review and approval prior to commencing construction of the facility. The plan shall address, at a minimum, specific steps that will be taken to minimize visual impact of the proposed facility. The plan shall specifically address the visibility of Mirant's oil storage tanks from Martinsburg Road and consider the use of earthen berms and vegetation to screen them from view. The plan shall also discuss how intrusive night lighting will be minimized.

75. Mirant shall install plume abated mechanical draft cooling towers for the combined cycle portions of Units 4 and 5.

Other

76. Mirant shall work closely with PPRP to prepare and execute a program of land preservation and/or reforestation to reflect a partial mitigation of the environmental impact from the project. The mitigation project will achieve one or more of the following objectives: 1) provide a nutrient reduction benefit to the Chesapeake Bay, 2) result in a net reduction of greenhouse gases leading to the establishment of potential carbon credits, or 3) protect important State terrestrial ecological assets.

77. Mirant will provide a minimum of 20 million gallons of water storage, the first 10 million gallons to be available when the Unit 4 HRSG and steam turbine commence commercial operation. The second 10 million gallons will be available when the Unit 5 HRSG and steam turbine commence commercial operation.

    After the Unit 5 HRSG and steam turbine commence commercial operation, Mirant will provide an additional 10 million gallons of water storage, not to exceed a total of 40 million gallons for the project, if, due to Potomac River water limitations, Mirant experiences a loss of 40 hours of generating availability when the PJM East hourly integrated load is more than 90% of the PJM East annual peak demand during any one year.

78. Informational copies of the reports required regarding change of ownership, major milestones, stack test protocols, stack testing, water withdrawals, archeological recovery guidelines, and noise studies as described in Conditions 11, 31, 40, 43, 49, 50, 52, 58, 67, 71, and 72 shall be sent to the Power Plant Research Program at:

    Power Plant Assessment Division
    Department of Natural Resources
    Tawes State Office Building, B-3
    580 Taylor Avenue
    Annapolis, Maryland 21401

APPENDIX B

SUPPLEMENTAL CPCN CONDITIONS

PSC CASE NO. 8888

MIRANT DICKERSON DEVELOPMENT, LLC

Transmission Improvements/Interconnection Requirements

1. Prior to putting any portion of the project in service, Mirant shall file with the Commission a listing of the transmission system improvements required by PJM and certification that the improvements have been completed; and, prior to putting any portion of the project in service, Mirant shall file with the Commission a listing of the interconnection requirements required by the interconnecting transmission line owner and certification that the interconnection requirements have been met. Mirant shall make such filings at least thirty (30) days prior to putting any portion of the project in service.

Water Use

2. As a result of a Trigger Low Flow Day, as defined in Condition 3 below, and after receiving the notice prescribed in Condition 5 below, Mirant will reduce its "consumptive water use" (as defined in COMAR § 26.17.07) for Units 4 and 5 from the Potomac River to 1 million gallons per day ("MGD") unless and until the Parties otherwise agree, in a writing duly executed by the Parties, upon the terms pursuant to which Mirant will compensate the Fairfax County Water Authority, Washington Suburban Sanitary Commission and Washington Aqueduct Division of the U.S. Army Corps of Engineers (collectively the "Suppliers") for Mirant's additional consumptive water use above 1 MGD during designated "Restriction Days," as hereafter defined.

3. A Trigger Low Flow Day is defined as:

   a. A calendar day when more than 25 million gallons of water is released from the Jennings-Randolph and/or Savage Reservoirs for water supply purposes; or

   b. A calendar day that is not the same calendar day as a Restriction Day, imposed pursuant to Condition 4a below, as a result of releases from the Jennings-Randolph and/or Savage Reservoirs as provided in Condition 3a above, when more than 10 million gallons of water is released from the Little Seneca Reservoir for water supply purposes.

c. For purposes of this Agreement, no more than two Trigger Low Flow Days can occur on a single calendar day.

d. The Parties agree that if a new water resource is developed by the Suppliers or the Interstate Commission on the Potomac River Basin Section for the Cooperative Water Supply Operations on the Potomac ("ICPRB Co-Op") in the future, the Parties will, in good faith, negotiate a new trigger mechanism for that resource.

4. Restriction Day is defined as either:

a. A calendar day that is no less than 3 days and no more than 8 days after a Trigger Low Flow Day from either the Jennings-Randolph or Savage Reservoirs. The exact calendar day within the 5-day window will be determined by ICPRB Co-Op, after consultation with the Suppliers and Mirant; or

b. A calendar day after a Trigger Low Flow Day from the Little Seneca Reservoir. The exact calendar day will be determined solely by ICPRB Co-Op, after consultation with the Suppliers and Mirant. A Restriction Day that results from a release at the Little Seneca Reservoir may not be imposed later than six months following the Trigger Low Flow Day from the Little Seneca Reservoir during which the restriction obligation was generated; and

c. Restriction Days cannot exceed in number the corresponding Trigger Low Flow Days.

5. The ICPRB Co-Op, after consultation with the Suppliers, must provide written notice that is received by Mirant at least three days in advance of the designated Restriction Day.

6. ICPRB Co-Op and Suppliers' Powers. Nothing in the Agreement shall modify or restrict the powers or authority of the ICPRB Co-Op, the Suppliers, the Commonwealth of Virginia, the State of Maryland or the District of Columbia. Furthermore, nothing in this Agreement is intended to alter the procedures set forth in the Drought-related Operations Manual for the Washington Metropolitan Area Water Supplies for determining when water releases shall occur including, without limitation, the review and oversight authority of the Operations Committee set forth in Section IV of that manual.

<u>CO_2 Project</u>

7. Sugarloaf will allocate 30% of the funds contributed by Mirant to the Environmental Foundation to a project or projects devoted to mitigation of CO_2 emissions, such

as the planting of trees.

8. The Agreement of Stipulation and Settlement between Mirant, Sugarloaf Citizens Association, Inc., Jane S. Hunter and Tina T. Brown (the "Settling Parties") is expressly contingent on the Department of Natural Resources, Power Plant Research Program agreeing that the Environmental Foundation's CO_2 project or projects referred to in paragraph 6 fulfills every requirement or condition for, and takes the place of, any other CO_2 project that might otherwise be imposed on Mirant in relation to the Project and further that no other CO_2 project be imposed on Mirant in this proceeding.

Environmental Management System

9. Mirant shall implement an Environmental Management System (EMS) for the Dickerson Generating Station that generally conforms to the substantive requirements of International Organization for Standardization's ISO 14001 standard titled "Environmental Management Systems – Specification with Guidance for Use" (1996), as it may be updated. The EMS will be implemented within six months of the beginning of commercial operation of Unit 5, the beginning of commercial operation of the Unit 4 HRSG, or July 1, 2008, whichever occurs first. Air emissions from all Mirant Dickerson operations will be addressed in the EMS as significant aspects. Mirant shall obtain an appropriate certification of the EMS through the ISO Registrar, or from another third party, such as the U.S.E.P.A., or from an internal authority which is independent from the facility, such as the Mirant Corporate Audit organization.

Diesel Fuel Transportation

10. Mirant will install the infrastructure necessary to receive diesel fuel by rail and convert to rail delivery by the date of commencement of operation of Unit 5. However, Mirant reserves the right to receive diesel fuel by truck in the event of an emergency, such as a rail strike, derailment or comparable emergency circumstance.

Piper Rudnick

111 S. Calvert Street, Suite 1950
Baltimore, Maryland 21202
main 410.580.3000 *fax* 410.580.3001

DEBORAH E. JENNINGS
deborah.jennings@piperrudnick.com
direct 410.580.4180

September 20, 2004

Via Hand Delivery

Ms. Felecia L. Greer
Executive Secretary
Public Service Commission
William Donald Schaefer Tower
6 St. Paul Street
Baltimore, MD 21202-6806

Re: Mirant Dickerson's Agreement of Stipulation and Settlement
PSC Case No: 8888

Dear Ms. Greer:

Enclosed are the original and 15 copies of the fully executed Agreement of Stipulation and Settlement, for filing in the above matter. Please have one copy of the Agreement date stamped and returned with the messenger. Simultaneously, we are filing with Nellie Tillery an electronic version for the docket. Please feel free to call if you have any questions or comments. Thank you.

Sincerely,

Deborah E. Jennings

DEJ/mkc
Enclosures

cc: All Counsel

FILED

SEP 20 2004

PUBLIC SERVICE COMM.
OF MARYLAND

BEFORE THE
PUBLIC SERVICE COMMISSION
OF MARYLAND

IN THE MATTER OF THE APPLICATION OF	)	
MIRANT DICKERSON DEVELOPMENT, LLC	)	
FOR A CERTIFICATE OF PUBLIC CONVENIENCE	)	**PSC CASE NO. 8888**
AND NECESSITY TO MODIFY ITS EXISTING	)	
GENERATING STATION H IN	)	
MONTGOMERY COUNTY, MARYLAND	)	

AGREEMENT OF STIPULATION AND SETTLEMENT

Mirant Dickerson Development, LLC ("Mirant" or "Applicant"); the Power Plant Research Program of the Department of Natural Resources ("PPRP"), acting on behalf of a number of interested State agencies; the Staff of the Public Service Commission of Maryland; the Office of People's Counsel; the Fairfax County Water Authority, a public body established under the laws of the Commonwealth of Virginia, Washington Suburban Sanitary Commission, a public body established under the laws of the State of Maryland, and the Washington Aqueduct Division of the U.S. Army Corps of Engineers, an agency or instrumentality of the United States of America (collectively, the "Water Suppliers"); Sugarloaf Citizens Association, Jane S. Hunter, and Tina T. Brown (collectively, "Sugarloaf"); together constituting the "Settling Parties," by their undersigned counsel, agree as follows:

BACKGROUND

On May 23, 2001, Mirant filed with the Public Service Commission of Maryland (the "Commission") an Application for the modification of its generating facilities in Montgomery County, Maryland pursuant to Sections 7-207 and 7-208 of the Public Utility Companies Article of

the Maryland Code. The requested modification is to convert the existing Station H simple cycle combustion turbine at its Dickerson site located in Montgomery County, Maryland to a combined cycle unit ("new Unit 4") with the installation of heat recovery steam generators, a steam turbine, and electric generator, and to construct a new combined cycle unit ("new Unit 5") consisting of two combustion turbines with electric generators, associated heat recovery steam generators, and a steam turbine with an electric generator (the "Project"). The matter was docketed as Case No. 8888 and delegated to Hearing Examiner David L. Moore for hearing.

Following submission of Mirant's Application, PPRP and others made numerous data requests of Mirant. Mirant answered each of these data requests and supplemented its Application in response to these data requests, as necessary. Mirant also filed written testimony of its staff and subject matter experts in support of its application.

Mirant entered into a "Stipulation and Settlement Agreement" with the Water Suppliers concerning water use from the Potomac River and agreed to incorporate certain terms of that Agreement into the CPCN. Mirant also entered into an "Agreement of Stipulation and Settlement" with Sugarloaf concerning several environmental issues and agreed to incorporate certain terms of that Agreement into the CPCN.

In accordance with the Power Plant Siting Act (Chapter 31 of the Laws of 1971), PPRP,, acting in concert with the Maryland Department of the Environment and other interested State agencies, conducted an environmental review of the impacts of the proposed modification and developed a set of conditions necessary to ensure that the construction and operation of the proposed modification will meet or exceed applicable environmental statutes and regulations and pose no undue detrimental impacts on the surrounding community.

On July 13, 2004, PPRP, acting on behalf of the State agencies, filed the final Recommended Licensing Conditions for Mirant's Application for a CPCN (attached as Appendix A). In addition to the Recommended Licensing Conditions, as a result of the aforementioned agreements with Water Suppliers and Sugarloaf and discussions with the Office of People's Counsel, Mirant hereby agrees to Supplemental CPCN Conditions (attached as Appendix B). Together, Appendix A and Appendix B constitute all of the CPCN conditions ("CPCN Conditions").

The Applicant agrees to abide by those CPCN Conditions if adopted in the form attached and the Settling Parties agree not to seek further Commission review of those CPCN Conditions in these proceedings. All of the Settling Parties except Sugarloaf and the Water Suppliers are in agreement that the issuance of a CPCN for the Project, subject to the recommended CPCN Conditions, is in the public interest. Sugarloaf agrees not to oppose issuance of the CPCN and the Water Suppliers take no position on the issuance of a CPCN.

AGREEMENT

NOW, THEREFORE, the Settling Parties do hereby stipulate and agree as follows:

1. The Settling Parties except Sugarloaf and the Water Suppliers recommend that the Commission issue a CPCN for the Project, subject to the final CPCN Conditions set forth in Appendices A and B. Sugarloaf does not oppose issuance of the CPCN and the Water Suppliers take no position on issuance of a CPCN. The Settling Parties that recommend issuance of the CPCN have taken into account each and all of the factors and considerations listed in Section 7-207(e) of the Public Utility Companies Article of the Maryland Code and the information contained in PPRP's Environmental Review and supporting testimony. The Settling Parties that recommend issuance of the CPCN stipulate and agree that the construction and operation of the Project in accordance with the final CPCN Conditions would meet or exceed the requirements of all currently applicable

environmental laws and regulations, including those relating to noise abatement and the control of air and water pollution.

3. The Settling Parties recognize and agree that the final CPCN Conditions are interrelated and that those provisions should be taken as a whole. The final CPCN Conditions are interdependent, in that a change or addition made to address a concern in one aspect (*e.g.,* air pollution) could well have an unanticipated adverse effect or other unintended consequence with respect to another aspect (*e.g.,* water usage or pollution). The Settling Parties accordingly agree, and enter into this Agreement with the understanding, that the final CPCN Conditions should be accepted by the Commission without further change, addition, or other alteration of any kind.

4. The Settling Parties view the final CPCN Conditions and this Agreement as a package, with all of the parts interrelating to each other. If the final CPCN Conditions are changed, supplemented or rejected by the Commission, this Agreement shall be deemed withdrawn and shall not constitute any part of the record in this proceeding or be used for any other purpose whatsoever. In the event the Commission determines not to accept and approve the final CPCN Conditions and this Agreement in their entirety, the Settling Parties respectfully request that the Commission provide the Settling Parties an opportunity (i) to negotiate a modified Agreement to address the Commission's concerns or a contested settlement agreement representing the terms of settlement that remain acceptable to some of the Parties, or (ii) to withdraw their support for this Agreement, to prepare and file briefs, and to proceed with further litigation of these issues.

WHEREFORE, the Settling Parties have caused their signatures to be affixed to this Agreement through and by their respective counsel.

Respectfully submitted,

STAFF OF MARYLAND PUBLIC SERVICE COMMISSION

By: James Boone dej

MIRANT DICKERSON DEVELOPMENT, LLC

By: Deborah E. Jenn

MARYLAND DEPARTMENT OF NATURAL RESOURCES POWER PLANT RESEARCH PROGRAM

By: M. Brent Hare dej
Assistant Attorney General

MARYLAND OFFICE OF PEOPLE'S COUNSEL

By:_____
Assistant People's Counsel

FAIRFAX COUNTY WATER AUTHORITY

By: Michael C. Powell dej
WASHINGTON SUBURBAN SANITARY COMMISSION

By: Joel Kramer dej

Respectfully submitted,

STAFF OF MARYLAND PUBLIC SERVICE COMMISSION

By: _____

MIRANT DICKERSON DEVELOPMENT, LLC

By: _____

MARYLAND DEPARTMENT OF NATURAL RESOURCES POWER PLANT RESEARCH PROGRAM

By: _____
Assistant Attorney General

MARYLAND OFFICE OF PEOPLE'S COUNSEL

By: Cynthia Green-Warren
Assistant People's Counsel

FAIRFAX COUNTY WATER AUTHORITY

By: _____
WASHINGTON SUBURBAN SANITARY COMMISSION

By: _____

WASHINGTON AQUEDUCT DIVISION
U.S. ARMY CORPS OF ENGINEERS

By: Robert A. Stanton
COUNSEL, U.S. DOD
9/16/04

SUGARLOAF CITIZENS ASSOCIATION, INC.

By: _____
James R. Choukas-Bradley

_____
Jane S. Hunter, Pro Se

_____
Tina T. Brown, Pro Se

WASHINGTON AQUEDUCT DIVISION
U.S. ARMY CORPS OF ENGINEERS

By:_____

SUGARLOAF CITIZENS ASSOCIATION, INC.

By: James R. Choukas-Bradley
James R. Choukas-Bradley

Jane S. Hunter
Jane S. Hunter, Pro Se

Tina T. Brown
Tina T. Brown, Pro Se

APPENDIX A

RECOMMENDED CPCN CONDITIONS

PSC CASE NO. 8888

MIRANT DICKERSON DEVELOPMENT, LLC

Recommended Licensing Conditions
PSC Case No. 8888
Mirant Dickerson Development, LLC

Air Quality

I. General Air Quality Requirements

1. Except as otherwise provided for in the following provisions, the application for the Certificate of Public Convenience and Necessity (CPCN) is considered to be part of this CPCN for the Mirant Dickerson Development, LLC (Mirant) Dickerson Generating Station Expansion. The application consists of the original application received by the Maryland Public Service Commission (PSC) on 23 May 2001 and subsequent amendments. Construction of the facility shall be undertaken in accordance with the CPCN application and subsequent amendments. If there are any inconsistencies between the conditions specified below and the application, the conditions in this CPCN shall take precedence. In the application, estimates of dimensions, volumes, emission rates, operating rates, feed rates and hours of operation are not deemed to constitute enforceable numeric limits except to the extent that they are necessary to make a determination of compliance with applicable regulations.

2. The application for a CPCN includes the application for Prevention of Significant Deterioration (PSD) approval and air quality construction permits. The CPCN serves as the construction permit.

3. For air permitting purposes, the Dickerson Generating Expansion Project shall include the addition of: heat recovery steam generators (HRSGs) to two (2) existing GE 7F combustion turbines, referred to as Unit 4; two (2) GE 7FA combustion turbines with heat recovery steam generators, referred to as Unit 5; one (1) auxiliary steam boiler with a heat input of 60 million British thermal units per hour (MMBtu/hr); one (1) additional 10,000,000-gallon aboveground distillate fuel oil storage tank; and two (2) cooling towers. The Unit 4 and Unit 5 combustion turbines will be equipped with selective catalytic reduction (SCR) systems for control of nitrogen oxides (NO_x), and oxidation catalyst systems for control of carbon monoxide (CO) and volatile organic compound (VOCs) during combined cycle operation. The existing Dickerson facility includes three nominal 180 megawatt (MW) coal-fired boilers, identified as Units 1, 2 and 3, and support facilities. Units 1, 2 and 3 will be equipped with separated overfire air (SOFA) systems as part of this project to reduce NO_x emissions.

4. Definitions:

   a) "Commence" as applied to the construction of the Dickerson Generating Expansion Project means that the owner or operator either has:

i) Begun, or caused to begin, a continuous program of actual on-site construction of the source, to be completed within a reasonable time; or

ii) Entered into binding agreements or contractual obligations which cannot be canceled or modified without substantial loss to the owner or operator, to undertake a continuous program of actual construction or modification of the source to be completed within a reasonable time.

5. Mirant shall construct exhaust stacks for the Unit 5 construction turbines at a minimum height of 130 feet above ground level for use during simple cycle operation.

6. Mirant shall construct exhaust stacks for Unit 4 and 5 at a minimum height of 190 feet above ground level for use during combined cycle operations.

7. If any provision of this CPCN shall be held invalid for any reason, the remaining provisions shall remain in full force and effect and such invalid provision shall be considered severed and deleted from this CPCN.

8. Representatives of the Maryland Department of the Environment (MDE) and the Montgomery County Health Department shall be afforded access to the Dickerson property at any reasonable time to conduct inspections and evaluations necessary to assure compliance with the CPCN. Mirant shall provide such assistance as may be necessary to conduct such inspections and evaluations by such representatives of MDE effectively and safely, which may include but need not be limited to the following:

   a) inspecting construction authorized under this CPCN;

   b) sampling any materials stored or processed on site, or any waste, or discharge into the environment;

   c) inspecting any monitoring or recording equipment required by this CPCN or applicable regulations;

   d) having access to or copying any records required to be kept by Mirant pursuant to this CPCN or applicable regulations;

   e) obtaining any photographic documentation and evidence; and

   f) determining compliance with the conditions and regulations specified in the CPCN.

9. This CPCN constitutes the PSD approval and air quality construction permit for the Dickerson Generating Station Expansion project. In accordance with COMAR 26.11.02.04B, the air quality provisions expire if, as determined by MDE, Air and Radiation Management Administration (ARMA):

a) Construction is not commenced within 18 months after the date of issuance of a final CPCN;

b) Construction is substantially discontinued for a period of 18 months or more after it has commenced; or

c) Construction is not completed within a reasonable period of time after the issuance of a final CPCN.

10. At least 60 days prior to the anticipated date of start-up of Unit 4 and Unit 5, Mirant shall submit to ARMA an application for a temporary permit to operate.

11. All requirements pertaining to air quality that apply to Mirant shall apply to all subsequent owners and/or operators of the facility. In the event of any change in control or ownership, Mirant shall notify the succeeding owner/operator of the existence of the requirements of this CPCN pertaining to air quality by letter and shall send a copy of that letter to MDE ARMA.

II. Applicable Air Quality Regulations

12. Mirant is subject to all applicable federally enforceable State air quality requirements including, but not limited to, the following regulations:

a) COMAR 26.11.01.04A which requires Mirant to follow test methods described in §C to determine compliance;

b) COMAR 26.11.01.05-1 which requires Mirant to submit to MDE by April 1 of each year an emissions statement for the previous calendar year that meets the requirements of this regulation;

c) COMAR 26.11.01.07C which requires Mirant to report excess emissions that are expected to last or actually last for one hour or more;

d) COMAR 26.11.06.02C(2) which prohibits the discharge of emissions from any installation, other than water in an uncombined form, which is visible to human observers;

Exception: Does not apply to emissions during start-up and process modifications or adjustments, or occasional cleaning of control equipment if:

i) The visible emissions are not greater than 40 percent opacity; and

ii) The visible emissions do not occur for more than 6 consecutive minutes in any 60 minute period.

e) COMAR 26.11.06.03D which requires reasonable precautions to prevent any particulate matter from becoming airborne as a result of material being handled, transported, or stored;

f) COMAR 26.11.09.05A(2) which prohibits Mirant from discharging emissions, other than water in an uncombined form, which is visible to human observers from fuel burning equipment;

Exception: Does not apply to emissions during load changing, soot blowing, startup, or adjustments or occasional cleaning of control equipment if:

i) The visible emissions are not greater than 40 percent opacity; and

ii) The visible emissions do not occur for more than 6 consecutive minutes in any 60 minute period.

g) For Units 4 and 5, and the auxiliary boiler: COMAR 26.11.09.07A(1)(c) which prohibits Mirant from burning fuel with a sulfur content by weight in excess of or which otherwise exceeds 0.3 percent;

h) For Unit 4 and Unit 5, COMAR 26.11.09.08B(1)(c): which requires the control of NO_x emissions to 0.25 lb/MMBtu which satisfies Reasonably Available Control Technology (RACT);

i) For the auxiliary boiler: COMAR 26.11.09.08E, which contains reporting, recordkeeping, maintenance, and training requirements for fuel burning sources with a rated heat input capacity of 100 MMBtu per hour or less;

j) COMAR 26.11.09.08B(2)(a)(i) and (ii) which require Mirant to demonstrate compliance with the NO_x emission standard for Units 4 and 5 through continuous emissions monitoring (CEM) data or stack tests using Method 7 or Method 7E of the test methods referenced in COMAR 26.11.01.04C(1) or other test methods approved by MDE and the U.S. Environmental Protection Agency (EPA);

k) COMAR 26.11.29 and .30 which require that Mirant hold an allowance for each ton of NO_x emissions from Units 1-5 by the reconciliation date of November 30 of each calendar year;

l) COMAR 26.11.30 which requires that Mirant follow the policies and procedures relating to Maryland's NO_x Reduction and Trading Program; and

m) COMAR 26.11.06.14 which prohibits the construction, modification, or operation of a source in violation of the requirements of 40 CFR 52.21: Prevention of Significant Deterioration.

13. The Mirant Dickerson Expansion Project is subject to all applicable State-only enforceable air quality requirements including, but not limited to, the following regulations:

    a) COMAR 26.11.02.13A(2) which requires Mirant to have in current effect a State Permit to Operate from the Department prior to the commencement of operations of the Units 4 and 5 Expansion Project;

    b) COMAR 26.11.02.19C which requires Mirant to maintain records necessary to support the emission certification;

    c) COMAR 26.11.02.19D which requires Mirant to certify the actual emissions of the regulated pollutants from the entire Dickerson facility; and

    d) COMAR 26.11.06.08 and .09 which generally prohibit the discharge of emissions beyond the property line in such a manner that a nuisance or air pollution is created.

14. The Units 4 and 5 combustion turbines are subject to 40 CFR Subpart GG – Standards of Performance for Stationary Gas Turbines, related provisions of 40 CFR §60.7 and §60.8, which contain various provisions for emission limitations, monitoring, testing, recordkeeping, and reporting, including but not limited to the following:

    a) Standard for Nitrogen Oxides (40 CFR §60.332)
    On or after the completion of performance testing conducted under §60.8, Mirant shall not cause to be discharged into the atmosphere from any stationary gas turbine any gases which contain nitrogen oxides in excess of:

    $STD = (0.0075 \times (14.4/Y)) + F$

    Where:

    STD = allowable NO_x emissions (percent by volume at 15 percent oxygen and on a dry basis)
    Y = manufacturer's rated heat rate at manufacturer's rated load (kilojoules per watt hour) or, actual measured heat rate based on lower heating value of fuel as measured at actual peak load for the facility. The value of Y shall not exceed 14.4 kilojoules per watt hour.
    F = NO_x emission allowance for fuel-bound nitrogen as defined in 40 CFR §60.332(a)(3):

Fuel-Bound Nitrogen (percent by weight)	F (NO_x percent by volume)
$N < 0.015$	0
$0.015 < N < 0.1$	0.04(N)
$0.1 < N < 0.25$	0.004 + 0.0067(N – 0.1)
$N > 0.25$	0.005

Therefore:

For Unit 4, NO_x shall not exceed 99 parts per million by volume at 15% oxygen on a dry weight basis (ppmvd @15%), based on a 1-hour average, when firing natural gas, or 98 ppmvd @15%, based on a 1-hour average, when firing fuel oil.

For Unit 5, NO_x shall not exceed 110 parts per million by volume at 15% oxygen on a dry weight basis (ppmvd @15%), based on a 1-hour average, when firing natural gas, or 101 ppmvd @15%, based on a 1-hour average, when firing fuel oil.

b) Standard for Sulfur Oxides (40 CFR §60.333)
On or after the completion of performance testing conducted under §60.8, Mirant shall comply with one or the other of the following conditions:

i) Mirant shall not cause to be discharged into the atmosphere from any stationary gas turbine any gases which contain sulfur dioxide in excess of 0.015 percent by volume at 15 percent oxygen and on a dry basis.

ii) Mirant shall not burn in any stationary gas turbine any fuel which contains sulfur in excess of 0.8 percent by weight.

c) Monitoring of Operations (40 CFR §60.334)

i) Mirant shall monitor sulfur content and nitrogen content of the fuel being fired in the turbines. The frequency of determination of these values shall be as follows:

(A) If the turbine is supplied its fuel from a bulk storage tank, the values shall be determined on each occasion that fuel is transferred to the storage tank from any other source.

(B) If the turbine is supplied its fuel without intermediate bulk storage, the values shall be determined and recorded daily. Owners, operators or fuel vendors may develop custom schedules for determination of the values based on the design and operation of the affected facility and the characteristics of the fuel supply. These custom schedules shall be substantiated with data and must be approved by the EPA Administrator before they can be used to comply with Paragraph (b) of 40 CFR §60.334.

ii) For the purpose of reports required under §60.7(c), periods of excess emissions that shall be reported are defined as follows:

(A) Nitrogen oxides. Any one-hour period during which the average water-to fuel ratio, as measured by the continuous monitoring system, falls below the water-to-fuel ratio determined to demonstrate compliance with §60.332 by the performance test required in §60.8 or any period during which the fuel-bound nitrogen of the fuel is greater than the maximum nitrogen content allowed by the fuel-bound nitrogen allowance used during the performance test required in §60.8. Each report shall include the average water-to-fuel ratio, average fuel consumption, ambient conditions, gas turbine load, and nitrogen content of the fuel during the period of excess emissions, and the graphs or figures developed under §60.335(a).

(B) Sulfur dioxide. Any daily period during which the sulfur content of the fuel being fired in the gas turbine exceeds 0.8 percent.

d) Test Methods (40 CFR §60.335)

i) To compute the nitrogen oxides emissions, Mirant shall use analytical methods and procedures that are accurate to within 5 percent and are approved by the EPA Administrator to determine the nitrogen content of the fuel being fired.

ii) In conducting the performance tests required in §60.8, Mirant shall use as reference methods and procedures the test methods in Appendix A of 40 CFR Part 60, or other methods and procedures as specified in this Subpart GG, except as provided for in §60.8(b). Acceptable alternative methods and procedures are given in paragraph (f) of §60.335.

iii) Mirant shall determine compliance with the nitrogen oxides and sulfur dioxide standards in §§60.332 and 60.333(a) as follows:

(A) The nitrogen oxides (NO_x) emission rate shall be computed for each run using the following equation:

$$NO_x = (NO_{xo})(P_r/P_o)^{0.5}\, e^{19(Ho - 0.00633)}(288°K/T_a)^{1.53}$$

where:

NO_x = emission rate of NO_x at 15 percent O_2 and ISO standard ambient conditions, ppm by volume.

NO_{xo} = observed NO_x concentration, ppm by volume at 15 percent O_2.
P_r = reference combustor inlet absolute pressure at 101.3 kilopascals ambient pressure, mm Hg.

P_o = observed combustor inlet absolute pressure at test, mm Hg.
H_o = observed humidity of ambient air, g H_2O/g air.
e = transcendental constant, 2.718.
T_a = ambient temperature, K.

(B) The monitoring device of §60.334(a) shall be used to determine the fuel consumption and the water-to-fuel ratio necessary to comply with §60.332 at 30, 50, 75, and 100 percent of peak load or at four points in the normal operating range of the gas turbine, including the minimum point in the range and peak load. All loads shall be corrected to ISO conditions using the appropriate equations supplied by the manufacturer.

(C) Method 20 shall be used to determine the nitrogen oxides, sulfur dioxide, and oxygen concentrations. The span values shall be 300 ppm of nitrogen oxide and 21 percent oxygen. The NO_x emissions shall be determined at each of the load conditions specified in paragraph (c)(2) of 40 CFR §60.335.

iv) Mirant shall determine compliance with the sulfur content standard in §60.333(b) (herein as Condition 14(b)(ii) as follows: ASTM D 2880-71, 78, or 96 shall be used to determine the sulfur content of liquid fuels and ASTM D 1072-80 or 90 (Reapproved 1994), D 3031-81, D 4084-82 or 94, or D 3246-81, 92, or 96 shall be used for the sulfur content of gaseous fuels (incorporated by reference-see §60.17). The applicable ranges of some ASTM methods mentioned above are not adequate to measure the levels of sulfur in some fuel gases. Dilution of samples before analysis (with verification of the dilution ratio) may be used, subject to the approval of the EPA Administrator.

v) To meet the requirements of §60.334(b) (herein as Condition 14(c)(i)), Mirant shall use the methods specified in paragraphs (a) and (d) of 40 CFR §60.335 (herein Conditions 14(d)(i) and 14(d)(iv)) to determine the nitrogen and sulfur contents of the fuel being burned. The analysis may be performed by the owner or operator, a service contractor retained by the owner or operator, the fuel vendor, or any other qualified agency.

vi) Mirant may use the following as alternatives to the reference methods and procedures specified in this section:

(A) Instead of using the equation in 40 CFR §60.335(c)(1), manufacturers may develop ambient condition correction factors to adjust the nitrogen oxides emission level measured by the performance test as provided in §60.8 to ISO standard day conditions. These factors are developed for each gas turbine model they manufacture in terms of combustion inlet pressure, ambient air

pressure, ambient air humidity, and ambient air temperature. They shall be substantiated with data and must be approved for use by the EPA Administrator before the initial performance test required by §60.8. Notices of approval of custom ambient condition correction factors will be published in the Federal Register.

15. The duct burners associated with Units 4 and 5 are subject to 40 CFR Subpart Da – Standards of Performance for Electric Utility Steam Generating Units for which Construction is Commenced after September 18, 1978, including, but not limited to:

    a) Subpart Da 60.42a(a) which limits particulate matter emissions to 0.03 lb per MMBtu (13 ng/J);

    b) Subpart Da 60.42a(b) which limits Mirant to 20 percent opacity (6-minute average), except for one 6-minute period per hour of not more than 27 percent opacity;

    c) Subpart Da 60.43a(b)(2) which limits SO_2 emissions to 0.20 lb per MMBtu (86 ng/J) with zero percent reduction;

    d) Subpart Da 60.44a(d)(1) which limits NO_x emissions to 1.6 lb per megawatt-hour (200 ng/J);

    e) Subpart Da 60.46a(c) which states that the PM and NO_x emission limits listed above apply at all times except during periods of startup, shutdown, or malfunction, and the SO_2 emission limits apply at all times except during periods of startup, shutdown, or when emergency conditions exist;

    f) Subpart Da 60.46a(e) which requires that after the initial performance test, compliance with the sulfur dioxide emission limitations and percentage reduction requirements under Sec. 60.43a and the nitrogen oxides emission limitations under Sec. 60.44a be based on the average emission rate for 30 successive duct burner operating days. A separate performance test is to be completed at the end of each duct burner operating day after the initial performance test, and a new 30 day average emission rate for both sulfur dioxide and nitrogen oxides and a new percent reduction for sulfur dioxide are to be calculated to show compliance with the standards;

    g) Subpart Da 60.46a(f) which requires that for the initial performance test required under Sec. 60.8, compliance with the sulfur dioxide emission limitations and percent reduction requirements and the nitrogen oxides emission limitation is based on the average emission rates for sulfur dioxide, nitrogen oxides, and percent reduction for sulfur dioxide for the first 30 successive duct burner operating days. The initial performance test is the only test in which at least 30 days prior notice is required unless otherwise specified by the EPA Administrator. The initial performance test is to be scheduled so that the first duct burner operating day of the 30 successive duct burner operating days is completed within 60 days after achieving the maximum production rate at which the

affected facility will be operated, but not later than 180 days after initial startup of the facility;

h) Subpart Da 60.46a(g) which requires that compliance is determined by calculating the arithmetic average of all hourly emission rates for SO_2 and NO_x for the 30 successive duct burner operating days, except for data obtained during startup, shutdown, malfunction (NO_x only), or emergency conditions (SO_2 only). Compliance with the percentage reduction requirement for SO_2 is determined based on the average inlet and average outlet SO_2 emission rates for the 30 successive duct burner operating days;

i) Subpart Da 60.46a(i) which requires that Mirant calculate NO_x emissions by multiplying the average hourly NO_x output concentration by the average hourly flow rate, and divided by the average hourly gross energy output. Compliance with the emissions limits for NO_x, is to be determined using either of the procedures described in paragraphs 60.46a(k)(1) and (2);

j) Subpart Da 60.47a(o), which states that Mirant is not required to install or operate a continuous emissions monitoring system to measure NO_X emissions; a wattmeter to measure gross electrical output; meters to measure steam flow, temperature, and pressure; and a continuous flow monitoring system to measure the flow of exhaust gases discharged to the atmosphere;

k) Subpart Da 60.48a(a) which requires that in conducting the performance tests required in Sec. 60.8, Mirant use as reference methods and procedures the methods in appendix A of this part or the methods and procedures as specified in this section, except as provided in Section 60.8(b);

l) Subpart Da 60.48a which requires that Mirant determine compliance with the particulate matter, SO_2, and NO_x standards through methods and procedures as spelled out in sections 60.48a(b), (c) and (d);

m) Subpart Da 60.49a which requires Mirant to submit to the EPA Administrator the performance test data for sulfur dioxide, nitrogen oxides, and particulate matter emissions to the Administrator, according to the specifications in this subsection; and

n) Subpart Da 60.49a(f) which requires that, for any periods for which opacity, sulfur dioxide or nitrogen oxides emissions data are not available, Mirant must submit a signed statement indicating if any changes were made in operation of the emission control system during the period of data unavailability. Operations of the control system and affected facility during periods of data unavailability are to be compared with operation of the control system and affected facility before and following the period of data unavailability.

16. The auxiliary boiler is subject to 40 CFR Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units, which contains various

provisions for emission limitations, monitoring, testing, recordkeeping, and reporting, including, but not limited to:

a) Mirant shall submit notification of the date of construction or reconstruction, anticipated startup, and actual startup, as provided by 40 CFR 60.7. This notification shall include:

   i) The design heat input capacity of the affected facility and identification of fuels to be combusted in the affected facility;

   ii) If applicable, a copy of any federally enforceable requirement that limits the annual capacity factor for any fuel or mixture of fuels under 40 CFR 60.42c, or 40 CFR 60.43c; and

   iii) The annual capacity factor at which the owner or operator anticipates operating the affected facility based on all fuels fired and based on each individual fuel fired.

17. Units 4 and 5 are subject to all applicable Acid Rain provisions under 40 CFR Part 72, including, but not limited to:

    a) Subpart A 72.9(b)(1) which requires Mirant, to the extent applicable, to comply with monitoring requirements in Part 75;

    b) Subpart A 72.9(c) which requires Mirant to hold allowances in the unit's compliance subaccount not less than the total annual emissions of sulfur dioxide (SO_2) for the previous year and comply with applicable Acid Rain limits for SO_2;

    c) Subpart A 72.9(e) which requires Mirant to submit a proposed offset plan if emission limitations are exceeded; and

    d) Subpart A 72.9(f) which requires Mirant, unless otherwise provided, to retain required documents for a period of 5 years from the date that the document was created. Documents may include, but are not limited to, certificates of representation, emissions monitoring information, copies of reports, compliance certifications, and other documentation pertaining to the Acid Rain program.

18. Units 4 and 5 are subject to all applicable monitoring provisions of the Acid Rain program under 40 CFR Part 75, including, but not limited to:

    a) Subpart A 75.4(b) which requires Mirant, in accordance with Sec. 75.20, to ensure that all applicable monitoring systems for SO_2, NO_x, carbon dioxide (CO_2), and volumetric flow required under this part to be installed and all certification tests completed not later than 90 days after the date the unit commences commercial operation;
    b) Subpart B 75.10 which generally requires Mirant to measure, as applicable, opacity, SO_2, NO_x, and CO_2 emissions; and to ensure that continuous emission monitoring systems required by this part meet the equipment, installation, and performance specifications in

this part; and are maintained according to the quality assurance and quality control procedures in this part;

c) Subpart F 75.53(a) which requires Mirant to prepare a monitoring plan with sufficient information on applicable continuous opacity or emissions monitoring systems to demonstrate that all SO_2, NO_x, CO_2 emissions and opacity, as required, are monitored and reported;

d) Subpart F 75.57(a) which requires Mirant to keep a file for each affected unit of all measurements, data, reports, and other information required by this part in a form suitable for inspection for at least 3 years from the date of each record;

e) Subpart F 75.57(b)-(f) which require Mirant to record various operations, emissions, and other information, as specified; and

f) Subpart G 75.60(a) and (b) which generally require Mirant to comply with all reporting requirements, with all signatory requirements of §72.21 of this chapter for all submissions, and with all required certifications and reports.

III. BACT Requirements

19. Mirant shall employ Best Available Control Technology (BACT) to control emissions of sulfur dioxide (SO_2), sulfuric acid mist (H_2SO_4), carbon monoxide (CO), and particulate matter (PM10) from the Dickerson Expansion Project as follows:

    a) BACT for Unit 5 prior to the heat recovery steam generator becoming operational shall be the use of natural gas fuel with limited operation on low sulfur (0.05% sulfur content by weight or less) distillate fuel oil, and application of good combustion practices to ensure that emissions do not exceed the levels identified in Table 1.

    b) BACT on Units 4 and 5 after the heat recovery steam generators become operational, shall be the use of natural gas fuel with operation on low sulfur (0.05% sulfur content by weight or less) distillate fuel oil limited to 250 hours during simple cycle operation and 720 hours during combined cycle operation, operation of an oxidation catalyst, and application of good combustion practices, to ensure that emissions do not exceed the levels identified in Table 2.

c) BACT for the auxiliary boiler shall be the use of distillate fuel oil with a sulfur content of 0.05% or less, use of distillate fuel oil for no more than 970 hours per year, and application of good combustion controls to achieve emissions rates that do not exceed the following on a 3-hour average basis:

CO: 9 lb/hr when firing both natural gas and distillate fuel
PM10: 0.6 lb/hr when firing natural gas and 3 lb/hr when firing distillate fuel
SO_2: 0.34 lb/hr when firing natural gas and 3.1 lb/hr when firing distillate fuel

d) BACT for all installed cooling towers shall be the installation and operation of mist eliminators designed to meet a PM10 emission rate of 0.001 percent of the cooling tower recirculating water flow.

20. Short term emission limits contained in Condition 19 do not apply during periods of startup, shutdown, or malfunction as defined in 40 CFR 60.2.

IV. National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines Requirements

21. The Mirant Unit 5 combustion turbines are subject to 40 CFR 63 Subpart YYYY– "National Emissions Standards for Hazardous Air Pollutants for Stationary Combustion Turbines" and related General Provisions in 40 CFR §63.1 through §63.15. These requirements include, but are not limited to the following:

a) Emissions and Operating Limitations [40 CFR §63.6100]:

i) The concentration of formaldehyde shall not exceed 91 parts per billion by volume dry basis (ppbvd) at 15 percent oxygen.

ii) During periods when the combustion turbines are using an oxidation catalyst, Mirant shall maintain the four-hour rolling average of the catalyst inlet temperature within the range suggested by the catalyst manufacturer.

iii) During periods when the combustion turbines are not using an oxidation catalyst, Mirant must maintain all operating limitations approved by the U.S. EPA Administrator.

iv) Mirant shall be in compliance with the emissions and operating limitations at all times except during startup, shutdown and malfunctions (§63.6104(a)).

v) Mirant shall operate and maintain the combustion turbines, oxidation catalysts or other air pollution control equipment, and monitoring equipment in a manner consistent with good air pollution control practices for minimizing emissions at all times including during startup, shutdown, and malfunction (§63.6105(b)).

b) Performance Testing Requirements [40 CFR §63.6110]:

i) Mirant shall conduct an initial performance test, as specified in §63.6110(a), to demonstrate compliance with the formaldehyde limitation in Condition 21.a.i within 180 calendar days after startup of the affected source (as specified in §63.6095(a)(2)).

ii) Mirant shall conduct annual performance tests, as specified in §63.6115, to demonstrate compliance with the formaldehyde limitation in Condition 21.a.i.

iii) Initial and annual performance tests shall be conducted according to the requirements of the General Provisions at §63.7(e)(1) and other applicable provisions.

iv) As stated in Table 3 to Subpart YYYY of Part 63:

(A) Mirant shall use Test Method 320 of 40 CFR Part 63, Appendix A, or other methods approved by the Administrator to conduct the initial and annual formaldehyde performance tests.

(B) The formaldehyde concentration must be corrected to 15 percent oxygen, dry basis.

(C) Results of the test shall consist of the average of three, 1-hour runs.

(D) Tests must be conducted within 10 percent of 100 percent load.

(E) Select sampling port locations and number of traverse points, and determine oxygen concentration and moisture content as specified in Table 3 to Subpart YYYY.

(F) Mirant shall petition the Administrator for operating limitations which shall be monitored to demonstrate compliance with the formaldehyde limitation in Condition 21.a.i. These operating parameters shall be monitored during the initial performance test and continuously thereafter (under §63.6120(e)). Alternatively, Mirant may petition the Administrator for approval of no additional operating limitations, as outlined in §S63.6120(g).

c) Monitoring Requirements [§63.6125]

i) When operating the oxidation catalyst, Mirant shall monitor on a continuous basis the catalyst inlet temperature to demonstrate that the unit is maintaining the 4-hour rolling average of the inlet temperature within the range suggested by the catalyst manufacturer.

ii) When operating without an oxidation catalyst, Mirant shall continuously monitor any parameters specified in Mirant's approved petition to the Administrator.

iii) Mirant shall monitor and record distillate oil usage rates daily for all new and existing stationary combustion turbines (Dickerson Units 4 and 5) with a non-resettable hour meter to measure the number of hours that distillate oil is fired.

d) Continuous Compliance Requirements [§63.6135]

i) Except for monitor malfunctions, associated repairs, and required quality assurance or quality control activities (including, as applicable, calibration checks and required zero and span adjustments of the monitoring system), Mirant shall conduct all parametric monitoring at all times that the combustion turbines are operating.

e) Notifications, Reports, Records [§63.6145]

i) Mirant shall submit all of the notifications in §§63.7(b) and (c), 63.8(3), 63.8(f)(4), and 63.9(b) and (h) that apply to Dickerson.

ii) Mirant shall submit an Initial Notification no later than 120 days after startup [§S63.6145(c)].

iii) Mirant shall submit a notification of intent to conduct an initial performance test at least 60 calendar days before the initial performance test is scheduled to begin as required in §63.7(b)(1) [§63.6145(e)].

iv) Mirant shall submit the Notification of Compliance Status according to the requirements of §63.9(h)(2)(ii), including the performance test results, before the close of business on the 60th calendar day following completion of the performance test [§63.6145(f)].

v) Mirant shall submit a semi-annual compliance report according to Table 6 of §63 Subpart YYYY according the schedules outlined in §63.6150.

vi) Mirant shall submit an annual report under §63.6150(e) describing the number of hours of distillate oil firing by each new or existing stationary combustion turbine at the Dickerson Station; operating limits provided in the federally enforceable permit; any deviations from these limits; and any problems or errors suspected with the meters.

vii) Mirant shall report each instance in which the units did not meet any emissions or operating limitation, and each instance in which the Company did not meet the General Provision requirements in Table 7 of §63 Subpart YYYY [§63.6140(b)].

viii) Mirant shall maintain the following records under §63.6155; the records shall be kept, according to §63.6160 in such a manner that they can be readily accessed and are suitable for inspection according to §63.10(b)(1); The records must be

maintained for five years following the date of each occurrence, measurement, maintenance, correction action, report or record; Mirant shall maintain the most recent 2 years of records on site or the records must be accessible on site:

(A) A copy of each notification and report submitted by Mirant to comply with this subpart;

(B) Records of performance tests and performance evaluations as required in §63.10(b)(2)(viii);

(C) Records of the occurrence and duration of each startup, shutdown, or malfunction as required in §63.10(b)(2)(i);

(D) Records of the occurrence and duration of each malfunction of the air pollution control equipment, if application, as required in §63.10(b)(2)(ii);

(E) Records of all maintenance on the air pollution control equipment as required in §63.10(b)(iii).

f) Other Requirements [§63.6165]

i) Mirant shall meet all applicable General Provisions of §63.1 through §63.15, as outlined in Table 7 of §63 Subpart YYYY, including but limited to performance testing requirements; monitoring, recordkeeping, and notification requirements; requirements related to Startup, Shutdown, and Malfunction (SSM) Plans; and notification requirements.

V. Other Emissions and Operating Restrictions

22. Until such time as the heat recovery steam generator becomes operational on Unit 4, Mirant shall continue to operate the Station H CTs under conditions established under the CPCN issued in 1988 under PSC Case 8063 or subsequent permitting or regulatory requirements.

23. Unit 4 shall be limited to the following after the heat recovery steam generator becomes operational:

a) Operation of a selective catalytic reduction (SCR) system, resulting in a maximum NO_x emission rate not to exceed 4.5 parts per million at 15 percent oxygen on a 3-hour rolling average basis based on valid 40 CFR Part 75 CEM data from the outlet of the device

during natural gas combined cycle firing. The 3-hour rolling average NO_x limit does not apply during periods of startup, shutdown, or malfunctions as defined in 40 CFR 60.2.

b) Operation in simple cycle mode for no more than 500 hours during any consecutive on a 12-month period, of which no more than 250 hours of operation is firing distillate fuel oil;

c) Operation in combined cycle mode while firing distillate fuel oil of no more than 720 hours during any consecutive 12-month period;

d) Operation in simple cycle mode when firing distillate fuel oil shall be limited as follows:

   i) Subject to condition 23(b), the CTs can generate electricity using distillate fuel oil during the ozone season (May 1 through September 30) when natural gas fuel delivery service is interrupted or curtailed by the supplier due to shortages;

   ii) Subject to condition 23(b), the CTs can generate electricity using distillate fuel oil during the ozone season (May 1 through September 30) when PJM declares an emergency, as defined below, or when PJM dispatches the CTs to stabilize the transmission system;

   iii) For the purposes of condition 23(d)(ii), a PJM system emergency is operation during reserve shortages and refers to Maximum Emergency Generation as defined in PJM Manual M-13, Emergency Operations, Section 2 dated May 1, 2003, and subsequent versions. Any changes affecting the definition of emergency conditions for the purposes of this permit must have the prior approval of ARMA, if the change can affect allowable emissions. Mirant shall submit annual reports to ARMA that describe the times, durations, and circumstances of any operations under emergency conditions, including dispatch of the CTs to stabilize the transmission system, and identify whether each declared emergency condition applied to Mirant alone or to any other part of the PJM Interconnection; and

   iv) Mirant shall provide MDE with written verification from its natural gas supplier in each instance where natural gas service to Dickerson is interrupted. Such verification shall be provided to MDE no later than 30 days after the end of the calendar year.

e) Operation of the duct burners shall be limited to periods when Unit 4 is operated in combined cycle mode and firing natural gas; and

f) Operation of each duct burner shall not exceed 688,800 MMBtu during any consecutive 12-month period.

24. Unit 5 shall be limited to the following prior to the heat recovery steam generator becoming operational:

a) Operating for no more than 1,500 hours during any consecutive 12-month rolling period, of which no more than 500 hours of operation is firing distillate fuel oil; and

b) Operation in simple cycle mode when firing distillate fuel oil shall be limited as follows:

i) Subject to condition 24(a), the CTs can generate electricity using distillate fuel oil during the ozone season (May 1 through September 30) when natural gas fuel delivery service is interrupted or curtailed by the supplier due to shortages;

ii) Subject to condition 24(a), the CTs can generate electricity using distillate fuel oil during the ozone season (May 1 through September 30) when PJM declares a system emergency, as defined below, or when PJM dispatches the CTs to stabilize the transmission system;

iii) For the purposes of condition 24(b)(ii), a PJM system emergency is operation during reserve shortages and refers to Maximum Emergency Generation as defined in PJM Manual M-13, Emergency Operations, Section 2 dated May 1, 2003, and subsequent versions. Any changes affecting the definition of emergency conditions for the purposes of this permit must have the prior approval of ARMA, if the change can affect allowable emissions. Mirant shall submit annual reports to ARMA that describe the times, durations, and circumstances of any operations under emergency conditions, including dispatch of the CTs to stabilize the transmission system, and identify whether each declared emergency condition applied to Mirant alone or to any other part of the PJM Interconnection; and

iv) Mirant shall provide MDE with written verification from its natural gas supplier in each instance where natural gas service to Dickerson is interrupted. Such verification shall be provided to MDE no later than 30 days after the end of the calendar year.

25. Pollutant emissions from Unit 5 shall not exceed the following for any consecutive 12-month period prior to the heat recovery steam generator becoming operational:

Pollutant	Emission Limit
Nitrogen Oxides (NO_x)	215 tons per year
Volatile Organic Compounds (VOC)	<25 tons per year
Sulfur Dioxide (SO_2)	59 tons per year
Particulate Matter (PM10)	18 tons per year
Carbon Monoxide (CO)	62 tons per year

26. Unit 5 shall be limited to the following after the heat recovery steam generator becomes operational:

a) Operation of a selective catalytic reduction (SCR) system, resulting in a maximum NO_x emission rate not to exceed 3.5 parts per million at 15 percent oxygen on a 3-hour rolling average basis based on valid 40 CFR Part 75 CEM data from the outlet of the device

during natural gas combined cycle firing. The 3-hour rolling average NO_x limit does not apply during periods of startup, shutdown, or malfunctions as defined in 40 CFR 60.2.

b) Operation in simple cycle mode for no more than 500 hours during any consecutive 12-month period, of which no more than 250 hours of operation is firing distillate fuel oil;

c) Operation in simple cycle mode when firing distillate fuel oil shall be limited as follows:

   i) Subject to condition 26(b), the CTs can generate electricity using distillate fuel oil during the ozone season (May 1 through September 30) when natural gas fuel delivery service is interrupted or curtailed by the supplier due to shortages;

   ii) Subject to condition 26(b), the CTs can generate electricity using distillate fuel oil during the ozone season (May 1 through September 30) when PJM declares a system emergency, as defined below, or when PJM dispatches the CTs to stabilize the transmission system;

   iii) For the purposes of condition 26(c)(ii), a PJM system emergency is operation during reserve shortages and refers to Maximum Emergency Generation as defined in PJM Manual M-13, Emergency Operations, Section 2 dated May 1, 2003, and subsequent versions. Any changes affecting the definition of emergency conditions for the purposes of this permit must have prior approval from ARMA. Mirant shall submit annual reports to ARMA that describe the times, duration, and circumstances of any operations under emergency conditions and identify whether each declared emergency condition applied to Mirant alone or to any other part of the PJM Interconnection; and

   iv) Mirant shall provide MDE with written verification from its natural gas supplier in each instance where natural gas service to Dickerson is interrupted. Such verification shall be provided to MDE no later than 30 days after the end of the calendar year.

d) Operation in combined cycle mode while firing distillate fuel oil for no more than 720 hours for any consecutive 12-month period;

e) Operation of the duct burners shall be limited to periods when Unit 5 is operated in combined cycle mode and firing natural gas; and

f) Operation of each duct burner shall not exceed 688,800 MMBtu for any consecutive 12-month rolling period.

27. Once the heat recovery steam generators become operational, emissions from Unit 4 and Unit 5, and the auxiliary boiler and the cooling tower combined in tons per year shall not exceed the following for any consecutive 12-month period:

Pollutant	Emission Limit
Nitrogen Oxides (NO_x)	841 tons per year
Volatile Organic Compounds (VOC)	<25 tons per year
Sulfur Dioxide (SO_2)	332 tons per year
Particulate Matter (PM10)	347 tons per year
Carbon Monoxide (CO)	205 tons per year

28. Short-term emission limits contained in Tables 1 and 2 do not apply during periods of start-up, shutdown, or malfunction as defined in 40 CFR 60.2.

29. Mirant shall implement control measures on existing Units 1, 2, and 3 such that there will be no net increase of NO_x emissions from the Dickerson source. For the purposes of this condition, net emission increase is defined in accordance with 40 CFR 52.21(b)(3).

30. To avoid triggering Nonattainment Area New Source Review for NO_x emissions, Mirant shall install and operate separated overfire air (SOFA) systems on existing Dickerson coal-fired boilers Unit 1, Unit 2, and Unit 3 prior to commencing operation of equipment covered by this CPCN. Emissions of NO_x from each of the these units individually shall not exceed 0.36 pounds per MMBtu on a 30-day rolling average basis once SOFA systems become operational.

VI. Testing

31. At least 30 days prior to conducting any compliance stack test, Mirant shall submit a test protocol to ARMA for review and approval. Compliance stack testing shall be conducted in accordance with ARMA Technical Memorandum (TM) 91-01, "Test Methods and Equipment Specifications for Stationary Sources" (January 1991), as amended by Supplement 1 (1 July 1991), 40 CFR 51, 40 CFR 60, or subsequent test protocols approved by ARMA. Test ports shall be located in accordance with TM 91-01 (January 1991), or subsequent or alternative measures approved by ARMA.

32. Mirant shall install the SOFA system on either existing Units 1, 2 and/or 3 and shall demonstrate, by a method approved by ARMA, that the unit is achieving the maximum emission rate of 0.36 pounds per MMBtu at least 60 days prior to operation of the Unit 5 combustion turbines in simple cycle mode.

33. Mirant shall install the SOFA systems on the remaining two Units, and shall demonstrate, by a method approved by ARMA, that the units are in compliance with the emission rate of 0.36 pounds per MMBtu at least 60 days prior to commencement of operation of the heat recovery steam generators on Units 4 and 5.

34. Compliance stack testing of Unit 5 in simple cycle mode shall be conducted within 180 days of initial start-up of the unit to quantify pollutant emissions and demonstrate compliance with the emission limits specified in the CPCN for the following pollutants: NO_x, SO_2, PM10, and CO.

35. Compliance stack testing of Units 4 and 5 in combined cycle mode shall be conducted within 180 days of initial start-up of the heat recovery steam generators to quantify pollutant emissions and demonstrate compliance with the emission limits specified in the CPCN for the following pollutants: NO_x, SO_2, PM10, and CO.

36. Compliance stack testing of the auxiliary boiler shall be conducted within 180 days of initial start-up to quantify pollutant emissions and demonstrate compliance with the emission limits specified in the CPCN for the following pollutants: NO_x, SO_2, PM10, and CO.

VII. Recordkeeping and Reporting

37. Within 45 days of the end of each calendar quarter, Mirant shall submit to ARMA quarterly reports that contain for each combustion turbine, the auxiliary boiler, the distillate fuel oil storage tanks, and the cooling towers, monthly summaries of construction progress.

38. Testing of NO_x from Dickerson Units 1, 2 and 3 shall be performed when operating at a minimum of 90% of the design load. If testing cannot be performed at the minimum load, then the actual load during testing shall become the allowable permitted load.

39. Testing of Units 4 and 5 shall be performed when operating at a minimum of 90% of the design turbine load for compressor inlet conditions. If testing cannot be performed at the minimum turbine load, then the actual turbine load during testing shall become the allowable permitted turbine load.

40. Within 60 days of completing the initial stack tests, Mirant shall provide ARMA copies of the testing results.

41. In accordance with COMAR 26.11.01.04A, Mirant may be required to conduct additional stack tests at any time as may be prescribed by ARMA.

42. Final results of each compliance stack test must be submitted to ARMA within 60 days of completion of the test. Analytical data shall be submitted to ARMA directly from the emission testing company.

43. Mirant shall furnish written notification to ARMA, and EPA of the following events:

a) the date construction commenced within 30 days after such date;

b) the anticipated start-up date, not more than 60 or less than 30 days prior to such date;

c) the actual start-up date within 15 days after such date; and

d) the anticipated date of compliance stack testing at least 30 days prior to such date.

44. Mirant shall certify the actual emissions of regulated pollutants from the facility.

a) Certification shall be on a form obtained from ARMA and shall be submitted to ARMA no later than April 1 of the year following the year for which certification is required.

b) The individual making the certification shall certify that the information is accurate to the individual's best knowledge. The certifying individual shall be:

i) familiar with each source for which the certification form is submitted; and

ii) responsible for the accuracy of the emission information.

45. All records and logs shall be maintained at the facility for at least 5 years after the completion of the calendar year in which they were collected. These data shall be readily available for inspection by representatives of ARMA.

46. All air quality notifications and reports required by this CPCN shall be submitted to:

Administrator, Compliance Program
Air and Radiation Management Administration
1800 Washington Blvd.
Baltimore, Maryland 21230

47. All notifications and reports required by 40 CFR 60 and Subpart GG, Subpart Da, Subpart Dc, and Acid Rain provisions, unless specified otherwise, shall be submitted to:

Regional Administrator, US Environmental Protection Agency
Region III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

Table 1
BACT Emission Limitations for Condition 19(a)

Air Emission Source	Fuel	Duct Firing	Emission Rate (lb/hr) PM10	SO_2	H_2SO_4	CO
Unit 5						
Simple Cycle	Natural Gas	No	9	12	1.5	32.2
Simple Cycle	Fuel Oil	No	17	106	5.4	72.4

Emission limitations are based on a 3-hour average.

Table 2
BACT Emission Limitations for Condition 19(b)

Air Emission Source	Fuel	Duct Firing	Emission Rate per CT (lb/hr) PM10	SO_2	H_2SO_4	CO
Unit 4						
Combined Cycle	Natural Gas	No	23	11	1.4	8.4
Combined Cycle	Natural Gas	Yes	26	11	1.7	11.5
Combined Cycle	Fuel Oil	No	41	92	4.4	8.5
Simple Cycle	Natural Gas	No	21	11	1.4	84.2
Simple Cycle	Fuel Oil	No	22	92	4.4	85.3
Unit 5						
Combined Cycle	Natural Gas	No	11	12	1.5	3.2
Combined Cycle	Natural Gas	Yes	15	12	1.8	7.6
Combined Cycle	Fuel Oil	No	39	106	5.4	7.2
Simple Cycle	Natural Gas	No	9	12	1.5	32.2
Simple Cycle	Fuel Oil	No	17	106	5.4	72.4

Emission limitations are based on a 3-hour average.

Water Appropriation

48. This CPCN authorizes Mirant to appropriate and use surface waters of the State. Appropriation means a withdrawal, movement, or diversion of water from its source of natural occurrence. The appropriation will be tracked under MDE WMA permit number MO19668017(07). The surface water appropriation will be subject to the following conditions:

    a) *Allocation.* The surface water withdrawal granted by this appropriation is limited to a daily average of 8.1 million gallons on a yearly basis and a maximum daily withdrawal of 10.1 million gallons. Consumptive use is limited to a daily average of 6.6 million gallons on a yearly basis and a maximum daily consumptive use of 8.3 million gallons.

    b) *Use.* The water is to be used for wet cooling of steam condensers, makeup to the heat recovery steam generators (HRSGs), makeup water for air inlet chillers, fire protection water, potable water, construction support, and plant service water for equipment cleaning and maintenance and general plant washdown.

    c) *Source.* The water shall be withdrawn from the Potomac River.

    d) *Location.* The point of withdrawal shall be on the existing discharge canal of the once-through cooling system at the Dickerson Generating Station in Montgomery County, Maryland.

49. *Initiation of Withdrawal.* Mirant shall notify MDE WMA by certified mail when withdrawals for the uses specified in this appropriation have been initiated. This appropriation shall expire if water withdrawal is not commenced within two years after the effective date of issuance of the CPCN. The time limit may be extended for good cause, at the discretion of MDE WMA, upon written request to MDE WMA prior to the expiration of the two-year period. Withdrawal associated with plant construction qualifies as initiation.

50. *Change of Operations.* Mirant shall report any anticipated change in appropriation, which may result in a new or different withdrawal, quantity, source, or place of use of water, to MDE WMA by submission of a new application.

51. *Triennial Review.* MDE WMA shall review the appropriation every three years (triennial review). Mirant will be queried every three years regarding water withdrawal under the terms and conditions of this appropriation. Failure to return the triennial review query will result in suspension or revocation of this appropriation.

52. *Appropriation Renewal.* This appropriation will expire twelve years from the date that the CPCN was issued. In order to renew the appropriation, Mirant shall file a renewal application with MDE WMA no later than 45 days prior to the expiration. MDE WMA may at any time (including triennial review or when a change application is submitted) revise any condition of this appropriation or add additional conditions concerning the character,

amount, means and manner of the appropriation, which may be necessary to properly protect, control and manage the water resources of the state. Condition revisions and additions will be accompanied by issuance of a revised appropriation.

53. *Right of Entry.* Mirant shall allow authorized representatives of MDE WMA and the Public Service Commission staff access to the facility to conduct inspections and evaluations necessary to assure compliance with the conditions of this appropriation. Mirant shall provide such assistance as may be necessary to effectively and safely conduct such inspections and evaluations.

54. *Appropriation Suspension or Revocation.* MDE WMA may suspend or revoke this appropriation upon violation of the conditions of this appropriation, or upon violation of any regulation promulgated pursuant to Title 5 of the Environment Article, Annotated Code of Maryland (1996 replacement volume) as amended.

55. *Non-Transferable.* This appropriation is only transferable to a new owner if the new owner acquires prior authorization to continue this appropriation by filing a new application with MDE WMA. Authorization will be accomplished by issuance of a new appropriation permit by MDE WMA.

56. *Drought Period Emergency Restrictions.* If MDE WMA determines that a drought period or emergency exists, Mirant may be required under MDE WMA's direction to stop or reduce water withdrawal from the Potomac River. Any cessation or reduction of water withdrawal must continue for the duration of the drought period or emergency, or until MDE WMA directs Mirant that water withdrawal under standard appropriation conditions may be resumed.

57. *Consumptive Use Restrictions.* When directed by MDE WMA, Mirant shall reduce maximum daily consumptive use to 1 million gallons per day or less to comply with the provisions of COMAR 26.07.02B.

58. Mirant shall conduct the following monitoring activities in support of the surface water appropriation:

    a) *Flow Measurement.* Measure all water withdrawn under this appropriation by a method approved by MDE WMA.

    b) *Withdrawal Reports.* Submit to MDE WMA, semi-annually (July-December, no later than January 31 and January-June, no later than July 31), water withdrawal records. These records shall show the total quantity of water withdrawn each month under this appropriation, and the total quantity of water consumed.

Terrestrial and Aquatic Ecology

59. Construction and operation of the power facility and transmission line shall be undertaken in accordance with this CPCN and shall comply with all applicable local, State, and Federal regulations, including but not limited to the following:

    a) Nontidal Wetlands - COMAR 08.05.04 applies to activities conducted in nontidal wetlands.

    b) Water Quality and Water Pollution Control - COMAR 26.08.01 through COMAR 26.08.04 applies to discharges to surface water and maintenance of surface water quality.

    c) Erosion and Sediment Control - COMAR 26.09.01 applies to the preparation, submittal, review, approval, and enforcement of erosion and sediment control plans.

60. All portions of the power plant and rights-of-way disturbed during construction shall be stabilized immediately after the cessation of construction activities within that portion of the right-of-way, followed by seed application, except in actively cultivated lands, in accordance with the best management practices presented in the MDE document 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control, and as approved by Montgomery County. In wetlands and wetland buffers, seed application shall consist of the following species: annual ryegrass (*Lolium multiflorum*), millet (*Setaria italica*), barley (*Horedum* spp.), oats (*Uniola* spp.), and/or rye (*Secale cereale*). Other non-persistent vegetation may be acceptable, but must be approved by MDE Water Management Administration. Kentucky 31 fescue shall not be used in wetlands or buffers.

61. Mirant shall work closely with DNR PPRP, DNR Division of Forestry, and Montgomery County to prepare a forest conservation plan to mitigate for forest losses caused by the proposed construction. The plan will detail methods and specifications for establishment of a total of 7 acres of forest. A draft forest conservation plan shall be submitted to DNR PPRP, DNR Division of Forestry, and Montgomery County for review and approval. Plan implementation shall commence before the facility begins commercial operation.

62. This CPCN is not an authorization to discharge wastewater to waters of the State. Mirant shall obtain a modification to its discharge permit under the National Pollutant Discharge Elimination System (NPDES) for the Dickerson Generating Station. As directed by MDE WMA, Mirant shall prepare a Stormwater Pollution Prevention Plan, incorporating best management practices to prevent runoff of contaminated stormwater.

Emergency Preparedness

63. Mirant shall prepare an updated Spill Prevention, Control and Countermeasures Plan and obtain an Oil Operations Permit from MDE to cover the increased amount of fuel oil storage and handling at the Dickerson site.

64. If the concentration of aqueous ammonia solution used for emissions control is 20 percent or greater and ammonia storage capacity exceeds 10,000 pounds, Mirant shall prepare a Risk Management Program (RMP) to address accidental release prevention as required by 40 CFR Part 68. All reports and notifications required by 40 CFR Part 68 must be submitted electronically to: RMP*Submit, RMP Reporting Center, P.O. Box 3346, Merrifield, VA 22116-3346.

65. Mirant shall provide to PPRP and the PSC copies of its security procedures, in particular those procedures to ensure site and plant safety and security during construction and operation of the power plant. The procedures should address issues such as how Mirant plans to control vehicle and construction worker access to the site and to protect any vulnerable assets from being threatened from outside the perimeter of the property. The procedures should also identify how local, state, and federal agencies would be coordinated in the event of a large-scale emergency. Security procedures should consider the effects of any proposed measures on the surrounding community and mitigate adverse effects to the maximum extent possible.

Cultural Resources

66. Mirant shall establish Archeological Protection Zones for the Benjamin and Charles Shreve Farm and the Shreve House in order to protect these historic resources from inadvertent damage from construction activities. Mirant shall erect temporary protective fencing around the sites during construction.

67. Mirant shall submit to Maryland Historical Trust (MHT) a copy of training programs, or guidelines provided to inspectors or contractors, to identify and/or protect unforeseen archeological sites that may be revealed during construction of the power plant and associated facilities. If such archeological sites or relics are identified in the project area, Mirant, in consultation with and as approved by MHT, shall develop and implement a plan for avoidance and protection, data recovery, or destruction without recovery of the properties adversely affected by the project.

Traffic

68. During construction, Mirant shall retain a Traffic Management Specialist to manually control vehicle movements at the intersection of Martinsburg Road with MD 28.

69. Mirant shall monitor the performance of the intersection of MD 28 and MD 109 to determine whether significant delays are occurring when construction traffic volumes are greatest. If significant delays are observed, Mirant shall take appropriate steps to reduce congestion at this intersection, such as working with State Highway Administration to adjust the timing of the traffic signal or staggering shift schedules to reduce the peak number of construction workers leaving the site in the afternoon.

70. Mirant shall instruct its contractors and employees to use MD 28 to Martinsburg Road as the

primary means of access to the site, and to avoid using the portion of Martinsburg Road to the south of the main plant entrance as an alternate route to the facility.

Noise Levels

71. Mirant shall design, construct, and operate the facility so as to comply with applicable Montgomery County and State of Maryland noise regulations. Before construction begins, Mirant shall verify that the analysis of noise impacts presented in the CPCN application adequately represents the predicted noise impacts of the actual equipment to be installed at the Dickerson site. If changes in configuration or equipment type occur during the detailed facility design, and these changes materially alter the facility's predicted noise characteristics, then Mirant shall provide an updated noise impact analysis.

72. Mirant shall monitor noise levels at the boundaries of the facility, after the plant is operational, to verify results of the predictive analysis. The scope of work for the noise monitoring shall be provided to MDE's Noise Control Program and to Montgomery County for review and approval, within one year after the issuance of this CPCN. The noise study shall include monitoring at facility site boundaries near residential properties. Measurements will be taken while the plant is operating at full load, to represent maximum noise emissions. Results shall be provided within six months after Units 4 and 5 begin commercial operation.

73. If the results of the noise monitoring conducted in Condition 71 indicate that the operation of Units 4 and 5 is creating an exceedance of the Maryland or Montgomery County noise standards, Mirant shall take corrective action in consultation with MDE's Noise Control Program and Montgomery County.

Visual Quality

74. Mirant shall develop a detailed visual impact mitigation plan and submit it to PPRP and the PSC for review and approval prior to commencing construction of the facility. The plan shall address, at a minimum, specific steps that will be taken to minimize visual impact of the proposed facility. The plan shall specifically address the visibility of Mirant's oil storage tanks from Martinsburg Road and consider the use of earthen berms and vegetation to screen them from view. The plan shall also discuss how intrusive night lighting will be minimized.

75. Mirant shall install plume abated mechanical draft cooling towers for the combined cycle portions of Units 4 and 5.

Other

76. Mirant shall work closely with PPRP to prepare and execute a program of land preservation and/or reforestation to reflect a partial mitigation of the environmental impact from the project. The mitigation project will achieve one or more of the following objectives: 1) provide a nutrient reduction benefit to the Chesapeake Bay, 2) result in a net reduction of greenhouse gases leading to the establishment of potential carbon credits, or 3) protect important State terrestrial ecological assets.

77. Mirant will provide a minimum of 20 million gallons of water storage, the first 10 million gallons to be available when the Unit 4 HRSG and steam turbine commence commercial operation. The second 10 million gallons will be available when the Unit 5 HRSG and steam turbine commence commercial operation.

    After the Unit 5 HRSG and steam turbine commence commercial operation, Mirant will provide an additional 10 million gallons of water storage, not to exceed a total of 40 million gallons for the project, if, due to Potomac River water limitations, Mirant experiences a loss of 40 hours of generating availability when the PJM East hourly integrated load is more than 90% of the PJM East annual peak demand during any one year.

78. Informational copies of the reports required regarding change of ownership, major milestones, stack test protocols, stack testing, water withdrawals, archeological recovery guidelines, and noise studies as described in Conditions 11, 31, 40, 43, 49, 50, 52, 58, 67, 71, and 72 shall be sent to the Power Plant Research Program at:

    Power Plant Assessment Division
    Department of Natural Resources
    Tawes State Office Building, B-3
    580 Taylor Avenue
    Annapolis, Maryland 21401

APPENDIX B

SUPPLEMENTAL CPCN CONDITIONS

PSC CASE NO. 8888

MIRANT DICKERSON DEVELOPMENT, LLC

Transmission Improvements/Interconnection Requirements

1. Prior to putting any portion of the project in service, Mirant shall file with the Commission a listing of the transmission system improvements required by PJM and certification that the improvements have been completed; and, prior to putting any portion of the project in service, Mirant shall file with the Commission a listing of the interconnection requirements required by the interconnecting transmission line owner and certification that the interconnection requirements have been met. Mirant shall make such filings at least thirty (30) days prior to putting any portion of the project in service.

Water Use

2. As a result of a Trigger Low Flow Day, as defined in Condition 3 below, and after receiving the notice prescribed in Condition 5 below, Mirant will reduce its "consumptive water use" (as defined in COMAR § 26.17.07) for Units 4 and 5 from the Potomac River to 1 million gallons per day ("MGD") unless and until the Parties otherwise agree, in a writing duly executed by the Parties, upon the terms pursuant to which Mirant will compensate the Fairfax County Water Authority, Washington Suburban Sanitary Commission and Washington Aqueduct Division of the U.S. Army Corps of Engineers (collectively the "Suppliers") for Mirant's additional consumptive water use above 1 MGD during designated "Restriction Days," as hereafter defined.

3. A Trigger Low Flow Day is defined as:

   a. A calendar day when more than 25 million gallons of water is released from the Jennings-Randolph and/or Savage Reservoirs for water supply purposes; or

   b. A calendar day that is not the same calendar day as a Restriction Day, imposed pursuant to Condition 4a below, as a result of releases from the Jennings-Randolph and/or Savage Reservoirs as provided in Condition 3a above, when more than 10 million gallons of water is released from the Little Seneca Reservoir for water supply purposes.

c. For purposes of this Agreement, no more than two Trigger Low Flow Days can occur on a single calendar day.

d. The Parties agree that if a new water resource is developed by the Suppliers or the Interstate Commission on the Potomac River Basin Section for the Cooperative Water Supply Operations on the Potomac ("ICPRB Co-Op") in the future, the Parties will, in good faith, negotiate a new trigger mechanism for that resource.

4. Restriction Day is defined as either:

a. A calendar day that is no less than 3 days and no more than 8 days after a Trigger Low Flow Day from either the Jennings-Randolph or Savage Reservoirs. The exact calendar day within the 5-day window will be determined by ICPRB Co-Op, after consultation with the Suppliers and Mirant; or

b. A calendar day after a Trigger Low Flow Day from the Little Seneca Reservoir. The exact calendar day will be determined solely by ICPRB Co-Op, after consultation with the Suppliers and Mirant. A Restriction Day that results from a release at the Little Seneca Reservoir may not be imposed later than six months following the Trigger Low Flow Day from the Little Seneca Reservoir during which the restriction obligation was generated; and

c. Restriction Days cannot exceed in number the corresponding Trigger Low Flow Days.

5. The ICPRB Co-Op, after consultation with the Suppliers, must provide written notice that is received by Mirant at least three days in advance of the designated Restriction Day.

6. ICPRB Co-Op and Suppliers' Powers. Nothing in the Agreement shall modify or restrict the powers or authority of the ICPRB Co-Op, the Suppliers, the Commonwealth of Virginia, the State of Maryland or the District of Columbia. Furthermore, nothing in this Agreement is intended to alter the procedures set forth in the Drought-related Operations Manual for the Washington Metropolitan Area Water Supplies for determining when water releases shall occur including, without limitation, the review and oversight authority of the Operations Committee set forth in Section IV of that manual.

<u>CO_2 Project</u>

7. Sugarloaf will allocate 30% of the funds contributed by Mirant to the Environmental Foundation to a project or projects devoted to mitigation of CO_2 emissions, such

as the planting of trees.

8. The Agreement of Stipulation and Settlement between Mirant, Sugarloaf Citizens Association, Inc., Jane S. Hunter and Tina T. Brown (the "Settling Parties") is expressly contingent on the Department of Natural Resources, Power Plant Research Program agreeing that the Environmental Foundation's CO_2 project or projects referred to in paragraph 6 fulfills every requirement or condition for, and takes the place of, any other CO_2 project that might otherwise be imposed on Mirant in relation to the Project and further that no other CO_2 project be imposed on Mirant in this proceeding.

Environmental Management System

9. Mirant shall implement an Environmental Management System (EMS) for the Dickerson Generating Station that generally conforms to the substantive requirements of International Organization for Standardization's ISO 14001 standard titled "Environmental Management Systems – Specification with Guidance for Use" (1996), as it may be updated. The EMS will be implemented within six months of the beginning of commercial operation of Unit 5, the beginning of commercial operation of the Unit 4 HRSG, or July 1, 2008, whichever occurs first. Air emissions from all Mirant Dickerson operations will be addressed in the EMS as significant aspects. Mirant shall obtain an appropriate certification of the EMS through the ISO Registrar, or from another third party, such as the U.S.E.P.A., or from an internal authority which is independent from the facility, such as the Mirant Corporate Audit organization.

Diesel Fuel Transportation

10. Mirant will install the infrastructure necessary to receive diesel fuel by rail and convert to rail delivery by the date of commencement of operation of Unit 5. However, Mirant reserves the right to receive diesel fuel by truck in the event of an emergency, such as a rail strike, derailment or comparable emergency circumstance.