

CALPINE
BLUE HERON
ENERGY CENTER

*Site Certification
Application*

*Volume 1
Chapters 1-2*

Submitted by



BLUE HERON
ENERGY CENTER, L.L.C.

Prepared by

ECT

Environmental Consulting & Technology, Inc.

*October 2000
(Rev. 1 - December 2004)*



Environmental Consulting & Technology, Inc.

December 20, 2004
ECT No. 040796-0100

RECEIVED

DEC 23 2004

BUREAU OF AIR REGULATION

Mr. Hamilton S. Oven, Jr.
Siting Coordination Office
Florida Department of Environmental Protection
2600 Blair Stone Road, MS 48
Tallahassee, FL 32399

Re: Blue Heron Energy Center
Site Certification Application (SCA) No. PA00-42
DOAH Case No. 00-4564EPP
Responses to Agency Sufficiency Comments and Revisions to the SCA

Dear Mr. Oven:

On behalf of Blue Heron Energy Center, L.L.C. (Calpine), enclosed are three copies of Calpine's responses to the "sufficiency comments" that were sent to Calpine by the Florida Department of Environmental Protection (FDEP) on March 15, 2002. The FDEP's sufficiency comments included questions and comments from the St. Johns River Water Management District (SJRWMD) and the other agencies involved in the review of Calpine's Blue Heron Energy Center (BHEC) in Indian River County. The agency comments are included in Attachment A of Calpine's response document.

Also included are three copies of Calpine's revisions to its SCA for the BHEC. Copies of Calpine's sufficiency responses and revisions to the SCA are also being provided directly to the recipients of the SCA and the parties to this proceeding as indicated in the attached Distribution List.

Calpine has concluded that several aspects of the BHEC should be changed and, therefore, Calpine has revised the project description in the SCA. The following paragraphs highlight the key changes to the BHEC and the SCA.

First, as a result of corporate organizational changes, the name of the applicant for the BHEC SCA has changed from Calpine Construction Finance Company, L.P., to Blue Heron Energy Center, L.L.C. (referred to herein and in the SCA as Calpine). Calpine is a Delaware limited liability company that will construct, own, and operate the BHEC. Calpine is a subsidiary of Calpine Corporation, which owns and operates over 90 power plants in the United States.

3701 Northwest
98th Street
Gainesville, FL
32606

(352)
332-0444

FAX (352)
332-6722

Y:\GDP-04\CALPINE\BHECSUFRESP\UDD1220.DOC.1

Letter Mr. Hamilton S. Oven, Jr.
Florida Department of Environmental Protection
December 20, 2004
Page 2

Second, Calpine has determined that the BHEC Project will be constructed in two phases, with an ultimate site capacity of a nominal 1,080 megawatts (MW). Phase I will consist of one "2 on 1" combined cycle power plant and will have a generating capacity of 540 MW. Phase I will consist of two Siemens Westinghouse 501F combustion turbine generators integrated with two heat recovery steam generators and one steam turbine generator, as described in the SCA. Phase II of the Project will consist of a second 540-MW "2 on 1" combined cycle power plant. Calpine currently anticipates that construction of Phase I will commence in mid-2005 with a commercial operation date in mid-2007. In the near future Calpine will submit its petition for a determination of need for Phase I of the BHEC to the Public Service Commission.

Based on its current phased development plan, Calpine is hereby amending the SCA for the BHEC. In this proceeding, Calpine is now requesting certification for the construction and operation of Phase I (i.e., a nominal 540-MW electric generating plant and associated facilities) and certification for an ultimate site capacity of 1,080 MW. Calpine recognizes that a supplemental application will need to be submitted and approved in the future, before Calpine commences construction and operation of Phase II (i.e., the second 540-MW facility).

Third, Calpine has concluded that the BHEC will *not* interconnect with the Gulfstream natural gas pipeline system and, therefore, Calpine will not build the natural gas pipeline through St. Lucie County that previously had been proposed. Instead, the BHEC will only interconnect with the Florida Gas Transmission (FGT) Company's natural gas transmission system, which is located on the west side of I-95 west of the Site. The FGT pipeline is located between two Florida Power & Light Company (FPL) 230-kV electric transmission line rights-of-way. Calpine's interconnection with FGT will serve as the only source of natural gas for the Project. The natural gas pipeline interconnection between the BHEC and FGT system will be constructed, owned, and operated by Calpine. Calpine is revising the SCA for the BHEC and seeking certification of the corridor for this natural gas pipeline interconnection in this proceeding.

Fourth, a Conceptual Site Plan and Special Exception Use for the BHEC was approved by the Board of County Commissioners of Indian River County on September 18, 2001. To satisfy the County's requirements, Calpine agreed to dedicate to the County a 30-foot-wide drainage and utility easement adjacent to the 74th Avenue right-of-way, which is located along the eastern boundary of the BHEC site. To provide this easement, the location of the BHEC on the site had to be shifted 30 feet to the west. This minor shift did not change the overall arrangement of the BHEC, but did necessitate a change in the site plan. However, the two onsite wetlands and buffer areas were not affected by this change.

Letter Mr. Hamilton S. Oven, Jr.
Florida Department of Environmental Protection
December 20, 2004
Page 3

Fifth, on August 12, 2004, Calpine entered into an "Agreement Concerning Delivery and Use of Stormwater" (Agreement) with Indian River County and the Indian River Farms Water Control District (IRFWCD). Under this Agreement, Indian River County will withdraw stormwater from the IRFWCD's canal system and then route the stormwater through the County's Egret Marsh Regional Stormwater Park. Water from the stormwater park will be provided to Calpine for use as the primary source of water for the BHEC. The Agreement also allows Indian River County, at its option, to supplement the stormwater with a specified quantity of brine discharged from the County's South Plant reverse osmosis drinking water treatment facility. Other aspects of the Agreement include Calpine's commitment to: (a) purchase additional property for expansion of the stormwater park by Indian River County; (b) design and construct, at its expense, the pipelines and pumping stations that will be used to deliver water to the stormwater park and to BHEC; and (c) transfer ownership of the property, pipelines, and pumping stations to Indian River County or IRFWCD. Therefore, Calpine will "be a contributing partner in the County's stormwater management efforts."

Most of the sufficiency comments from FDEP and the other reviewing agencies concerned the water supply plan for the BHEC. Calpine's plan has now been finalized with the Agreement, which is contained in Attachment B of the sufficiency responses. The Agreement also is contained in the revised Appendix 10.9 of the SCA.

Sixth, Calpine has continued to refine its plans to minimize potential environmental impacts associated with airborne emissions from the BHEC. Based on these refinements, Calpine is revising the entire PSD permit application in Volume 3, Appendix 10.1.1, of the SCA. Key revisions in the PSD permit application primarily involve reductions in air emissions based on the use of the best available control technology. For example, the removal efficiency of the selective catalytic reduction system has been improved and nitrogen oxides emissions will be reduced from the previously requested 3.5 parts per million, volume dry (ppmvd), to 2.0 ppmvd (corrected to 15 percent oxygen, on a 24-hour block average basis). In addition, Calpine is now planning to use an oxidation catalyst system to minimize emissions of carbon monoxide and volatile organic compounds. Calpine's revised PSD permit application, and other related SCA sections that reflect the changes in the PSD application, are provided in the enclosed revisions.

The revisions to the SCA include updated information and an analysis of the electromagnetic (EMF) fields associated with the new transmission lines that Calpine will use to connect the BHEC to the existing FPL transmission lines on the west side of I-95. The EMF analyses demonstrate that the new transmission lines comply with FDEP's EMF rules.

The enclosed revisions to the SCA are designated as Rev. 1—12/04, which indicate that these revisions were submitted in December 2004. The revisions include instructions for

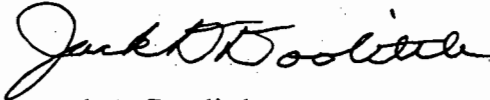
Letter Mr. Hamilton S. Oven, Jr.
Florida Department of Environmental Protection
December 20, 2004
Page 4

inserting the revised pages and sections in the 4-volume SCA. Calpine requests each recipient to update their copy(ies) of the SCA accordingly.

We are available to discuss any of Calpine's sufficiency responses and SCA revisions with you or other agency personnel to facilitate your review of the SCA. Please call me at 352/332-0444 if you have any questions.

Sincerely,

ENVIRONMENTAL CONSULTING & TECHNOLOGY, INC.



Jack D. Doolittle
Project Manager

JDD/tsw

Enclosure

cc: Steve Palmer, FDEP, w/attachments
Scott Goorland, Esq., FDEP w/attachments
Tim Eves, Calpine, w/attachments
Ben Borsch, Calpine, w/attachments
David Dee, Esq., Landers & Parsons, w/attachments
All Recipients of Site Certification Application, as shown on the attached Distribution List, w/attachments

SCA DISTRIBUTION LIST FOR BLUE HERON ENERGY CENTER

DEP - Tallahassee

1. Al Linero
Administrator of New Source Review
Bureau of Air Regulation
Department of Environmental Protection
2600 Blair Stone Road
MS: 5500
Tallahassee, Florida 32399-2400
(1 copy)

2. Cleve Holladay
Engineer IV
Bureau of Air Regulation
Department of Environmental Protection
2600 Blair Stone Road
MS: 5505
Tallahassee, Florida 32399-2400
(1 copy)

3. Jeff Koerner
Bureau of Air Regulation
Department of Environmental Protection
2600 Blair Stone Road
MS: 5505
Tallahassee, Florida 32399-2400
(1 copy)

4. Hamilton S. Oven, Jr., P.E.
Administrator
Office of Siting Coordination
Department of Environmental
Protection
2600 Blair Stone Road, MS: 48
Tallahassee, Florida 32399-3000
(3 copies)

5. Scott Goorland
Senior Assistant General Counsel
Office of General Counsel
Department of Environmental Protection
3900 Commonwealth Blvd., MS: 35
Tallahassee, Florida 32399-3000
(1 copy)

6. Steven Palmer, P.E.
Office of Siting Coordination
Department of Environmental Protection
2600 Blair Stone Road, MS 48
Tallahassee, Florida 32399-3000

7. Richard D. Drew
Bureau Chief
Bureau of Water Facilities Regulation
NPDES
2600 Blair Stone Road, MS: 3535
Tallahassee, Florida 32399
(1 copy)

8. Jim Stoutamire
Administrator
Water Resource Management
2600 Blair Stone Road, Room 530-B
Tallahassee, Florida 32399-2400
(1 copy)

9. William Hinkley
Bureau of Solid and Hazardous Waste
Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399
(1 copy)

DEP - Melbourne

10. Deborah Valin
Central District Branch Office
Department of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, Florida 32803
(1 copy)

DEP - Orlando

11. Len Kozlov
Program Administrator
Air Resources Management
Department of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, Florida 32803
(1 copy)

12. Christianne Ferraro, P.E.
Program Administrator, Water Facilities
Department of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, Florida 32803
(1 copy)

13. Debra Laisure
Stormwater Engineer
Environmental Resource Program
Department of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, Florida 32803
(1 copy)

14. Tom Lubozynski, P.E.
Administrator, Waste Management
Department of Environmental Protection
Central District Office
3319 Maguire Blvd., Suite 232
Orlando, Florida 32803-3767
(1 copy)

Division of Administrative Hearings

15. Honorable J. Lawrence Johnston
Administrative Law Judge
Division of Administrative Hearings
The DeSoto Building
1230 Apalachee Parkway
Tallahassee, Florida 32399-3060
(1 copy)

DOT

16. Sandra Whitmire
Intergovernmental Coordination & Review Coordinator
Department of Transportation
605 Suwannee Street, MS: 27
Tallahassee, Florida 32399-0450
(1 copy)

17. Gus Schmidt
Planning Manager
Florida Department of Transportation
3400 W. Commercial Blvd.
Ft. Lauderdale, Florida 33309
(1 copy)

18. Sheauching Yu
Assistant General Counsel
Department of Transportation
605 Suwannee Street, MS 58
Tallahassee, FL 32399-0458
(transmittal letter only-no SCA copies)

FFWCC

19. Jim Antista
General Counsel
Florida Fish and Wildlife Conservation Commission
620 S. Meridian Street
Tallahassee, Florida 32399-1600
(1 copy)

20. Mary Ann Poole
Director
Office of Policy and Stakeholder Coordination
Florida Fish and Wildlife Conservation Commission
Ferris Bryant Building, Room 101
620 S. Meridian Street
Tallahassee, Florida 32399
(1 copy)

DCA

21. Heidi Hughes
General Counsel
Office of General Counsel
Department of Community Affairs
2555 Shumard Oak Blvd.
Tallahassee, Florida 32399-2100
(1 copy)

22. Paul Darst
Planner IV
Department of Community Affairs
Sadowski Building
2555 Shumard Oak Blvd.
Tallahassee, Florida 32399-2100
(1 copy)

SJRWMD

23. Mary Ellen Jones
Office of General Counsel
St. Johns River Water Management District
4049 Reid Street
Palatka, Florida 32177
(3 copies)

24. Rich Burklew
St. Johns River Water Management District
525 Community College Parkway, S.E.
Palm Bay, Florida 32909
(3 copies)

TCRPC

25. Michael Busha
Executive Director
Treasure Coast Regional Planning Council
301 E. Ocean Blvd., Suite 300
Stuart, Florida 34994
(1 copy)

26. Roger Saberson
General Counsel
Treasure Coast Regional Planning Council
70 S.E. 4th Avenue
Delray Beach, Florida 33483
(1 copy)

St. Lucie County

27. Doug Anderson
County Administrator
St. Lucie County
2300 Virginia Avenue
Ft. Pierce, Florida 34982
(3 copies)
28. Dan McIntyre
County Attorney
St. Lucie County
2300 Virginia Avenue
3rd Floor Administrative Annex
Ft. Pierce, Florida 34982-5652
(1 copy)

Indian River County

29. Joseph A. Baird
County Administrator
Indian River County
1840 25th Street
Vero Beach, Florida 32960
(3 copies)
30. William G. Collins, II
County Attorney
Indian River County
1840 25th Street
Vero Beach, Florida 32960
(1 copy)

PSC

31. Rick Melson
General Counsel
Public Service Commission
Division of Legal Services
2540 Shumard Oak Blvd.
Tallahassee, Florida 32399
(2 copies)

Indian River Farms

32. Scott Lambath
President
Indian River Farms Water Control District
4400 20th Street
Vero Beach, Florida 32966
(1 copy)
33. David Gunter
Secretary-Treasurer
Indian River Farms Water Control District
4400 20th Street
Vero Beach, Florida 32966
(2 copies)
34. Michael O'Haire
O'Haire Quinn & Candler, Chartered
3111 Cardinal Drive
Vero Beach, Florida 32963
(1 copy)

Others

35. Beverly Bannister, Director
Division of Air, Pesticides and Toxic Management
U.S. Environmental Protection Agency
61 Forsyth Street, SW
Atlanta, Georgia 30303
(1 copy)

36. Ellen Porter
National Park Service
Air Quality Branch
Post Office Box 25287
Denver, Colorado 80225
(1 copy)

37. Dr. John O. Agwunobi
Secretary
Department of Health
4052 Bald Cypress Way
Tallahassee, Florida 32399
(1 copy)

38. Michael Long
Director
Division of Forestry
Department of Agriculture & Consumer Services
3125 Conner Blvd.
Tallahassee, Florida 32399-1650
(1 copy)

39. Frederick Gaske
Division of Historical Resources
Department of State
R.A. Gray Bldg.
500 S. Bronough, Room 305
Tallahassee, Florida 32399-0250
(1 copy)

40. Indian River County Main Library
1600 21st Street
Vero Beach, Florida 32960
(1 copy)

41. St. Lucie County Library
Ft. Pierce Branch
101 Melody Lane
Ft. Pierce, Florida 34950
(1 copy)

42. Terry E. Lewis
Amy M. Dukes
Lewis, Longman & Walker, P.A.
1700 Palm Beach Lakes Blvd., Suite 1000
West Palm Beach, Florida 33401
(1 copy)

43. Charles Lee
Senior Vice President
Audubon of Florida
1331 Palmetto Avenue, Suite 110
Winter Park, Florida 32789
(1 copy)
44. Kevin S. Doty
Hatch & Doty, P.A.
1701 A1A, Suite 220
Vero Beach, Florida 32963-2206
(1 copy)

APPLICANT INFORMATION

Please supply the following information

Applicant's Official Name: Blue Heron Energy Center, L.L.C.

Applicant's Address: 2701 N. Rocky Point Drive, Suite 1200
Tampa, FL 33607

Address of Official Headquarters: 50 West San Fernando Street
San Jose, CA 95113

Business Entity (corporation, partnership, co-operative): Corporation

Owner: Blue Heron Energy Center, L.L.C.

Name and Title of Chief Executive Officer: Peter Cartwright, Chief Executive Officer

Name, Address, and Phone Number of Official Representative Responsible for

Obtaining Certification: Timothy R. Eves, Vice President

Blue Heron Energy Center, L.L.C.

2701 N. Rocky Point Drive, Suite 1200

Tampa, FL 33607

813/637-7303; 813/637-7399 (FAX)

Site Location (County): Indian River County

Nearest Incorporated City: Vero Beach

Latitude and Longitude: 27° 33' 49N" 80° 28' 52W"

UTMs: Northerly: 3,048.7 Easterly: 551.2 Zone: 17

Section, Township, Range: Section 36, Township 33S, Range 38E

Location of any directly associated transmission facilities (counties): N/A

Name Plate Generating Capacity: 1,080 MW (nominal, average ambient)

Capacity of Proposed Additions and Ultimate Site Capacity (where applicable): N/A

Remarks (additional information that will help identify the applicant): N/A

**SITE CERTIFICATION APPLICATION
FOR THE
BLUE HERON ENERGY CENTER**

Environmental Consulting & Technology, Inc.
3701 Northwest 98th Street
Gainesville, Florida 32606



Thomas W. Davis, P.E.
Florida Professional Engineer Registration No. 36777

December 15, 2004

Date

TABLE OF CONTENTS

<u>Section</u>		<u>Page</u>
	EXECUTIVE SUMMARY	ex-1
1.0	NEED FOR POWER AND THE PROPOSED FACILITIES	1-1
1.1	<u>INTRODUCTION</u>	1-2
1.1.1	THE APPLICANT	1-2
1.1.2	PURPOSE OF SITE CERTIFICATION APPLICATION	1-2
1.2	<u>NEED FOR THE PROPOSED PROJECT</u>	1-4
1.2.1	NEED FOR THE PROJECT	1-4
1.2.2	NEED FOR ELECTRIC SYSTEM RELIABILITY AND INTEGRITY	1-5
1.2.3	NEED FOR ADEQUATE ELECTRICITY AT A REASONABLE COST	1-7
1.2.4	STRATEGIC CONSIDERATIONS	1-8
1.2.5	COST EFFECTIVENESS	1-9
	1.2.5.1 <u>Cost Effectiveness to Specific Utilities</u>	1-9
	1.2.5.2 <u>Cost Effectiveness to Peninsular Florida</u>	1-9
	1.2.5.3 <u>Cost Effectiveness to Calpine</u>	1-11
1.2.6	ENERGY CONSERVATION	1-11
1.3	<u>OVERVIEW OF THE BLUE HERON ENERGY CENTER</u>	1-13
1.3.1	INTRODUCTION	1-13
1.3.2	SITE LOCATION AND DESCRIPTION	1-13
1.3.3	PROJECT DESCRIPTION	1-14
1.4	BENEFITS OF THE PROJECT	1-16
2.0	SITE AND VICINITY CHARACTERIZATION	2-1
2.1	<u>SITE AND ASSOCIATED FACILITIES DELINEATION</u>	2-2
2.2	<u>SOCIO-POLITICAL ENVIRONMENT</u>	2-10
2.2.1	Governmental Jurisdictions	2-11
2.2.2	Zoning and Land Use Plans	2-13

TABLE OF CONTENTS
(Continued, Page 2 of 10)

<u>Section</u>		<u>Page</u>
	2.2.2.1 <u>Comprehensive Plan Future Land Use Map</u>	2-13
	2.2.2.2 <u>Zoning</u>	2-13
2.2.3	DEMOGRAPHY AND ONGOING LAND USE	2-16
2.2.4	EASEMENTS, TITLE, AND AGENCY WORKS	2-19
2.2.5	REGIONAL SCENIC, CULTURAL, AND NATURAL LANDMARKS	2-20
2.2.6	ARCHAEOLOGICAL AND HISTORIC SITES	2-25
2.2.7	SOCIOECONOMIC AND PUBLIC SERVICES	2-26
	2.2.7.1 <u>Socioeconomic</u>	2-26
	2.2.7.2 <u>Public Services</u>	2-28
2.3	<u>BIOPHYSICAL ENVIRONMENT</u>	2-35
2.3.1	GEOHYDROLOGY	2-36
	2.3.1.1 <u>Geological Description of Site Area</u>	2-36
	2.3.1.2 <u>Detailed Site Lithologic Description</u>	2-40
	2.3.1.3 <u>Geologic Maps</u>	2-50
	2.3.1.4 <u>Bearing Strength</u>	2-55
2.3.2	SUBSURFACE HYDROLOGY	2-56
	2.3.2.1 <u>Subsurface Hydrological Data for Site</u>	2-56
	2.3.2.2 <u>Karst Hydrogeology</u>	2-80
2.3.3	SITE WATER BUDGET AND AREA USERS	2-85
2.3.4	SURFICIAL HYDROLOGY	2-111
	2.3.4.1 <u>Hydrologic Characterization</u>	2-111
	2.3.4.2 <u>Measurement Programs</u>	2-132
2.3.5	VEGETATION/LAND USE	2-133
2.3.6	ECOLOGY	2-138
	2.3.6.1 <u>Species—Environmental Relationships</u>	2-138
	2.3.6.2 <u>Preexisting Stresses</u>	2-150
	2.3.6.3 <u>Measurement Programs</u>	2-150

TABLE OF CONTENTS
(Continued, Page 3 of 10)

<u>Section</u>	<u>Page</u>
2.3.7 METEOROLOGY AND AMBIENT AIR QUALITY	2-152
2.3.7.1 <u>Climatology/Meteorology</u>	2-152
2.3.7.2 <u>Ambient Air Quality</u>	2-161
2.3.7.3 <u>Measurement Programs</u>	2-167
2.3.8 NOISE	2-169
2.3.9 OTHER ENVIRONMENTAL FEATURES	2-181
3.0 THE PLANT AND DIRECTLY ASSOCIATED FACILITIES	3-1
3.1 <u>BACKGROUND</u>	3-2
3.1.1 MAJOR POWER PLANT FACILITIES AND SYSTEMS	3-3
3.1.2 ASSOCIATED LINEAR FACILITIES	3-8
3.2 <u>SITE LAYOUT</u>	3-10
3.3 <u>FUEL</u>	3-15
3.4 <u>AIR EMISSIONS AND CONTROLS</u>	3-17
3.4.1 AIR EMISSION TYPES AND SOURCES	3-17
3.4.2 AIR EMISSION CONTROLS	3-22
3.4.3 BEST AVAILABLE CONTROL TECHNOLOGY	3-26
3.4.3.1 <u>Methodology</u>	3-27
3.4.3.2 <u>Summary of BACT Determinations</u>	3-28
3.4.4 DESIGN DATA FOR CONTROL EQUIPMENT	3-32
3.4.5 DESIGN PHILOSOPHY	3-32
3.5 <u>PLANT WATER USE</u>	3-34
3.5.1 HEAT DISSIPATION SYSTEM	3-39
3.5.1.1 System Design	3-39
3.5.1.2 <u>Source of Cooling Water</u>	3-40
3.5.1.3 <u>Dilution System</u>	3-43
3.5.1.4 <u>Blowdown, Screened Organisms, and Trash Disposal</u>	3-48
3.5.1.5 <u>Injection Wells</u>	3-48

TABLE OF CONTENTS
(Continued, Page 4 of 10)

<u>Section</u>		<u>Page</u>
	3.5.2 DOMESTIC/SANITARY WASTEWATER	3-48
	3.5.3 POTABLE WATER SYSTEMS	3-48
	3.5.4 PROCESS WATER SYSTEMS	3-48
3.6	<u>CHEMICAL AND BIOCIDES WASTE</u>	3-50
3.7	<u>SOLID AND HAZARDOUS WASTE</u>	3-51
	3.7.1 SOLID WASTE	3-51
	3.7.2 HAZARDOUS WASTE	3-51
3.8	<u>ONSITE DRAINAGE SYSTEM</u>	3-52
	3.8.1 DESIGN CONCEPTS	3-52
	3.8.2 SITE LAYOUT AND IMPERVIOUS AREAS	3-52
	3.8.3 SURFACE RECEIVING WATERS	3-53
	3.8.4 GROUND RECEIVING WATERS	3-53
	3.8.5 DIVERSION OF OFFSITE DRAINAGE	3-53
	3.8.6 EROSION CONTROL MEASURES	3-53
	3.8.7 RUNOFF CONTROL	3-54
	3.8.8 LOCATION OF DISCHARGE POINTS FOR STORM RUNOFF	3-55
	3.8.9 STORMWATER DETENTION POND	3-55
	3.8.10 OFFSITE CONSTRUCTION LAYDOWN AREA DRAINAGE SYSTEM	3-56
3.9	<u>MATERIALS HANDLING</u>	3-58
	3.9.1 CONSTRUCTION MATERIALS AND EQUIPMENT	3-58
	3.9.2 OPERATIONS MATERIALS	3-59
4.0	EFFECTS OF SITE PREPARATION, AND PLANT AND ASSOCIATED FACILITIES CONSTRUCTION	4-1
4.1	<u>LAND IMPACT</u>	4-2
	4.1.1 GENERAL CONSTRUCTION IMPACTS	4-3
	4.1.1.1 <u>Use of Explosives</u>	4-4
	4.1.1.2 <u>Laydown Area</u>	4-4
	4.1.1.3 <u>Railroads</u>	4-4
	4.1.1.4 <u>Bridges</u>	4-5

TABLE OF CONTENTS
(Continued, Page 5 of 10)

<u>Section</u>	<u>Page</u>
4.1.1.5 <u>Service Lines</u>	4-5
4.1.1.6 <u>Disposal of Trash and Other Construction Wastes</u>	4-5
4.1.1.7 <u>Clearing, Site Preparation, and Earthwork</u>	4-6
4.1.1.8 <u>Impact of Construction Activities on Existing Terrain</u>	4-6
4.1.2 ROADS	4-7
4.1.3 FLOOD ZONES	4-7
4.1.4 TOPOGRAPHY AND SOILS	4-7
4.2 <u>IMPACT ON SURFACE WATER BODIES AND USES</u>	4-9
4.2.1 IMPACT ASSESSMENT	4-9
4.2.2 MEASURING AND MONITORING PROGRAM	4-9
4.3 <u>GROUND WATER IMPACTS</u>	4-11
4.3.1 IMPACT ASSESSMENT	4-11
4.3.2 MEASURING AND MONITORING PROGRAM	4-13
4.4 <u>ECOLOGICAL IMPACTS</u>	4-14
4.4.1 IMPACT ASSESSMENT	4-14
4.4.1.1 <u>Aquatic Systems</u>	4-14
4.4.1.2 <u>Terrestrial Systems—Flora</u>	4-14
4.4.1.3 <u>Terrestrial Systems—Fauna</u>	4-17
4.4.2 MEASURING AND MONITORING PROGRAM	4-18
4.5 <u>AIR IMPACTS</u>	4-19
4.5.1 EMISSIONS	4-19
4.5.2 EMISSION CONTROL MEASURES	4-19
4.5.3 POTENTIAL IMPACTS AND MONITORING PROGRAMS	4-20
4.6 <u>IMPACT ON HUMAN POPULATIONS</u>	4-21
4.6.1 LAND USE IMPACTS	4-21
4.6.2 CONSTRUCTION EMPLOYMENT	4-21

TABLE OF CONTENTS
(Continued, Page 6 of 10)

<u>Section</u>		<u>Page</u>
	4.6.3 CONSTRUCTION TRAFFIC IMPACTS	4-22
	4.6.4 HOUSING IMPACTS	4-22
	4.6.5 PUBLIC FACILITIES AND SERVICES	4-22
	4.7 <u>NOISE IMPACTS</u>	4-24
	4.8 <u>IMPACT ON LANDMARKS AND SENSITIVE AREAS</u>	4-27
	4.9 <u>IMPACT ON ARCHAEOLOGICAL AND HISTORIC SITES</u>	4-28
	4.10 <u>SPECIAL FEATURES</u>	4-29
	4.11 <u>BENEFITS FROM CONSTRUCTION</u>	4-30
	4.12 <u>VARIANCES</u>	4-31
5.0	EFFECTS OF PLANT OPERATION	5-1
	5.1 <u>EFFECTS OF THE OPERATION OF THE HEAT DISSIPATION SYSTEM</u>	5-2
	5.1.1 TEMPERATURE EFFECT OF RECEIVING BODY OF WATER	5-2
	5.1.2 EFFECTS ON AQUATIC LIFE	5-2
	5.1.3 BIOLOGICAL EFFECTS OF MODIFIED CIRCULATION	5-3
	5.1.4 EFFECTS OF OFFSTREAM COOLING	5-3
	5.1.4.1 <u>Blowdown Discharge Effects</u>	5-3
	5.1.4.2 <u>Cooling Tower Fogging/Drift Effects</u>	5-3
	5.1.5 MEASUREMENT PROGRAM	5-8
	5.2 <u>EFFECTS OF CHEMICAL AND BIOCIDES DISCHARGES</u>	5-9
	5.2.1 INDUSTRIAL WASTEWATER DISCHARGES	5-9
	5.2.2 COOLING TOWER BLOWDOWN	5-9
	5.2.3 MEASUREMENT PROGRAMS	5-9
	5.3 IMPACTS ON WATER SUPPLIES	5-10
	5.3.1 SURFACE WATER	5-10
	5.3.1.1 <u>Primary Water Supply Impacts</u>	5-10
	5.3.1.2 <u>Surface Water Quality Impact</u>	5-16

TABLE OF CONTENTS
(Continued, Page 7 of 10)

<u>Section</u>		<u>Page</u>
5.3.2	GROUND WATER	5-17
5.3.2.1	<u>Impacts from Plant Pollutants</u>	5-17
5.3.2.2	<u>Impacts from Ground Water Withdrawals</u>	5-17
5.3.3	DRINKING WATER	5-18
5.3.4	LEACHATE AND RUNOFF	5-18
5.3.5	MEASUREMENT PROGRAMS	5-19
5.4	<u>SOLID/HAZARDOUS WASTE DISPOSAL IMPACTS</u>	5-20
5.4.1	SOLID WASTE	5-20
5.4.2	HAZARDOUS WASTE	5-21
5.5	<u>SANITARY AND OTHER WASTE DISCHARGES</u>	5-22
5.6	<u>AIR QUALITY IMPACTS</u>	5-23
5.6.1	IMPACT ASSESSMENT	5-23
5.6.1.1	<u>Introduction</u>	5-23
5.6.1.2	<u>Regulatory Applicability and Overview of Impact Analyses</u>	5-23
5.6.1.3	<u>Analytical Approach</u>	5-25
5.6.1.4	<u>Summary of Air Quality Impacts</u>	5-26
5.6.1.5	<u>Nitrogen Deposition</u>	5-27
5.6.1.6	<u>Other Air Quality-Related Impacts</u>	5-30
5.6.2	MONITORING PROGRAMS	5-33
5.7	<u>NOISE</u>	5-36
5.7.1	IMPACTS TO ADJACENT PROPERTIES	5-36
5.7.2	IMPACTS TO BIOTA	5-41
5.8	<u>CHANGES IN NON-AQUATIC SPECIES POPULATIONS</u>	5-42
5.8.1	IMPACTS	5-42
5.8.2	MONITORING	5-42

TABLE OF CONTENTS
(Continued, Page 8 of 10)

<u>Section</u>		<u>Page</u>
5.9	<u>OTHER PLANT OPERATION EFFECTS</u>	5-43
	5.9.1 TRAFFIC IMPACTS	5-43
	5.9.2 MONITORING	5-43
5.10	<u>ARCHAEOLOGICAL SITES</u>	5-44
5.11	<u>RESOURCES COMMITTED</u>	5-45
5.12	<u>VARIANCES</u>	5-46
6.0	TRANSMISSION LINES AND OTHER LINEAR FACILITIES	6-1
6.1	<u>TRANSMISSION LINES</u>	6-2
	6.1.1 PROJECT INTRODUCTION	6-2
	6.1.2 CORRIDOR LOCATION AND LAYOUT	6-2
	6.1.3 TRANSMISSION LINE DESIGN CHARACTERISTICS	6-6
	6.1.4 COST PROJECTIONS	6-10
	6.1.5 CORRIDOR SELECTION	6-10
	6.1.6 SOCIO-POLITICAL ENVIRONMENT OF THE CORRIDOR AREA	6-11
	6.1.7 BIOPHYSICAL ENVIRONMENT OF THE CORRIDOR AREA	6-12
	6.1.8 EFFECTS OF RIGHT-OF-WAY PREPARATION AND TRANSMISSION LINE CONSTRUCTION	6-19
	6.1.9 POST-CONSTRUCTION IMPACTS AND EFFECTS OF MAINTENANCE	6-24
	6.1.10 OTHER POST-CONSTRUCTION EFFECTS	6-25
6.2	<u>NATURAL GAS PIPELINE</u>	6-58
	6.2.1 PROJECT INTRODUCTION	6-58
	6.2.2 CORRIDOR LOCATION AND LAYOUT	6-58
	6.2.3 PIPELINE DESIGN CHARACTERISTICS	6-59
	6.2.4 COST PROJECTIONS	6-59
	6.2.5 CORRIDOR SELECTION	6-59
	6.2.6 SOCIO-POLITICAL ENVIRONMENT OF THE CORRIDOR AREA	6-60
	6.2.7 BIO-PHYSICAL ENVIRONMENT OF THE CORRIDOR AREA	6-61
	6.2.8 EFFECTS OF NATURAL GAS PIPELINE CONSTRUCTION	6-62

TABLE OF CONTENTS
(Continued, Page 9 of 10)

<u>Section</u>	<u>Page</u>
6.2.9 POST-CONSTRUCTION IMPACTS AND EFFECTS OF MAINTENANCE	6-73
6.3 <u>WATER SUPPLY PIPELINE</u>	6-77
6.3.1 INTRODUCTION	6-77
6.3.2 CORRIDOR LOCATION AND LAYOUT	6-79
6.3.3 WATER SUPPLY PIPELINE DESIGN CHARACTERISTICS	6-79
6.3.4 COST PROJECTIONS	6-81
6.3.5 CORRIDOR SELECTION	6-81
6.3.6 SOCIO-POLITICAL ENVIRONMENT OF THE CORRIDOR	6-81
6.3.7 BIO-PHYSICAL ENVIRONMENT OF THE CORRIDOR	6-86
6.3.8 EFFECTS OF RIGHT-OF-WAY PREPARATION AND PIPELINE CONSTRUCTION	6-87
6.3.9 POST-CONSTRUCTION IMPACT AND EFFECTS OF MAINTENANCE	6-89
6.3.10 OTHER POST-CONSTRUCTION EFFECTS	6-90
7.0 ECONOMIC AND SOCIAL EFFECTS OF PLANT CONSTRUCTION AND OPERATION	7-1
7.1 <u>SOCIOECONOMIC BENEFITS</u>	7-2
7.1.1 TAX REVENUES	7-2
7.1.2 CONSTRUCTION EMPLOYMENT	7-4
7.1.3 OPERATION EMPLOYMENT	7-4
7.1.4 BRINE USE	7-5
7.1.5 OTHER BENEFITS	7-5
7.2 <u>SOCIOECONOMIC COSTS</u>	7-7
7.2.1 TEMPORARY EXTERNAL COSTS	7-7
7.2.2 LONG-TERM EXTERNAL COSTS	7-7
7.2.2.1 <u>Aesthetics</u>	7-7
7.2.2.2 <u>Public Services/Facilities</u>	7-78
7.2.2.3 <u>Land Use</u>	7-8

TABLE OF CONTENTS
(Continued, Page 10 of 10)

Section

8.0	SITE AND DESIGN ALTERNATIVES	8-1
9.0	COORDINATION	9-1
10.0	APPENDICES	
10.1	<u>FEDERAL AND STATE PERMIT APPLICATIONS OR APPROVALS</u>	
	10.1.1 PREVENTION OF SIGNIFICANT DETERIORATION	
	10.1.2 JOINT ENVIRONMENTAL RESOURCE PERMIT/ SECTION 404 APPLICATION/PLANS	
	10.1.3 STORMWATER MANAGEMENT PLAN	
	10.1.4 CONSUMPTIVE WATER USE PERMIT APPLICATION (SURFACE WATER)	
	10.1.5 COASTAL ZONE MANAGEMENT CERTIFICATIONS	
	10.1.6 LAND USE SPECIAL EXCEPTION APPLICATION AND APPROVAL	
10.2	<u>ZONING DESCRIPTIONS</u>	
10.3	<u>LAND USE PLAN DESCRIPTIONS</u>	
10.4	<u>EXISTING STATE PERMITS</u>	
10.5	<u>MONITORING PROGRAMS</u>	
10.6	<u>CORRESPONDENCE WITH FDEP AND DHR</u>	
10.7	<u>SEASONAL AND ANNUAL COOLING TOWER DRIFT ANALYSIS</u>	
10.8	<u>PROPOSED NATURAL GAS PIPELINE PLANS</u>	
10.9	<u>WATER SUPPLY AGREEMENT</u>	
10.10	<u>SITE SURVEY</u>	

LIST OF TABLES

<u>Table</u>		<u>Page</u>
2.3.2-1	Ground Water Quality Results, Onsite Surficial Aquifer Samples Collected April 27, 2000	2-65
2.3.2-2	Artesian Wells Sampled Near Hercules Injection Test Well	2-74
2.3.3-1	Average Monthly Temperatures and Rainfall at West Palm Beach, Florida, for October 1950 through September 1999	2-85
2.3.3-2	Water Use in 1996 By Category in Indian River County	2-87
2.3.3-3	Projected Water Use in 2020 By Category in Indian River County	2-88
2.3.3-4	Monthly Agricultural, Recreational, and Landscape Irrigation Water Use in Indian River County in 1996	2-88
2.3.3-5	1996 Monthly Thermoelectric Power Generation Water Use in Indian River County (Vero Beach Municipal Power Plant)	2-89
2.3.3-6	1996 Monthly Commercial/Industrial/Institutional Water Use in Indian River County	2-89
2.3.3-7	1996 Monthly Public Supply Water Use in Indian River County	2-91
2.3.3-8	Indian River County Consumptive Use Permits—Ground Water	2-93
2.3.3-9	Indian River County Consumptive Use Permits—Surface Water	2-102
2.3.3-10.	Indian River County Consumptive Use Permittees	2-104
2.3.3-11	St. Lucie County Consumptive Use Permit Holders within SFWMD	2-107
2.3.4-1	Historic Flow Values for Main, North, and South Canals	2-115
2.3.4-2	Indian River Lagoon Water Quality Sampling	2-118
2.3.4-3	Indian River County Surface Water Samples, March 2000 Sampling Event	2-120
2.3.4-4	Historical Water Quality of Main, North, and South Canals	2-123
2.3.4-5	Indian River County Surface Water, Sediment, and Reclaimed Water Samples (July 12, 2000 Sampling Event)	2-127

LIST OF TABLES
(Continued, Page 2 of 4)

<u>Table</u>		<u>Page</u>
2.3.5-1	Land Use Cover Types Present at the BHEC Site	2-137
2.3.6-1	Wildlife Species Observed On The BHEC Site February 15 and April 10-12, 2000	2-142
2.3.6-2	State- or Federally Listed Plant Species Potentially Occurring Onsite	2-145
2.3.6-3	State- or Federally Listed Wildlife Species Potentially Occurring Onsite	2-148
2.3.7-1	Meteorological Data from West Palm Beach, Florida	2-153
2.3.7-2	Annual and Seasonal Average Distribution of Atmospheric Stability Classes for West Palm Beach, Florida (1987 through 1991)	2-160
2.3.7-3	Annual and Seasonal Average Mixing Heights for West Palm Beach, Florida (1987 through 1991)	2-161
2.3.7-4	National and Florida Air Quality Standards	2-162
2.3.7-5	Ambient Air Quality Monitoring Stations Closest to the BHEC Site	2-163
2.3.7-6	Summary of FDEP PM ₁₀ Monitoring Near the BHEC Site	2-165
2.3.7-7	Summary of FDEP SO ₂ Monitoring Near the BHEC Site	2-165
2.3.7-8	Summary of FDEP NO ₂ Monitoring Near the BHEC Site	2-166
2.3.7-9	Summary of FDEP CO Monitoring Near the BHEC Site	2-166
2.3.7-10	Summary of FDEP Ozone Monitoring Near the BHEC Site	2-166
2.3.8-1	24-Hour Composite Ambient Sound Survey Data	2-172
2.3.8-2	15-Minute Ambient Sound Level Survey Data	2-173
2.3.8-3	Indian River County Noise Limits	2-178
2.3.8-4	St. Lucie County Applicable Noise Limits	2-180

LIST OF TABLES
(Continued, Page 3 of 4)

<u>Table</u>		<u>Page</u>
3.2.0-1	Preliminary Dimensions of Major Plant Facilities and Structures for the BHEC	3-10
3.3.0-1	Typical Natural Gas Composition	3-15
3.4.1-1	Maximum Criteria Pollutant Emission Rates for Three Unit Loads and Five Ambient Temperatures (per CTG/HRSG)	3-18
3.4.1-2	Maximum H ₂ SO ₄ Mist Emission Rates for Three Unit Loads and Five Ambient Temperatures (per CTG/HRSG)	3-19
3.4.1-3	Emergency Diesel Engine Maximum Criteria Pollutant Emission Rates	3-20
3.4.1-4	Cooling Tower Maximum Criteria Pollutant Emission Rates	3-20
3.4.1-5	Fuel Gas Heater Maximum Criteria Pollutant Emission Rates	3-21
3.4.1-6	Maximum Annualized Emission Rates for BHEC	3-22
3.4.1-7	CTG/HRSG Stack Parameters for Three Unit Loads and Five Ambient Temperatures (Per CTG/HRSG)	3-23
3.4.1-8	Cooling Tower Stack Parameters	3-24
3.4.2-1	Summary of Air Emission Controls	3-26
3.4.3-1	Summary of Proposed BACT Emission Limitations	3-27
4.7.0-1	Construction Equipment and Composite Site Noise Levels	4-25
5.1.4-1	SACTI Modeling Results for the BHEC	5-5
5.3.1-1	Historical Discharge Flows for Main, North, and South Canals	5-11
5.3.1-2	Computed Historic Discharges from IRFWCD Lower Pool	5-12
5.3.1-3	Results of Simulations of Lower Pool Levels and Discharges with Project Water Withdrawals	5-13
5.6.1-1	Projected Emissions Compared to PSD Significance Rates	5-24

LIST OF TABLES
(Continued, Page 4 of 4)

<u>Table</u>		<u>Page</u>
5.6.1-2	Maximum BHEC Project Criteria Pollutant Impacts	5-27
5.6.1-3	AAQS and PSD Class Increment Analysis for PM ₁₀	5-29
5.7.0-1	Summary of Ambient Sound Level Measurements	5-38
5.7.0-2	Sound Attenuation for Sound Transmission Through Medium-Dense Woods	5-40
5.7.0-3	BHEC Noise Modeling Results	5-41
6.1.10-1	Transmission Line Parameter Data	6-28
6.1.10-2	Calculated Maximum EMF for the BHEC 230-kV Transmission Lines	6-32
6.1.10-3	Calculated Maximum EMF for the BHEC 230-kV Transmission Lines at the Point of Entry to the Facility Property—Phasing Option 1	6-42
6.1.10-4	Calculated Maximum EMF for the BHEC 230-kV Transmission Lines	6-46
6.1.10-5	Calculated Maximum EMF for the BHEC 230-kV Transmission Lines at the Point of Entry to the Facility Property—Phasing Option 2	6-56
7.1.1-1	BHEC Estimated Local Tax Revenue	7-3
9.0.0-1	BHEC Agency Contacts	9-1

LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
2.1.0-1	BHEC Site Location Map	2-3
2.1.0-2	Site Vicinity Map	2-4
2.1.0-3	Aerial at 1:24,000 Showing Locational Features	2-5
2.1.0-4	Project Site and Immediate Vicinity	2-6
2.1.0-5	Flood-Prone Map	2-9
2.2.1-1	FDOT Map with 5-Mile Radius	2-12
2.2.2-1	Comprehensive Plan Designations within 5-Mile Radius	2-14
2.2.2-2	Approximate Zoning Designations	2-15
2.2.3.1	Land Use/Vegetation Type within 5-Mile Radius of Plant Site	2-18
2.2.5-1	Surface Water Resources	2-21
2.2.5-2	Upland Natural Communities	2-22
2.2.5-3	Upland Plant Communities	2-23
2.2.7-1	Parks in Indian River County	2-29
2.2.7-2	St. Lucie County Recreational Facilities	2-30
2.2.7-3	Fire And EMS Station Locations	2-31
2.2.7-4	Transportation Network	2-34
2.3.1-1	Block Diagram Showing Generalized Features and Geologic Formations in Indian River County	2-37
2.3.1-2	Generalized Section of Geologic Formations in Indian River County	2-39
2.3.1-3	Soil Boring Locations	2-42
2.3.1-4	Lithologic Profiles at the Site—Deep	2-43

LIST OF FIGURES
(Continued, Page 2 of 7)

<u>Figure</u>		<u>Page</u>
2.3.1-5	Lithologic Profiles at the Site—Shallow	2-44
2.3.1-6	Lithologic Cross-Section A-A' at the Site	2-45
2.3.1-7	Lithologic Cross-Section B-B' at the Site	2-46
2.3.1-8	Lithologic Log for Well 34D at the Indian River County Landfill	2-48
2.3.1-9	Lithologic Log at Hercules, Inc.	2-49
2.3.1-10	Geologic Map of Indian River and St. Lucie Counties	2-51
2.3.1-11	Soils Map	2-52
2.3.2-1	Hydrogeologic Cross Section through Southern Indian River County	2-57
2.3.2-2	Deep Regional Hydrogeologic Cross Section	2-58
2.3.2-3	Water Table Elevation Contour Map (January 1994)	2-61
2.3.2-4	Onsite Monitoring Well Locations and Water Level Data	2-62
2.3.2-5	Middle Semi-Confining Unit: Thickness and Top Elevation	2-67
2.3.2-6	Elevation of Top of Upper Floridan Aquifer in Indian River County	2-68
2.3.2-7	Model-Derived Transmissivity of the Upper Floridan Aquifer and Locations of Selected Aquifer Test Sites	2-70
2.3.2-8	Potentiometric Surface Elevation of the Upper Floridan Aquifer (May 1997)	2-71
2.3.2-9	Potentiometric Surface Elevation of the Upper Floridan Aquifer (September 1997)	2-72
2.3.2-10	Locations of Artesian Wells Inventoried Near the Hercules, Inc. Deep Injection Well Site	2-76
2.3.2-11	Thickness of the Upper Confining Unit	2-78

LIST OF FIGURES
(Continued, Page 3 of 7)

<u>Figure</u>		<u>Page</u>
2.3.2-12	Model-Derived Leakage Coefficient of the Upper Confining Unit	2-79
2.3.2-13	Geologic, Hydrologic, and Water Quality Summary from the Deep Injection Well at the Hercules, Inc. Site	2-81
2.3.2-14	Map of Florida Showing Areas Prone to Sinkhole Development	2-83
2.3.3-1	Water Users Within a 5-Mile Radius of the Site	2-92
2.3.4-1	IRFWCD Within East Indian River County	2-112
2.3.4-2	IRFWCD Canal Network and Gate Locations	2-113
2.3.4-3	Main, North, and South Canals—Monthly Average Flow (01/01/49 to 09/30/96)	2-116
2.3.4-4	Main, North, and South Canals—Minimum Monthly Flows (01/01/49 to 09/30/96)	2-117
2.3.4-5	Water Quality Sampling Locations	2-122
2.3.5-1	Vegetation and Land Use Map	2-134
2.3.5-2	Vegetation and Land Use Map	2-135
2.3.5-3	Land Use/Vegetation Types within 5-Mile Radius of Plant Site	2-136
2.3.7-1	5-Year Annual Wind Rose for West Palm International Airport (1987-1991)	2-155
2.3.7-2	5-Year Winter Wind Rose for West Palm Beach International Airport (1987-1991)	2-156
2.3.7-3	5-Year Spring Wind Rose for West Palm Beach International Airport (1987-1991)	2-157
2.3.7-4	5-Year Summer Wind Rose for West Palm Beach International Airport (1987-1991)	2-158
2.3.7-5	5-Year Fall Wind Rose for West Palm Beach International Airport (1987-1991)	2-159

LIST OF FIGURES
(Continued, Page 4 of 7)

<u>Figure</u>		<u>Page</u>
2.3.7-6	Locations of Closest FDEP Ambient Air Quality Monitoring Stations	2-164
2.3.7-7	Other Point Air Emission Sources	2-168
2.3.8-1	Noise Monitoring Locations	2-170
3.1.1-1	Combined-Cycle Schematic Diagram	3-4
3.2.0-1	General Site Layout	3-11
3.2.0-2	Site Layout on Aerial Photograph	3-12
3.2.0-3	Site Elevation Profiles	3-13
3.5.0-1	Water Balance Diagram—Annual Average Daily Water Use	3-36
3.5.0-2	Water Balance Diagram—Peak Daily Water Use	3-37
3.5.1-1	Location of Pumping Stations and Pipelines for Plant Water Supply	3-41
3.5.1-2	Location of Pumping Stations and Pipelines for Plant Water Supply—Aerial Photograph	3-42
3.5.1-3	Pump Structure Location in Lateral C Canal	3-44
3.5.1-4	Pump Station Cross Section in Lateral C Canal	3-45
3.5.1-5	Piping and Pump Station Location in Stormwater Park	3-46
3.5.1-6	Pump Station Cross Section in Stormwater Park	3-47
4.4.1-1	Project Area—Land Use and Vegetation Construction Impacts	4-15
5.6.1-1	Comparison of Background Atmospheric Deposition of Nitrogen to the Maximum Nitrogen Deposition Attributable to the BHEC Project	5-29
5.7.0-1	Noise Receptor and Ambient Noise Measurement Locations	5-37

LIST OF FIGURES
(Continued, Page 5 of 7)

<u>Figure</u>		<u>Page</u>
6.1.2-1	FDOT Map with 5-Mile Radius (1-Mile Intervals) From Transmission Line and Natural Gas Pipeline Corridors	6-3
6.1.2-2	Transmission Line and Natural Gas Pipeline Corridors Vicinity Map	6-4
6.1.2-3	Aerial Photograph of Corridors for Proposed Transmission Line and Natural Gas Pipeline Interconnections.	6-5
6.1.3-1	Typical Single Pole Transmission Configuration	6-7
6.1.3-2	Proposed Onsite Switchyard Arrangement	6-9
6.1.7-1	Land Use/Land Cover Types On and In the Vicinity of the Proposed Transmission Line and Natural Gas Pipeline Corridors	6-13
6.1.7-2	Vegetative Communities On and Surrounding Proposed Transmission Line and Natural Gas Pipeline Corridors	6-14
6.1.8-1	Proposed Transmission Line Crossing of I-95	6-22
6.1.10-1	Lateral (Mid-Span) Profile of Electric Field at Maximum Operating Voltage for Minimum Conductor Heights over Open Ground (23 ft) and at Highway Crossings (25 ft) with all Four Circuits Operating (Phasing Option 1)	6-34
6.1.10-2	Lateral (Mid-Span) Profile of Magnetic Field at Maximum Conductor Rating for Minimum Conductor Heights over Open Ground (23 ft) and at Highway Crossings (25 ft) with all Four Circuits Operating (Phasing Option 1)	6-35
6.1.10-3	Lateral (Mid-Span) Profile of Electric Field at Maximum Operating Voltage for Minimum Conductor Heights over Open Ground (23 ft) and at Highway Crossings (25 ft) with the Two Outer Circuits Operating (Phasing Option 1)	6-36
6.1.10-4	Lateral (Mid-Span) Profile of Magnetic Field at Maximum Operating Conductor Rating for Minimum Conductor Heights over Open Ground (23 ft) and at Highway Crossings (25 ft) with the Two Outer Circuits Operating (Phasing Option 1)	6-37

LIST OF FIGURES
(Continued, Page 6 of 7)

<u>Figure</u>		<u>Page</u>
6.1.10-5	Lateral (Mid-Span) Profile of Electric Field at Maximum Operating Voltage for Minimum Conductor Heights over Open Ground (23 ft) and at Highway Crossings (25 ft) with the Two Inner Circuits Operating (Phasing Option 1)	6-38
6.1.10-6	Lateral (Mid-Span) Profile of Magnetic Field at Maximum Conductor Rating for Minimum Conductor Heights over Open Ground (23 ft) and at Highway Crossings (25 ft) with the Two Inner Circuits Operating (Phasing Option 1)	6-39
6.1.10-7	Lateral (Mid-Span) Profile of Electric Field at Maximum Operating Voltage for Minimum Conductor Heights at the Crossing of the Substation Property Line (Phasing Option 1)	6-40
6.1.10-8	Lateral (Mid-Span) Profile of Magnetic Field at Maximum Conductor Rating for Minimum Conductor Height at the Crossing of the Substation Property Line (Phasing Option 1)	6-41
6.1.10-9	Lateral (Mid-Span) Profile of Electric Field at Maximum Operating Voltage for Minimum Conductor Heights Over Open Ground (23 ft) and at Highway Crossings (25 ft) with all Four Circuits Operating (Phasing Option 2)	6-48
6.1.10-10	Lateral (Mid-Span) Profile of Magnetic Field at Maximum Conductor Rating for Minimum Conductor Heights Over Open Ground (23 ft) and at Highway Crossings (25 ft) with all Four Circuits Operating (Phasing Option 2)	6-49
6.1.10-11	Lateral (Mid-Span) Profile of Electric Field at Maximum Operating Voltage for Minimum Conductor Heights Over Open Ground (23 ft) and at Highway Crossings (25 ft) with the Two Outer Circuits Operating (Phasing Option 2)	6-50
6.1.10-12	Lateral (Mid-Span) Profile of Magnetic Field at Maximum Conductor Rating for Minimum Conductor Heights Over Open Ground (23 ft) and at Highway Crossings (25 ft) with the Two Outer Circuits Operating (Phasing Option 2)	6-51
6.1.10-13	Lateral (Mid-Span) Profile of Electric Field at Maximum Operating Voltage for Minimum Conductor Heights Over Open Ground (23 ft) and at Highway Crossings (25 ft) with the Two Inner Circuits Operating (Phasing Option 2)	6-52

LIST OF FIGURES
(Continued, Page 7 of 7)

<u>Figure</u>		<u>Page</u>
6.1.10-14	Lateral (Mid-Span) Profile of Magnetic Field at Maximum Conductor Rating for Minimum Conductor Heights Over Open Ground (23 ft) and at Highway Crossings (25 ft) with the Two Inner Circuits Operating (Phasing Option 2)	6-53
6.1.10-15	Lateral Profile of Electric Field at Maximum Operating Voltage for Minimum Conductor Height at the Crossing of the Substation Property Line (Phasing Option 2)	6-54
6.1.10-16	Lateral (Mid-Span) Profile of Magnetic Field at Maximum Conductor Rating for Minimum Conductor Height at the Crossing of the Substation Property Line (Phasing Option 2)	6-55
6.2.8-1	Right-of-Way Configuration for 24-Inch OD Pipeline Collocated with Existing Pipeline, Powerline, or Railroad Right-of-Way	6-64
6.3.1-1	Location of Pumping Stations and Pipelines for Plant Water Supply	6-78
6.3.2-1	Location of Pumping Stations and Pipelines for Plant Water Supply—Aerial Photograph	6-80
6.3.3-1	Makeup Water Pump Structure Location	6-82
6.3.3-2	Pump Station Cross Section in Lateral C Canal	6-83
6.3.3-3	Piping and Pump Station Location in Stormwater Park	6-84
6.3.3-4	Pump Station Cross Section in Stormwater Park	6-85

ABBREVIATIONS, ACRONYMS, AND
UNITS OF MEASURE

AAP	ABB Alstom Power Environmental Segment
AAQS	ambient air quality standards
ACSR	aluminum conductor steel reinforced
AET	actual evapotranspiration
AM	amplitude modulation
ANSI	American National Standards Institute
AQRV	air quality related value
BACT	best available control technology
BDL	below detection limit
BEBR	Bureau of Economic and Business Research
BHEC	Blue Heron Energy Center
BMP	best management practice
B.P.	Before Present
BPA	Bonneville Power Authority
B&R	Burns and Roe Enterprises
Btu	British thermal unit
Btu/ft ³	British thermal unit per cubic foot
°C	degrees Centigrade
CAA	Clean Air Act
Calpine	Blue Heron Energy Center, L.L.C.
CCSI	Catalytica Combustion Systems, Inc.
CCVT	coupling capacitor voltage transformer
CDM	Camp Dresser & McKee
CFR	Code of Federal Regulations
cfm-ft ²	cubic foot per minute-square foot
cfs	cubic feet per second
cm/sec	centimeter per second
CNEL	community noise equivalent level
CO	carbon monoxide
CO ₂	carbon dioxide
CR	County Road
CTG	combustion turbine generator
CUP	consumptive use permit
°	degree
db	decibel
DB	duct burner
dBA	A-weighted decibel
DDT	dichlorodiphenyltrichloroethane
DHR	Division of Historic Resources
DHS	Division of Historical Resources
DLN	dry low-NO _x
DOE	Department of Energy
DOT	U.S. Department of Transportation

ABBREVIATIONS, ACRONYMS, AND
UNITS OF MEASURE
(Continued, Page 2 of 6)

ECT	Environmental Consulting & Technology, Inc.
EMF	electric and magnetic fields
EMS	Emergency Medical Service
EPA	U.S. Environmental Protection Agency
ER&M	Electric Research & Management, Inc.
ERP	environmental resource permit
ESP	electrostatic precipitator
°F	degrees Fahrenheit
F.A.C.	Florida Administrative Code
FAESS	Florida Association of Environmental Soil Scientists
FBN	fuel bound nitrogen
FCC	Federal Communications Commission
FCG	Florida Electric Power Coordinating Group
FCMP	Florida Coastal Management Program
FDACS	Florida Department of Agriculture and Consumer Services
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
FEER	Florida East Coast Railroad
FEECA	Florida Energy Efficiency and Conservation Act
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FFWCC	Florida Fish and Wildlife Conservation Commission
FGD	flue gas desulfurization
FGT	Florida Gas Transmission Company
FIRM	Flood Insurance Rate Map
FLUCFCS	Florida Land Use, Cover and Forms Classification System
FM	frequency modulation
FMPA	Florida Municipal Power Agency
FNAI	Florida Natural Areas Inventory
FPL	Florida Power & Light Company
fps	foot per second
FRCC	Florida Reliability Coordinating Council
F.S.	Florida Statutes
ft	foot
ft ²	square foot
ft ³	cubic foot
ft/day	feet per day
ft ² /day	square foot per day
ft bls	feet below land surface
ft-msl	feet above mean sea level
ft-NGVD	feet National Geodetic Vertical Datum
FWENC	Foster Wheeler Environmental Corporation

ABBREVIATIONS, ACRONYMS, AND
UNITS OF MEASURE
(Continued, Page 3 of 6)

GAQM	<i>Guideline for Air Quality Models</i>
GLET	Goal Line Environmental Technologies
gN/m ² -yr	grams nitrogen per square meter per year
gpd	gallon per day
gpm	gallon per minute
gr S/100 dscf	grains of sulfur per 100 dry standard cubic feet
gr/dscf	grains per dry standard cubic foot
g/s	gram per second
GSU	generator step-up
Gulfstream	Gulfstream Natural Gas System, L.L.C.
H ₂ O	water
H ₂ S	hydrogen sulfide
H ₂ SO ₄	sulfuric acid
HAP	hazardous air pollutant
HHV	higher heating value
HNO ₃	nitric acid
HRSG	heat recovery steam generator
hr/yr	hour per year
I	Interstate
IRFWCD	Indian River Farms Water Control District
ISCST3	Industrial Source Complex Short-Term
ISO	International Standards Organization
JEA	Jones, Edmunds & Associates, Inc.
K	Kelvin
kcmil	thousand circular mil
kg/km ²	kilogram per square kilometer
km	kilometer
kV	kilovolt
kV/m	kilovolt per meter
kW	kilowatt
kWh	kilowatt-hour
lb/acre/month	pound per acre per month
lb/acre/yr	pound per acre per year
lb/hr	pound per hour
LHV	lower heating value
LOS	level of service
MACT	maximum achievable control technology
MCR	maximum current rating
mG	milligauss
MGD	million gallons per day
mg/L	milligram per liter
MMBtu/hr	million British thermal units per hour

ABBREVIATIONS, ACRONYMS, AND
UNITS OF MEASURE
(Continued, Page 4 of 6)

MMscf/day	million standard cubic feet per day
MOA	Memorandum of Agreement
mph	miles per hour
MSCU	middle semi-confining unit
m/sec	meter per second
msl	mean sea level
MVA	megavolt-amperes
MW	megawatt
N ₂	molecular nitrogen
N/A	not applicable
NCDC	National Climatic Data Center
Neg	negligible
NEPA	National Environmental Policy Act
NESC	National Electrical Safety Code
NESHAP	National Emission Standards for Hazardous Air Pollutants
NH ₃	ammonia
NO	nitric oxide
NO ₂	nitrogen dioxide
NO _x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Service
NSCR	nonselective catalytic reduction
NSPS	new source performance standards
NSR	new source review
NTU	nephelometric turbidity units
NWI	National Wetlands Inventory
NWS	National Weather Service
O ₂	oxygen
OAQPS	Office of Air Quality Planning and Standards
OD	outside diameter
OHGW	overhead ground wire
PAN	peroxyacetyl nitrate
PBS&J	Post, Buckley, Schuh & Jernigan
pCi/L	picocuries per liter
PEM	palustrine, emergent
PFO	palustrine, forested
PM	particulate matter
PM ₁₀	particulate matter less than or equal to 10 micrometers aerodynamic diameter
POTW	publicly owned treatment works
PPA	power purchase agreement
ppmv	part per million by volume

ABBREVIATIONS, ACRONYMS, AND
UNITS OF MEASURE
(Continued, Page 5 of 6)

ppmvd	part per million by volume, dry
PPSA	Power Plant Siting Act
ppt	part per thousand
PSC	Public Service Commission
PSD	prevention of significant deterioration
psia	pounds per square inch absolute
PSS	palustrine, scrub/shrub
RARE	roadless area review and evaluation
SACTI	Seasonal/Annual Cooling Tower Impact
SCA	site certification application
SCADA	Supervisory Control and Data Acquisition
scfm	standard cubic foot per minute
SCR	selective catalytic reduction
SCRAM	Support Center for Regulatory Air Models
SCS	Soil Conservation Service
Seminole	Seminole Electric Cooperative, Inc.
SFWMD	South Florida Water Management District
SIA	significant impact area
SJRWMD	St. Johns River Water Management District
SJWCD	St. Johns Water Control District
SNCR	selective noncatalytic reduction
SNR	signal-to-noise ratio
SO ₂	sulfur dioxide
SO ₃	sulfur trioxide
SPL	sound pressure level
SR	State Road
SRPP	strategic regional policy plan
SSC	species of special concern
STP	standard penetration test
S.U.	standard unit
SWIM	Surface Water Improvement and Management
TCRPC	Treasure Coast Regional Planning Council
TDS	total dissolved solids
tpy	ton per year
µg/L	microgram per liter
µg/m ³	microgram per cubic meter
UCU	upper confining unit
U.S.	U.S. Highway
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UCU	upper confining unit

ABBREVIATIONS, ACRONYMS, AND
UNITS OF MEASURE
(Continued, Page 6 of 6)

VMT	vehicle miles traveled
VOC	volatile organic compound
WWTP	wastewater treatment plant
yd ³	cubic yard

EXECUTIVE SUMMARY

Blue Heron Energy Center, L.L.C. (Calpine), plans to certify, permit, construct, own, and operate a new nominal 1,080-megawatt (MW) electrical power generating plant (Project) in Indian River County, Florida. The new power plant, called the Blue Heron Energy Center (BHEC), will use clean natural gas fuel and state-of-the-art, highly efficient combined cycle generating and pollution control technologies to produce cost-effective electric power in an environmentally friendly manner. The BHEC will be constructed in two phases. Each phase will consist of two combustion turbine generators (CTGs), two heat recovery steam generators, one steam turbine generator, and associated facilities.

This Executive Summary describes the key features of the BHEC. More detailed information on the BHEC is provided in the site certification application (SCA) filed by Calpine pursuant to the Florida Electrical Power Plant Siting Act (PPSA).

SITE CERTIFICATION APPLICATION AND NEED FOR THE PROJECT

The certification of electrical power plants in Florida requires compliance with applicable federal, state, and local laws, regulations, and ordinances. The most comprehensive state law governing the licensing of the BHEC is the PPSA, which establishes the State's policy to balance the need for new power plant facilities with the potential effects of the facility's construction and operation on human health, welfare, and the environmental resources of the State. The PPSA establishes a centrally coordinated permitting process that is initiated when the applicant files a SCA with the Florida Department of Environmental Protection, which administers and coordinates the process with affected state, regional, and local agencies, governmental entities, and other parties. The process concludes with the approval or certification of the power plant by the Governor and Cabinet, sitting as the Siting Board.

In the PPSA proceeding, Calpine is seeking the Siting Board's certification for construction and operation of Phase I of the BHEC (i.e., a nominal 540-MW generating plant and associated facilities) and an ultimate site capacity of 1,080 MW.

Phase I of the Project will be used to meet the needs of two Florida utilities with responsibility for serving retail electricity consumers—the Florida Municipal Power Agency (FMPA) and another load-serving utility with whom Calpine is presently in the final stages of confidential contract negotiations. Phase I of the Project also will be used to serve the needs of the other Florida load-serving utilities to whom Calpine supplies wholesale electric generating capacity and energy. The Project's electrical output will contribute meaningfully to meeting Peninsular Florida's needs for electrical system reliability and integrity.

SITE AND VICINITY

The BHEC will be constructed on an approximately 50.5-acre property (Site) in southeastern Indian River County. The Site is immediately east of Interstate 95 (I-95), immediately north of the St. Lucie County line, and approximately 5 miles southwest of the City of Vero Beach. The Site primarily consists of pine flatwoods. Two wetland areas (i.e., one approximately 3.5-acre mixed hardwood forest and a 0.7-acre marsh) are present on the Site, which will be preserved. Hand ferns, which are listed by the State as an endangered plant species, have been identified at four locations within or adjacent to the hardwood forest wetland system. An upland buffer area will surround and protect both wetland areas and the ferns. Several inactive gopher tortoise burrows occur on the Site and this species is probably present in small numbers. It is unlikely that other listed species use the Site. The Site does not contain any surface water bodies, significant wildlife habitats, or known historic or archaeological resources.

The Site is located in an area that has been affected by a variety of agricultural, industrial, institutional, and residential activities. The Site is bordered on the east by the 74th Avenue right-of-way, the Indian River Farms Water Control District (IRFWCD) Lateral C Canal, the Ocean Spray Cranberries' industrial wastewater sprayfield, and citrus groves. The IRFWCD Sublateral C-7 Canal, a single-family residence, abandoned citrus groves, and the Indian River County solid waste landfill and correctional institution are located to the north of the Site. I-95 runs along the western Site boundary. Several borrow pits, an electric transmission line corridor, a natural gas pipeline corridor, and undeveloped brushland are located to the west of I-95. In St. Lucie County, open pasturelands and the Spanish

Lakes Fairways residential development are located southwest and southeast, respectively, of the Site. The Site is separated from the Spanish Lakes development by a drainage ditch, berm, and existing buffer of mature trees and vegetation.

AIR EMISSION CONTROLS

The BHEC will use the best available control technology (BACT) to minimize the Project's airborne emissions. Emissions of nitrogen oxides (NO_x) will be reduced to very low levels (2.0 parts per million, dry volume on a 24-hour block average basis) through the use of dry low-NO_x technology and a selective catalytic reduction (SCR) system. Emissions of carbon monoxide (CO) and volatile organic compounds (VOCs) will be minimized through use of an oxidation catalyst. Emissions of other pollutants also will be reduced to very low levels by using clean-burning natural gas and advanced combustion turbines.

The Project's impacts on ambient air quality will be minimal. The Project will not cause or contribute to any violations of any state or national ambient air quality standards (AAQS), or any Class I or II increments for the prevention of significant deterioration of air quality. The Project's impacts on ambient air quality will be significantly less than the impacts allowed under the AAQS, which have been set by the U.S. Environmental Protection Agency to protect human health and the environment, including the health of the young, the elderly, and those with respiratory diseases.

WATER USE AND SUPPLY

The primary water uses for the BHEC will be for cooling tower makeup; boiler makeup; CTG inlet air evaporative cooling; and potable, sanitary, and other miscellaneous plant process water purposes. Cooling tower makeup is by far the largest use. The Project's consumptive water use will be approximately 5.8 million gallons per day (MGD) on an average annual daily basis, and 8.2 MGD on a peak daily basis. The primary source of water for the Project's operations will be excess surface water withdrawn from the IRFWCD drainage canal system, which will be provided through Indian River County's Egret Marsh Regional Stormwater Park. The Project will also use brine water from the County's South Plant water treatment facility. Potable water and sanitary wastewater ser-

vice will be provided by Indian River County. No ground water will be used or impacted by the Project.

The use of excess surface water and brine water will provide significant environmental benefits to the area. The Project's water use plans support the goals of the master stormwater planning program of the St. Johns River Water Management District (SJRWMD), Indian River County, City of Vero Beach, and IRFWCD, which call for a reduction in freshwater flows and pollutant loadings to the Indian River Lagoon system. The Project's water use will reduce freshwater flows from the IRFWCD canal system to the Indian River Lagoon by an average of 6 percent. To further support these programs, Calpine will have entered into an agreement with Indian River County and IRFWCD to obtain the Project's water supply from the Egret Marsh Regional Stormwater Park, which will be developed by the County as part of the current master stormwater planning program. As part of the agreement, Calpine will also contribute financially to the construction of the water supply pipelines and pumping stations for the stormwater park.

ZERO WASTEWATER DISCHARGES

The BHEC will be designed and operated as a *zero wastewater discharge* facility. All plant wastewaters will be collected, treated, recycled, and evaporated on the Site. There will be no discharges of wastewaters from the Project to surface waters. The nonhazardous solids resulting from the wastewater treatment system will be disposed in a permitted landfill.

The Project's zero wastewater discharge system will provide significant environmental benefits by removing all pollutants in the water supply from the area's surface water canal system. Thus, the Project operations will reduce pollutant loadings to the Indian River Lagoon.

STORMWATER MANAGEMENT

The drainage facilities for the BHEC will be constructed and operated to control and treat stormwater runoff on the Site during construction and operation. The Project's stormwater management systems will be designed to comply with all applicable Indian River

County, SJRWMD, and IRFWCD criteria and requirements. A 5.2-acre stormwater detention pond will be constructed on the Site to control peak runoff from a 25-year, 24-hour storm event and limit the offsite discharge to less than 2 inches over a 24-hour period. Excess flows from the detention pond will be directed to the Lateral C Canal, which is located east of the Site.

TRAFFIC AND PUBLIC SERVICES

During the construction of the BHEC, there will be a temporary increase in traffic on local roads, but the roads will continue to operate at acceptable levels (level of service “C” or greater). Calpine will pave the extension of 74th Avenue to the Site early in the construction phase. The long-term operation of the BHEC will not cause any significant impacts on traffic or public services.

ZONING AND COMPREHENSIVE LAND USE PLAN

The Site is currently zoned Agriculture (A-1). Public facilities and utilities, including power plants, are allowed within this zoning district with the approval of a Special Exception Use. The Indian River County Board of County Commissioners approved the Special Exception Use and Conceptual Site Plan for the BHEC Project on September 18, 2001.

The Future Land Use Map in Indian River County’s Comprehensive Plan designates the Site as Agriculture (AG-1). This designation allows the construction of public facilities, including public utilities. The Project is in compliance with the current land use designation and will not require an amendment or modification of the County’s Comprehensive Plan.

In compliance with the PPSA, a land use hearing was conducted by the Administrative Law Judge on February 6, 2002. Based on the evidence presented by Calpine at the hearing, the Administrative Law Judge issued a Recommended Order on March 5, 2002, recommending that the Siting Board enter a Final Order finding that the Site of the BHEC is consistent and in compliance with existing land use plans and zoning ordinances.

NOISE

The Project will use various noise suppression techniques and equipment. In addition, a 200-foot (ft), heavily vegetated buffer area will be left undisturbed along the northern Site boundary to attenuate potential noise impacts at the residence and correctional institution located to the north of the Site. Noise modeling analyses demonstrate that the Project will comply with the Indian River County noise limits for the areas near the Site. The noise modeling analyses also demonstrate that the Project will comply with St. Lucie County's noise limits for residential uses in the Spanish Lakes Fairways development, which is south of the Site. The existing ambient noise levels in the northwestern portion of Spanish Lakes Fairways (i.e., the area closest to the Site) are primarily due to traffic on I-95. The Project will cause the sound levels at this location to increase less than 1 A-weighted decibel, which would not be perceptible or measurable.

LINEAR FACILITIES

The BHEC will require the construction of several linear facilities to interconnect the Project with existing facilities and services in the Site vicinity. For the primary water supply, a new pumping structure will be constructed in the IRFWCD Lateral C Canal, just south of Glendale Road (State Road 612), and an approximately 0.5-mile water supply pipeline will be installed within the IRFWCD right-of-way adjacent to the canal from the structure to the Egret Marsh Regional Stormwater Park. A new pumping structure will also be constructed in the pretreatment pond at the stormwater park and an approximately 3.0-mile pipeline will be installed in IRFWCD right-of-way to deliver water to the BHEC Site. Natural gas for the Project will be supplied to the Site via a new pipeline running approximately 1,000 ft from a new Florida Gas Transmission Company metering station located on the west side of I-95.

The BHEC will be interconnected with the Florida power grid by two new 230-kilovolt (kV) transmission lines running approximately 1,400 ft from the Site to Florida Power & Light Company's two existing 230-kV lines located west of I-95.

Calpine is seeking certification of the water supply pumping stations, the water pipelines, the natural gas pipeline corridor, and the transmission line corridor in the PPSA proceeding for the Project.

ECONOMIC BENEFITS

The Project's direct economic benefits will include:

- Approximately \$2.8 to \$3.2 million annually in additional ad valorem tax revenue to Indian River County.
- Approximately \$3.1 to \$3.6 million annually in additional tax revenues to the Indian River County School District.
- Approximately \$6.8 to \$7.8 million annually in additional total tax revenues.
- Approximately 36 new permanent jobs with a total payroll of approximately \$2.0 million annually at the completion of Phase II of the Project.
- An average of approximately 165 construction jobs (full time equivalent) and construction wages of approximately \$16 million over the 24-month construction period for each phase of the Project.
- A capital investment of about \$600 million to build the Project.

In addition to the direct benefits, numerous indirect benefits will accrue as a result of the construction and operation of the Project.

ENVIRONMENTAL PROTECTION AND BENEFITS

Throughout its development efforts for the BHEC, Calpine has selected and implemented Project designs that avoid or minimize potential environmental impacts. These environmentally protective designs include:

- Use of combined cycle technology with advanced CTGs, which provides higher efficiency electric generation and lower environmental impacts than other technologies.
- Use of natural gas only as fuel for the CTGs, which produces lower air emissions than coal- or oil-fired power plants.
- Use of advanced dry low-NO_x combustor design for the CTGs and SCR systems, which represent BACT for minimizing NO_x air emissions.

- Use of an oxidation catalyst, which represents BACT for minimizing CO and VOC air emissions.
- Development of a facility layout that avoids and preserves existing wetlands on the Site.
- Use of excess surface water and brine water for plant water supply, which is consistent with SJRWMD's consumptive water use criteria (i.e., avoid use of ground water) and supportive of the current master stormwater planning program for the IRFWCD drainage basin, which seeks to reduce pollutant loadings and freshwater flows to the Indian River Lagoon.
- Use of a zero wastewater discharge treatment system to eliminate cooling tower blowdown and wastewater discharges to surface waters. This system also is consistent with the local and SJRWMD plans to reduce pollutant loadings and freshwater inflows to the Indian River Lagoon.

1.0 NEED FOR POWER AND THE PROPOSED FACILITIES

This chapter of the Site Certification Application (SCA) introduces Blue Heron Energy Center, L.L.C. (Calpine)¹ and explains why Calpine's Blue Heron Energy Center (BHEC) is needed.

¹ Various aspects of the BHEC's development and financial and physical operations will be performed by different Calpine affiliates, all of which are subsidiaries of Calpine's parent corporation, Calpine Corporation. For example, power from the BHEC will be sold through Calpine Energy Services, L.P. For convenience, "Calpine" is used throughout this SCA to refer to Blue Heron Energy Center, L.L.C., and to other Calpine affiliates, as applicable and as indicated by the context.

1.1 INTRODUCTION

1.1.1 THE APPLICANT

Blue Heron Energy Center, L.L.C. (Calpine), is a Delaware limited liability company that intends to own and operate a new gas-fired, combined cycle electrical power plant, which will be known as the Blue Heron Energy Center (BHEC or the Project). Calpine's parent company, Calpine Corporation, is a San Jose, California-based company that owns and operates 92 power plants in the United States. The aggregate capacity of the operating plants is approximately 27,700 megawatts (MW). The operating gas-fired plants are located in Florida, California, New Jersey, Pennsylvania, New York, Texas, Illinois, Massachusetts, Oklahoma, Rhode Island, Wisconsin, Maine, Louisiana, South Carolina, Alabama, Arkansas, Missouri, Oregon, Colorado, Arizona, Virginia, and Washington. In addition, Calpine Corporation has 11 plants under construction with total capacity of 5,750 MW. Calpine Corporation has plants in every electric reliability council region in the United States, and in Canada, Mexico, and the United Kingdom. In Florida, Calpine Corporation owns² and operates, through wholly-owned subsidiaries, the Osprey Energy Center, a 529-MW gas-fired combined cycle plant located in Auburndale, Florida; the Auburndale Power Plant, a 150-MW natural gas-fired, combined cycle cogeneration plant in Polk County, Florida, southwest of Auburndale; the Auburndale Peaker Energy Center, a 120-MW combustion turbine power plant located within the site of the Auburndale Power Plant; and the Santa Rosa Energy Center, a 240-MW natural gas-fired, combined cycle cogeneration power plant located in Santa Rosa County.

1.1.2 PURPOSE OF SITE CERTIFICATION APPLICATION

Calpine intends to own and operate the Project, which will be a new 1,080-MW (nominal) natural gas-fired, combined cycle power plant. The BHEC will be built on a 50.5-acre parcel of land (the Site) that is located southwest of the City of Vero Beach in Indian River County, Florida. The Site was selected as the preferred location for the BHEC because, among other things, the Site is near existing, required infrastructure (e.g., access road, natural gas pipeline, and electric transmission lines) and because the Site is predominantly surrounded by agricultural and other non-residential uses (e.g., Interstate 95

² Calpine Corporation owns 100 percent of the ownership interests in all of the listed power plants except the 150 MW Auburndale Power Plant, in which Calpine holds 30 percent of the ownership interests.

[I-95], a landfill, a correctional institution, and an industrial wastewater sprayfield). The Site's features are suitable for a power plant and the Site is of sufficient size to accommodate the Project without significant adverse environmental impacts.

The licensing of power plants in Florida requires compliance with federal, state, regional, and local laws, regulations, and ordinances. The primary state law governing the licensing of the Project is the Florida Electrical Power Plant Siting Act (PPSA), Sections 403.501 through 403.518, Florida Statutes (F.S.)³ Under the PPSA, the Florida Department of Environmental Protection (FDEP) coordinates the PPSA review process for the certification (i.e., approval) of a new power plant. The PPSA process begins with the submittal of an SCA to FDEP by the applicant and culminates with the certification of the Project by the Governor and Cabinet, sitting as the Siting Board.

Accordingly, Calpine is submitting this SCA to the FDEP for the BHEC. In this PPSA proceeding, Calpine is seeking the Siting Board's certification for construction and operation of Phase I of the BHEC, i.e., a nominal 540-MW generating plant and the associated facilities described herein, and certification for ultimate Site capacity of 1,080 MW. This SCA describes the BHEC, the need for the Project, the environmental conditions on the Site, and impacts associated with the Project. The SCA has been prepared to meet the requirements of the PPSA and the FDEP rules in Chapter 62-17, Florida Administrative Code (F.A.C.).

³ All references to the Florida Statutes in this Site Certification Application are to the 2004 edition. Florida Statutes is abbreviated "F.S." in this Application.

1.2 NEED FOR THE PROPOSED PROJECT

The Project is needed to meet the needs of two Florida utilities with responsibility for serving the needs of retail electricity consumers, the Florida Municipal Power Agency (FMPA) and another load-serving utility with whom Calpine is presently in the final stages of confidential contract negotiations, and the needs of the end-use customers served by those utilities. The Project is also needed by Calpine to enable Calpine to reliably and cost-effectively serve FMPA's needs and the needs of the other Florida load-serving utilities to which Calpine supplies wholesale electric generating capacity and energy. The Project's output will be sold to FMPA and other Florida retail-serving utilities and will contribute meaningfully to meeting Peninsular Florida's needs for electrical system reliability and integrity and for adequate electricity at reasonable cost. For example and reference, Calpine's Osprey Energy Center presently supplies electrical generating capacity and associated energy under wholesale power sales contracts to Seminole Electric Cooperative, Inc. (Seminole), and to Florida Power & Light Company (FPL). From all of its power generation facilities in Florida, Calpine sells, will sell, or has sold power to Seminole, FPL, Progress Energy Florida, Inc., FMPA, Gulf Power Company, Tampa Electric Company, the Orlando Utilities Commission, JEA, the Reedy Creek Improvement District, the Florida Municipal Power Pool, and the Utilities Commission of New Smyrna Beach. The BHEC is also needed to provide the energy conservation and environmental benefits described herein. The "need for power" issue often encompasses several aspects of need. The following discussion addresses in detail the manner in which the Project meets these needs.

1.2.1 NEED FOR THE PROJECT

As previously stated, Blue Heron Energy Center, L.L.C. (Calpine) is a wholly owned subsidiary of Calpine Corporation. Calpine will construct, own, and operate the Project in a manner that will provide reliable, competitively priced, environmentally clean power to FMPA, to the other load-serving utility with whom Calpine is presently negotiating a power purchase agreement (PPA), and to other load-serving utilities in the Peninsular Florida wholesale market. Calpine seeks to continue its role in developing competitive, wholesale power plants, like the Osprey Energy Center, the BHEC, and Calpine's other Florida power generation facilities. Calpine seeks to construct and operate the BHEC

specifically to satisfy the needs of FMPA and the other load-serving utility with whom Calpine is negotiating, and the needs of the end-use customers served by those utilities, and to make the balance of the BHEC's capacity and energy available to other Florida load-serving utilities, including those listed above to whom Calpine sells or has sold wholesale power, for the benefit of their customers. Calpine expects to thus satisfy the general public need for cost-effective and environmentally clean power supply resources such as the Project, and to promote the state and federal governments' goal of ensuring competitively priced wholesale generation for the benefit of electric customers.

There are immediate reliability and economic needs in Peninsular Florida for the Project. The reliability need for the nominal 1,080 MW of highly efficient, reliable electric capacity and associated energy production in Peninsular Florida is evidenced by the needs of FMPA and of the other load-serving utility with whom Calpine is negotiating, and by the State's overall projected needs for additional generating capacity to maintain planned reserve margins. Peninsular Florida needs the BHEC because the Project will provide bulk power and energy at the lowest cost available to customers as compared to the continued use of traditional rate-based power plants, most of which are more costly to operate and significantly less efficient than the Project. Moreover, the state-of-the-art, high-efficiency, gas-fired, combined cycle technology chosen for the Project represents the lowest cost technology available to serve Peninsular Florida's future power supply needs. In addition, the Project represents an environmentally superior alternative to conventional power plants. Accordingly, there is a demonstrable need for the Project specifically to meet the needs of FMPA and the other load-serving utility with whom Calpine is negotiating, as well as the needs of the end-use customers that those utilities serve, and generally to meet Florida's need for clean, reliable, efficient, and cost-effective power supplies.

1.2.2 NEED FOR ELECTRIC SYSTEM RELIABILITY AND INTEGRITY

The Project is consistent with and will meet the needs of FMPA and the other load-serving utility with whom Calpine is negotiating a PPA. The Project is also consistent with and meets Peninsular Florida's needs for generating capacity to maintain system reliability and integrity. According to the *2004 Regional Load & Resource Plan* prepared by the Florida Reliability Coordinating Council (FRCC) dated July 2004 (*FRCC 2004*

Regional Plan), Peninsular Florida needs approximately 16,000 MW of new installed capacity in order to maintain winter reserve margins generally between 14 and 16 percent without exercising load management and interruptible resources from the winter of 2004-2005 through the winter of 2013-2014. A 20-percent reserve margin has been adopted by Florida's three large investor-owned utilities, which together account for approximately three-fourths of all generation resources in Peninsular Florida (in Re: Generic Investigation into Aggregate Electric Utility Reserve Margins Planned for Peninsular Florida, 99 PSC 12:426). Most of the capacity planned by Florida utilities over this period is not yet in the permitting process, and a significant portion of this planned capacity does not yet even have identified sites.

The foregoing discussion of reserve requirements clearly demonstrates that there is a significant and substantial reliability need for new generating capacity in Peninsular Florida. The Project will contribute to meeting that need by providing firm capacity to FMPA, to the other specific load-serving utility with whom Calpine is negotiating a PPA, and to the other Florida retail-serving utilities that purchase the Project's output. Phase I of the BHEC Project will improve the Peninsular Florida winter reserve margin by approximately 1.0 percent in the winter of 2007-2008. The full output of the BHEC will improve the Peninsular Florida winter reserve margin by approximately 2.0 percent as of the winter of 2009-2010, based on Calpine's currently projected in-service date for Phase II of the BHEC as reflected in Calpine's 2004 Ten-Year Site Plan. The Project will provide similar reserve margin improvements in the summer seasons, and these improvements will continue to be realized in subsequent years.

Under any scenario, the BHEC Project is expected to provide 1,168 MW of net capacity to Peninsular Florida utilities during winter peaking conditions and 1,350 MW of additional capacity (with duct firing) during extreme winter peaks. The Project is also expected to provide at least 1,022 MW of additional capacity during summer peaking conditions, and up to 1,226 MW of additional capacity (with duct firing) during extreme summer peaks. In an extreme weather event (e.g., a prolonged period in the summer with daily temperatures exceeding 100 degrees Fahrenheit [°F] or winter weather similar to that experienced at Christmas of 1989), the Project will provide substantial additional

generating capacity to Peninsular Florida that would not otherwise be available. Assuming an average coincident peak demand of 3.5 to 5.0 kilowatts (kW) per residential customer, the Project's capacity would be sufficient to maintain electric service to approximately 200,000 to 330,000 customers during such an event.

1.2.3 NEED FOR ADEQUATE ELECTRICITY AT A REASONABLE COST

The Project meets Peninsular Florida's need for adequate electricity at a reasonable cost. Most new capacity proposed by other Florida utilities is similar gas-fired, combined cycle capacity. The direct construction cost and heat rate of the Project compare favorably to those of other similar power plants, including repowering projects that are outside the scope of the PPSA, proposed in Peninsular Florida. Because no utilities or retail customers can be required to pay for the cost of the Project, because FMPA and other Peninsular Florida utilities have only contracted to purchase power from Calpine when cost-effective, and because FMPA and other utilities can reasonably be expected to buy power from the Project *only* when it is cost effective (as compared to other supply sources), the Project is also necessarily consistent with and meets Peninsular Florida's need for adequate electricity at a reasonable cost. Moreover, the Project's estimated projected operating costs will place it favorably in the Peninsular Florida "supply stack" of generating plants.

As indicated above, the Project will be a wholesale power plant, with the Project's output committed to FMPA and to the other specific load-serving utility with whom Calpine is negotiating a PPA pursuant to long-term contracts, and to other Florida retail-serving utilities pursuant to long- and short-term contracts. Competitive wholesale power plants differ from traditional "rate-based" plants in that the overhead, finance, construction, and operating costs of a rate-based plant are recovered through rates, which include a reasonable rate of return on investment, charged to the utility's captive customers. If lower cost power becomes available after a rate-based plant is constructed, the utility nevertheless remains entitled to recover the costs of its plant through its rates. Hence, the utility's ratepayers, rather than its shareholders, bear the risks associated with obsolescence. Similarly, absent a finding of imprudence, a utility is permitted to recover the fixed and variable operating costs of its rate-based plants, even if those costs are higher than originally

projected or if the plant fails to operate as projected. In essence, the utility has an incentive to maximize the amount of its rate base, thereby permitting its allowed return on equity to be applied to a larger sum that results in greater earnings.

In contrast, a competitive wholesale power plant, like the BHEC, has no rate base and no captive customers. Therefore, it must produce power at the lowest possible cost and with maximum reliability to ensure it remains truly competitive. Competitive wholesale plants simply offer their capacity and energy to potential wholesale customers, such as FMPA and the other load-serving utility with whom Calpine is negotiating and such as the nine other load-serving utilities in Florida who have bought power from Calpine's other power facilities, who are free to purchase or decline to purchase capacity and energy offered by competitive wholesale suppliers.

1.2.4 STRATEGIC CONSIDERATIONS

The Project is consistent with strategic factors that may be considered when building a power plant, from Calpine's perspective, from the perspective of FMPA and the other Florida load-serving utilities that will purchase the Project's output, and from the perspective of the State of Florida as a whole. The Project will be fueled by domestically produced natural gas rather than by imported fuel that may be subject to interruption due to political or other events. The Project has a low installed cost and a highly efficient heat rate, assuring its long-term economic viability. The Project's gas-fired, combined cycle technology is exceptionally clean and minimizes airborne emissions. Since the BHEC will use very clean natural gas as its fuel, there is substantially less risk that the Project will be adversely affected by future changes in environmental regulations. Moreover, the Project's use of natural gas in a very efficient generation technology will improve the overall environmental profile of electricity generation in Florida. The Project will also conserve fuel consumed for electricity production in Florida by displacing generation from less efficient power plants. Consistent with the goals of the Florida Energy Efficiency and Conservation Act (FEECA), Sections 366.80-366.85 and 403.519, F.S., the Project will enhance the overall efficiency of electricity production and of natural gas use in Florida, as well as reduce the consumption of petroleum fuels for electricity generation

in Florida. Additionally, the Project will enhance competition and reduce market concentration, thereby reducing wholesale power supply costs (and thus retail prices).

1.2.5 COST EFFECTIVENESS

1.2.5.1 Cost Effectiveness to Specific Purchasing Utilities

As discussed above, the BHEC will be cost-effective to FMPA, to the other specific load-serving utility with whom Calpine is negotiating a PPA, and to the other Florida load-serving utilities that purchase power from the Project. This is true because neither FMPA nor any other utility can be forced to purchase power from the Project and because neither FMPA nor any other utility would purchase power from the BHEC unless that utility first determined that such purchases were cost-effective as compared to the utility's other available power supply alternatives.

1.2.5.2 Cost Effectiveness to Peninsular Florida

The Project will be a cost-effective power supply resource for Peninsular Florida. Forecasts of the Project's operations indicate that the BHEC will operate, economically, at annual capacity factors of approximately 60 to 70 percent beginning in 2007. The Project is expected to operate more cost effectively, in terms of incremental generation costs, than much of the existing generating capacity in Peninsular Florida. Moreover, the Project cannot increase power supply costs above the cost of existing or planned power supply alternatives.

Beginning in 2007, the BHEC's output is expected to be sold in the wholesale power market to FMPA, to the other load-serving utility with whom Calpine is negotiating a PPA, and to other retail-serving utilities in Peninsular Florida (i.e., within the FRCC region) pursuant to voluntary contractual arrangements entered into on the basis of the relative economics of the Project and other Peninsular Florida generation facilities. Sales outside of Florida are not expected under any realistic scenario due to generation costs, in general, being lower in Georgia than in Florida, and additional transmission wheeling charges that would be incurred to make such sales. Moreover, transmission export capability at the Georgia/Florida interface is limited.

Calpine will *only* be able to sell its wholesale power to other utilities if and when those utility purchasers determine that such purchases are cost effective relative to those utilities' alternative power supply options (e.g., self-generation or other wholesale power purchases). In addition, the Public Service Commission's (PSC's) ongoing regulatory oversight of investor-owned utilities' fuel and purchased power costs ensures that Florida's ratepayers are responsible only for reasonable and prudent expenses. In other words, not only will the market ensure that Florida retail-serving utilities' purchases are cost effective, the PSC's ongoing regulation will similarly ensure that purchases from the Project are cost effective to ratepayers. These conclusions apply equally to longer-term power sales contracts, such as the PPA between FMPA and Calpine and the PPA that Calpine is presently negotiating with the other load-serving utility referenced above, and to shorter-term power sales.

The Project is needed to maintain reliable service to Florida electric customers. Moreover, the Project is needed to provide adequate, cost-effective electricity to utilities that provide retail service in Florida. Since the savings resulting from cost-effective purchases from the Project will be passed directly through to retail customers through the purchasing utilities' fuel and purchased power cost recovery charges, the Project will also provide cost-effective power to those utilities' retail customers. The Project will not be subject to inclusion in any utility's rate base; accordingly, there is no risk that captive retail (or wholesale) customers will be *required* to bear the Project's capital or other costs. Retail customers can only be asked to pay for the cost of power from the Project when their retail-serving utility elects to buy power from the Project. These purchases will occur *only* when such transactions are cost effective to the purchasing utility (i.e., when the Project offers power that costs less than what is available elsewhere).

By virtue of the lack of risk to Florida's electric customers and the low cost production characteristics of this proposed plant, the Project will *necessarily* be a cost-effective power supply option for the utilities that elect to purchase the Project's power. This will translate into lower rates for customers of these utilities. Because no utility or retail customers will be obligated to purchase the Project's output except by choice, and assuming economically rational behavior by purchasing utilities, it is reasonable to conclude that

any purchases from the Project will be made at prices less than or equal to the cost of the purchasing utility's next-best alternative. In light of these facts, the Project's actual costs are not essential to a determination of cost effectiveness to Florida ratepayers. Ratepayers *cannot be required* to bear the Project's costs in their rates.

1.2.5.3 Cost Effectiveness to Calpine

Calpine has considered various generating technologies and various configurations of combined cycle power plants that could be accommodated at the proposed Site and determined that the BHEC represents the most cost-effective and reliable alternative for Calpine to meet its projected wholesale power sales commitments. Calpine considered and evaluated the following technologies in reaching its decision to construct the BHEC with the chosen gas-fired, combined cycle technology: gas- and oil-fired combustion turbines; gas- and oil-fired combined cycle units; gas-fired steam generation units; conventional pulverized coal steam units; nuclear steam units; renewable energy technology; and integrated coal gasification combined cycle units

1.2.6 ENERGY CONSERVATION

As a utility selling electricity only at wholesale, Calpine does not engage directly in the implementation of end-use energy conservation programs. Moreover, Calpine is not required to have conservation goals pursuant to Section 366.82(2), F.S. Nonetheless, the Project meets the overall goals of the FEECA, because the Project contributes directly and significantly to the increased efficiency and cost effectiveness of electricity production and natural gas use as directed by Section 366.81, F.S. The Project does so by using state-of-the-art generation technology. The Project's primary energy conversion efficiency of approximately 50.2 percent, calculated using the higher heating value (HHV) of natural gas, is significantly better than almost all existing utility generating capacity in Florida, better than most cogeneration facilities, and as good as or better than the vast majority of other Florida utilities' proposed new gas-fired, combined cycle capacity. To the extent that the Project, with its average heat rate of approximately 6,800 British thermal units (Btu) per kilowatt hour (kWh) at ambient Site conditions, displaces generation from less efficient oil-, coal-, and gas-fired units, the Project will result in substantial increases in the efficiency of natural gas use. Based on projected operations, the BHEC can

reasonably be expected to save approximately 6 to 17 trillion Btu of primary energy per year (at heat rate differentials of 1,000 Btu/kWh and 3,000 Btu/kWh, respectively). If the entire savings were realized through the displacement of natural gas-fired generation, this would represent savings of approximately 6 to 17 billion cubic feet of natural gas per year. If the Project displaced only oil-fired generation, this would reflect equivalent savings of approximately 0.9 to 2.7 million barrels of residual fuel oil per year. To the extent that the Project displaces gas-fired or oil-fired generation, it will contribute to the express statutory goal of conserving expensive resources, especially petroleum fuels (Sections 366.81 and 366.82(2), F.S.). In addition, the Project's capacity and energy will be economically and environmentally preferable to other supply-side alternatives. Thus, future cost-effective conservation measures would likely displace other supply-side alternatives, rather than displace the capacity and energy available from the Project.

1.3 OVERVIEW OF THE BLUE HERON ENERGY CENTER

1.3.1 INTRODUCTION

As noted previously, Calpine is proposing to own and operate a nominal 1,080 MW natural gas-fired, combined cycle electrical power plant, which will be known as the BHEC. The BHEC will be constructed in two phases, each with a nominal generating capacity of 540 MW. Construction of Phase I of the BHEC is expected to commence in 2005, with the facility being placed into service in mid-2007. In this PPSA proceeding, Calpine is seeking certification for construction and operation of Phase I (i.e., a nominal 540-MW generating plant and associated facilities) and certification for an ultimate Site capacity of 1,080 MW.

Calpine will submit its petition for determination of need for the BHEC to the PSC in the near future. The need determination hearing is expected to be held in early 2005. The PPSA time frames for processing the SCA indicate that the Siting Board will issue the Site Certification in mid-2005. Calpine expects the construction of the Project to begin immediately thereafter.

A more detailed description of the proposed power plant is contained in Chapter 3.0 of this SCA.

1.3.2 SITE LOCATION AND DESCRIPTION

The BHEC will be located in unincorporated Indian River County, Florida. The Site is approximately 5 miles southwest of the City of Vero Beach (see Figures 2.1.0-1 through 2.1.0-3). The Site is approximately 50.5 acres in size and is presently undeveloped. An aerial photograph of the Site is presented in Figure 2.1.0-4. A boundary and topographic survey map of the Site is found in Appendix 10.10. A more detailed description of the Site and surrounding areas is contained in Chapter 2.0 of the SCA.

The Site is presently owned by Ocean Spray Cranberries, Inc.; Calpine has an option agreement to purchase the Site.

1.3.3 PROJECT DESCRIPTION

The Project will include two power blocks constructed in two phases. Each phase will consist of two Siemens Westinghouse Model 501F Class combustion turbine generators (CTGs) in combined cycle configuration with two matching heat recovery steam generators (HRSGs) and one steam turbine generator. The total generating capacity of the Project (both power blocks) will be a nominal 1,080 MW at average Site conditions without duct-firing. The CTGs will be fired using natural gas as the only fuel. A Site layout (Site plan) for the Project is presented in Figure 3.2.0-1.

The Project also will include directly associated facilities, such as the operations control center, cooling towers, a water treatment building, pump houses, storage facilities, a general services and warehouse building, a gas regulating station, and a stormwater management system.

The Project will be a highly efficient combined cycle electrical power plant that will utilize the latest pollution control technology and provide optimum efficiency in electric power generation. Nitrogen oxides (NO_x) will be controlled by dry, low-NO_x (DLN) combustion technology in conjunction with selective catalytic reduction (SCR) technology. The NO_x emission limit for the Project is proposed to be 2.0 parts per million, volume dry (ppmvd), corrected to 15 percent oxygen (O₂), on a 24-hour block average basis. Also, an oxidation catalyst will be utilized to control carbon monoxide (CO) and volatile organic compound (VOC) emissions.

For water supply, the Project will utilize excess stormwater provided by Indian River County from a regional stormwater park which the County will construct. In addition to the water supplied to the BHEC, the stormwater park will be used to treat water from the Indian River Farms Water Control District (IRFWCD) canal system. The County, at its option, may also provide a limited quantity of brine discharge from its water treatment plant as a portion of the Project's water supply. The daily average annual water consumption of the Project is expected to be approximately 5.8 million gallons per day (MGD), and the peak daily use is expected to be approximately 8.2 MGD. The Project has been designed as a *zero wastewater discharge* facility; therefore, no wastewater will be dis-

charged from the Project to surface or ground waters. Details of the water supply plan, water supply needs, and wastewater management system are provided in Chapter 3.0 of this SCA.

The proposed Project will interconnect to the Peninsular Florida transmission grid via connections to FPL's Malabar-Midway 230-kilovolt (kV) line and to FPL's Malabar-Emerson 230-kV line, both of which are located in rights-of-way immediately west of I-95. For this interconnection, two 230-kV transmission lines will be constructed within a corridor running from the 230-kV substation on the BHEC Site to FPL's existing transmission lines. The total distance from the onsite substation to the projected interconnection points with FPL's existing 230-kV lines is approximately 1,400 feet (ft). It is anticipated that the 230-kV transmission lines will be overhead, over I-95. There will be no other new linear transmission line corridors required to accommodate the Project's interconnection with the Peninsular Florida grid. The corridor for the new transmission lines will be certified by Calpine in the PPSA proceeding for Phase I of the Project. The transmission lines and corridor are described in Section 6.1 of this SCA.

Calpine expects that natural gas will be transported to the Site via an approximately 1,000-ft new underground pipeline to be constructed from the Site to an interconnection with the Florida Gas Transmission Company (FGT) pipeline and a new metering station located to the west of I-95 and the Site. The corridor for this pipeline interconnection will be certified in the PPSA proceeding for Phase I of the Project. The gas pipeline corridor is described in Chapter 6.2 of this SCA.

A conceptual design for the Project has been developed to provide an initial basis for planning and development of this SCA. Specific environmental criteria have been used to ensure that the BHEC will be in compliance with all applicable federal, state, and local regulations.

1.4 BENEFITS OF THE PROJECT

The primary benefits of this Project to FMPPA, to the other load-serving utility with whom Calpine is negotiating a PPA, to the other load-serving utilities that will purchase the BHEC's output, to Indian River County, to the region, and to all of Florida are clean, reliable, cost-effective, and environmentally beneficial electrical capacity and energy. In addition, the Project will enhance the reliability of Florida's electric power supply system. The BHEC also will provide an average of approximately 165 construction jobs for each phase and approximately 36 permanent jobs at the completion of Phase II for the local economy, as well as substantial tax revenues to the local governments and agencies within whose jurisdictions the Project will be located. The Project will make beneficial use of the Site with minimal adverse environmental impacts.

Due to the location of the Site, the Project's use of clean-burning natural gas fuel, and the use of both DLN combustion technology and SCR for NO_x control, no significant adverse environmental or social impacts will result from the construction or operation of the BHEC. Indeed, the BHEC will reduce the airborne emissions associated with generating Florida's electrical power supply.

Natural gas for the BHEC will be supplied via a new natural gas pipeline that will connect a new FGT metering station to the BHEC. The metering station will be located approximately 1,000 ft west of the Site and will be west of I-95. This new natural gas pipeline is a directly associated facility that is to be certified in this PPSA proceeding. Detailed descriptions of the corridor for this pipeline are provided in Chapter 6.0.

The primary source of cooling and other plant process water for the BHEC will consist of excess surface water withdrawn from the Egret Marsh Regional Stormwater Park, which will be constructed and operated by Indian River County to treat water from the IRFWCD canal system. Water for the BHEC use and for treatment in the stormwater park will be withdrawn from the Lateral C Canal in the lower pool of the canal system by using a new pipeline and pumping station located approximately 0.5 mile north of the park. A new pumping station also will be built in the stormwater park, and an approximately 3.0-mile water supply pipeline will be constructed from the stormwater park to the Site. A by-pass pipeline system also will be installed so that the pumping station in the Lateral C Canal can provide water directly to the BHEC in the event that the pumping station in the stormwater park is inoperable. All of these pipelines will be located in IRFWCD's rights-of-way and will be parallel to the Lateral C Canal. The pumping structures and pipelines are directly associated facilities that are to be certified in this PPSA proceeding. Detailed descriptions and locations of the structure and pipeline are provided in Chapter 6.0, Transmission Lines and Other Linear Facilities.

As shown in Figure 2.1.0-2, the Site is located in proximity to an existing corridor with two 230- kV electrical transmission lines, which are part of the FPL system. The FGT natural gas pipeline is located between the two electric transmission lines. Two new transmission lines, approximately 1,400 ft in length will be installed across I-95, and they will provide the power plant's interconnection to the existing 230-kV transmission lines. These two new transmission lines will be certified by Calpine in this PPSA proceeding. The new transmission lines and corridor are described in Chapter 6.0.

Additional water for the BHEC operations may be supplied by Indian River County from its South Plant water treatment facility. More specifically, the County may provide the

brine discharged from the reverse osmosis system at the County's water treatment plant. Potable water and sanitary wastewater services for the BHEC also will be provided by Indian River County. Existing pipelines for these county systems are currently located approximately 0.5 mile to the north of the Site. Indian River County will own, operate, and maintain these pipelines, as well as the pipeline that will supply brine to the BHEC. Therefore, these pipeline facilities are not included for certification in this PPSA proceeding. The BHEC will be designed and operated as a *zero-discharge* wastewater facility. There will be no industrial wastewater discharges from the Project to any surface or ground water.

The Site's topography is nearly level, ranging from approximately 20 to 25 feet above mean sea level (ft-msl) (Masteller, Moler & Reed, Inc., 2000). According to Flood Insurance Rate Map (FIRM) Panel No. 1201190165-E, dated May 4, 1989, the Site is located within Zone X, classified as an area determined to be outside the 500-year floodplain (see Figure 2.1.0-5).

2.2.2 ZONING AND LAND USE PLANS

The Site is undeveloped. The current zoning and land use plan designations for the Site are described in the following sections. Copies of applicable sections of the Indian River County and St. Lucie County zoning ordinances and comprehensive land use plans are provided in Appendices 10.2 and 10.3, respectively. Descriptions of the zoning and land use plan designations for the transmission line and natural gas pipeline corridors are provided in Chapter 6.0.

2.2.2.1 Comprehensive Plan Future Land Use Map

The Site is located within unincorporated Indian River County. Indian River County has designated the Site as Agriculture (AG-1) on its Comprehensive Plan Future Land Use Map (Indian River County, 1998). The Agriculture land use designation allows public facilities, which include public utilities. Neither public facilities nor public utilities are specifically defined within the Indian River County Comprehensive Plan, according to county planning staff. In the AG-1 land use category, the only zoning district is Agriculture A-1, which allows Private Utilities, Heavy, with the approval of a Special Exception Use. The proposed Project is in compliance with the Agriculture land use designation and will not require modification of the Indian River County Comprehensive Plan. Figure 2.2.2-1 depicts the Indian River County and St. Lucie County comprehensive plan land use descriptions in proximity to the Site.

2.2.2.2 Zoning

The Site is currently zoned Agriculture (A-1) within Indian River County. One of the intentions of this zoning district is to permit activities that require non-urban locations and do not detrimentally impact lands devoted to rural and agricultural activities. Public facilities and utilities are allowed within this zoning district with the approval of a Special Exception Use in accordance with Section 971.05 of the Code of Indian River County. Figure 2.2.2-2 depicts the surrounding Indian River and St. Lucie County zoning designations.

The Indian River County Board of County Commissioners approved the Conceptual Site Plan and Special Exception Use for the BHEC Project on September 18, 2001. A copy of the approval is provided in Appendix 10.1.6.

Also, in compliance with Section 403.508(1), F.S., of the PPSA, a land use hearing was conducted by the Administrative Law Judge on February 6, 2002. The sole purpose of the land use hearing was to determine whether the proposed BHEC Project is consistent and in compliance with existing land use plans and zoning ordinances. Based on evidence presented by Calpine at the hearing and the findings of facts of law, the Administrative Law Judge issued a Recommended Order on March 5, 2002. In this Recommended Order, the Administrative Law Judge recommended that the Governor and Cabinet, sitting as the Siting Board, enter a Final Order finding that the Site of the BHEC is consistent and in compliance with existing land use plans and zoning ordinances. A copy of the Land Use Recommended Order is provided in Appendix 10.4.

2.2.4 EASEMENTS, TITLE, AND AGENCY WORKS

Approval for the use of the IRFWCD and Indian River County rights-of-way or easements will be required for the water supply pumping stations and pipelines to withdraw water from the Lateral C Canal and the County stormwater park. An easement or permit from the Florida Department of Transportation (FDOT) or right-of-way will be required for the natural gas pipeline interconnection to the Site under the I-95 right-of-way and for the transmission line overhead crossing of I-95.

The existing 30-ft right-of-way of Indian River County on the Site will be abandoned and a 30-ft easement for the County will be provided along the eastern boundary of the Site.

Stormwater discharges from the Site will be routed via a culvert eastward to the Lateral C Canal which will require easements from the County and IRFWCD.

On August 12, 2004, Calpine entered into an Agreement Concerning Delivery and Use of Stormwater for the Project with Indian River County and the IRFWCD. This Agreement allows Calpine to utilize all County and IRFWCD rights-of-way and easements required for the construction of the pumping stations and pipelines for the Project. A copy of the agreement is contained in Appendix 10.9 to this Application.

Stormwater Management Planning

SJRWMD, Indian River County, IRFWCD, and the City of Vero Beach have prepared a Master Stormwater Management Plan for the East Indian River County watershed within IRFWCD. The purpose of this stormwater master plan is to address flood control, water quality, natural and recreational areas, and water reuse in the watershed, as well as to provide information needed for a National Pollutant Discharge Elimination System (NPDES) Phase II compliance program. The specific goals of this program are to develop and implement hydrologic and hydraulic design alternatives for stormwater storage, flood attenuation, and water quality treatment to achieve, as feasible, a 50-percent or greater reduction in pollutant loads and a significant reduction in fresh water discharges to the Indian River Lagoon. In the master plan, a County-owned parcel of land was identified for potential use for the treatment of water from the IRFWCD canal system and for the storage of water for the proposed BHEC Project. This parcel of land is being developed by the County as the Egret Marsh Regional Stormwater Park.

The water supply plans for the BHEC are consistent with and supportive of the goals established by the SJRWMD, Indian River County, IRFWCD, and Vero Beach to reduce freshwater discharge and pollutant loading into the Indian River Lagoon System.

Hydrologic Characteristics

The Site consists of 50.5 acres of wooded undeveloped land, inhabited with pine and palmetto scrub. According to FIRM Panel No. 1201190165-E, dated May 4, 1989, the Site is located within Zone X, classified as an area determined to be outside the 500-year flood plain (see Figure 2.1.0-5). Offsite drainage is limited to minor contributions from part of the undeveloped roadway along the eastern perimeter (74th Avenue) and I-95 right-of-way green areas.

There are two isolated wetlands on Site, also classified as Class III surface waters. The forested wetland on the northwest corner of the Site is approximately 3.4 acres and may be hydraulically connected to Sublateral C-7 Canal during storm events in excess of the 25-year storm. The marsh wetland near the center of the property is approximately 0.7 acre and is not connected hydraulically to any surface water body. Typically, the wetlands have standing water during the wet season and may become dry during the dry season. The Site is relatively flat, with changes throughout the project area in general grade of less than 1 ft, ranging in elevation from 23 to 24 ft-NGVD. The northern part of

2.3.5 VEGETATION/LAND USE

The land use/vegetation types present at the Site area were characterized utilizing the Florida Land Use, Cover and Forms Classification System (FLUCFCS) Level III code (Florida Department of Transportation [FDOT], 1985). Three Site visits were conducted on February 15, April 10, and April 26, 2000. Another Site inspection was conducted on October 12, 2004, to identify any changes that may have occurred on the Site since April 2000. Two hurricanes struck the area during 2004 and some damage to the Site was noted. Numerous trees and shrubs had been toppled or snapped off in both upland and wetland areas. Understory vegetation also experienced damage from the storms. Overall, however, the vegetation has remained relatively unchanged. The shrub cover has increased in density and height because there have been no fires on the Site. Water levels on the Site were unseasonably high in October 2004 as a result of the recent storm events. Otherwise, the Site conditions in October 2004 were similar to those observed during early 2000.

Based on these Site surveys, the predominant vegetative community was determined to be overgrown pine flatwoods (FLUCFCS Code 411). There are no natural water bodies on the Site. Nearby aquatic communities are restricted to drainage canals on the east and north and drainage ditch on the south boundaries of the Site. Since no construction or operation aspects of the power plant will occur within these areas, no aquatic baseline studies were performed. A small, 0.7-acre herbaceous marsh (FLUCFCS Code 641) exists in the central portion and a 3.5-acre forested wetland (FLUCFCS Code 617) exists in the northwestern portion of the Site. No impacts to these wetlands are proposed; therefore, the analyses focused on the terrestrial ecological resources on the Site. Existing land use and vegetation types occurring on the Site are shown on Figure 2.3.5-1 (USGS quadrangle map) and Figure 2.3.5-2 (aerial photograph). Figure 2.3.5-3 is a map showing the land uses and vegetation types in an area within a radius of 5 miles from the Site. During these ecological surveys, vegetation and land uses on the Site were inspected and described qualitatively.

Descriptions of land use/vegetation for the temporary construction laydown area are provided in Chapter 4.0, and for the transmission line and natural gas and water supply pipeline corridors are provided in Chapter 6.0.

Currently, no portion of the Site has been developed or cleared. The Site is comprised of overgrown pine flatwoods. This community type occupies approximately 45.4 acres (89.9 percent) of the 50.5-acre Site. Historic fire suppression has increased the density and height of saw palmetto and numerous other common shrubs. The canopy consists of slash pine with scattered laurel and live oak saplings, comprising an open subcanopy. A small cabbage palm hammock, 0.9 acre (1.8 percent), exists in the southern portion of the Site. Of the approximately 50.5-acre Site, 4.2 acres (8.3 percent) support natural wetland communities: 0.7 acre of freshwater swamp and 3.5 acres of mixed wetland hardwoods.

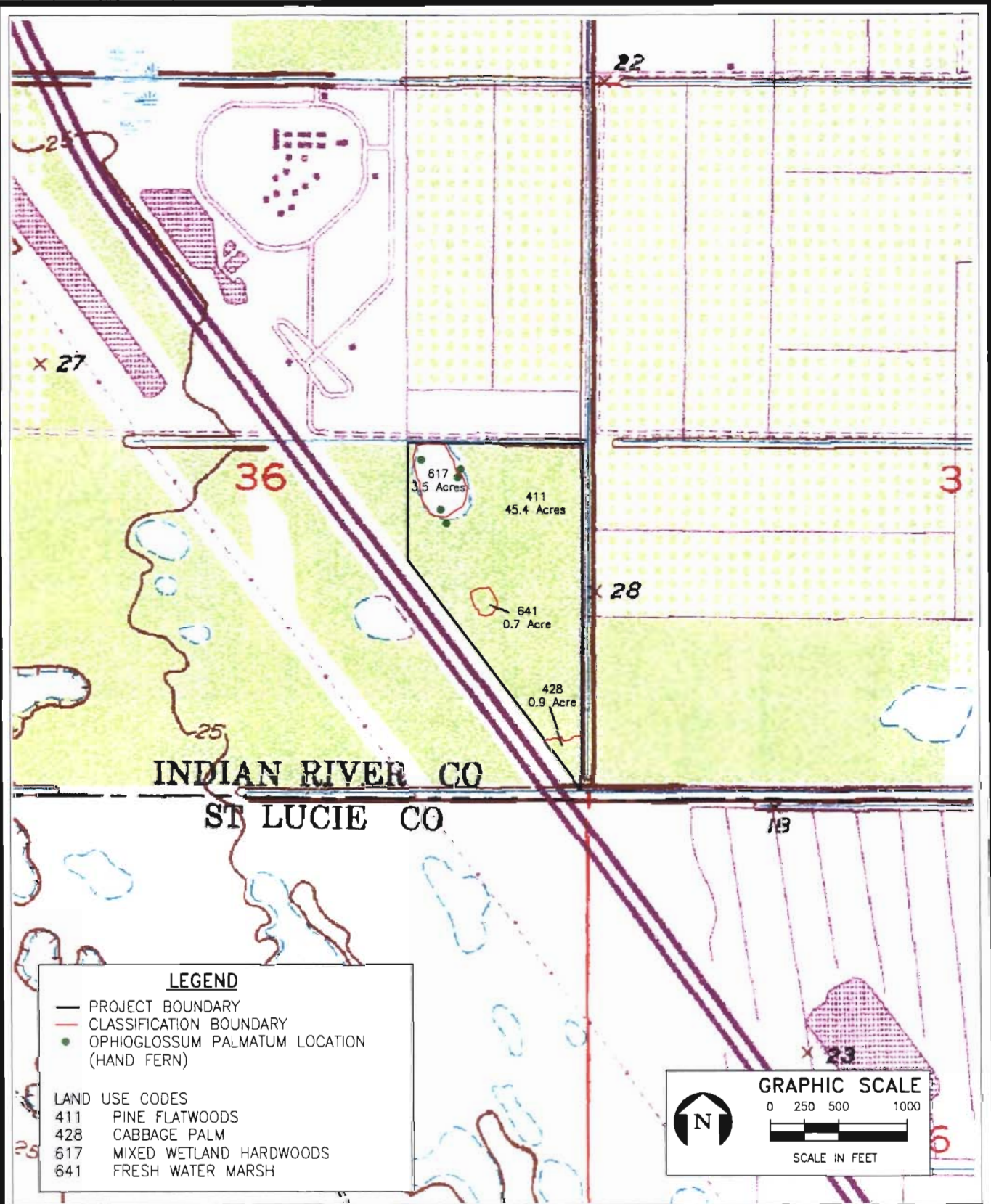
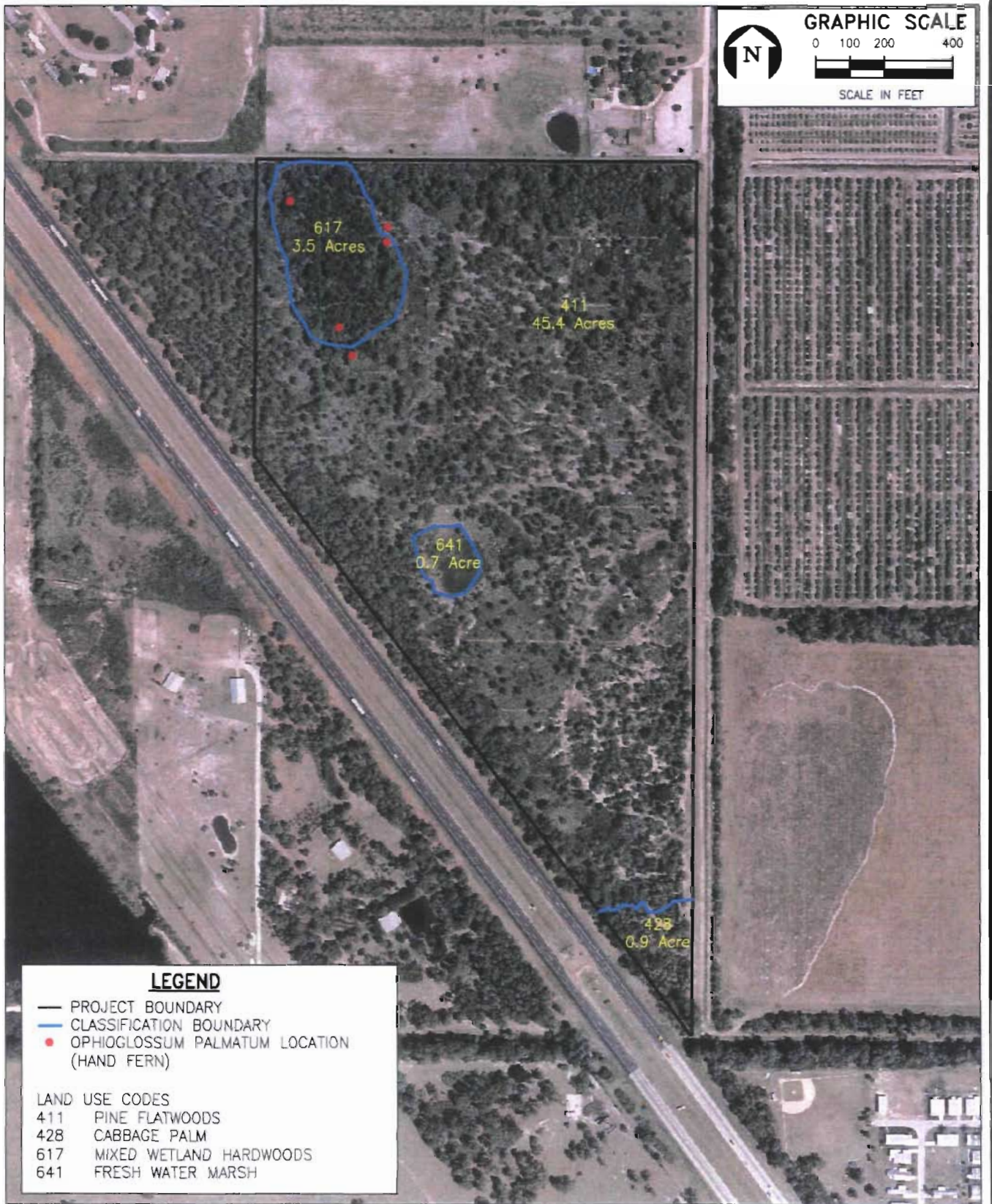


FIGURE 2.3.5-1. (REV. 1 - 12/04)
VEGETATION AND LAND USE MAP

Sources: USGS Quad: Oslo, FL, 1983; ECT, 2004.



CALPINE
BLUE HERON
ENERGY CENTER



LEGEND

- PROJECT BOUNDARY
- CLASSIFICATION BOUNDARY
- OPHIOGLOSSUM PALMATUM LOCATION (HAND FERN)

LAND USE CODES

411	PINE FLATWOODS
428	CABBAGE PALM
617	MIXED WETLAND HARDWOODS
641	FRESH WATER MARSH

FIGURE 2.3.5-2. (REV. 1 - 12/04)
VEGETATION AND LAND USE MAP

Sources: Aerial Cartographics of America, 2000; ECT, 2004.



2.3.6 ECOLOGY

An ecological assessment of the approximately 50.5-acre Site was conducted to ascertain the identity and abundance of important natural communities, flora, and fauna. In addition to field surveys, a literature search was completed to determine state and federal listed species that could potentially be present in the habitats found on the Site and within a 5-mile radius.

Based on the onsite surveys, the predominant vegetative community onsite is pine flatwoods, as discussed in Section 2.3.5. Four state-listed plant species were noted on the Site, all located within a wetland hardwood forest or a designated buffer area, both of which will be preserved. Two are listed as commercially exploited and two are listed as endangered.

2.3.6.1 Species—Environmental Relationships

Aquatic Systems

No natural lake, river, or similar surface water bodies exist on the Site; therefore, none will be affected by construction of the Project. The only aquatic resources potentially affected by this Project will be offsite systems. The nearest aquatic communities are associated with the Lateral C Canal located to the eastern side of the Site, Sublateral C-7 Canal on the north boundary, and the drainage ditch along the south property boundary. The Lateral C Canal will provide water to the County's stormwater park, which will be used for the primary water supply for the Project. The intake for the water supply pipeline from the park will be located approximately 3.0 miles north of the Site. Potential impacts to offsite aquatic systems are addressed in Chapter 6.0.

Terrestrial Systems—Flora

The following descriptions of plant community/association types and land uses are based upon qualitative vegetation field surveys conducted during February and April 2000 and a Site inspection on October 12, 2004. A discussion of potential impacts to these habitats resulting from power plant development is provided in Section 4.4.

Pine Flatwoods—411

Approximately 45.4 acres (89.9 percent) of the Site are vegetated by pine flatwoods. This community predominates on the central and southern portions of the Site. A dense to

Threatened and Endangered Species

Flora

Important flora species for the purpose of the SCA are those species listed as endangered, threatened, or commercially exploited by the U.S. Fish and Wildlife Service (USFWS) or the Florida Department of Agriculture and Consumer Services (FDACS). Several state listed plant species were noted on the Site during field investigations conducted in April 2000 and also during the inspection conducted in October 2004. Prior to this survey, literature searches were completed to determine the listed species that occurred in Indian River County. Each species was reviewed for its potential to occur on the Site due to available habitat and known range of the species. Primary sources of information utilized included:

- The Florida Natural Areas Inventory (FNAI) database.
- Rules of the FDACS, Division of Plant Industry, Chapter 5B-40, F.A.C., Preservation of Native Flora of Florida, Regulated Plant Index (5B-40.0055).
- Rare and Endangered Biota of Florida, Volume 5, Plants (Ward, 1978).
- Notes on Florida's Endangered and Threatened Plants, FDACS, Division of Plant Industry, Bureau of Entomology, Nematology and Plant Pathology.
- Atlas of Florida Vascular Plants (Wunderlin *et al.*, 1996).

Table 2.3.6-2 shows the listed plant species with the potential to occur on the Site based on geographic location and habitat records. This table also includes the characteristic habitat of each species as well as the likelihood for a species to occur on the Site.

Four state-listed plant species were observed on the Site. Two species are listed as commercially exploited and two are listed as endangered. All four species occur within the mixed hardwood forested wetland on the northern portion of the Site, which will be preserved. The commercially exploited species were cinnamon fern and royal fern, both of which are common within the state of Florida and listed to discourage commercial exploitation. Royal fern was more common in the wetland than cinnamon fern. Giant wild pine, an epiphytic species commonly found throughout hammocks in the state of Florida, was noted on several trees within the western portion of the forested wetland. The giant wild pine is listed as endangered due to the Chervolat weevil (*Metamasius callizona*)

whose larvae tunnel through the plant bases. Thirty-nine hand fern plants were observed in the boots of four cabbage palm trees during the 2000 site surveys. Two of the cabbage palm trees are located on the southern perimeter of the forested wetland and one each was found on the eastern and northwestern perimeters. During the inspection of the Site in October 2004, one new population of hand ferns was discovered along the eastern edge of the forested wetland. At this new location, two very small hand fern plants were noted in the boots of a cabbage palm tree located directly northeast of a previously identified population. It is assumed, given the immature nature of this population, that the two new plants are the offspring from the adjacent population. During the October 2004 Site inspection, it also was discovered that one of the populations located on the southern perimeter of the wetland no longer existed. The cabbage palm in that area had been stripped of many of its boots, apparently as a result of the recent hurricanes, and the population of hand fern plants at this location was eliminated. The approximate locations of the trees are noted on Figures 2.3.5-1 and 2.3.5-2. This endangered species is relatively uncommon in the state. Formerly widespread throughout the southern half of the state, the hand fern is now rare in most places. Collectors have taken many hand ferns from the wild, while loss of habitat and destruction by fire has also contributed to the decline in populations.

No federally listed species were observed on the Site, or are likely to occur within the habitats found onsite. Three federally listed plant species are known to occur in Indian River County. Two species (Olga's mint and Small's milkpea) require scrub habitat, which does not occur on the Site. The third (Indian River prickly-apple) is a coastal species, normally found on shell mounds or in coastal hammocks, which also does not occur on the Site.

Fauna

Table 2.3.6-3 lists potentially occurring state or federally listed wildlife species on the Site. The list was developed from the FNAI matrix, Florida Fish and Wildlife Conservation Commission (FFWCC), and USFWS records, as well as personal observations.

The only listed wildlife species documented onsite was the gopher tortoise. Gopher tortoises are currently listed as a species of special concern (SSC) by FFWCC. The little blue heron is listed as SSC by FFWCC and was observed just offsite in the east perimeter drainage ditch. Data searches of FNAI, FFWCC, or USFWS records indicate that no other listed species occur on the Site.

Gopher tortoises are in low numbers on the Site; one active and two inactive burrows were observed. Several abandoned burrows were found, possibly indicating a greater population historically. Habitat is present but without fire onsite, the flatwoods are getting too dense to make ideal gopher tortoise habitat.

Table 2.3.7-4. National and Florida Air Quality Standards ($\mu\text{g}/\text{m}^3$ unless otherwise stated)

Pollutant (units)	Averaging Periods	National Standards		Florida Standards
		Primary	Secondary	
SO ₂ (ppmv)	3-hour ¹		0.5	0.5
	24-hour ¹	0.14		0.1
	Annual ²	0.030		0.02
SO ₂	3-hour ¹			1,300
	24-hour ¹			260
	Annual ²			60
PM ₁₀	24-hour ³	150	150	150
	Annual ⁴	50	50	50
PM _{2.5}	24-hour ⁵	65	65	
	Annual ⁶	15	15	
CO (ppmv)	1-hour ¹	35		35
	8-hour ¹	9		9
CO	1-hour ¹			40,000
	8-hour ¹			10,000
Ozone (ppmv)	1-hour ⁷	0.12		0.12
	8-hour ⁸	0.08	0.08	
NO ₂ (ppmv)	Annual ²	0.053	0.053	0.05
NO ₂	Annual ²			100
Lead	Calendar Quarter Arithmetic Mean	1.5	1.5	1.5

¹Not to be exceeded more than once per calendar year.

²Arithmetic mean.

³The standards are attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu\text{g}/\text{m}^3$, as determined in accordance with Appendix K to this part, is equal to or less than one

⁴The standards are attained when the expected annual arithmetic mean concentration, as determined in accordance with Appendix K to this part, is less than or equal to 50 $\mu\text{g}/\text{m}^3$.

⁵Standards are met when the 98th percentile 24-hour concentration, as determined in accordance with Appendix N, is less than or equal to 65 $\mu\text{g}/\text{m}^3$.

⁶Standards are met when the annual arithmetic mean concentration, as determined in accordance with appendix N of this part, is less than or equal to 15.0 $\mu\text{g}/\text{m}^3$.

⁷Standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤ 1 , as determined by appendix H. The 1-hour ozone standard will be revoked on June 15, 2005, one year following the effective date of the 8-hour ozone standard designations.

⁸To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

Sources: 40 CFR 50.

Section 62-204.240, F.A.C.

Ambient air monitoring data are available with which to generally characterize the existing conditions in the vicinity of the Site. Table 2.3.7-5 lists the ambient monitoring stations closest to the Site for each criteria pollutant, per FDEP reports for calendar years 2002 and 2003. Figure 2.3.7-6 shows the locations of these stations relative to the Site.

Table 2.3.7-5. Ambient Air Quality Monitoring Stations Closest to the BHEC Site

Pollutant	FDEP Station No.	Station Location		Relative to Project Site (km)
		County	City	
PM ₁₀	12 111 1002	St. Lucie	Fort Pierce	15 SE
SO ₂	12 099 3004	Palm Beach	Riviera Beach	138 SE
NO ₂	12 099 1004	Palm Beach	Palm Beach	104 SE
CO	12 099 1004	Palm Beach	Palm Beach	104 SE
Ozone	12 111 1002	St. Lucie	Fort Pierce	15 SE

Sources: FDEP, 2002 and 2003.
ECT, 2004.

The nearest FDEP ambient air monitoring station is located in Fort Pierce, St. Lucie County, approximately 15 km southeast of the Site. The FDEP monitoring station in Fort Pierce monitors for particulate matter less than or equal to 10 micrometers aerodynamic diameter (PM₁₀), PM_{2.5}, and ozone. The nearest FDEP station that monitors for nitrogen dioxide (NO₂) is located in Palm Beach, Palm Beach County, approximately 104 km southeast of the Project Site. The nearest FDEP station that monitors for CO is located in West Palm Beach, Palm Beach County, approximately 104 km southeast of the Project Site. The nearest FDEP station that monitors for sulfur dioxide (SO₂) is located in Riviera Beach, Palm Beach County, approximately 138 km southeast of the Site. The monitoring data collected in urban Palm Beach County would not be truly representative of the rural Site location. Accordingly, existing concentrations of SO₂, NO_x, and CO, which are usually associated with urban environments, are likely to be lower at the Site than is indicated by the monitoring data for more urban areas.

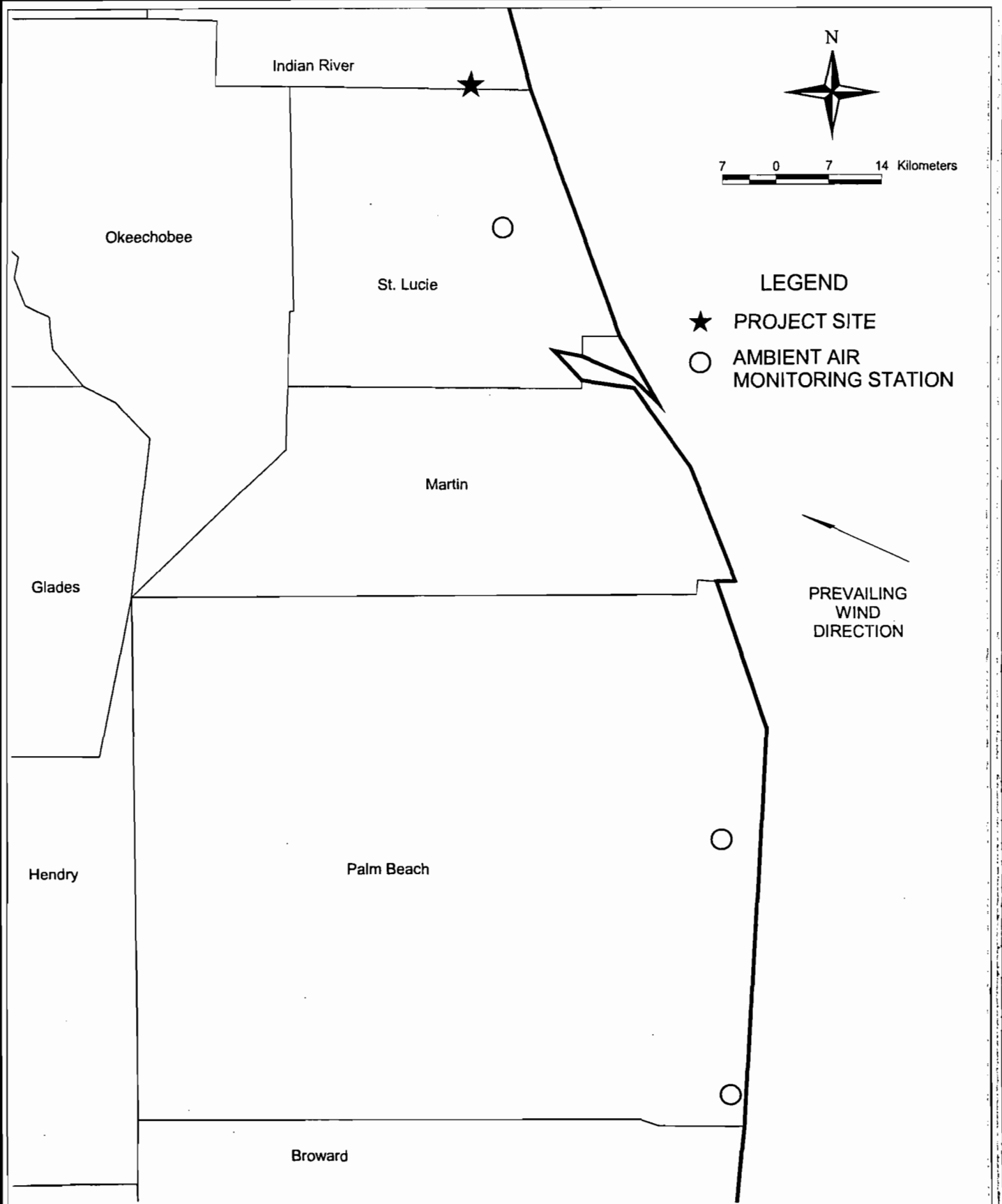


FIGURE 2.3.7-6. (REV. 1 - 12/04)

LOCATIONS OF CLOSEST FDEP AMBIENT AIR QUALITY MONITORING STATIONS

Source: ECT, 2004.



CALPINE
BLUE HERON
 ENERGY CENTER

Tables 2.3.7-6 through 2.3.7-10 present summaries of the available data. These presentations of data are consistent with the conclusion that the Site is characterized as having good air quality.

Table 2.3.7-6. Summary of FDEP PM₁₀ Monitoring Near the BHEC Site

Location	Site Identification Number	Year	24-Hour Measurement		Annual Arithmetic Mean (µg/m ³)
			Highest (µg/m ³)	Second-highest (µg/m ³)	
Fort Pierce	12 111 1002	2002	55	38	19
		2003	35	28	16.8

Note: Not to be exceeded more than once per year. To attain this standard, the expected annual arithmetic mean PM₁₀ concentration at each monitor within an area must not exceed 50 µg/m³.

Source: FDEP, 2002 and 2003.

Table 2.3.7-7. Summary of FDEP SO₂ Monitoring Near the BHEC Site

Location	Site Identification Number	Year	Second Highest 3-Hour Average	Second Highest 24-Hour Average	Annual Average
			(µg/m ³)	(µg/m ³)	
Riviera Beach	12 099 3004	2002	13.1	5.2	2.9
		2003	7.9	5.2	2.6

Note: The 3-hour ambient standard is 1,300 µg/m³, not to be exceeded more than once per year. The 24-hour ambient standard is 260 µg/m³, not to be exceeded more than once per year. The annual ambient standard is 60 µg/m³, arithmetic mean.

Source: FDEP, 2002 and 2003.

Table 2.3.7-8. Summary of FDEP NO₂ Monitoring Near the BHEC Site

Location	Site Identification Number	Year	Annual Average (µg/m ³)
Palm Beach	12 099 1004	2002	31.8
		2003	27.1

Note: The annual ambient standard is 100 µg/m³, arithmetic mean.

Source: FDEP, 2002 and 2003.

Table 2.3.7-9. Summary of FDEP CO Monitoring Near the BHEC Site

Location	Site Identification Number	Year	Highest 1-Hour Average (µg/m ³)	Highest 8-Hour Average (µg/m ³)
Palm Beach	12 999 1004	2002	4,370	2,645
Palm Beach		2003	9,315	1,840

Note: The 1-hour ambient standard is 40,000 µg/m³, not to be exceeded more than once per year.
The 8-hour ambient standard is 10,000 µg/m³, not to be exceeded more than once per year.

Source: FDEP, 2002 and 2003.

Table 2.3.7-10. Summary of FDEP Ozone Monitoring Near the BHEC Site

Location	Identification Number	Year	1-Hour Measurement*		8-Hour Measurement	
			Highest (µg/m ³)	Second-highest (µg/m ³)	Highest (µg/m ³)	Second-highest (µg/m ³)
Fort Pierce	12 111 1002	2002	159.0	153.1	147.2	123.7
		2003	159.0	149.2	139.4	139.4

* Not to be exceeded more than once per year. To attain this standard, the expected annual arithmetic mean PM₁₀ concentration at each monitor within an area must not exceed 50 µg/m³.

Source: FDEP, 2002 and 2003.

Another indicator of existing air quality is proximity to other emission sources. Indian River County has, in general, less heavy industry than many counties in Florida. The largest potential sources of air emissions are power plants. The power plant closest to the Site is the City of Vero Beach power plant in Vero Beach. Other point sources of anthro-

pogenic emissions in Indian River County are the Ocean Spray Cranberries food citrus processing facility, and the Piper Aircraft Inc., manufacturing facility; both are located in the vicinity of the Site, as shown in Figure 2.3.7-7.

2.3.7.3 Measurement Programs

No programs to measure existing meteorological or ambient air quality conditions were undertaken for the Project. Given the low impacts predicted for the Project's combustion emissions, the use of existing data was deemed appropriate.