

Harvey, Mary

4/2/07

**From:** Dee\_Morse@nps.gov  
**Sent:** Monday, September 17, 2007 11:50 AM  
**To:** Harvey, Mary  
**Subject:** Final Permit #1290001-008-AC - City of Tallahassee Electric Utilities

Return Receipt

Your document: Final Permit #1290001-008-AC - City of Tallahassee Electric Utilities  
was Dee Morse/DENVER/NPS

## Harvey, Mary

---

**From:** Forney.Kathleen@epamail.epa.gov  
**Sent:** Friday, September 14, 2007 10:48 AM  
**To:** Harvey, Mary  
**Subject:** Re: FW: Final Permit #1290001-008-AC - City of Tallahassee Electric Utilities

**Attachments:** City of Tallahassee - 1290001-008-AC- FINAL.pdf



City of Tallahassee  
- 1290001-...

Ok. Thanks. I don't know what happened then.

Katy

-----  
Katy R. Forney  
Air Permits Section  
EPA - Region 4  
61 Forsyth St., SW  
Atlanta, GA 30024

Phone: 404-562-9130  
Fax: 404-562-9019

"Harvey, Mary"  
<Mary.Harvey@dep  
.state.fl.us>

09/14/2007 10:44  
AM

To  
Kathleen Forney/R4/USEPA/US@EPA  
cc  
Subject  
FW: Final Permit #1290001-008-AC  
- City of Tallahassee Electric  
Utilities

Katy - I email this to you on September 12th.

Thanks,  
Mary

From: Harvey, Mary  
Sent: Wednesday, September 12, 2007 11:08 AM  
To: 'forney.kathleen@epa.gov'; 'little.james@epamail.epa.gov'  
Subject: FW: Final Permit #1290001-008-AC - City of Tallahassee Electric Utilities

From: Harvey, Mary

**Harvey, Mary**

**From:** Harvey, Mary  
**Sent:** Wednesday, September 12, 2007 11:07 AM  
**To:** 'Mr. Robert E. McGarrah, City of Tallahassee'; 'Mr. John Powell, City of Tallahassee, Electric Utilities'; 'Ken Kosky, P.E., Golder'; Bradburn, Rick; Halpin, Mike; 'forney.kathleen@epa.gov'; 'little.james@epamail.epa.gov'; 'Mr. Dee Morse, National Park Service'  
**Cc:** Koerner, Jeff; Adams, Patty; Gibson, Victoria  
**Subject:** Final Permit #1290001-008-AC - City of Tallahassee Electric Utilities  
**Attachments:** 1290001.008.AC.F\_pdf.zip

Tracking:	Recipient	Read
	'Mr. Robert E. McGarrah, City of Tallahassee'	
	'Mr. John Powell, City of Tallahassee, Electric Utilities'	
	'Ken Kosky, P.E., Golder:'	
	Bradburn, Rick	Read: 9/12/2007 1:17 PM
	Halpin, Mike	Read: 9/12/2007 11:15 AM
	'forney.kathleen@epa.gov'	
	'little.james@epamail.epa.gov'	
	'Mr. Dee Morse, National Park Service'	
	Koerner, Jeff	
	Adams, Patty	Read: 9/12/2007 11:18 AM
	Gibson, Victoria	Read: 9/12/2007 11:15 AM

Dear Sir/Madam:

Please send a "reply" message verifying receipt of the attached document(s); this may be done by selecting "Reply" on the menu bar of your e-mail software and then selecting "Send". We must receive verification of receipt and your reply will preclude subsequent e-mail transmissions to verify receipt of the document(s).

The document(s) may require immediate action within a specified time frame. Please open and review the document(s) as soon as possible.

The document is in Adobe Portable Document Format (pdf). Adobe Acrobat Reader can be downloaded for free at the following internet site:  
<http://www.adobe.com/products/acrobat/readstep.html>.

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Thank you,

DEP, Bureau of Air Regulation

9/13/2007

## Harvey, Mary

---

**From:** Powell, John [PowellJ@talgov.com]  
**To:** Harvey, Mary  
**Sent:** Wednesday, September 12, 2007 11:08 AM  
**Subject:** Read: Final Permit #1290001-008-AC - City of Tallahassee Electric Utilities

Your message

**To:** PowellJ@talgov.com  
**Subject:**

was read on 9/12/2007 11:08 AM.

## Harvey, Mary

---

**From:** Bradburn, Rick  
**To:** Harvey, Mary  
**Sent:** Wednesday, September 12, 2007 1:17 PM  
**Subject:** Read: Final Permit #1290001-008-AC - City of Tallahassee Electric Utilities

Your message

**To:** 'Mr. Robert E. McGarrah, City of Tallahassee'; 'Mr. John Powell, City of Tallahassee, Electric Utilities'; 'Ken Kosky, P.E., Golder';  
Bradburn, Rick; Halpin, Mike; 'forney.kathleen@epa.gov'; 'little.james@epamail.epa.gov'; 'Mr. Dee Morse, National Park Service'  
**Cc:** Koerner, Jeff; Adams, Patty; Gibson, Victoria  
**Subject:** Final Permit #1290001-008-AC - City of Tallahassee Electric Utilities  
**Sent:** 9/12/2007 11:07 AM

was read on 9/12/2007 1:17 PM.

## Harvey, Mary

---

**From:** Mcgarrah, Rob [McGarraR@talgov.com]  
**Sent:** Wednesday, September 12, 2007 11:20 AM  
**To:** Harvey, Mary  
**Cc:** Powell, John  
**Subject:** RE: Final Permit #1290001-008-AC - City of Tallahassee Electric Utilities

Tallahassee has received this document.

-----Original Message-----

**From:** Harvey, Mary [mailto:Mary.Harvey@dep.state.fl.us]  
**Sent:** Wednesday, September 12, 2007 11:07 AM  
**To:** Mcgarrah, Rob; Powell, John; Ken Kosky, P.E., Golder.; Bradburn, Rick; Halpin, Mike; forney.kathleen@epa.gov; little.james@epamail.epa.gov; Mr. Dee Morse, National Park Service  
**Cc:** Koerner, Jeff; Adams, Patty; Gibson, Victoria  
**Subject:** Final Permit #1290001-008-AC - City of Tallahassee Electric Utilities

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The document(s) may require immediate action within a specified time frame. Please open and review the document(s) as soon as possible.

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Thank you,

DEP, Bureau of Air Regulation

## Harvey, Mary

---

**From:** MCGARRAH, ROB [McGarraR@talgov.com]  
**To:** Harvey, Mary  
**Sent:** Wednesday, September 12, 2007 11:18 AM  
**Subject:** Read: Final Permit #1290001-008-AC - City of Tallahassee Electric Utilities

Your message

To: MCGARRAH, ROB [McGarraR@talgov.com]  
Subject:

was read on 9/12/2007 11:18 AM.

## Harvey, Mary

---

**From:** Adams, Patty  
**To:** Harvey, Mary  
**Sent:** Wednesday, September 12, 2007 11:18 AM  
**Subject:** Read: Final Permit #1290001-008-AC - City of Tallahassee Electric Utilities

Your message

**To:** 'Mr. Robert E. McGarrah, City of Tallahassee'; 'Mr. John Powell, City of Tallahassee, Electric Utilities'; 'Ken Kosky, P.E., Golder:'; Bradburn, Rick; Halpin, Mike; 'forney.kathleen@epa.gov'; 'little.james@epamail.epa.gov'; 'Mr. Dee Morse, National Park Service'  
**Cc:** Koerner, Jeff; Adams, Patty; Gibson, Victoria  
**Subject:** Final Permit #1290001-008-AC - City of Tallahassee Electric Utilities  
**Sent:** 9/12/2007 11:07 AM

was read on 9/12/2007 11:18 AM.



## Harvey, Mary

---

**From:** Halpin, Mike  
**To:** Harvey, Mary  
**Sent:** Wednesday, September 12, 2007 11:15 AM  
**Subject:** Read: Final Permit #1290001-008-AC - City of Tallahassee Electric Utilities

Your message

**To:** 'Mr. Robert E. McGarrah, City of Tallahassee'; 'Mr. John Powell, City of Tallahassee, Electric Utilities'; 'Ken Kosky, P.E., Golder'; Bradburn, Rick; Halpin, Mike; 'forney.kathleen@epa.gov'; 'little.james@epamail.epa.gov'; 'Mr. Dee Morse, National Park Service'  
**Cc:** Koerner, Jeff; Adams, Patty; Gibson, Victoria  
**Subject:** Final Permit #1290001-008-AC - City of Tallahassee Electric Utilities  
**Sent:** 9/12/2007 11:07 AM

was read on 9/12/2007 11:15 AM.

## Harvey, Mary

---

**From:** Gibson, Victoria  
**To:** Harvey, Mary  
**Sent:** Wednesday, September 12, 2007 11:15 AM  
**Subject:** Read: Final Permit #1290001-008-AC - City of Tallahassee Electric Utilities

Your message

**To:** 'Mr. Robert E. McGarrah, City of Tallahassee'; 'Mr. John Powell, City of Tallahassee, Electric Utilities'; 'Ken Kosky, P.E., Golder'; Bradburn, Rick; Halpin, Mike; 'forney.kathleen@epa.gov'; 'little.james@epamail.epa.gov'; 'Mr. Dee Morse, National Park Service'  
**Cc:** Koerner, Jeff; Adams, Patty; Gibson, Victoria  
**Subject:** Final Permit #1290001-008-AC - City of Tallahassee Electric Utilities  
**Sent:** 9/12/2007 11:07 AM

was read on 9/12/2007 11:15 AM.

## Memorandum

# Florida Department of Environmental Protection

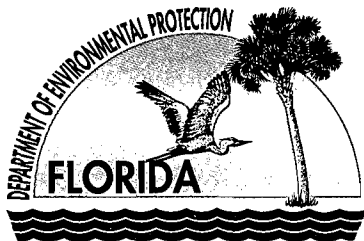
---

TO: Joe Kahn, Division of Air Resource Management  
THROUGH: Trina Vielhauer, Bureau of Air Regulation  
FROM: Jeff Koerner, Air Permitting North Section *JK*  
DATE: September 10, 2007  
SUBJECT: Final Air Permit No. 1290001-008-AC  
City of Tallahassee, Electric Utilities  
Sam O. Purdom Generating Station  
BART Project, Unit 7

Attached for your review is the final permit package for this project. Based on the Ten Year Site Plan on file with the Public Service Commission, Unit 7 is scheduled for permanent shutdown by March of 2011. To satisfy the provisions of Rule 62-296.340, F.A.C., the permit requires the permanent shut down of Unit 7 on or before December 31, 2013. I recommend your approval of the attached Final Permit.

Attachments

JK/tlv/jfk



# Florida Department of Environmental Protection

Bob Martinez Center  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Charlie Crist  
Governor

Jeff Kottkamp  
Lt. Governor

Michael W. Sole  
Secretary

## PERMITTEE

City of Tallahassee, Electric Utilities  
2602 Jackson Bluff Road  
Tallahassee, Florida 32304

Authorized Representative:

Mr. Robert E. McGarrah, Production Superintendent

Air Permit No. 1290001-008-AC  
Sam O. Purdom Generating Station  
Facility ID No. 1290001  
BART Project, Unit 7  
Wakulla County, Florida

## PROJECT

The City of Tallahassee operates the existing Sam O. Purdom Generating Station, which is an existing power plant (SIC No. 4911) located in Wakulla County at 667 Port Leon Drive in St. Marks, Florida. The Department identified existing Unit 7 at this plant as an eligible unit subject to a determination of the Best Available Retrofit Technology (BART) pursuant to Rule 62-296.340, Florida Administrative Code (F.A.C.). Primarily fired with fuel oil and natural gas, Unit 7 began operation in 1966 and is a 621 MMBtu per hour steam generator paired with a nominal 44 MW steam-electrical generator. To satisfy the provisions of Rule 62-296.340, F.A.C., the City of Tallahassee will shut down Unit 7.

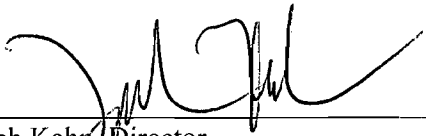
## PERMIT CONDITION

1. **Permanent Shutdown:** To satisfy the provisions of Rule 62-296.340, F.A.C., the permittee shall permanently shut down Unit 7 (Emissions Unit No. 007) on or before December 31, 2013. This condition reflects the permittee's plans and intentions for the scheduled shutdown of Unit 7. If these plans change due to some unforeseeable event, the permittee must take the following actions before December 31, 2013: submit a BART application; obtain an air construction permit authorizing the BART control strategies; implement the BART control strategies; and demonstrate compliance with the BART standards. Based on the duration of extended shutdown, other preconstruction requirements may also apply.

[Rule 62-296.340, F.A.C.; Applicant's Request]

This air pollution construction permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), and Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.). The permittee is authorized to conduct the proposed work in accordance with the conditions of this permit and as described in the application, approved drawings, plans, and other documents on file with the Department.

Executed in Tallahassee, Florida

  
\_\_\_\_\_  
Joseph Kahn, Director  
Division of Air Resource Management

9/11/2007  
\_\_\_\_\_  
(Date)

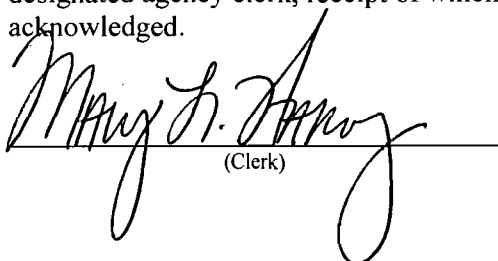
**CERTIFICATE OF SERVICE**

The undersigned duly designated deputy agency clerk hereby certifies that this Notice of Final Permit package (including the Final Permit and Final Determination) was sent by electronic mail with received receipt requested to the persons listed below.

- Mr. Robert E. McGarrah, City of Tallahassee ([McGarraR@talgov.com](mailto:McGarraR@talgov.com))
- Mr. John Powell, City of Tallahassee, Electric Utilities ([PowellJ@talgov.com](mailto:PowellJ@talgov.com))
- Mr. Ken Kosky, Golder Associates Inc. ([Ken\\_Kosky@golder.com](mailto:Ken_Kosky@golder.com))
- Mr. Rick Bradburn, NWD Office ([Rick.Bradburn@dep.state.fl.us](mailto:Rick.Bradburn@dep.state.fl.us))
- Mr. Mike Halpin, Siting Office ([Mike.Halpin@dep.state.fl.us](mailto:Mike.Halpin@dep.state.fl.us))
- Ms. Kathleen Forney ([Forney.Kathleen@epa.gov](mailto:Forney.Kathleen@epa.gov))
- Mr. Jim Little, EPA Region 4 ([Little.James@epa.gov](mailto:Little.James@epa.gov))
- Mr. Dee Morse, National Park Service ([Dee\\_Morse@nps.gov](mailto:Dee_Morse@nps.gov))

Clerk Stamp

**FILING AND ACKNOWLEDGMENT FILED**, on this date, pursuant to Section 120.52(7), Florida Statutes, with the designated agency clerk, receipt of which is hereby acknowledged.

  
\_\_\_\_\_  
(Clerk)

  
\_\_\_\_\_  
(Date)

STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

NOTICE OF FINAL PERMIT

*In the Matter of an  
Application for Permit by:*

City of Tallahassee, Electric Utilities  
2602 Jackson Bluff Road  
Tallahassee, Florida 32304

Air Permit No. 1290001-008-AC  
Sam O. Purdom Generating Station  
BART Project, Unit 7  
Wakulla County, Florida

Authorized Representative:

Mr. Robert E. McGarrah, Production Superintendent

We received your application for Best Available Retrofit Technology (BART) for existing Unit 7 in accordance with Rule 62-296.340, Florida Administrative Code (F.A.C.). Unit 7 began operation 1966 at the Sam O. Purdom Generating Station, which is located in Wakulla County at 667 Port Leon Drive in St. Marks, Florida. Primarily fired with fuel oil and natural gas, Unit 7 is a 621 MMBtu per hour steam generator paired with a nominal 44 MW steam-electrical generator. Based on the Ten Year Site Plan on file with the Public Service Commission, Unit 7 is scheduled for permanent shutdown by March of 2011. Enclosed is the final air construction permit, which specifies the enforceable shutdown date for this unit and satisfies the requirements of Rule 62-296.340, F.A.C. This permit is issued pursuant to Chapter 403, Florida Statutes.

Any party to this order has the right to seek judicial review of it under Section 120.68 of the Florida Statutes by filing a notice of appeal under Rule 9.110 of the Florida Rules of Appellate Procedure with the clerk of the Department of Environmental Protection in the Office of General Counsel (Mail Station #35, 3900 Commonwealth Boulevard, Tallahassee, Florida, 32399-3000) and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The notice must be filed within 30 days after this order is filed with the clerk of the Department.

Executed in Tallahassee, Florida.



Trina Vielhauer, Chief  
Bureau of Air Regulation

TV/jfk

Friday, Barbara

5/24/07

**From:** Harvey, Mary  
**Sent:** Friday, May 25, 2007 2:12 PM  
**To:** Adams, Patty  
**Subject:** FW: Draft Air Permit No. 1290001-008-AC-DRAFT

-----Original Message-----

**From:** Dee\_Morse@nps.gov [mailto:Dee\_Morse@nps.gov]  
**Sent:** Thursday, May 24, 2007 5:23 PM  
**To:** Harvey, Mary  
**Subject:** Draft Air Permit No. 1290001-008-AC-DRAFT

Return Receipt

Your Draft Air Permit No. 1290001-008-AC-DRAFT  
document:

was Dee Morse/DENVER/NPS  
received  
by:

at: 05/24/2007 03:23:23 PM

## Friday, Barbara

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**From:** Harvey, Mary  
**Sent:** Friday, May 25, 2007 2:11 PM  
**To:** Adams, Patty  
**Subject:** FW: Draft Air Permit No. 1290001-008-AC-DRAFT

---

**From:** Bradburn, Rick  
**Sent:** Friday, May 25, 2007 8:48 AM  
**To:** Harvey, Mary  
**Subject:** Read: Draft Air Permit No. 1290001-008-AC-DRAFT

Your message

**To:** 'Mr. Robert E. McGarrah, City of Tallahassee'; 'Mr. John Powell, City of Tallahassee, Electric Utilities'; 'Mr. Ken Kosky, Golder Associates Inc.'; Bradburn, Rick; Halpin, Mike; 'Ms. Kathleen Forney, EPA Region 4'; 'Mr. Jim Little, EPA Region 4'; 'Mr. Dee Morse, National Park Service'  
**Cc:** Koerner, Jeff; Adams, Patty; Gibson, Victoria  
**Subject:** Draft Air Permit No. 1290001-008-AC-DRAFT  
**Sent:** 5/24/2007 3:29 PM

was read on 5/25/2007 8:48 AM.



## Friday, Barbara

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**From:** Harvey, Mary  
**Sent:** Friday, May 25, 2007 2:12 PM  
**To:** Adams, Patty  
**Subject:** FW: Draft Air Permit No. 1290001-008-AC-DRAFT

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**From:** Powell, John [<mailto:PowellJ@talgov.com>]  
**Sent:** Thursday, May 24, 2007 6:09 PM  
**To:** Harvey, Mary  
**Subject:** Read: Draft Air Permit No. 1290001-008-AC-DRAFT

Your message

To: [PowellJ@talgov.com](mailto:PowellJ@talgov.com)  
Subject:

was read on 5/24/2007 6:09 PM.

**Friday, Barbara**

---

**From:** Harvey, Mary  
**Sent:** Thursday, May 24, 2007 3:29 PM  
**To:** 'Mr. Robert E. McGarrah, City of Tallahassee'; 'Mr. John Powell, City of Tallahassee, Electric Utilities'; 'Mr. Ken Kosky, Golder Associates Inc.'; Bradburn, Rick; Halpin, Mike; 'Ms. Kathleen Forney, EPA Region 4'; 'Mr. Jim Little, EPA Region 4'; 'Mr. Dee Morse, National Park Service'  
**Cc:** Koerner, Jeff; Adams, Patty; Gibson, Victoria  
**Subject:** Draft Air Permit No. 1290001-008-AC-DRAFT  
**Attachments:** 1290001.008.AC.D\_pdf.zip

Dear Sir/Madam:

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Thank you,

DEP, Bureau of Air Regulation

6/26/2007

**Friday, Barbara**

---

**From:** Harvey, Mary  
**Sent:** Thursday, May 24, 2007 3:31 PM  
**To:** 'Ms. Kathleen Forney, EPA Region 4'; 'Mr. Jim Little, EPA Region 4'  
**Cc:** Koerner, Jeff; Adams, Patty  
**Subject:** FW: Draft Air Permit No. 1290001-008-AC-DRAFT  
**Attachments:** Draft Permit 1290001-008-AC - DRAFT.PDF; Public Notice - 1290001-008-AC - DRAFT.PDF; Signed Documents - Facility #1290001-008-AC-DRAFT.pdf; Written Notice - 1290001-008-AC - DRAFT.PDF

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**From:** Harvey, Mary  
**Sent:** Thursday, May 24, 2007 3:29 PM  
**To:** 'Mr. Robert E. McGarrah, City of Tallahassee'; 'Mr. John Powell, City of Tallahassee, Electric Utilities'; 'Mr. Ken Kosky, Golder Associates Inc.'; Bradburn, Rick; Halpin, Mike; 'Ms. Kathleen Forney, EPA Region 4'; 'Mr. Jim Little, EPA Region 4'; 'Mr. Dee Morse, National Park Service'  
**Cc:** Koerner, Jeff; Adams, Patty; Gibson, Victoria  
**Subject:** Draft Air Permit No. 1290001-008-AC-DRAFT

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<http://www.adobe.com/products/acrobat/readstep.html>.

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DEP, Bureau of Air Regulation

6/26/2007

## Friday, Barbara

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**From:** Harvey, Mary  
**Sent:** Thursday, May 24, 2007 3:43 PM  
**To:** Adams, Patty; Koerner, Jeff  
**Subject:** FW: Draft Air Permit No. 1290001-008-AC-DRAFT

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**From:** Halpin, Mike  
**Sent:** Thursday, May 24, 2007 3:32 PM  
**To:** Harvey, Mary  
**Subject:** Read: Draft Air Permit No. 1290001-008-AC-DRAFT

Your message

**To:** 'Mr. Robert E. McGarrah, City of Tallahassee'; 'Mr. John Powell, City of Tallahassee, Electric Utilities'; 'Mr. Ken Kosky, Golder Associates Inc.'; Bradburn, Rick; Halpin, Mike; 'Ms. Kathleen Forney, EPA Region 4'; 'Mr. Jim Little, EPA Region 4'; 'Mr. Dee Morse, National Park Service'  
**Cc:** Koerner, Jeff; Adams, Patty; Gibson, Victoria  
**Subject:** Draft Air Permit No. 1290001-008-AC-DRAFT  
**Sent:** 5/24/2007 3:29 PM

was read on 5/24/2007 3:32 PM.

**Friday, Barbara**

---

**From:** Harvey, Mary  
**Sent:** Thursday, May 24, 2007 3:50 PM  
**To:** Adams, Patty; Koerner, Jeff  
**Subject:** FW: Draft Air Permit No. 1290001-008-AC-DRAFT

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**From:** Mcgarrah, Rob [<mailto:McGarraR@talgov.com>]  
**Sent:** Thursday, May 24, 2007 3:35 PM  
**To:** Harvey, Mary  
**Subject:** Read: Draft Air Permit No. 1290001-008-AC-DRAFT

Your message

To: [McGarraR@talgov.com](mailto:McGarraR@talgov.com)  
Subject:

was read on 5/24/2007 3:35 PM.



# Florida Department of Environmental Protection

Bob Martinez Center  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Charlie Crist  
Governor

Jeff Kottkamp  
Lt. Governor

Michael W. Sole  
Secretary

May 24, 2007

Mr. Robert E. McGarrah, Production Superintendent  
City of Tallahassee, Electric Utilities  
2602 Jackson Bluff Road  
Tallahassee, Florida 32304

Re: Air Construction Permit No. 1290001-008-AC  
Sam O. Purdom Generating Station  
BART Project, Unit 7

Dear Mr. McGarrah:

On January 31, 2007, you submitted an application for Best Available Retrofit Technology (BART) for Unit 7 in accordance with Rule 62-296.340, Florida Administrative Code (F.A.C.). Unit 7 began operation in 1966 at the Sam O. Purdom Generating Station, which is located in Wakulla County at 667 Port Leon Drive in St. Marks, Florida. Enclosed are the following documents:

- The proposed Draft Permit specifies the enforceable shutdown date for this unit and satisfies the requirements of Rule 62-296.340, F.A.C.
- The Written Notice of Intent to Issue Air Permit provides important information regarding: the Permitting Authority's intent to issue an air permit for the proposed project; the requirements for publishing a Public Notice of the Permitting Authority's intent to issue an air permit; the procedures for submitting comments on the Draft Permit; the process for filing a petition for an administrative hearing; and the availability of mediation.
- The Public Notice of Intent to Issue Air Permit is the actual notice that you must have published in the legal advertisement section of a newspaper of general circulation in the area affected by this project.

If you have any questions, please contact the Project Engineer, Jeff Koerner, at 850/921-9536.

Sincerely,


Trina Vielhauer, Chief  
Bureau of Air Regulation

Enclosures

## Memorandum

# Florida Department of Environmental Protection

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TO: Trina Vielhauer, Bureau of Air Regulation  
FROM: Jeff Koerner, Air Permitting North Section   
DATE: May 24, 2007  
SUBJECT: Draft Air Permit No. 1290001-008-AC  
City of Tallahassee, Electric Utilities  
Sam O. Purdom Generating Station  
BART Project, Unit 7

This project is subject to minor source preconstruction review. Attached for your review are the following items:

- Written Notice of Intent to Issue Air Permit;
- Public Notice of Intent to Issue Air Permit;
- Draft Permit; and
- P.E. Certification.

To satisfy the provisions of Rule 62-296.340, F.A.C., the Draft Permit requires the permanent shut down of Unit 7 on or before December 31, 2013. The P.E. certification briefly summarizes the proposed project. I recommend your approval of the attached Draft Permit.

Attachments

**P.E. CERTIFICATION STATEMENT**

**PERMITTEE**

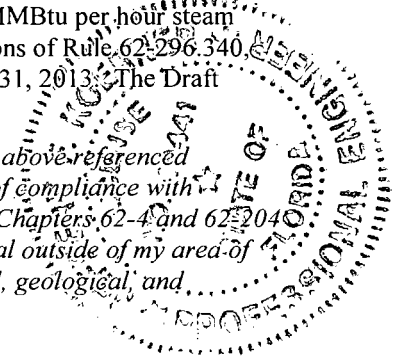
City of Tallahassee, Electric Utilities  
2602 Jackson Bluff Road  
Tallahassee, Florida 32304

Draft Permit No. 1290001-008-AC  
Sam O. Purdom Generating Station  
BART Project, Unit 7  
Wakulla County, Florida

**PROJECT DESCRIPTION**

The Department of Environmental Protection identified existing Unit 7 at this plant as an eligible unit subject to a determination of the Best Available Retrofit Technology (BART) pursuant to Rule 62-296.340, Florida Administrative Code (F.A.C.). The applicant submitted an application for an air permit in accordance with the rule. Primarily fired with fuel oil and natural gas, Unit 7 began operation in 1966 and is a 621 MMBtu per hour steam generator paired with a nominal 44 MW steam-electrical generator. To satisfy the provisions of Rule 62-296.340, F.A.C., the City of Tallahassee will permanently shut down Unit 7 on or before December 31, 2013. The Draft Permit establishes this shutdown date.

*I HEREBY CERTIFY that the air pollution control engineering features described in the above referenced application and subject to the proposed permit conditions provide reasonable assurance of compliance with applicable provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 62-4 and 62-204 through 62-297. However, I have not evaluated and I do not certify aspects of the proposal outside of my area of expertise (including, but not limited to, the electrical, mechanical, structural, hydrological, geological, and meteorological features).*



*Jeffery F. Koerner*

*5-24-07*

Jeffery F. Koerner, P.E.  
Registration Number: 49441

(Date)



## WRITTEN NOTICE OF INTENT TO ISSUE AIR PERMIT

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*In the Matter of an  
Application for Air Permit by:*

City of Tallahassee, Electric Utilities  
2602 Jackson Bluff Road  
Tallahassee, Florida 32304

Air Permit No. 1290001-008-AC  
Sam O. Purdom Generating Station  
Facility ID No. 1290001  
BART Project, Unit 7  
Wakulla County, Florida

Authorized Representative:  
Mr. Robert E. McGarrah, Production Superintendent

**Facility Location:** The City of Tallahassee operates the existing Sam O. Purdom Generating Station, which is an existing power plant located in Wakulla County at 667 Port Leon Drive in St. Marks, Florida.

**Project:** The Department of Environmental Protection identified existing Unit 7 at this plant as an eligible unit subject to a determination of the Best Available Retrofit Technology (BART) pursuant to Rule 62-296.340, Florida Administrative Code (F.A.C.). The applicant submitted an application for an air permit in accordance with the rule. Primarily fired with fuel oil and natural gas, Unit 7 began operation in 1966 and is a 621 MMBtu per hour steam generator paired with a nominal 44 MW steam-electrical generator. To satisfy the provisions of Rule 62-296.340, F.A.C., the City of Tallahassee will permanently shut down Unit 7 on or before December 31, 2013. The Draft Permit establishes this shutdown date.

**Permitting Authority:** Applications for air construction permits are subject to review in accordance with the provisions of Chapter 403, Florida Statutes (F.S.) and Chapters 62-4, 62-210, and 62-212 of the Florida Administrative Code (F.A.C.). The proposed project is not exempt from air permitting requirements and an air permit is required to perform the proposed work. The Bureau of Air Regulation is the Permitting Authority responsible for making a permit determination for this project. The Permitting Authority's physical address is: 111 South Magnolia Drive, Suite #4, Tallahassee, Florida. The Permitting Authority's mailing address is: 2600 Blair Stone Road, MS #5505, Tallahassee, Florida 32399-2400. The Permitting Authority's telephone number is 850/488-0114.

**Project File:** A complete project file is available for public inspection during the normal business hours of 8:00 a.m. to 5:00 p.m., Monday through Friday (except legal holidays), at the address indicated above for the Permitting Authority. The complete project file includes the Draft Permit, the Technical Evaluation and Preliminary Determination, the application, and the information submitted by the applicant, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Permitting Authority's project review engineer for additional information at the address or phone number listed above.

**Notice of Intent to Issue Permit:** The Permitting Authority gives notice of its intent to issue an air permit to the applicant for the project described above. The applicant has provided reasonable assurance that operation of the proposed equipment will not adversely impact air quality and that the project will comply with all appropriate provisions of Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297, F.A.C. The Permitting Authority will issue a Final Permit in accordance with the conditions of the proposed Draft Permit unless a timely petition for an administrative hearing is filed under Sections 120.569 and 120.57, F.S. or unless public comment received in accordance with this notice results in a different decision or a significant change of terms or conditions.

**Public Notice:** Pursuant to Section 403.815, F.S. and Rules 62-110.106 and 62-210.350, F.A.C., you (the applicant) are required to publish at your own expense the enclosed Public Notice of Intent to Issue Air Permit (Public Notice). The Public Notice shall be published one time only as soon as possible in the legal advertisement section of a newspaper of general circulation in the area affected by this project. The

## WRITTEN NOTICE OF INTENT TO ISSUE AIR PERMIT

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newspaper used must meet the requirements of Sections 50.011 and 50.031, F.S. in the county where the activity is to take place. If you are uncertain that a newspaper meets these requirements, please contact the Permitting Authority at above address or phone number. Pursuant to Rule 62-110.106(5) and (9), F.A.C., the applicant shall provide proof of publication to the Permitting Authority at the above address within 7 days of publication. Failure to publish the notice and provide proof of publication may result in the denial of the permit pursuant to Rule 62-110.106(11), F.A.C.

**Comments:** The Permitting Authority will accept written comments concerning the proposed Draft Permit for a period of 14 days from the date of publication of the Public Notice. Written comments must be postmarked by the Permitting Authority by close of business (5:00 p.m.) on or before the end of this 14-day period. If written comments received result in a significant change to the Draft Permit, the Permitting Authority shall revise the Draft Permit and require, if applicable, another Public Notice. All comments filed will be made available for public inspection.

**Petitions:** A person whose substantial interests are affected by the proposed permitting decision may petition for an administrative hearing in accordance with Sections 120.569 and 120.57, F.S. The petition must contain the information set forth below and must be filed with (received by) the Department's Agency Clerk in the Office of General Counsel of the Department of Environmental Protection, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000. Petitions filed by the applicant or any of the parties listed below must be filed within 14 days of receipt of this Written Notice of Intent to Issue Air Permit. Petitions filed by any persons other than those entitled to written notice under Section 120.60(3), F.S., must be filed within 14 days of publication of the attached Public Notice or within 14 days of receipt of this Written Notice of Intent to Issue Air Permit, whichever occurs first. Under Section 120.60(3), F.S., however, any person who asked the Permitting Authority for notice of agency action may file a petition within 14 days of receipt of that notice, regardless of the date of publication. A petitioner shall mail a copy of the petition to the applicant at the address indicated above, at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57, F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention (in a proceeding initiated by another party) will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205, F.A.C.

A petition that disputes the material facts on which the Permitting Authority's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address, and telephone number of the petitioner; the name, address and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination; (c) A statement of when and how each petitioner received notice of the agency action or proposed decision; (d) A statement of all disputed issues of material fact. If there are none, the petition must so state; (e) A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action; (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action including an explanation of how the alleged facts relate to the specific rules or statutes; and, (g) A statement of the relief sought by the petitioner, stating precisely the action the petitioner wishes the agency to take with respect to the agency's proposed action. A petition that does not dispute the material facts upon which the Permitting Authority's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.301, F.A.C.


Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Permitting Authority's final action may be different from the position taken by it

**WRITTEN NOTICE OF INTENT TO ISSUE AIR PERMIT**

in this Written Notice of Intent to Issue Air Permit. Persons whose substantial interests will be affected by any such final decision of the Permitting Authority on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

**Mediation:** Mediation is not available in this proceeding.

Executed in Tallahassee, Florida.



Trina Vielhauer, Chief  
Bureau of Air Regulation

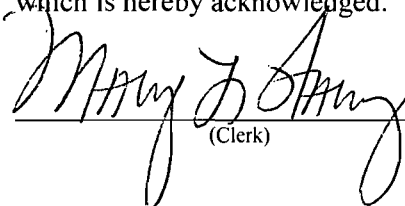
**CERTIFICATE OF SERVICE**

The undersigned duly designated deputy agency clerk hereby certifies that this Notice of Intent to Issue Air Permit package (including the Written Notice, the Public Notice and the Draft Permit) was sent by electronic mail with received receipt requested before the close of business on 5/24/07 to the persons listed below.

- Mr. Robert E. McGarrah, City of Tallahassee ([McGarraR@talgov.com](mailto:McGarraR@talgov.com))
- Mr. John Powell, City of Tallahassee, Electric Utilities ([PowellJ@talgov.com](mailto:PowellJ@talgov.com))
- Mr. Ken Kosky, Golder Associates Inc. ([Ken\\_Kosky@golder.com](mailto:Ken_Kosky@golder.com))
- Mr. Rick Bradburn, NWD Office ([Rick.Bradburn@dep.state.fl.us](mailto:Rick.Bradburn@dep.state.fl.us))
- Mr. Mike Halpin, Siting Office ([Mike.Halpin@dep.state.fl.us](mailto:Mike.Halpin@dep.state.fl.us))
- Ms. Kathleen Forney, EPA Region 4 ([Forney.Kathleen@epa.gov](mailto:Forney.Kathleen@epa.gov))
- Mr. Jim Little, EPA Region 4 ([Little.James@epa.gov](mailto:Little.James@epa.gov))
- Mr. Dee Morse, National Park Service ([Dee\\_Morse@nps.gov](mailto:Dee_Morse@nps.gov))

Clerk Stamp

**FILING AND ACKNOWLEDGMENT FILED**, on this date, pursuant to Section 120.52(7), Florida Statutes, with the designated agency clerk, receipt of which is hereby acknowledged.



(Clerk)

5/24/07  
(Date)

## PUBLIC NOTICE OF INTENT TO ISSUE AIR PERMIT

Florida Department of Environmental Protection  
Division of Air Resource Management, Bureau of Air Regulation

Draft Air Permit No. 1290001-008-AC  
City of Tallahassee, Electric Utilities  
Sam O. Purdom Generating Station  
Wakulla County, Florida

**Applicant:** The applicant for this project is the City of Tallahassee. The applicant's authorized representative and mailing address is: Mr. Robert E. McGarrah, Production Superintendent, City of Tallahassee Electric Utilities, 2602 Jackson Bluff Road, Tallahassee, Florida 32304.

**Facility Location:** The City of Tallahassee operates the existing Sam O. Purdom Generating Station, which is an existing power plant located in Wakulla County at 667 Port Leon Drive in St. Marks, Florida.

**Project:** The Department of Environmental Protection identified existing Unit 7 at this plant as an eligible unit subject to a determination of the Best Available Retrofit Technology (BART) pursuant to Rule 62-296.340, Florida Administrative Code (F.A.C.). The applicant submitted an application for an air permit in accordance with the rule. Primarily fired with fuel oil and natural gas, Unit 7 began operation in 1966 and is a 621 MMBtu per hour steam generator paired with a nominal 44 MW steam-electrical generator. To satisfy the provisions of Rule 62-296.340, F.A.C., the City of Tallahassee will permanently shut down Unit 7 on or before December 31, 2013. The Draft Permit establishes this shutdown date.

**Permitting Authority:** Applications for air construction permits are subject to review in accordance with the provisions of Chapter 403, Florida Statutes (F.S.) and Chapters 62-4, 62-210, and 62-212 of the Florida Administrative Code (F.A.C.). The proposed project is not exempt from air permitting requirements and an air permit is required to perform the proposed work. The Bureau of Air Regulation is the Permitting Authority responsible for making a permit determination for this project. The Permitting Authority's physical address is: 111 South Magnolia Drive, Suite #4, Tallahassee, Florida. The Permitting Authority's mailing address is: 2600 Blair Stone Road, MS #5505, Tallahassee, Florida 32399-2400. The Permitting Authority's telephone number is 850/488-0114.

**Project File:** A complete project file is available for public inspection during the normal business hours of 8:00 a.m. to 5:00 p.m., Monday through Friday (except legal holidays), at the address indicated above for the Permitting Authority. The complete project file includes the Draft Permit, the Technical Evaluation and Preliminary Determination, the application, and the information submitted by the applicant, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Permitting Authority's project review engineer for additional information at the address and phone number listed above. In addition, electronic copies of these documents are available on the following web site:  
<http://www.dep.state.fl.us/air/eproducts/apds/default.asp>.

**Notice of Intent to Issue Air Permit:** The Permitting Authority gives notice of its intent to issue an air permit to the applicant for the project described above. The applicant has provided reasonable assurance that operation of proposed equipment will not adversely impact air quality and that the project will comply with all appropriate provisions of Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297, F.A.C. The Permitting Authority will issue a Final Permit in accordance with the conditions of the proposed Draft Permit unless a timely petition for an administrative hearing is filed under Sections 120.569 and 120.57, F.S. or unless public comment received in accordance with this notice results in a different decision or a significant change of terms or conditions.

**Comments:** The Permitting Authority will accept written comments concerning the proposed Draft Permit for a period of 14 days from the date of publication of the Public Notice. Written comments must be postmarked by the Permitting Authority by close of business (5:00 p.m.) on or before the end of this 14-day period. If written comments received result in a significant change to the Draft Permit, the Permitting Authority shall

(Public Notice to be Published in the Newspaper)

revise the Draft Permit and require, if applicable, another Public Notice. All comments filed will be made available for public inspection.

**Petitions:** A person whose substantial interests are affected by the proposed permitting decision may petition for an administrative hearing in accordance with Sections 120.569 and 120.57, F.S. The petition must contain the information set forth below and must be filed with (received by) the Department's Agency Clerk in the Office of General Counsel of the Department of Environmental Protection at 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000. Petitions filed by any persons other than those entitled to written notice under Section 120.60(3), F.S. must be filed within 14 days of publication of this Public Notice or receipt of a written notice, whichever occurs first. Under Section 120.60(3), F.S., however, any person who asked the Permitting Authority for notice of agency action may file a petition within 14 days of receipt of that notice, regardless of the date of publication. A petitioner shall mail a copy of the petition to the applicant at the address indicated above, at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57, F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention (in a proceeding initiated by another party) will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205, F.A.C.

A petition that disputes the material facts on which the Permitting Authority's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address and telephone number of the petitioner; the name address and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial rights will be affected by the agency determination; (c) A statement of when and how the petitioner received notice of the agency action or proposed decision; (d) A statement of all disputed issues of material fact. If there are none, the petition must so state; (e) A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action; (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action including an explanation of how the alleged facts relate to the specific rules or statutes; and, (g) A statement of the relief sought by the petitioner, stating precisely the action the petitioner wishes the agency to take with respect to the agency's proposed action. A petition that does not dispute the material facts upon which the Permitting Authority's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.301, F.A.C.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Permitting Authority's final action may be different from the position taken by it in this Public Notice of Intent to Issue Air Permit. Persons whose substantial interests will be affected by any such final decision of the Permitting Authority on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

**Mediation:** Mediation is not available for this proceeding.

# DRAFT PERMIT

## PERMITTEE

City of Tallahassee, Electric Utilities  
2602 Jackson Bluff Road  
Tallahassee, Florida 32304

Authorized Representative:  
Mr. Robert E. McGarran, Production Superintendent

Air Permit No. 1290001-008-AC Sam O. Purdom Generating Station Facility ID No. 1290001 BART Project, Unit 7 Wakulla County, Florida
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## PROJECT

The City of Tallahassee operates the existing Sam O. Purdom Generating Station, which is an existing power plant (SIC No. 4911) located in Wakulla County at 667 Port Leon Drive in St. Marks, Florida. The Department identified existing Unit 7 at this plant as an eligible unit subject to a determination of the Best Available Retrofit Technology (BART) pursuant to Rule 62-296.340, Florida Administrative Code (F.A.C.). Primarily fired with fuel oil and natural gas, Unit 7 began operation in 1966 and is a 621 MMBtu per hour steam generator paired with a nominal 44 MW steam-electrical generator. To satisfy the provisions of Rule 62-296.340, F.A.C., the City of Tallahassee will shut down Unit 7.

## PERMIT CONDITION

1. Permanent Shutdown: To satisfy the provisions of Rule 62-296.340, F.A.C., the permittee shall permanently shut down Unit 7 (Emissions Unit No. 007) on or before December 31, 2013. This condition reflects the permittee's plans and intentions for the scheduled shutdown of Unit 7. If these plans change due to some unforeseeable event, the permittee must take the following actions before December 31, 2013: submit a BART application; obtain an air construction permit authorizing the BART control strategies; implement the BART control strategies; and demonstrate compliance with the BART standards. Based on the duration of extended shutdown, other preconstruction requirements may also apply.

[Rule 62-296.340, F.A.C.; Applicant's Request]

This air pollution construction permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), and Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.). The permittee is authorized to conduct the proposed work in accordance with the conditions of this permit and as described in the application, approved drawings, plans, and other documents on file with the Department.

Executed in Tallahassee, Florida

(DRAFT)

\_\_\_\_\_  
Joseph Kahn, Director  
Division of Air Resource Management

\_\_\_\_\_  
(Date)

		<b>Pieces:</b> <b>1/1</b>	
<b>FM: DEP AIR RESOURCE MGMT</b> P. Adams DIRECTOR OFFICE STE 23 111 S MAGNOLIA DR TALLAHASSEE, FL 32301 UNITED STATES Phone: 850-921-9505		<b>ORIGIN:</b> TLH Sender's ref 37550201000 A7 AP255	
<b>To: DEP NORTHWEST DISTRICT</b> MR. RICK BRADBURN 160 GOVERNMENTAL CENTER SUITE 160 PENSACOLA, FL 32502 UNITED STATES		<b>POSTCODE:</b> <b>32502</b>	
TEL: 850-595-8300 ex 1225			
Description: BART app, Smurfit Stone, COT, PSD-FL-388 4/11 lett Weight: 2 lbs for 1 pcs Date: 2007-04-25 DHL standard terms and conditions apply.			
		<b>27FR</b> Day	
		<b>PNS 6K</b> <b>SSH</b>	
(ZLJUS32502)			
			
WAYBILL: 21248984455 (Non-Negotiable)			

▲ PEEL HERE PEEL HERE ▲

Please fold or cut in half  
**DO NOT PHOTOCOPY**

Using a photocopy could delay the delivery of your package and will result in additional shipping charge

<b>SENDER'S RECEIPT</b> Waybill #: 21248984455		Rate Estimate: 3.06 Protection: Not Required Description: BART app, Smurfit Stone, COT, PSD-FL-388 4/11 lett
To(Company): DEP Northwest District Suite 160 160 Governmental Center  Pensacola, FL 32502 UNITED STATES		Weight (lbs.): 2 Dimensions: 0 x 0 x 0
Attention To: Mr. Rick Bradburn Phone#: 850-595-8300 ex 1225		Ship Ref: 37550201000 A7 AP255 Service Level: Ground (Est. delivery in 2 business day(s))
Sent By: P. Adams Phone#: 850-921-9505		Special Svc:  Date Printed: 4/25/2007 Bill Shipment To: Sender Bill To Acct: 778941286

DHL Signature (optional) \_\_\_\_\_ Route \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

For Tracking, please go to [www.dhl-usa.com](http://www.dhl-usa.com) or call 1-800-225-5345  
 Thank you for shipping with DHL





2602 Jackson Bluff Road, Tallahassee, Florida 32304, (850) 891-4YOU (4968), talgov.com

March 4, 2007

**VIA ELECTRONIC MEANS – NO HARD COPY TO FOLLOW**

Mr. Jeffery F. Koerner, Administrator  
Permitting North Section  
Bureau of Air Regulation  
Florida Department of Environmental Protection  
2600 Blair Stone Road, MS # 5505  
Tallahassee, FL 32399-2400

RE: Project No. 129001-008-AC  
Sam O Purdom Generating Station  
Bart Applications

Dear Mr. Koerner:

We are in receipt of your letter dated March 1, 2007 concerning the City's plans to retire Purdom Unit 7 no later than December 31, 2013. Your understanding is correct that the City plans on retiring this unit from service no later than December 31, 2013.

Please advise if you have any questions.

Yours truly,

Robert E. McGarrah  
Manager Power Production

Cc: Kevin Wailes  
Gary Brinkworth  
John Powell  
Gordon King





# Florida Department of Environmental Protection

Bob Martinez Center  
2600 Blair Stone Road, MS#5505  
Tallahassee, Florida 32399-2400

Charlie Crist  
Governor

Jeff Kotkamp  
Lt. Governor

Michael W. Sole  
Secretary

March 1, 2007

*Electronically Sent – Return Receipt Requested*

Mr. Robert E. McGarrah, Production Superintendent  
City of Tallahassee, Electric Utilities  
2602 Jackson Bluff Road  
Tallahassee, Florida 32304

Re: Project No. 1290001-008-AC  
Sam O. Purdom Generating Station  
BART Application

Dear Mr. McGarrah:

On January 31, 2007, we received your application for Best Available Retrofit Technology (BART) for Unit 7 in accordance with Rule 62-296.340, Florida Administrative Code (F.A.C.). On February 14, 2007, we received a facsimile of an earlier letter dated January 24, 2007 indicating your intent to comply with the BART requirements by shutting down Unit 7 before December 31, 2013. Currently, it is your tentative plan to shutdown Unit 7 by March of 2011. Based on this information, the Department intends to issue a federally enforceable permit requiring the permanent shutdown of Unit 7 on or before December 31, 2013. If your plans to permanently shut down Unit 7 change, you must take the following actions before December 31, 2013: submit a BART application; obtain an air construction permit authorizing the BART control strategies; implement the BART control strategies; and demonstrate compliance with the BART standards.

If this is not your intent, please contact me by March 15<sup>th</sup>. Otherwise, we will proceed accordingly. If you have any questions, please contact me at 850/921-9536.

Sincerely,

A handwritten signature in black ink that reads 'Jeffery F. Koerner'.

Jeffery F. Koerner, Administrator  
Permitting North Section  
Bureau of Air Regulation

*This document was sent electronically to the following people:*

cc: Mr. Robert McGarrah, City of Tallahassee, Electric Utilities ([McGarraR@talgov.com](mailto:McGarraR@talgov.com))  
Mr. John Powell, City of Tallahassee, Electric Utilities ([powellj@talgov.com](mailto:powellj@talgov.com))  
Mr. Ken Kosky, Golder Associates Inc. ([ken\\_kosky@golder.com](mailto:ken_kosky@golder.com))  
Mr. Gregg Worley, EPA Region 4 ([worley.gregg@epamail.epa.gov](mailto:worley.gregg@epamail.epa.gov))  
Mr. Dee Morse, NPS ([dee\\_morse@nps.gov](mailto:dee_morse@nps.gov))

## Adams, Patty

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**From:** Koerner, Jeff  
**Sent:** Thursday, March 01, 2007 4:00 PM  
**To:** (McGarraR@talgov.com); John Powell (powellj@talgov.com); Ken Kosky (ken\_kosky@golder.com); Gregg Worley (worley.gregg@epa.gov); Dee Morse (dee\_morse@nps.gov)  
**Cc:** Adams, Patty  
**Subject:** Sam O. Purdom Generating Station, Project No. 1290001-008-AC, BART Application  
**Attachments:** Purdom BART - RFI.pdf



Purdom BART -  
RFI.pdf (527 KB)...

Dear Sir:

Please send a "reply" message verifying receipt of the attached document. This may be done by selecting "Reply" on the menu bar of your e-mail software and then selecting "Send". We must receive verification of receipt and your reply will preclude subsequent e-mail transmissions to verify receipt of the document.

The documents may require immediate action within a specified time frame. Please open and review the documents as soon as possible.

The document is in Adobe Portable Document Format (pdf). Adobe Acrobat Reader can be downloaded for free at the following internet site:

<http://www.adobe.com/products/acrobat/readstep.html>.

The Bureau of Air Regulation is issuing electronic documents for permits, notices and other correspondence in lieu of hard copies through the United States Postal System, to provide greater service to the applicant and the engineering community. Please advise this office of any changes to your e-mail address or that of the Engineer-of-Record.

Thank you,

DEP, Bureau of Air Regulation

**Adams, Patty**

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**From:** MCGarrah, Rob [McGarraR@talgov.com]  
**Sent:** Thursday, March 01, 2007 4:33 PM  
**To:** Koerner, Jeff; Powell, John; ken\_kosky@golder.com; worley.gregg@epa.gov; dee\_morse@nps.gov  
**Cc:** Adams, Patty  
**Subject:** RE: Sam O. Purdom Generating Station, Project No. 1290001-008-AC, BART Application

Tallahassee has received this e-mail.

Rob McGarrah, Manager Power Production  
City of Tallahassee Electric Utility  
2602 Jackson Bluff Road  
Tallahassee, FL 32304  
850-891-5534 (o)  
850-891-5162 (fax)  
[mcgarrar@talgov.com](mailto:mcgarrar@talgov.com)

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**From:** Koerner, Jeff [mailto:Jeff.Koerner@dep.state.fl.us]  
**Sent:** Thu 3/1/2007 3:59 PM  
**To:** MCGarrah, Rob; Powell, John; ken\_kosky@golder.com; worley.gregg@epa.gov; dee\_morse@nps.gov  
**Cc:** Adams, Patty  
**Subject:** Sam O. Purdom Generating Station, Project No. 1290001-008-AC, BART Application

<<Purdom BART - RFI.pdf>>

Dear Sir:  
Please send a "reply" message verifying receipt of the attached document. This may be done by selecting "Reply" on the menu bar of your e-mail software and then selecting "Send". We must receive verification of receipt and your reply will preclude subsequent e-mail transmissions to verify receipt of the document.

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<http://www.adobe.com/products/acrobat/readstep.html>.

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Thank you,

DEP, Bureau of Air Regulation

**BART EXEMPTION MODELING ANALYSIS  
FOR  
AFFECTED CITY OF TALLAHASSEE  
GENERATING STATIONS**

**Prepared For:  
City of Tallahassee  
300 South Adams Street  
Tallahassee, Florida**

**Prepared By:  
Golder Associates Inc.  
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**January 2007  
0637625**

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## INTRODUCTION

Pursuant to Section 403.061(35), Florida Statutes, the Federal Clean Air Act, and the regional haze regulations contained in Title 40, Part 51 of the Code of Federal Regulations (40 CFR 51), Subpart P – Protection of Visibility, the Florida Department of Environmental Protection (FDEP) is required to ensure that certain sources of visibility impairing pollutants in Florida use Best Available Retrofit Technology (BART) to reduce the impact of their emissions on regional haze in federal Class I areas. Requirements for individual source BART control technology determinations and for BART exemptions are proposed in Rule 62-296.340 of the Florida Administrative Code (F.A.C.).

Proposed Rule 62-296.340(5)(c), F.A.C., states that a BART-eligible source may demonstrate that it is exempt from the requirement for BART determination for all pollutants by performing an individual source attribution analysis in accordance with the procedures contained in 40 CFR 51, Appendix Y. A BART-eligible source is exempt from BART determination requirements if its contribution to visibility impairment, as determined below, does not exceed 0.5 deciview (dv) above natural conditions in any Class I area.

For electric generating units subject to the clean air interstate rule (CAIR) program, the source attribution analysis need only consider particulate matter emissions (including primary sulfate) for comparison with the contribution threshold.

The 98<sup>th</sup> percentile, i.e., the 8<sup>th</sup> highest 24-hour average visibility impairment value in any year or the 22<sup>nd</sup> highest 24-hour average visibility impairment value over 3 years combined, whichever is higher, is compared to 0.5 dv in the source attribution analysis.

Based on the proposed Rule 62-296.340(5)(c), F.A.C., if the owner or operator of a BART-eligible source requests exemption from the requirement for BART determination for all pollutants by submitting its source attribution analysis to the FDEP by January 31, 2007, and the FDEP ultimately grants such exemption, the requirement for submission of an air construction permit application pursuant to 62-296.340(3)(b)1., F.A.C., shall not apply.

This report is submitted to the FDEP to present the source attribution analysis for the following BART-eligible emissions units at the two City of Tallahassee generating stations that are BART-eligible sources:

- Arvah B. Hopkins Generating Station – Boiler No. 1 and Boiler No. 2 (EU ID Nos. 001 and 004, respectively); and
- Sam O. Purdom Generating Station – Boiler No. 7 (EU ID 007).

The objective of the analysis is to demonstrate that these emissions units are exempt from BART determination.

Section A of this report contains a brief source description, modeling methodology and the modeling analysis results for the Hopkins Generating Station. Section B of this report contains a brief source description, modeling methodology and the modeling analysis results for the Purdom Generating Station. The source information and methodologies used for the BART exemption analysis are the same as those presented in the document entitled “Air Modeling Protocol to Evaluate Best Available Retrofit Technology (BART) Options for Affected City of Tallahassee Generating Stations.” A copy of this document has been included for reference in Appendix A.

## SECTION A- ARVAH R. HOPKINS GENERATING STATION

### 1.0 SOURCE DESCRIPTION

The Arvah B. Hopkins Generating Station is an existing generating facility presently comprised of two steam electric generating units (Units 1 and 2), two Westinghouse combustion turbines (CTs) (referred to as HC-1 and HC-2), and two General Electric (GE) LM6000 CTs (referred to as HC-3 and HC-4). HC-3 and HC-4 began operation in 2005. In 2006, the City of Tallahassee submitted an air construction permit application to repower Unit No. 2. The repowering of Unit No. 2 will include the addition of one nominal 188-megawatt (MW) combined-cycle unit and the permanent shut down of the fossil fuel steam boiler for Unit 2. The proposed combined cycle unit will consist of one GE7FA CT and associated electric generator, heat recovery steam generator (HRSG), and the existing steam turbine-electric generator. The unit will be equipped with a bypass stack that will be used with natural gas firing only.

Although the repowering of Unit No. 2 at the Hopkins Generating Station will include the permanent shut down of the fossil fuel steam boiler for Unit 2, this unit is not exempt from the BART exemption modeling. As a result, both Units 1 and 2 were modeled together.

The Hopkins Generating Station is located at 1125 Geddie Road in Tallahassee, Leon County, Florida. An area map showing the Hopkins Generating Station and Prevention of Significant Deterioration (PSD) Class I areas located within 300 kilometers (km) of the station is presented in Figure 1-1 of the Protocol. The PSD Class I areas and their distances from the station are as follows:

- St. Marks National Wilderness Area (NWA) - 39 km;
- Okefenokee (NWA) - 182 km; and
- Chassahowitzka (NWA) - 249 km.

The general location of this station, in Universal Transverse Mercator (UTM) coordinates, is 749.665 km East; 3,371.565 km North, Zone 16.

The stack, operating and particulate matter (PM) emission data, including PM speciation, for the BART-eligible emissions units are presented in detail in the Protocol.



Because there are minimal fugitive PM emissions and the station is 39 km from the St. Marks Class I area, fugitive PM emissions from this station were not addressed in the BART evaluation.

Building downwash effects were considered in the modeling since the distance of the nearest PSD Class I area is less than 50 km from the station.

## 2.0 AIR QUALITY MODELING METHODOLOGY

The CALPUFF model, Version 5.756, was used to predict the maximum visibility impairment at the PSD Class I areas located within 300 km of the Hopkins Generating Station. Recent technical enhancements, including changes to the over-water boundary layer formulation and coastal effects modules (sponsored by the Minerals Management Service), are included in this version. The methods and assumptions used in the CALPUFF model are presented in the Protocol. The 4-km spacing Florida domain was used for the BART exemption. The refined CALMET domain used for this modeling analysis has been provided by the FDEP. The major features used in preparing these CALMET data have also been described in Section 4.0 of the Protocol.

Currently, the atmospheric light extinction is estimated by an algorithm developed by the Interagency Monitoring of Protected Visual Environments (IMPROVE) committee, which was adopted by the EPA under the 1999 Regional Haze Rule (RHR) and referred to in this report as the "1999 IMPROVE algorithm". This algorithm tends to underestimate light extinction for the highest haze conditions and overestimate it for the lowest haze conditions and does not include light extinction due to sea salt, which is important at sites near the sea coasts. As a result of these limitations, the IMPROVE Steering Committee recently developed a new algorithm (the "new IMPROVE algorithm") for estimating light extinction from particulate matter component concentrations, which provides a better correspondence between measured visibility and that calculated from particulate matter component concentrations. A detailed description of the new IMPROVE algorithm and its implementation is presented in Section 3.4 of the Protocol.

The new IMPROVE algorithm can be used if the visibility impairment values predicted with the 1999 IMPROVE algorithm are greater than 0.5 dv. If the new IMPROVE algorithm is used, the maximum predicted visibility impairment values will be lower than those predicted with the 1999 IMPROVE algorithm.

Visibility impacts were predicted at each PSD Class I area using receptors provided by the National Park Service and are presented in Figures 4-1 through 4-3 of the Protocol.

### 3.0 AIR MODELING ANALYSIS RESULTS

Summaries of the maximum visibility impairment values for the Units 1 and 2 at the Purdom Generating Station estimated using the 1999 IMPROVE algorithm are presented in Tables A-1 and A-2. The 98<sup>th</sup> percentile 24-average visibility impairment values (i.e., 8<sup>th</sup> highest) for the years 2001, 2002 and 2003, and the 22<sup>nd</sup> highest 24-average visibility impairment value over the three years, are presented in Table A-1. The number of days and receptors for which the visibility impairment was predicted to be greater than 0.5 dv is also presented in Table A-1. The eight highest visibility impairment values predicted at the PSD Class I areas are presented in Table A-2.

As shown in Tables A-1 and A-2, the 8<sup>th</sup> highest visibility impairment values predicted for each year at two of the PSD Class I areas using the 1999 IMPROVE algorithm are less than 0.5 dv. The 22<sup>nd</sup> highest visibility impairment value predicted over the 3-year period at the PSD Class I areas are also less than 0.5 dv. However, at the St. Marks NWA, the highest 8<sup>th</sup> highest visibility impairment value is predicted to be 0.52 dv in 2002 while the 22<sup>nd</sup> highest visibility impairment value predicted over the 3-year period is 0.49 dv.

As a result, the visibility impacts were evaluated at the St. Marks NWA with the new IMPROVE algorithm. Similar to the results presented using the 1999 IMPROVE algorithm, summaries of the maximum visibility impairment values estimated using the new IMPROVE algorithm are presented in Tables A-3 and A-4. As shown in Tables A-3 and A-4, the highest 8<sup>th</sup> highest visibility impairment value predicted at the St. Marks NWA with the new IMPROVE algorithm is 0.44 dv. The 22<sup>nd</sup> highest visibility impairment value predicted at this PSD Class I area over the 3-year period is 0.42 dv.

Based on these results which demonstrate that the maximum visibility impairment values for the station are predicted to be less than the FDEP's BART exemption criteria of 0.5 dv, an exemption from BART determination is requested for the Hopkins Generating Station.

The input and output files (excluding CALMET) used for the exemption modeling are provided on a CD submitted with this report. Quality assurance procedures were followed, as described in the Protocol, to ensure that the setup and execution of the CALPUFF model and processing of the modeling results satisfy the regulatory objectives of the BART program.

**TABLE A-1  
SUMMARY OF BART EXEMPTION MODELING RESULTS  
HOPKINS GENERATING STATION**

Class I Area	Distance (km) of Source to Nearest Class I Area Boundary	Number of Days and Receptors with Impact >0.5 dv									22 <sup>nd</sup> Highest Impact (dv) Over 3-Yr Period
		2001			2002			2003			
		No. of Days	No. of Receptors	8 <sup>th</sup> Highest Impact (dv)	No. of Days	No. of Receptors	8 <sup>th</sup> Highest Impact (dv)	No. of Days	No. of Receptors	8 <sup>th</sup> Highest Impact (dv)	
St. Marks NWA	39	9	90	0.518	8	55	0.522	4	53	0.422	0.492
Okefenokee NWA	182	0	0	0.085	0	0	0.072	0	0	0.090	0.085
Chassahowitzka NWA	249	0	0	0.056	0	0	0.039	0	0	0.043	0.048

**TABLE A-2  
VISIBILITY IMPACT RANKINGS AT PSD CLASS I AREAS  
HOPKINS GENERATING STATION**

Class I Area	Rank	Predicted Impact (dv)		
		2001	2002	2003
St. Marks NWA	1	0.854	0.675	0.659
	2	0.799	0.672	0.645
	3	0.699	0.658	0.548
	4	0.626	0.604	0.513
	5	0.599	0.584	0.492
	6	0.521	0.562	0.488
	7	0.519	0.526	0.450
	8	0.518	0.522	0.422
Okefenokee NWA	1	0.107	0.125	0.135
	2	0.101	0.116	0.121
	3	0.096	0.116	0.119
	4	0.093	0.098	0.115
	5	0.089	0.096	0.115
	6	0.088	0.076	0.114
	7	0.087	0.074	0.094
	8	0.085	0.072	0.090
Chassahowitzka NWA	1	0.121	0.147	0.106
	2	0.085	0.086	0.085
	3	0.072	0.077	0.061
	4	0.066	0.069	0.059
	5	0.061	0.058	0.053
	6	0.061	0.057	0.045
	7	0.058	0.046	0.043
	8	0.056	0.039	0.043

**TABLE A-3  
SUMMARY OF BART EXEMPTION MODELING RESULTS- BASED ON NEW IMPROVE EQUATION  
HOPKINS GENERATING STATION**

Class I Area	Distance (km) of Source to Nearest Class I Area Boundary	Number of Days and Receptors with Impact >0.5 dv <sup>a</sup>									22 <sup>nd</sup> Highest Impact (dv) Over 3-Yr Period
		2001			2002			2003			
		No. of Days	No. of Receptors	8 <sup>th</sup> Highest Impact (dv)	No. of Days	No. of Receptors	8 <sup>th</sup> Highest Impact (dv)	No. of Days	No. of Receptors	8 <sup>th</sup> Highest Impact (dv)	
St. Marks NWA	39	NA	NA	0.440	NA	NA	0.444	NA	NA	0.362	0.422

NA= not available

<sup>a</sup> No. of days and receptors are not readily available from the spreadsheet developed by VISTAS to estimate visibility impairment with the new IMPROVE equation.

**TABLE A-4**  
**VISIBILITY IMPACT RANKINGS AT PSD CLASS I AREAS**  
**BASED ON NEW IMPROVE EQUATION**  
**HOPKINS GENERATING STATION**

Class I Area	Rank	Predicted Impact (dv)		
		2001	2002	2003
St. Marks NWA	1	0.728	0.581	0.562
	2	0.683	0.572	0.549
	3	0.597	0.561	0.464
	4	0.534	0.518	0.436
	5	0.515	0.502	0.422
	6	0.445	0.482	0.418
	7	0.445	0.450	0.384
	8	0.440	0.444	0.362

## SECTION B- SAM O. PURDOM GENERATING STATION

### 1.0 SOURCE DESCRIPTION

The Sam O. Purdom Generating Station consists of a steam electric generating unit (Unit 7), two simple cycle CTs, an auxiliary boiler, and a combined cycle gas turbine.

The Purdom Generating Station is located at 667 Port Leon Drive in St. Marks, Wakulla County, Florida. An area map showing the Purdom Generating Station and PSD Class I areas located within 300 kilometers (km) of the station is presented in Figure 1-1 of the Protocol. The PSD Class I areas and their distances from the station are as follows:

- St. Marks NWA - 1 km;
- Okefenokee NWA - 175 km; and
- Chassahowitzka (NWA) - 213 km.

The general location of this station, in Universal Transverse Mercator (UTM) coordinates, is 769.877 km East; 3,339.814 km North, Zone 16.

The stack, operating and PM emission data, including PM speciation, for the BART-eligible emissions units are presented in detail in the Protocol.

Because the Purdom Station is operated infrequently and has material handling operations that generate minimal fugitive PM emissions due to the type of fuel fired at the station, fugitive PM emissions from this station were not addressed in the BART evaluation.

Building downwash effects were considered in the modeling since the distance of the nearest PSD Class I area is less than 50 km from the station.



## 2.0 AIR QUALITY MODELING METHODOLOGY

The CALPUFF model, Version 5.756, was used to predict the maximum visibility impairment at the PSD Class I areas located within 300 km of the Purdom Generating Station. Recent technical enhancements, including changes to the over-water boundary layer formulation and coastal effects modules (sponsored by the Minerals Management Service), are included in this version. The methods and assumptions used in the CALPUFF model are presented in the Protocol. The 4-km spacing Florida domain was used for the BART exemption. The refined CALMET domain used for this modeling analysis has been provided by the FDEP. The major features used in preparing these CALMET data have also been described in Section 4.0 of the Protocol.

Currently, the atmospheric light extinction is estimated by an algorithm developed by the Interagency Monitoring of Protected Visual Environments (IMPROVE) committee, which was adopted by the EPA under the 1999 Regional Haze Rule (RHR) and referred to in this report as the "1999 IMPROVE algorithm". This algorithm tends to underestimate light extinction for the highest haze conditions and overestimate it for the lowest haze conditions and does not include light extinction due to sea salt, which is important at sites near the sea coasts. As a result of these limitations, the IMPROVE Steering Committee recently developed a new algorithm (the "new IMPROVE algorithm") for estimating light extinction from particulate matter component concentrations, which provides a better correspondence between measured visibility and that calculated from particulate matter component concentrations. A detailed description of the new IMPROVE algorithm and its implementation is presented in Section 3.4 of the Protocol.

The new IMPROVE algorithm can be used if the visibility impairment values predicted with the 1999 IMPROVE algorithm are greater than 0.5 dv. If the new IMPROVE algorithm is used, the maximum predicted visibility impairment values will be lower than those predicted with the 1999 IMPROVE algorithm.

Visibility impacts were predicted at each PSD Class I area using receptors provided by the National Park Service and are presented in Figures 4-1 through 4-3 of the Protocol. Because of the proximity of St. Marks NWA, visibility impacts were also predicted at 40 receptors that were added to that PSD Class I area and are presented in Figure 4-4 of the Protocol.

### 3.0 AIR MODELING ANALYSIS RESULTS

Summaries of the maximum visibility impairment values for the sulfur recovery plants at the Purdom Generating Station estimated using the 1999 IMPROVE algorithm are presented in Tables B-1 and B-2. The 98<sup>th</sup> percentile 24-average visibility impairment values (i.e., 8<sup>th</sup> highest) for the years 2001, 2002 and 2003, and the 22<sup>nd</sup> highest 24-average visibility impairment value over the three years, are presented in Table B-1. The number of days and receptors for which the visibility impairment was predicted to be greater than 0.5 dv is also presented in Table B-1. The 8 highest visibility impairment values predicted at the PSD Class I areas are presented in Table B-2.

As shown in Tables B-1 and B-2, the 8<sup>th</sup> highest visibility impairment values predicted for each year at two of the PSD Class I areas using the 1999 IMPROVE algorithm are less than 0.5 dv. The 22<sup>nd</sup> highest visibility impairment value predicted over the 3-year period at the PSD Class I areas are also less than 0.5 dv. However, at the St. Marks NWA, the highest 8<sup>th</sup> highest visibility impairment value is predicted to be 3.05 dv in 2001 while the 22<sup>nd</sup> highest visibility impairment value predicted over the 3-year period is 2.38 dv.

As a result, the visibility impacts were evaluated at the St. Marks NWA with the new IMPROVE algorithm. Similar to the results presented using the 1999 IMPROVE algorithm, summaries of the maximum visibility impairment values estimated using the new IMPROVE algorithm are presented in Tables B-3 and B-4. As shown in Tables B-3 and B-4, the highest 8<sup>th</sup> highest visibility impairment value predicted at the St. Marks NWA with the new IMPROVE algorithm is 2.75 dv. The 22<sup>nd</sup> highest visibility impairment value predicted at this PSD Class I area over the 3-year period is 2.41 dv.

Based on these results which demonstrate that the maximum visibility impairment values for the station are predicted to be greater than the FDEP's BART exemption criteria of 0.5 dv, further BART control evaluations are required.

The input and output files (excluding CALMET) used for the exemption modeling are provided on a CD submitted with this report. Quality assurance procedures were followed, as described in the Protocol, to ensure that the setup and execution of the CALPUFF model and processing of the modeling results satisfy the regulatory objectives of the BART program.

**TABLE B-1  
SUMMARY OF BART EXEMPTION MODELING RESULTS  
PURDOM GENERATING STATION**

Class I Area	Distance (km) of Source to Nearest Class I Area Boundary	Number of Days and Receptors with Impact >0.5 dv									22 <sup>nd</sup> Highest Impact (dv) Over 3-Yr Period
		2001			2002			2003			
		No. of Days	No. of Receptors	8 <sup>th</sup> Highest Impact (dv)	No. of Days	No. of Receptors	8 <sup>th</sup> Highest Impact (dv)	No. of Days	No. of Receptors	8 <sup>th</sup> Highest Impact (dv)	
St. Marks NWA	39	132	116	3.054	137	112	2.626	121	135	2.420	2.700
Okefenokee NWA	182	0	0	0.024	0	0	0.023	0	0	0.027	0.025
Chassahowitzka NWA	249	0	0	0.020	0	0	0.018	0	0	0.014	0.017

**TABLE B-2  
VISIBILITY IMPACT RANKINGS AT PSD CLASS I AREAS  
PURDOM GENERATING STATION**

Class I Area	Rank	Predicted Impact (dv)		
		2001	2002	2003
St. Marks NWA	1	4.531	3.595	3.269
	2	3.810	2.959	2.946
	3	3.739	2.924	2.870
	4	3.362	2.894	2.810
	5	3.288	2.757	2.576
	6	3.161	2.700	2.545
	7	3.121	2.635	2.455
	8	3.054	2.626	2.420
Okefenokee NWA	1	0.040	0.033	0.044
	2	0.037	0.033	0.035
	3	0.037	0.030	0.035
	4	0.031	0.030	0.035
	5	0.025	0.026	0.032
	6	0.025	0.025	0.031
	7	0.024	0.025	0.028
	8	0.024	0.023	0.027
Chassahowitzka NWA	1	0.042	0.046	0.034
	2	0.036	0.042	0.028
	3	0.025	0.034	0.026
	4	0.023	0.033	0.025
	5	0.022	0.021	0.017
	6	0.022	0.020	0.017
	7	0.022	0.018	0.014
	8	0.020	0.018	0.014

**TABLE B-3  
SUMMARY OF BART EXEMPTION MODELING RESULTS- BASED ON NEW IMPROVE EQUATION  
PURDOM GENERATING STATION**

Class I Area	Distance (km) of Source to Nearest Class I Area Boundary	Number of Days and Receptors with Impact >0.5 dv									22 <sup>nd</sup> Highest Impact (dv) Over 3-Yr Period
		2001			2002			2003			
		No. of Days	No. of Receptors	8 <sup>th</sup> Highest Impact (dv)	No. of Days	No. of Receptors	8 <sup>th</sup> Highest Impact (dv)	No. of Days	No. of Receptors	8 <sup>th</sup> Highest Impact (dv)	
St. Marks NWA	39	NA	NA	2.752	NA	NA	2.360	NA	NA	2.190	2.413

NA= not available

<sup>a</sup> No. of days and receptors are not readily available from the spreadsheet developed by VISTAS to estimate visibility impairment with the new IMPROVE equation.

**TABLE B-4  
 VISIBILITY IMPACT RANKINGS AT PSD CLASS I AREAS  
 BASED ON NEW IMPROVE EQUATION  
 PURDOM GENERATING STATION**

Class I Area	Rank	Predicted Impact (dv)		
		2001	2002	2003
St. Marks NWA	1	4.110	3.271	2.907
	2	3.471	2.686	2.653
	3	3.408	2.625	2.563
	4	3.020	2.619	2.509
	5	2.951	2.498	2.333
	6	2.870	2.448	2.268
	7	2.813	2.368	2.199
	8	2.752	2.360	2.190

#### 4.0 BART DETERMINATION

Based on proposed Rule 62-296.340(3)(b), F.A.C., the owner or operator of a BART-eligible source subject to the requirements for BART determination shall perform a BART evaluation for each emissions unit comprising the BART-eligible source and for each pollutant for which a BART determination is required. In addition, the air construction permit issued by the Department shall require the owner or operator of a BART-eligible source to comply with BART as expeditiously as practicable, but no later than December 31, 2013.

The BART-eligible emissions unit at the Purdom Generating Station, Unit 7, is planned to be permanently shutdown by March 2011. Since the unit is planned to be shutdown prior to the effective date that BART controls must be in place (i.e., December 31, 2013), the BART determination is based on the unit shutdown. No further BART evaluation is required for Unit 7. As a result, Unit 7 will comply with the BART regulations.

**ATTACHMENT A**

**AIR MODELING PROTOCOL**

**TO EVALUATE**

**BEST AVAILABLE RETROFIT TECHNOLOGY (BART) OPTIONS  
FOR AFFECTED CITY OF TALLAHASSEE GENERATING STATIONS**



**AIR MODELING PROTOCOL  
TO EVALUATE  
BEST AVAILABLE RETROFIT  
TECHNOLOGY (BART) OPTIONS  
FOR AFFECTED CITY OF TALLAHASSEE  
GENERATING STATIONS**

**Prepared For:  
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**January 2007  
0637625**

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## 1.0 INTRODUCTION

### 1.1 Objectives

Under the regional haze regulations, which are contained in Title 40, Part 51 of the Code of Federal Regulations (40 CFR 51), Subpart P – Protection of Visibility, the U.S. Environmental Protection Agency (EPA) has issued final guidelines dated July 6, 2005 for Best Available Retrofit Technology (BART) determinations [Federal Register (FR), Volume 70, pages 39104-39172]. BART applies to certain large stationary sources known as BART-eligible sources. Sources are BART-eligible if they meet the following three criteria:

- Contains emissions units that are one of the 26 listed source categories in the guidance;
- Contains emissions units that were “in existence” on August 7, 1962 and “began operation” before August 7, 1977; and
- Potential emissions from these emissions units of at least 250 tons per year (TPY) of a visibility-impairing pollutant [sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), and direct particulate matter of equal to less than 10 microns (PM<sub>10</sub>)].

The Florida Department of Environmental Protection (FDEP) has identified two City of Tallahassee generating stations as BART-eligible sources with BART-eligible emissions units. These stations include:

- Arvah B. Hopkins Generating Station – Boiler No. 1 and Boiler No. 2 (EU ID Nos. 001 and 004, respectively); and
- Sam O. Purdom Generating Station – Boiler No. 7 (EU ID 007).

FDEP has proposed to adopt EPA’s visibility protection rules and guidelines contained in 40 CFR 51, Subpart P. Final adoption of these rules is expected by the end of this year.

The basic tenet of the regional haze program is the achievement of natural visibility conditions in Prevention of Significant Deterioration (PSD) Class I areas by the year 2064. Florida has four PSD Class I areas while Georgia has two PSD Class I areas that can be affected by Florida sources [i.e., located in Florida or within 300 kilometers (km) of Florida].

BART is required for any BART-eligible source that the FDEP determines emits any air pollutant that may "reasonably be anticipated to cause or contribute to any impairment of visibility in any Class I area." The BART guidelines establish a threshold value of 0.5 deciview (dv) for any single source for determining whether the source contributes to visibility impairment.

Throughout this protocol the terms "source" and "facility" have the same meanings. The term "BART-eligible emissions unit" is defined as any single emissions unit that meets the criteria described above, except for the 250 TPY criteria, which applies to the BART-eligible source. A "BART-eligible source" is defined as the collection of all BART-eligible emissions units at a single facility. If a source has several emissions units, only those that meet the BART-eligible criteria are included in the definition of "BART-eligible source."

The FDEP requires that the California Puff (CALPUFF) modeling system be used to determine visibility impacts from BART-eligible sources at the PSD Class I areas. A source-specific modeling protocol is required to be submitted by the affected sources to the FDEP for review and approval. The source-specific modeling must be included in the BART application, due to FDEP no later than January 31, 2007.

This protocol describes the modeling procedures to be followed for performing the air modeling and includes site-specific data for the BART-eligible emissions units. The site-specific data includes emissions unit locations, stack parameters, emission rates, and PM<sub>10</sub> speciation information.

For guidance in preparing the air modeling protocol, the Visibility Improvement State and Tribal Association of the Southeast (VISTAS) has developed a general modeling protocol outline that describes the recommended procedures for performing a visibility impairment analysis under the BART regulations [see *Protocol for the Application of the CALPUFF Model for Analyses of Best Available Retrofit Technology (BART)*, December 22, 2005 (Revision 3.2- August 31, 2006)]. The proposed modeling protocol for the facility follows the general procedures recommended by VISTAS.

## **1.2 Location of Source**

The Hopkins Generating Station is located at 1125 Geddie Road in Tallahassee, Leon County and the Purdom Generating Station is located at 667 Port Leon Drive in St. Marks, Wakulla County. An area map showing the Hopkins and Purdom Generating Stations and PSD Class I areas located within

300 km of the each station is presented in Figure 1-1. The PSD Class I areas and their distances from the stations are as follows:

- Hopkins – Saint Marks National Wilderness Area (NWA) - 39 km;  
Okefenokee NWA - 182 km; and  
Chassahowitzka (NWA) - 249 km.
- Purdom – Saint Marks NWA - 1 km;  
Okefenokee NWA - 175 km; and  
Chassahowitzka (NWA) - 213 km.

The general locations of the City of Tallahassee generating stations, in Universal Transverse Mercator (UTM) coordinates, are as follows:

- Hopkins – 749.665 km East; 3,371.565 km North, Zone 17; and
- Purdom – 769.877 km East; 3,339.814 km North, Zone 17.

### 1.3 Source Impact Evaluation Criteria

The common BART modeling protocol describes the application of the CALPUFF modeling system for two purposes:

- Air quality modeling to determine whether a BART-eligible source is “subject to BART” – to evaluate whether a BART-eligible source is exempt from BART controls because it is not reasonably expected to cause or contribute to impairment of visibility in Class I areas, and
- Air quality modeling of emissions from sources that have been found to be subject to BART – to evaluate regional haze benefits of alternative control options and to document the benefits of the preferred option.

The common BART protocol identifies the first situation as the “BART exemption analysis” and the second situation as the “BART control analysis.”

The final BART rule (70 FR 39118) states that the proposed threshold at which a source may “contribute” to visibility impairment should not be higher than 0.5 dv. The FDEP is also recommending the criterion of 0.5 dv.

Based on VISTAS recommendations regarding BART exemption analysis, “initial screening” and “refined” analyses can be performed to determine whether a BART-eligible source is subject to or

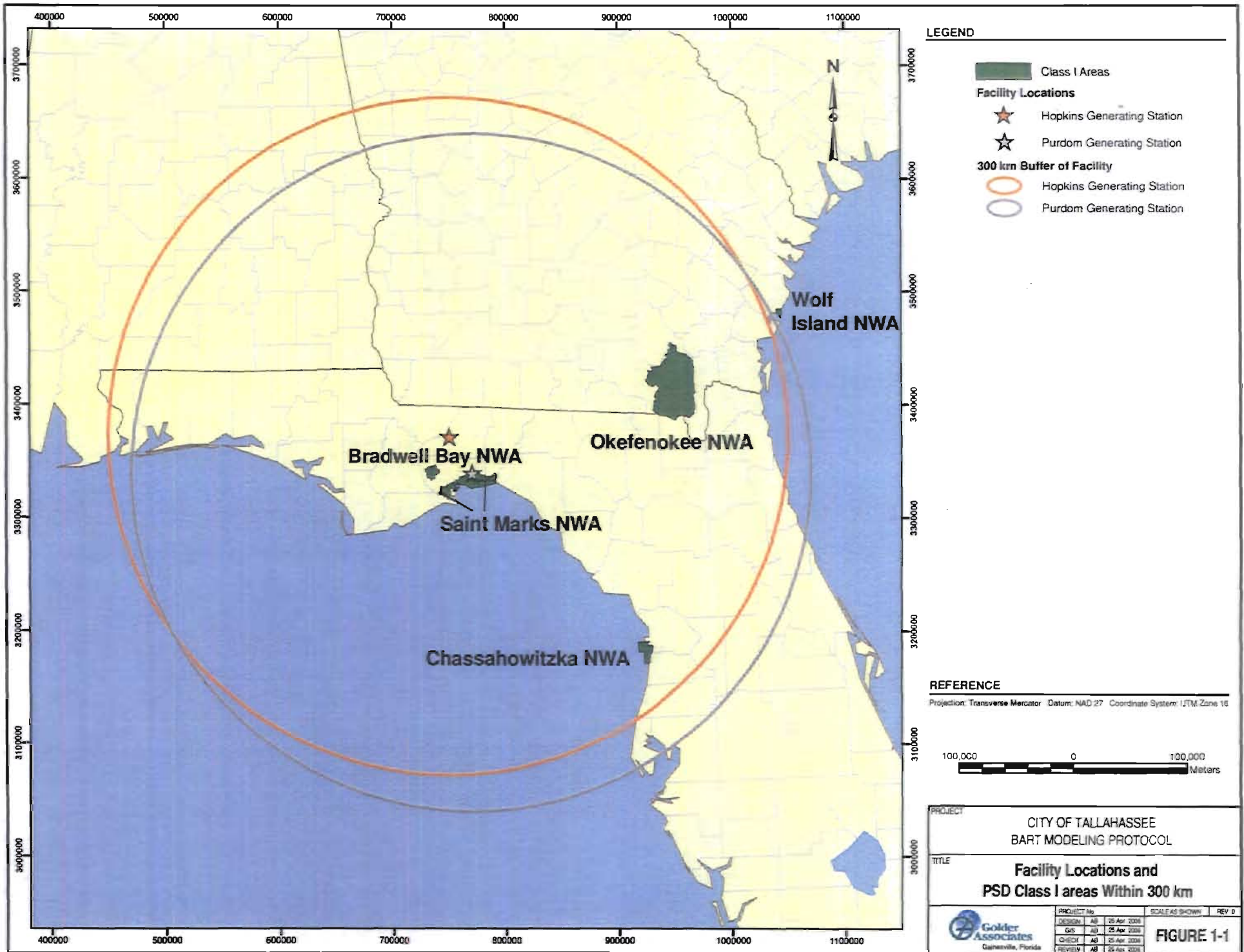
exempt from BART. The initial screening analysis, which is based on a coarse scale 12-km regional VISTAS CALMET domain, is optional and answers two questions – whether (a) a particular source may be exempted from further BART analyses and (b) if refined (finer grid) CALPUFF analyses were to be undertaken, which Class I areas should be included.

For the screening analysis, the highest predicted 24-hour impairment value is compared to the 0.5 dv criteria. If the highest predicted impacts are found to be less than 0.5 dv, no further analysis is required. But if the highest impact is predicted to be greater than 0.5 dv, then a refined, finer grid, analysis may be performed.

The refined analysis, which is based on a finer grid subregional California Meteorological Model (CALMET) domain, is the definitive test for whether a source is subject to BART. In the refined analysis, the 98<sup>th</sup> percentile, i.e., the 8<sup>th</sup> highest 24-hour average visibility impairment value in 1 year or the 22<sup>nd</sup> highest 24-hour average visibility impairment value over 3 years combined, whichever is higher, is compared to 0.5 dv.

The screening analysis is optional for large sources that will clearly exceed the initial screening thresholds or sources that are very close to the Class I areas, which will be better treated by a finer grid resolution. For the City of Tallahassee BART analyses, only the refined analysis will be performed to determine whether the source is exempt from BART. All Class I areas within 300 km of the City of Tallahassee stations will be included in the refined modeling analysis and modeling results will be presented for each evaluated Class I area.

If the BART exemption analysis reveals that the BART-eligible source is subject to BART controls, part of the BART review process involves evaluating the visibility benefits of different BART control measures. These benefits will be determined by the refined analysis, where CALPUFF will be executed with the baseline emission rates and again with emission rates reflective of BART control options.





## 2.0 SOURCE DESCRIPTION

### 2.1 Source Applicability

The Arvah B. Hopkins Generating Station is an existing generating facility presently comprised of two steam electric generating units (Units 1 and 2), two Westinghouse combustion turbines (CTs) (referred to as HC-1 and HC-2), and two General Electric (GE) LM6000 CTs (referred to as HC-3 and HC-4). HC-3 and HC-4 began operation in 2005. In 2006, the City of Tallahassee submitted an air construction permit application to repower Unit No. 2. The repowering of Unit No. 2 will include the addition of one nominal 188-megawatt (MW) combined-cycle unit and the permanent shut down of the fossil fuel steam boiler for Unit 2. The proposed combined cycle unit will consist of one GE 7FA CT and associated electric generator, heat recovery steam generator (HRSG), and the existing steam turbine-electric generator. The unit will be equipped with a bypass stack that will be used with natural gas firing only.

The Sam O. Purdom Generating Station consists of a steam electric generating unit (Unit 7), two simple cycle CTs, an auxiliary boiler, and a combined cycle gas turbine.

The FDEP has published a list of potential BART-eligible sources (updated September 12, 2006), which is based on a survey questionnaire sent by FDEP to selected facilities in Florida on November 4, 2002 and April 18, 2003. The FDEP's list contains a total of 3 potential BART-eligible emissions units from the Hopkins and Purdom Generating Stations. These generating stations are on the FDEP list since they are one of the 26 major source categories identified in the BART regulation [fossil-fuel fired steam electric plants of more than 250 million British thermal units per hour (MMBtu/hr) heat input] and has potential emissions of visibility impairment pollutants (i.e., SO<sub>2</sub>, NO<sub>x</sub>, and PM<sub>10</sub>) that are greater than 250 TPY. As presented earlier, these emission units are:

- Arvah B. Hopkins Generating Station – Boiler No. 1 and Boiler No. 2 (EU ID Nos. 001 and 004, respectively); and
- Sam O. Purdom Generating Station – Boiler No. 7 (EU ID 007)

First, each station is classified under the source category of "Fossil-fuel fired steam electric plants of more than 250 MMBtu/hr heat input".

Second, each emissions unit and each station was reviewed to determine which units met the date requirements for a BART-eligible unit. For each emissions unit, it was determined which units began operation after August 7, 1962, and also were in existence on August 7, 1977.

Third, if an emissions unit met the date requirements for BART eligibility, the potential emissions of visibility impairing pollutants from each unit were identified. At present, the visibility impairing pollutants include SO<sub>2</sub>, NO<sub>x</sub>, and PM<sub>10</sub>. Other potential visibilities impairing pollutants, such as volatile organic compounds (VOC), and ammonia, have been determined by the FDEP to have no significant effect on regional haze in Florida. As a result, the SO<sub>2</sub>, NO<sub>x</sub>, and PM<sub>10</sub> emissions from the facility are the only pollutants that would be included in the analysis unless FDEP makes a determination to include the other pollutants.

On March 10, 2005, EPA issued the Clean Air Interstate Rule (CAIR) requiring affected electric generating units (EGUs) in the eastern U.S. to reduce emissions of NO<sub>x</sub> and SO<sub>2</sub>. Some issues regarding how the CAIR emission reductions would affect BART-eligible units pursued, and based on a proposed settlement agreement between the EPA and the Utility Air Regulatory (UARG), EGUs would have to model only particulate matter (PM) and primary sulfate emissions for either BART exemption or BART determination. The FDEP has agreed to uphold the proposed agreement and, because the City of Tallahassee stations are subject to the provisions of CAIR, SO<sub>2</sub> and NO<sub>x</sub> emissions will not be included in the air modeling analysis.

Although the repowering of Unit No. 2 at the Hopkins Generating Station will include the permanent shut down of the fossil fuel steam boiler for Unit 2, this unit is not exempt from the BART exemption modeling. As a result, both Units 1 and 2 will be modeled together.

As shown in Table 2-1, the potential annual PM<sub>10</sub> emissions from the BART-eligible emissions units total more than 250 TPY for each of the plants. Although the emissions of one or more pollutants are greater than the 250 TPY threshold, only PM emissions will be included in the visibility impairment assessment because each station is subject to CAIR.

Based on discussions with the FDEP, if a facility is more than 50 km from the nearest PSD Class I area, fugitive PM emissions from BART-eligible emissions units are not required to undergo BART control evaluation nor need to be included in assessing visibility impairment. Except for the St. Marks Class I area, both generating stations are more than 50 km from any PSD Class I area.

Based on comments received from the FDEP, although fugitive PM emissions are minimal from the Purdom Station, to the extent quantifiable, they will be considered in the analysis. For the Hopkins Station, because there are minimal fugitive PM emissions and the station is 39 km from the St. Marks Class I area, fugitive PM emissions from this station will not be addressed in the BART evaluation.

## 2.2 Stack Parameters

The stack height above ground, stack diameter, exit velocity, and exit temperature for the BART-eligible emissions units at the Hopkins and Purdom Generating Stations are presented in Table 2-2. The general location of each plant is provided in UTM coordinates and in the VISTAS domain Lambert Conformal Conic (LCC) coordinate system.

## 2.3 Emission Rates for Visibility Impairment Analyses

The EPA BART guidance indicates that the emission rate to be used for BART modeling is the highest 24-hour actual emission rate representative of normal operations for the modeling period. Depending on the availability of the source data, the source emissions information should be based on the following in order of priority, based on the BART common protocol:

- 24-hour maximum emissions based on continuous emission monitoring (CEM) data for the period 2001-2003,
- Facility stack test emissions,
- Potential to emit,
- Allowable permit limits, and
- AP-42 emission factors.

PM<sub>10</sub> emission rates for the Hopkins and Purdom Generating Stations were obtained from Permit Nos. 0730003-007-AV and 1290001-007-AV, respectively, which are the current Title V permits or available stack tests. For the Purdom Station, since stack tests have not been performed over the last five years due to minimal operation of the emission unit, PM<sub>10</sub> emissions were calculated based on maximum permitted normal operation for 21 hours at 0.1 lb/MMBtu and soot blowing for 3 hours in a 24-hour period at 0.3 lb/MMBtu.

For the Hopkins Station, stack tests for PM emissions have been performed since 2001 with a summary of the actual measure PM emissions presented in Table 2-4. The maximum daily PM emission rate was based on the maximum PM emission rate measured during normal operation, which

is assumed to occur for 21 hours, added to the maximum PM emission rate during soot blowing, which is assumed to occur for 3 hours.

The maximum 24-hour average PM<sub>10</sub> emission rates for filterable PM emissions for the BART-eligible units at both stations are presented in Table 2-4. As discussed in Section 2.4, both filterable and condensable PM emissions will be used in the modeling.

#### **2.4 Particulate Matter (PM) Speciation**

Based on the latest regulatory guidance, PM emissions by size category need to be considered in the appropriate species for the visibility analysis. The effect that each species has on visibility impairment is related to a parameter called the extinction coefficient. The higher the extinction coefficient, the greater the species' affect on visibility. Filterable PM is speciated into coarse (PMC), fine (PMF), and elemental carbon (EC), with default extinction efficiencies of 0.6, 1.0, and 10.0, respectively. PMC is PM with aerodynamic diameter between 10 microns and 2.5 microns. Both EC and PMF have aerodynamic diameters equal to or less than 2.5 microns. Condensable PM is comprised of inorganic PM, such as sulfate (SO<sub>4</sub>), and organic PM, such as secondary organic aerosols (SOA). The extinction efficiencies for these species are  $3 \times f(\text{RH})$  and 4, respectively, where  $f(\text{RH})$  is the relative humidity factor.

Summaries of PM speciation for the Hopkins Generating Station are presented in Tables 2-5a and 2-5b while those for the Purdom Generating Station are presented in Table 2-6. These species categories were generally based on the speciation profile provided by VISTAS for Uncontrolled Utility Residual Oil Boiler. The PM condensable emission rates were estimated based on emission factors presented in Table 1.3-2 in AP-42 while the different PM particle size categories were determined from particle size distribution for Uncontrolled Residual Oil-fired Utility Boilers provided in Table 1.3-4 in AP-42. The PM elemental carbon emission rates were based on data provided in EPA's January 2002 DRAFT "Catalog of Global Emissions Inventories and Emission Inventory Tools for Black Carbon".

#### **2.5 Building Dimension**

Based on discussions with FDEP, building downwash effects will be considered in the modeling since the distance of the nearest PSD Class I area is less than 50 km from both generating stations.

**TABLE 2-1  
BART ELIGIBILITY ANALYSIS FOR THE CITY OF TALLAHASSEE - ARVAH B. HOPKINS AND SAM O. PURDOM GENERATING STATIONS  
(FACILITY ID NOS. 0730003 AND 1290001)**

EU ID	Emission Unit	BART Category <sup>a</sup>	Dates		In Existence on 8/7/1977 ? (Yes/No)	Began Operation After 8/7/1962 ? (Yes/No)	Meets BART Date Criteria ? (Yes/No)	SO <sub>2</sub> , NO <sub>x</sub> , or PM Source ? (Yes/No)	BART Eligible ? (Yes/No)	Potential PM <sub>10</sub> Emissions (TPY)	Comments
			Start-Up	Initial Construction							
<b><u>ARVAH B. HOPKINS GENERATING STATION</u></b> <sup>b</sup>											
001	Boiler No. 1	1	May 1971	--	Yes	Yes	Yes	Yes	Yes	494	<sup>d</sup>
004	Boiler No. 2	1	October 1977		Yes	Yes	Yes	Yes	Yes	1273	<sup>d</sup> To be shutdown
										<b>Hopkins Total TPY =</b>	494
<b><u>SAM O. PURDOM GENERATING STATION</u></b> <sup>c</sup>											
007	Boiler No. 7	1	1966	--	Yes	Yes	Yes	Yes	Yes	340	<sup>d</sup>
										<b>Purdom Total TPY =</b>	340

<sup>a</sup> BART category 1 is Steam Electric Plants of More Than 250 MMBtu/hr Heat Input.

<sup>b</sup> Title V permit No. 0730003-007-AV.

<sup>c</sup> Title V permit No. 1290001-007-AV.

<sup>d</sup> PM<sub>10</sub> emissions based on maximum hourly rate and maximum heat input rate for 8,760 hours/year.

	Heat Input Rate MMBtu/hr	Normal Operation		Soot Blowing	
		lb/MMBtu	Hours/day	lb/MMBtu	Hours/day
Hopkins Boiler No. 1	903	0.1	21	0.3	3
Boiler No. 2	2325	0.1	21	0.3	3
Purdom Boiler No. 7	621	0.1	21	0.3	3

**TABLE 2-2  
SUMMARY OF STACK AND OPERATING PARAMETERS AND LOCATIONS FOR THE BART-ELIGIBLE EMISSIONS UNITS  
CITY OF TALLAHASSEE - ARVAH B. HOPKINS AND SAM O. PURDOM GENERATING STATIONS**

Emission Unit	Model ID	Stack Parameters				Operating Parameters				
		Height		Diameter		Flow Rate acfm	Exit Temperature		Velocity	
		ft	m	ft	m		°F	K	ft/s	m/s
<b><u>ARVAH B. HOPKINS GENERAING STATION</u><sup>a</sup></b>										
Boiler No. 1	AHBLR1	200	61.0	11.0	3.35	223,755	261	400	39.2	11.96
Boiler No. 2	AHBLR2	250	76.2	14.0	4.27	636,706	260	400	68.9	21.01
<b><u>SAM O. PURDOM GENERATING STATION</u><sup>a</sup></b>										
Boiler No. 7	SPBLR7	180	54.9	9.0	2.74	180,798	300	422	47.4	14.44

<sup>a</sup> UTM East and North Coordinates (km), Zone 16	Hopkins	749.665	3,371.565
	Purdom	769.662	3,339.938
Latitude and Longitude:	Hopkins	30° 27' 8.26"	84° 23' 59.78"
	Purdom	30° 09' 46"	84° 12' 00"
Lambert Conformal Conic (LCC) coordinates:	Hopkins	1,210.334	-975.166
	Purdom	1,233.955	-1,004.523



**TABLE 2-4  
SUMMARY OF MAXIMUM 24-HOUR AVERAGE ACTUAL PM<sub>10</sub> EMISSION RATES FOR THE BART-ELIGIBLE EMISSIONS UNITS  
CITY OF TALLAHASSEE - ARVAH B. HOPKINS AND SAM O. PURDOM GENERATING STATIONS**

Source	Model ID	Heat Input Rate MMBtu/hr	Maximum PM <sub>10</sub> Emission Rate <sup>c</sup>				Daily PM <sub>10</sub> Emissions		Maximum PM <sub>10</sub> Emissions lb/hr
			Normal Operation		Soot Blowing		Normal Operation lb/hr	Soot Blowing lb/hr	
			lb/MMBtu	Hours/day	lb/MMBtu	Hours/day			
<b><u>ARVAH B. HOPKINS GENERAING STATION <sup>a</sup></u></b>									
Boiler No. 1	AHBLR1	903	0.0431	21	0.0460	3	34.1	5.2	39.2
Boiler No. 2	AHBLR2	2325	0.0674	21	0.0944	3	137.1	27.4	164.6
<b><u>SAM O. PURDOM GENERATING STATION <sup>b</sup></u></b>									
Boiler No. 7	SPBLR7	621	0.1	21	0.3	3	54.3	23.3	77.6

<sup>a</sup> Based on maximum actual PM emissions from stack test results.

<sup>b</sup> Based on maximum allowable PM emissions from Title V permit No. 1290001-007-AV (stack tests not performed since unit operated less than 400 hours/year).

<sup>c</sup> Based on filterable PM emissions.



TABLE 2-5a  
PM SPECIATION SUMMARY - HOPKINS GENERATING STATION, UNIT NO. 1

PM Category	Emission Unit <sup>a</sup>	Units	Total	Coarse PM	Soil (Fine PM)	Elemental Carbon (EC)	Inorganic (as H <sub>2</sub> SO <sub>4</sub> )	Organic
PM Filterable <sup>b</sup>	Boiler No. 1	lb/hr %	39.2 100%	10.64 27%	26.49 67%	2.12 5%	NA NA	NA NA
PM Condensable <sup>c</sup>	Boiler No. 1	lb/hr %	9.03 100%	NA NA	NA NA	NA NA	7.68 85%	1.35 15%
Total PM <sub>10</sub> (filterable+condensable)	Boiler No. 1	lb/hr %	48.3 100%	10.64 22.0%	26.49 54.9%	2.12 4.4%	7.68 15.9%	1.35 2.8%
Total PM <sub>10</sub> (filterable+Organic Condensable PM) Modeled PM Speciation % (SO <sub>2</sub> modeled separately)	Boiler No. 1	lb/hr %	40.6 100%	10.64 26.2%	26.49 65.2%	2.12 5.2%	0.0 0.0%	1.35 3.4%

PM Particle Size Distribution for CALPUFF Assessment

Species Name	Size Distribution by Category (%)					Emission Rate (lb/hr)		
	AP-42 (Table 1.3-4)		Cumulative Normalized PM10 (%)	Individual Categories		Filterable	Organic Condensable	Total
	Particle Size (microns)	Cumulative (%)		Filterable (%)	Organic Condensable (%)			
Total PM <sub>10</sub>						39.2	1.4	40.6
PM0063	0.63	20.0%	28.2%	28.2%	50.0%	11.1	0.7	11.7
PM0100	1	39.0%	54.9%	26.8%	50.0%	10.5	0.7	11.2
PM0125	1.25	43.0%	60.6%	5.6%	0	2.2	0.0	2.2
PM0250	2.5	52.0%	73.2%	12.7%	0	5.0	0.0	5.0
PM0600	6	58.0%	81.7%	8.5%	0	3.3	0.0	3.3
PM1000	10	71.0%	100.0%	18.3%	0	7.2	0.0	7.2
Totals				100.0%	100.0%	39.2	1.4	40.6

Total Modeled PM<sub>10</sub> 40.6

<sup>a</sup> Heat input rate for unit and fuel heat content

903 MMBtu/hr  
150,000 Btu/gal fuel oil

<sup>b</sup> PM fine consists of PM soil and PM elemental carbon  
PM fine based on ratio of PM2.5 (fine) to PM10 (filterable) emission factor (Table 1.3-4, AP-42)

lb/1000 gal  
PM2.5 4.3 x sulfur content factor Ratio = 0.73 PM2.5/PM10  
PM10 5.9 x sulfur content factor

PM elemental carbon based on EPA's "Catalog of Global Emissions Inventories and Emission Inventory Tools for Black Carbon", Table 5, January 2002 DRAFT  
0.074 of PM2.5

PM elemental carbon 0.05 PM elemental carbon/PM10  
PM soil= PM2.5 - PM elemental carbon 0.67 PM soil/PM10  
PM2.5 0.73 PM2.5/PM10  
PM coarse= PM10 - PM2.5

<sup>c</sup> Condensable PM (Table 1.3-2, AP-42)

	lb/1000 gal	lb/MMBtu	
Total	1.5	0.0100	
Inorganic	1.275	0.0085	(0.85 of Total)
Organic	0.225	0.0015	(0.15 of Total)

TABLE 2-5b  
PM SPECIATION SUMMARY - HOPKINS GENERATING STATION, UNIT 2

PM Category	Emission Unit <sup>a</sup>	Units	Total	Coarse PM	Soil (Fine PM)	Elemental Carbon (EC)	Inorganic (as H <sub>2</sub> SO <sub>4</sub> )	Organic
PM Filterable <sup>b</sup>	Boiler No. 2	lb/hr %	164.6 100%	44.62 27%	111.05 67%	8.87 5%	NA NA	NA NA
PM Condensable <sup>c</sup>	Boiler No. 2	lb/hr %	23.25 100%	NA NA	NA NA	NA NA	19.76 85%	3.49 15%
Total PM <sub>10</sub> (filterable+condensable)	Boiler No. 2	lb/hr %	187.8 100%	44.62 23.8%	111.05 59.1%	8.87 4.7%	19.76 10.5%	3.49 1.9%
Total PM <sub>10</sub> (filterable+Organic Condensable PM) Modeled PM Speciation % (SO <sub>4</sub> modeled separately)	Boiler No. 2	lb/hr %	168.0 100%	44.62 26.6%	111.05 66.1%	8.87 5.3%	0.0 0.0%	3.49 2.1%

PM Particle Size Distribution for CALPUFF Assessment

Species Name	Size Distribution by Category (%)					Emission Rate (lb/hr)			
	AP-42 (Table 1.3-4)		Cumulative		Individual Categories		Filterable	Organic Condensable	Total
	Particle Size (microns)	Cumulative (%)	Normalized PM10 (%)	Filterable (%)	Organic Condensable (%)				
Total PM <sub>10</sub>						164.6	3.5	168.0	
PM0063	0.63	20.0%	28.2%	28.2%	50.0%	46.4	1.7	48.1	
PM0100	1	39.0%	54.9%	26.8%	50.0%	44.0	1.7	45.8	
PM0125	1.25	43.0%	60.6%	5.6%	0	9.3	0.0	9.3	
PM0250	2.5	52.0%	73.2%	12.7%	0	20.9	0.0	20.9	
PM0600	6	58.0%	81.7%	8.5%	0	13.9	0.0	13.9	
PM1000	10	71.0%	100.0%	18.3%	0	30.1	0.0	30.1	
Totals				100.0%	100.0%	164.6	3.5	168.0	

Total Modeled PM<sub>10</sub> 168.0

<sup>a</sup> Heat input rate for unit and fuel heat content

2325 MMBtu/hr  
150,000 Btu/gal fuel oil

<sup>b</sup> PM fine consists of PM soil and PM elemental carbon  
PM fine based on ratio of PM2.5 (fine) to PM10 (filter emission factor (Table 1.3-4, AP-42)

$\frac{\text{lb}/1000 \text{ gal}}{\text{PM}2.5 \quad 4.3 \times \text{sulfur content factor} \quad \text{Ratio} = \quad 0.73 \text{ PM}2.5/\text{PM}10}$   
 $\text{PM}10 \quad 5.9 \times \text{sulfur content factor}$

PM elemental carbon based on EPA's "Catalog of Global Emissions Inventories and Emission Inventory Tools for Black Carbon", Table 5, January 2002 DRAFT  
0.074 of PM2.5

PM elemental carbon 0.05 PM elemental carbon/PM10  
PM soil= PM2.5 - PM elemental carbon 0.67 PM soil/PM10  
PM2.5 0.73 PM2.5/PM10  
PM coarse= PM10 - PM2.5

<sup>c</sup> Condensable PM (Table 1.3-2, AP-42)

	lb/1000 gal	lb/MMBtu	
Total	1.5	0.0100	
Inorganic	1.275	0.0085	(0.85 of Total)
Organic	0.225	0.0015	(0.15 of Total)

TABLE 2-6  
PM SPECIATION SUMMARY - PURDOM GENERATING STATION, UNIT 7

PM	Emission Unit *	Units	Total	Coarse PM	Soil (Fine PM)	Elemental Carbon (EC)	Inorganic (as H <sub>2</sub> SO <sub>4</sub> )	Organic
PM Filterable <sup>b</sup>	Boiler No. 7	lb/hr %	77.6 100%	21.05 27%	52.39 67%	4.19 5%	NA NA	NA NA
PM Condensable <sup>c</sup>	Boiler No. 7	lb/hr %	6.21 100%	NA NA	NA NA	NA NA	5.28 85%	0.93 15%
Total PM <sub>10</sub> (filterable+condensable)	Boiler No. 7	lb/hr %	83.8 100%	21.05 25.1%	52.39 62.5%	4.19 5.0%	5.28 6.3%	0.93 1.1%
Total PM <sub>10</sub> (filterable+Organic Condensable PM) Modeled PM Speciation % (SO <sub>4</sub> modeled separately)	Boiler No. 7	lb/hr %	78.6 100%	21.05 26.8%	52.39 66.7%	4.19 5.3%	0.0 0.0%	0.93 1.2%

Species Name	Size Distribution by Category (%)					Emission Rate (lb/hr)		
	AP-42 (Table 1.3-4)		Cumulative Normalized PM10 (%)	Individual Categories		Filterable	Organic Condensable	Total
	Particle Size (microns)	Cumulative (%)		Filterable (%)	Organic Condensable (%)			
Total PM <sub>10</sub>						77.6	0.9	78.6
PM0063	0.63	20.0%	28.2%	28.2%	50.0%	21.9	0.5	22.3
PM0100	1	39.0%	54.9%	26.8%	50.0%	20.8	0.5	21.2
PM0125	1.25	43.0%	60.6%	5.6%	0	4.4	0.0	4.4
PM0250	2.5	52.0%	73.2%	12.7%	0	9.8	0.0	9.8
PM0600	6	58.0%	81.7%	8.5%	0	6.6	0.0	6.6
PM1000	10	71.0%	100.0%	18.3%	0	14.2	0.0	14.2
Totals				100.0%	100.0%	77.6	0.9	78.6
						Total Modeled PM <sub>10</sub> 78.6		

\* Heat input rate for unit and fuel heat content

621 MMBtu/hr  
150,000 Btu/gal fuel oil

<sup>b</sup> PM fine consists of PM soil and PM elemental carbon  
PM fine based on ratio of PM2.5 (fine) to PM10 (filter emission factor (Table 1.3-4, AP-42)

lb/1000 gal  
PM2.5 4.3 x sulfur content factor Ratio = 0.73 PM2.5/PM10  
PM10 5.9 x sulfur content factor

PM elemental carbon based on EPA's "Catalog of Global Emissions Inventories and Emission Inventory Tools for Black Carbon", Table 5, January 2002 DRAFT  
0.074 of PM2.5

PM elemental carbon 0.05 PM elemental carbon/PM10  
PM soil= PM2.5 - PM elemental carbon 0.67 PM soil/PM10  
PM2.5 0.73 PM2.5/PM10  
PM coarse= PM10 - PM2.5

<sup>c</sup> Condensable PM (Table 1.3-2, AP-42)

	lb/1000 gal	lb/MMBtu	
CPM	1.5	0.0100	
Inorganic CPM	1.275	0.0085	(0.85 of Total)
Organic CPM	0.225	0.0015	(0.15 of Total)

### **3.0 GEOPHYSICAL AND METEOROLOGICAL DATA**

#### **3.1 Modeling Domain and Terrain**

CALMET data sets have been developed by EarthTech that are based on the following 3 years of Fifth Generation Mesoscale Model (MM5) meteorological data assembled by VISTAS:

- 2001 MM5 data set at 12-km grid (developed by EPA),
- 2002 MM5 data set at 12-km grid (developed by VISTAS), and
- 2003 MM5 data set at 36-km grid (developed by Midwest Regional Planning Organization).

For the finer grid modeling analysis (refined analysis), the 4-km spacing Florida CALMET domain will be used. VISTAS has prepared a total of five sub-regional 4-km spacing CALMET domains. Domain 2 covers all Florida sources and Class I areas that can be potentially affected by the Florida sources.

Golder Associates Inc. (Golder) obtained these data sets from the FDEP. As indicated in Section 1.3, for this protocol, the exemption modeling will be based on the finer grid modeling since the Hopkins and Purdom Generating Stations are large sources that are likely to exceed the initial screening thresholds. Therefore, only the refined analysis will be performed to determine whether the source is exempt from BART.

#### **3.2 Land Use and Meteorological Database**

The CALMET meteorological data sets to be used in the exemption modeling have been supplied by VISTAS. The CALMET data sets contain hourly meteorological data and land use parameters.

#### **3.3 Air Quality Database**

##### **3.3.1 Ozone Concentrations**

For these analyses, observed ozone data for 2001-2003 from CASTNet and Aerometric Information Retrieval System (AIRS) stations will be used. These data sets have been obtained from EarthTech's website as recommended by FDEP.

### 3.3.2 Ammonia Concentrations

A fixed monthly background ammonia concentration of 0.5 parts per billion (ppb) will be used based on FDEP's recommendation.

### 3.4 Natural Conditions at Class I Area

Based on VISTAS' recommendation, Visibility Method 6 will be used in all BART-related modeling, which will compute extinction coefficients for hygroscopic species (modeled and background) using a monthly  $f(RH)$  in lieu of calculating hourly RH factors. Monthly RH values from Table A-3 of EPA's *Guidance for Estimating Natural Visibility Conditions under the Regional Haze Rule* (Haze Guideline) will be used. Monthly RH factors for the Class I areas within 300 km of the City of Tallahassee plants are as follows:

Month	St. Marks NWA	Okefenokee NWA	Chassahowitzka NWA
January	3.7	3.5	3.8
February	3.4	3.2	3.5
March	3.4	3.1	3.4
April	3.4	3.0	3.2
May	3.5	3.6	3.3
June	4.0	3.7	3.9
July	4.1	3.7	3.9
August	4.4	4.1	4.2
September	4.2	4.0	4.1
October	3.8	3.8	3.9
November	3.7	3.5	3.7
December	3.8	3.6	3.9

Method 6 requires input of natural background (BK) concentrations of ammonium sulfate ( $BKSO_4$ ), ammonium nitrate ( $BKNO_3$ ), coarse particulates ( $BKPMC$ ), organic carbon ( $BKOC$ ), soil ( $BKSOIL$ ), and elemental carbon ( $BKEC$ ) in micrograms per cubic meter ( $\mu g/m^3$ ). The model then calculates the natural background light extinction and haze index based on these values.

According to FDEP recommendations, the natural background light extinction may be based on haze index (HI) values (in dv) for either the annual average or the 20-percent best visibility days provided by EPA in Appendix B of the Haze Guideline document (using the 10<sup>th</sup> percentile HI value). For this BART analysis, the annual average HI values will be used to determine natural background light extinction of the Class I areas. The light extinction coefficient in inverse megameters ( $Mm^{-1}$ ) is based on the concentration of the visibility impairing components and the extinction efficiency, in square meters per gram ( $m^2/g$ ), for each component.

Per VISTAS and FDEP recommendations, the natural background light extinction that is equivalent to EPA-provided background HI values for each Class I area, based on the annual average, will be estimated using the following background values:

- Rayleigh scattering =  $10 Mm^{-1}$ ;
- Concentrations of  $BKSO_4$ ,  $BKNO_3$ ,  $BKPMC$ ,  $BKEC$ , and  $BKEC = 0.0$ ; and
- $BKSOIL$  concentration, which is estimated from the extinction coefficient that corresponds to EPA's HI value (corresponding to the annual average) and then subtracting the Rayleigh scattering of  $10 Mm^{-1}$  (assumes that the extinction efficiency of soil is  $1 m^2/g$ ).

According to Appendix B of the Haze Guideline document, the annual average background light extinction coefficients for each PSD Class I area and corresponding calculated  $BKSOIL$  concentrations are as follows:

- Saint Marks NWA –  $21.53 Mm^{-1}$  (equivalent to 7.67 dv);  $11.53 \mu g/m^3$ ;
- Okefenokee NWA –  $21.40 Mm^{-1}$  (equivalent to 7.61 dv);  $11.40 \mu g/m^3$ ; and
- Chassahowitzka NWA –  $21.45 Mm^{-1}$  (equivalent to 7.63 dv);  $11.45 \mu g/m^3$ .

Currently, the atmospheric light extinction is estimated by an algorithm developed by the Interagency Monitoring of Protected Visual Environments (IMPROVE) committee, which was adopted by the EPA under the 1999 Regional Haze Rule (RHR). This algorithm for estimating light extinction from particle speciation data tends to underestimate light extinction for the highest haze conditions and overestimate it for the lowest haze conditions and does not include light extinction due to sea salt, which is important at sites near the sea coasts. As a result of these limitations, the IMPROVE Steering Committee recently developed a new algorithm (the "new IMPROVE algorithm") for estimating light extinction from particulate matter component concentrations, which provides a better

correspondence between measured visibility and that calculated from particulate matter component concentrations.

The new algorithm splits the total sulfate, nitrate, and organic carbon compound concentrations into two fractions, representing small and large size distributions of those compounds. New terms added to the algorithm are light absorption by NO<sub>2</sub> gas and light scattering due to fine sea salt accompanied by its own hygroscopic scattering enhancement factor and Class I area specific Rayleigh scattering values rounded off to the nearest whole number. The EPA and the Federal Land Managers (FLM) from the National Park Service and the U.S. Fish and Wildlife Service have determined that adding site-specific data (e.g., sea salt and site-specific Rayleigh scattering) to the old IMPROVE algorithm, for a hybrid approach, is not recommended and is allowing the optional use of the new IMPROVE algorithm.

As one or more of the Class I areas within 300 km of the Hopkins and Purdom Stations are located near the sea coast, the new IMPROVE algorithm may additionally be used to calculate the natural background at these Class I areas. The new IMPROVE algorithm accounts for the background sea-salt concentrations and site-specific Rayleigh scattering. Since the new IMPROVE equation cannot be directly implemented using the existing version of the CALPUFF model without additional post-processing or model revision, VISTAS has developed a methodology for implementing the new IMPROVE equation using existing CALPUFF/CALPOST output in a spreadsheet. This spreadsheet, known as the CALPOST-IMPROVE Processor, will be used to re-calculate visibility impacts due to BART-eligible units if the visibility impacts determined using the old IMPROVE equation are predicted to be greater than 0.5 dv.

Because ambient NO<sub>2</sub> concentrations due to the Hopkins and Purdom Stations are not being modeled, light absorption by NO<sub>2</sub> gas, which is a new term added to the new IMPROVE algorithm, will not be considered for the BART modeling analysis.

The following Class I area specific Rayleigh scattering (in Mm<sup>-1</sup>) and sea salt concentrations (in µg/m<sup>3</sup>) values will be used to evaluate the visibility impacts using the new CALPOST-IMPROVE Processor:

- Saint Marks NWA – 11 Mm<sup>-1</sup>; 0.03 µg/m<sup>3</sup>.
- Okefenokee NWA – 11 Mm<sup>-1</sup>; 0.09 µg/m<sup>3</sup>.
- Chassahowitzka NWA – 11 Mm<sup>-1</sup>; 0.08 µg/m<sup>3</sup>.

## **4.0 AIR QUALITY MODELING METHODOLOGY**

For predicting maximum visibility impairment at the Class I areas, the CALPUFF modeling system will be used. For BART-related visibility impact assessments, the CALPUFF model, Version 5.756 (060725), is recommended for use by EPA and VISTAS. Recent technical enhancements, including changes to the over-water boundary layer formulation and coastal effects modules (sponsored by the Minerals Management Service), are included in this version. The CALPUFF model is a non-steady-state long-range transport Lagrangian puff dispersion model applicable for estimating visibility impacts. The methods and assumptions used in the CALPUFF model will be based on the latest recommendations for CALPUFF analysis as presented in the VISTAS modeling protocol, Interagency Workgroup on Air Quality Models (IWAQM) Phase 2 Summary Report and the Federal Land Managers' Air Quality Related Values Work Group (FLAG) document. This model is also maintained by EPA on the Support Center for Regulatory Air Models (SCRAM) website.

### **4.1 Modeling Domain Configuration**

The 4-km spacing Florida domain will be used for the BART exemption modeling and if required, modeling to evaluate visibility benefits of different BART control measures. VISTAS has prepared five sub-regional 4-km spacing CALMET domains. Domain 2 covers sources in Florida and Class I areas that are affected by the sources in Florida.

### **4.2 CALMET Meteorological Domain**

The refined CALMET domain, to be used for City of Tallahassee's BART modeling has been provided by the FDEP. The major features used in preparing these CALMET data have been described in Section 4.0 of the VISTAS BART common modeling protocol.

### **4.3 CALPUFF Computational Domain and Receptors**

The computational domain to be used for the refined modeling will be equal to the full extent of the meteorological domain. Visibility impacts will be predicted at each PSD Class I area using receptors provided by the Federal Land Managers. The receptors to be used for each of the PSD Class I areas are the National Park Service's (NPS) complete receptor sets and are presented in Figures 4-1 through 4-3. In addition, at the request of the FDEP, for the Purdom Station which is located about 1 km from



the St. Marks Class I area, an additional set of receptors were added to provide more coverage in the Class I area when predicting impacts for this station only. These receptors are presented in Figure 4-4.

#### **4.4 CALPUFF Modeling Options**

The major CALPUFF modeling options recommended in the IWAQM guidance (EPA, 1988; Pages B-1 through B-8), in addition to the recommendations in Section 4.3.3 of the VISTAS BART modeling protocol will be used. An example CALPUFF input file showing the modeling options is presented in Appendix B.

#### **4.5 Light Extinction and Haze Impact Calculations**

The CALPOST program will be used to calculate the light extinction and the haze impact. The Method 6 technique, which is recommended by the BART guideline document, will be used to compute change in light extinction.

#### **4.6 QA/QC**

Quality assurance procedures will be established to ensure that the setup and execution of the CALPUFF model and processing of the modeling results satisfy the regulatory objectives of the BART program. The meteorological datasets to be used in the modeling were developed and provided by VISTAS and therefore, no further QA will be required for these.

The CALPUFF modeling options are described in Section 4.4. The site-specific source data program will be independently confirmed by an independent modeler not involved in the initial setup of the modeling files. This verification will include:

- Units of measure;
- Verification of the correct source and receptor locations, including datum and projection;
- Confirmation of the switch selections relative to modeling guidance;
- Checks of the program switches and file names of the various processing steps; and
- Confirmation of the use of the proper version and level of each model.

In addition, all the data and program files needed to reproduce the modeling results will be supplied with the modeling report.

The source and emission data will be independently verified by Golder and the City of Tallahassee. The source coordinates and related projection/datum parameters will be checked using the CALPUFF GUI's COORDS software and other comparable coordinate translation software such as CORPSCON and National Park Services Conversion Utilities software.

The POSTUTIL and CALPOST post-processor input files will be carefully checked to make sure of the following:

- Appropriate CALPUFF concentrations files are used in the POSTUTIL run;
- The PM species categories are computed using the appropriate fractions;
- Background light extinction computation method selected as Method 6;
- Correct monthly relative humidity adjustment factors used for the appropriate Class I area;
- Background light extinction values as described in Section 3.4 of this protocol;
- Appropriate species names for coarse and fine PM;
- Appropriate Rayleigh scattering term used; and
- Appropriate Class I receptors selected for each Class I area-specific CALPOST run.

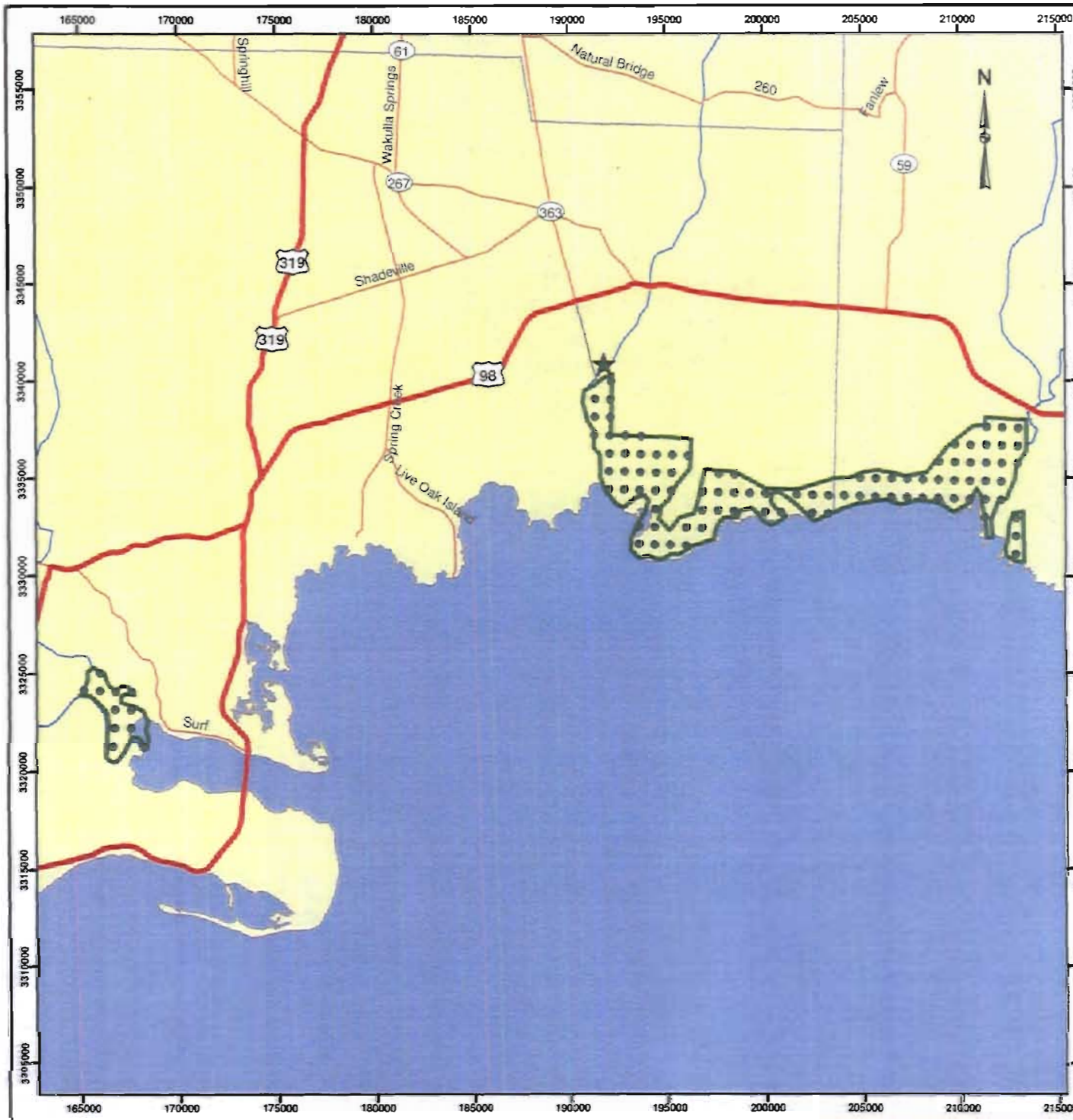
#### 4.7 Modeling Report

A modeling report will be submitted containing the following information:

- Map of source location and Class I areas within 300 km of the source;
- Table showing visibility impacts at each Class I area within 300 km of the source;
- For the refined modeling analysis, a table showing the eight highest visibility impairment values ranked in a descending order for the prime Class I area(s) of interest; and
- All input and output files (excluding CALMET) used for either the exemption or determination modeling will be provided on CD.

The predicted visibility impairment results for the base emission case and selected BART emission scenarios, if applicable, will be included in the report to show the affect on visibility for each

proposed control technology. Final recommendations for BART will also be presented, based on the analysis results of the five evaluation criteria presented in the regulations.



**LEGEND**

- ★ COT Purdom Plant Location
- Saint Marks NWA**
- 101 Receptor Grid
- Class I Boundary

**REFERENCE**

Projection: Transverse Mercator; Datum: NAD 83; Coordinate System: UTM Zone 17

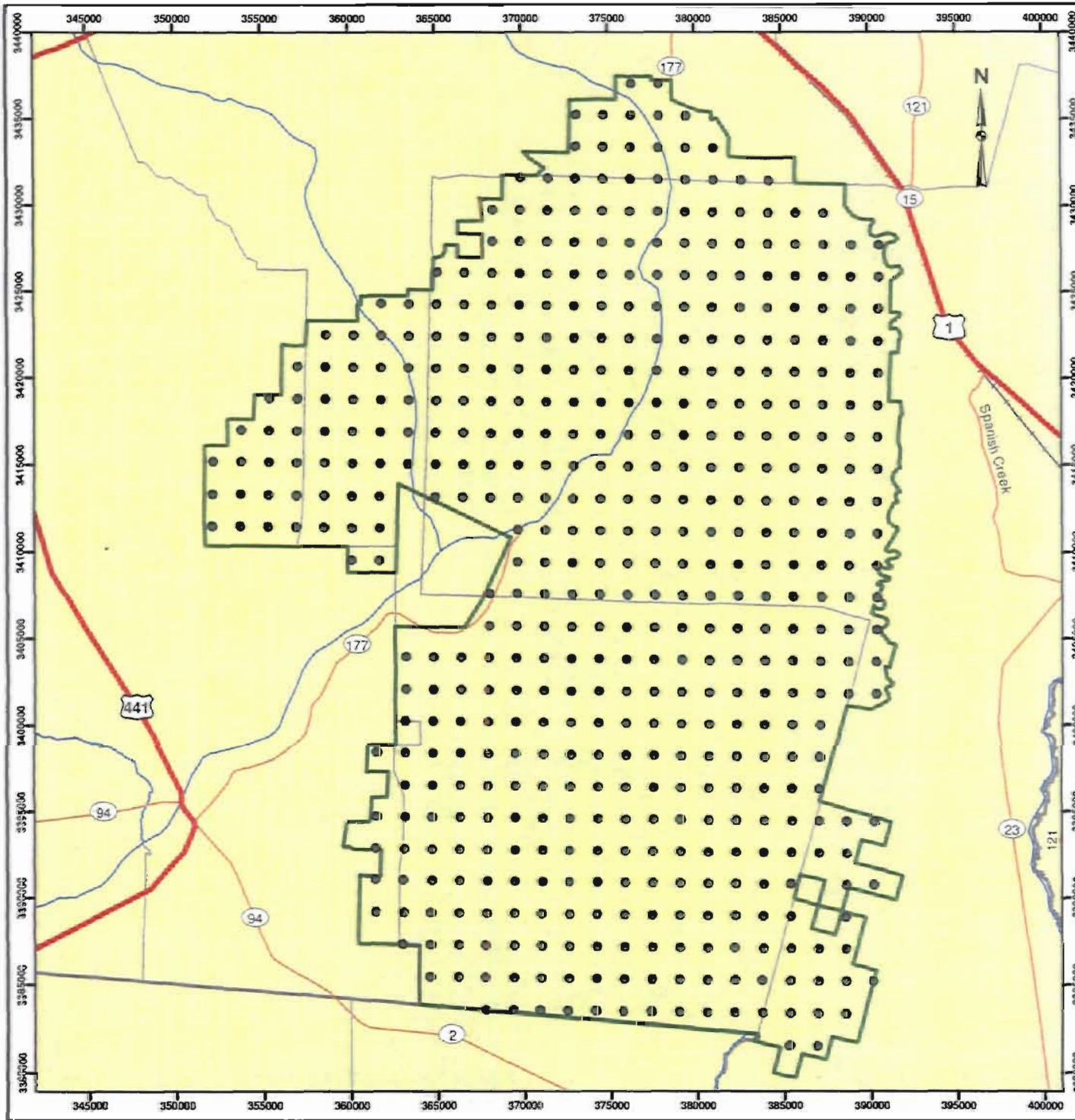
PROJECT: CITY OF TALLAHASSEE  
BART MODELING PROTOCOL

TITLE: Saint Marks NWA Receptor Grid

PROJECT NO.	DATE	BY	REVISION
	15 Apr 2008	AS	

**FIGURE 4-1**

**Golden Associates**  
Gainesville, Florida



**LEGEND**

- Okefenokee NWA**
- 500 Receptor Grid
  - Class I Boundary

**REFERENCE**

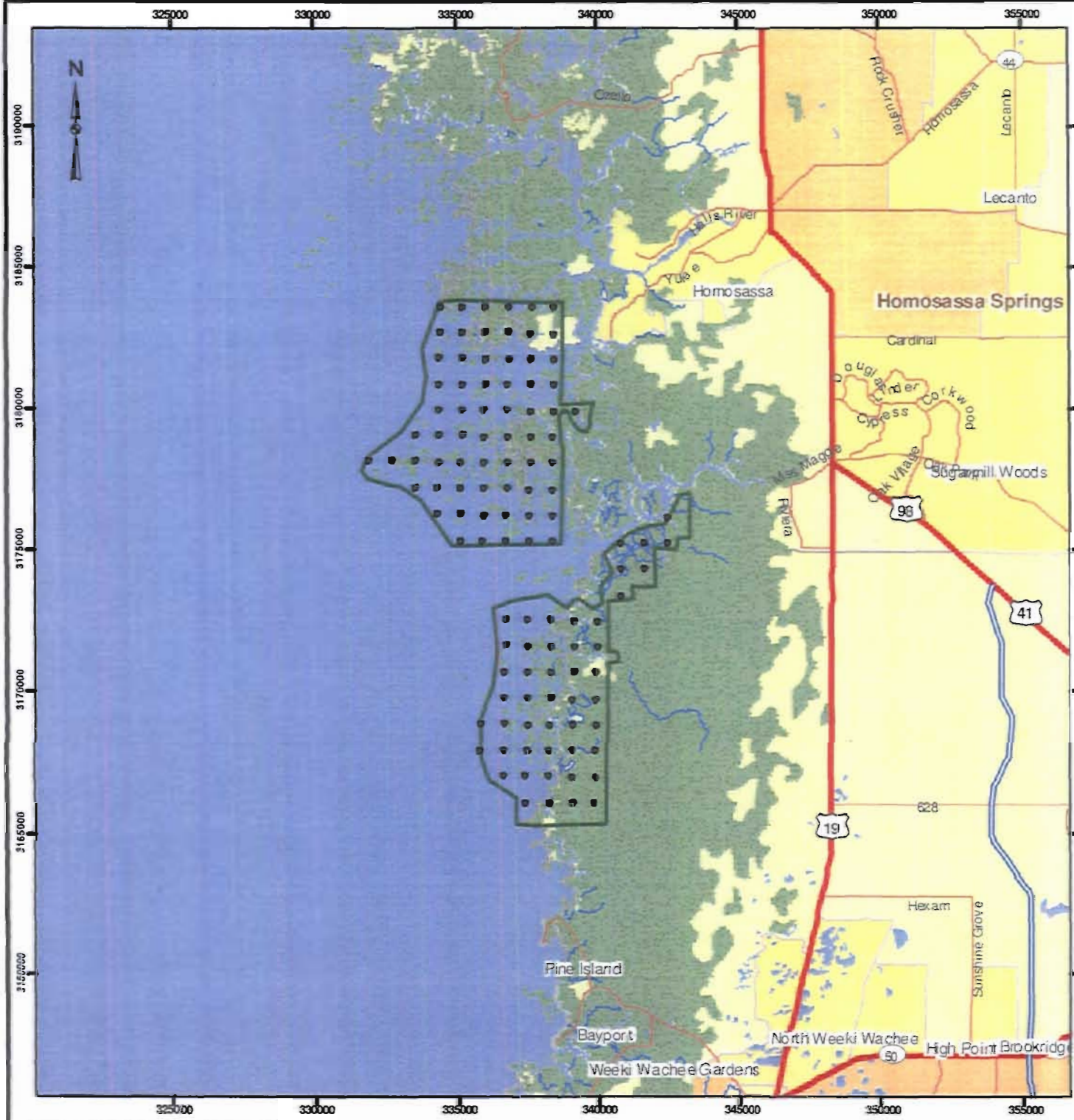
Projection: Transverse Mercator Datum: NAD 27 Coordinate System: UTM Zone 17



PROJECT  
CITY OF TALLAHASSEE  
BART MODELING PROTOCOL

TITLE  
**Okefenokee NWA Receptor Grid**

	PROJECT NO.	SCALE AS SHOWN	REV. 0
	SHEET NO. 1 OF 1 DATE 25 APR 2020	<b>FIGURE 4-2</b>	



**LEGEND**

- Chassahowitzka NWA**
- 113 Receptor Grid
  - Class I Boundary

**REFERENCE**

Projection: Transverse Mercator Datum: NAD 27 Coordinate System: UTM Zone 19



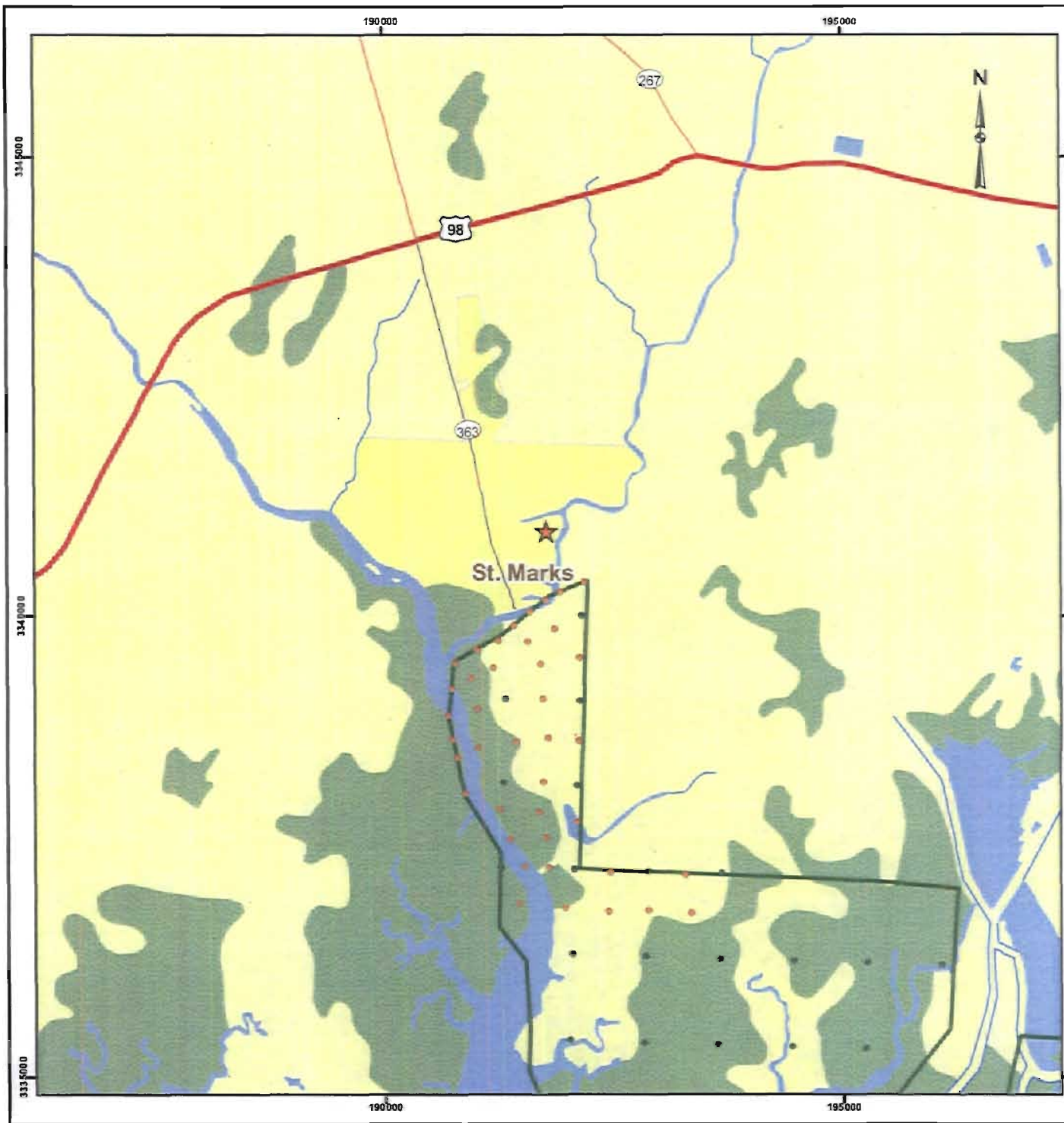
PROJECT: CITY OF TALLAHASSEE  
BART MODELING PROTOCOL

TITLE: **Chassahowitzka NWA Receptor Grid**



PROJECT NO.	REVISION	DATE	BY	CHK
	1	08/25/11	AS	AS

SCALE AS SHOWN: REV 0  
**FIGURE 4-3**



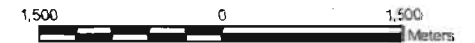
**LEGEND**

**Saint Marks NWA**

- 101 Receptor Grid
- 40 Refined Receptors
- Class I Boundary
- ★ COT Purdom Plant Location

**REFERENCE**

Projection: Transverse Mercator Datum: NAD 27 Coordinate System: UTM Zone 17



PROJECT  
CITY OF TALLAHASSEE  
BART MODELING PROTOCOL

TITLE  
**Saint Marks NWA Refined Receptor Grid**



PROJECT No.	AS	2-Apr-2010	SCALE AS SHOWN	REV 0
DESIGN	AS	2-Apr-2010	<b>FIGURE 4-4</b>	
CR	AS	2-Apr-2010		

**APPENDIX A**

**EXAMPLE CALPUFF INPUT FILE**



EXAMPLE FACILITY XYZ - CALPUFF  
 IMPACTS AT SOURCE-SPECIFIC CLASS I AREAS  
 4-km FLORIDA DOMAIN (VISTAS REFINED DOMAIN 2), 2001  
 ----- Run title (3 lines) -----

CALPUFF MODEL CONTROL FILE  
 -----

INPUT GROUP: 0 -- Input and Output File Names

Default Name	Type	File Name
CALMET.DAT	input	* METDAT = *
or		
ISCMET.DAT	input	* ISCDAT = *
or		
PLMMET.DAT	input	* PLMDAT = *
or		
PROFILE.DAT	input	* PRFDAT = *
SURFACE.DAT	input	* SFCDAT = *
RESTARTB.DAT	input	* RSTARTB= *
-----		
CALPUFF.LST	output	! PUFLST = PUFFEXP.LST !
CONC.DAT	output	! CONDAT = PUFFEXP.CON !
DFLX.DAT	output	* DFDAT = *
WFLX.DAT	output	* WFDAT = *
-----		
VISB.DAT	output	* VISDAT = *
TK2D.DAT	output	* T2DDAT = *
RHO2D.DAT	output	* RHODAT = *
RESTARTE.DAT	output	* RSTARTE= *

Emission Files

PTEMARB.DAT	input	* PTDAT = *
VOLEMARB.DAT	input	* VOLDAT = *
BAEMARB.DAT	input	* ARDAT = *
LNEMARB.DAT	input	* LNDAT = *

Other Files

OZONE.DAT	input	! OZDAT =C:\BARTHRO3\2001FLOz.DAT !
VD.DAT	input	* VDDAT = *
CHEM.DAT	input	* CHEMDAT= *
H2O2.DAT	input	* H2O2DAT= *
HILL.DAT	input	* HILDAT= *
HILLRCT.DAT	input	* RCTDAT= *
COASTLN.DAT	input	* CSTDAT= *
FLUXBDY.DAT	input	* BDYDAT= *
BCON.DAT	input	* BCNDAT= *
DEBUG.DAT	output	* DEBUG = *
MASSFLX.DAT	output	* FLXDAT= *
MASSBAL.DAT	output	* BALDAT= *
FOG.DAT	output	* FOGDAT= *

All file names will be converted to lower case if LCFILES = T  
 Otherwise, if LCFILES = F, file names will be converted to UPPER CASE  
 T = lower case ! LCFILES = T !  
 F = UPPER CASE

NOTE: (1) file/path names can be up to 70 characters in length

Provision for multiple input files

Number of CALMET.DAT files for run (NMETDAT)  
 Default: 1 ! NMETDAT = 36 !

Number of PTEMARB.DAT files for run (NPTDAT)  
 Default: 0 ! NPTDAT = 0 !

Number of BAEMARB.DAT files for run (NARDAT)...

Default: 0 ! NARDAT = 0 !

Number of VOLEMARB.DAT files for run (NVOLDAT)

Default: 0 ! NVOLDAT = 0 !

!END!

-----  
Subgroup (0a)  
-----

The following CALMET.DAT filenames are processed in sequence if NMETDAT>1

Default Name	Type	File Name
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-01A.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-01B.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-01C.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-02A.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-02B.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-02C.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-03A.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-03B.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-03C.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-04A.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-04B.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-04C.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-05A.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-05B.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-05C.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-06A.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-06B.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-06C.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-07A.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-07B.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-07C.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-08A.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-08B.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-08C.DAT ! !END!
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CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-09C.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-10A.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-10B.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-10C.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-11A.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-11B.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-11C.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-12A.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-12B.DAT ! !END!
CALMET.DAT	input	! METDAT =E:\FLA4KM\2001\MET2001-DOM2-12C.DAT ! !END!

-----  
INPUT GROUP: 1 -- General run control parameters  
-----

Option to run all periods found  
in the met. file (METRUN) Default: 0 ! METRUN = 0 !

METRUN = 0 - Run period explicitly defined below  
METRUN = 1 - Run all periods in met. file

Starting date: Year (IBYR) -- No default ! IBYR = 2001 !  
(used only if Month (IBMO) -- No default ! IBMO = 1 !  
METRUN = 0) Day (IBDY) -- No default ! IBDY = 1 !  
Hour (IBHR) -- No default ! IBHR = 1 !

Base time zone (XBTZ) -- No default ! XBTZ = 5.0 !  
PST = 8., MST = 7.  
CST = 6., EST = 5.

Length of run (hours) (IRLG) -- No default ! IRLG = 8760 !

Number of chemical species (NSPEC)  
Default: 5 ! NSPEC = 11 !

Number of chemical species  
to be emitted (NSE)                    Default: 3            ! NSE = 9 !

Flag to stop run after  
SETUP phase (ITEST)                    Default: 2            ! ITEST = 2 !  
(Used to allow checking  
of the model inputs, files, etc.)  
ITEST = 1 - STOPS program after SETUP phase  
ITEST = 2 - Continues with execution of program  
          after SETUP

Restart Configuration:

Control flag (MRESTART)                Default: 0            ! MRESTART = 0 !

- 0 = Do not read or write a restart file
- 1 = Read a restart file at the beginning of  
    the run
- 2 = Write a restart file during run
- 3 = Read a restart file at beginning of run  
    and write a restart file during run

Number of periods in Restart  
output cycle (NRESPD)                 Default: 0            ! NRESPD = 0 !

- 0 = File written only at last period
- >0 = File updated every NRESPD periods

Meteorological Data Format (METFM)  
  Default: 1            ! METFM = 1 !

- METFM = 1 - CALMET binary file (CALMET.MET)
- METFM = 2 - ISC ASCII file (ISCMET.MET)
- METFM = 3 - AUSPLUME ASCII file (PLMMET.MET)
- METFM = 4 - CTDM plus tower file (PROFILE.DAT) and  
            surface parameters file (SURFACE.DAT)

PG sigma-y is adjusted by the factor (AVET/PGTIME)\*\*0.2  
Averaging Time (minutes) (AVET)  
  Default: 60.0        ! AVET = 60. !

PG Averaging Time (minutes) (PGTIME)  
  Default: 60.0        ! PGTIME = 60. !

!END!

-----  
INPUT GROUP: 2 -- Technical options  
-----

Vertical distribution used in the  
near field (MGAUSS)                    Default: 1            ! MGAUSS = 1 !  
0 = uniform  
1 = Gaussian

Terrain adjustment method  
(MCTADJ)                                Default: 3            ! MCTADJ = 3 !  
0 = no adjustment  
1 = ISC-type of terrain adjustment  
2 = simple, CALPUFF-type of terrain  
   adjustment  
3 = partial plume path adjustment

Subgrid-scale complex terrain  
flag (MCTSG)                            Default: 0            ! MCTSG = 0 !  
0 = not modeled  
1 = modeled

Near-field puffs modeled as  
elongated 0 (MSLUG)                    Default: 0            ! MSLUG = 0 !  
0 = no

1 = yes (slug model used)

Transitional plume rise modeled ?  
(MTRANS) Default: 1 ! MTRANS = 1 !  
0 = no (i.e., final rise only)  
1 = yes (i.e., transitional rise computed)

Stack tip downwash? (MTIP) Default: 1 ! MTIP = 1 !  
0 = no (i.e., no stack tip downwash)  
1 = yes (i.e., use stack tip downwash)

Vertical wind shear modeled above  
stack top? (MSHEAR) Default: 0 ! MSHEAR = 0 !  
0 = no (i.e., vertical wind shear not modeled)  
1 = yes (i.e., vertical wind shear modeled)

Puff splitting allowed? (MSPLIT) Default: 0 ! MSPLIT = 0 !  
0 = no (i.e., puffs not split)  
1 = yes (i.e., puffs are split)

Chemical mechanism flag (MCHEM) Default: 1 ! MCHEM = 1 !  
0 = chemical transformation not modeled  
1 = transformation rates computed internally (MESOPUFF II scheme)  
2 = user-specified transformation rates used  
3 = transformation rates computed internally (RIVAD/ARM3 scheme)  
4 = secondary organic aerosol formation computed (MESOPUFF II scheme for OH)

Aqueous phase transformation flag (MAQCHEM)  
(Used only if MCHEM = 1, or 3) Default: 0 ! MAQCHEM = 0 !  
0 = aqueous phase transformation not modeled  
1 = transformation rates adjusted for aqueous phase reactions

Wet removal modeled ? (MWET) Default: 1 ! MWET = 1 !  
0 = no  
1 = yes

Dry deposition modeled ? (MDRY) Default: 1 ! MDRY = 1 !  
0 = no  
1 = yes  
(dry deposition method specified for each species in Input Group 3)

Method used to compute dispersion coefficients (MDISP) Default: 3 ! MDISP = 3 !  
1 = dispersion coefficients computed from measured values of turbulence, sigma v, sigma w  
2 = dispersion coefficients from internally calculated sigma v, sigma w using micrometeorological variables (u\*, w\*, L, etc.)  
3 = PG dispersion coefficients for RURAL areas (computed using the ISCST multi-segment approximation) and MP coefficients in urban areas  
4 = same as 3 except PG coefficients computed using the MESOPUFF II eqns.  
5 = CTDM sigmas used for stable and neutral conditions. For unstable conditions, sigmas are computed as in MDISP = 3, described above. MDISP = 5 assumes that measured values are read

Sigma-v/sigma-theta, sigma-w measurements used? (MTURBVW)  
(Used only if MDISP = 1 or 5) Default: 3 ! MTURBVW = 3 !  
1 = use sigma-v or sigma-theta measurements from PROFILE.DAT to compute sigma-y (valid for METFM = 1, 2, 3, 4)  
2 = use sigma-w measurements from PROFILE.DAT to compute sigma-z (valid for METFM = 1, 2, 3, 4)

- 3 = use both sigma-(v/theta) and sigma-w from PROFILE.DAT to compute sigma-y and sigma-z (valid for METFM = 1, 2, 3, 4)
- 4 = use sigma-theta measurements from PLMMET.DAT to compute sigma-y (valid only if METFM = 3)

Back-up method used to compute dispersion when measured turbulence data are missing (MDISP2)

Default: 3 ! MDISP2 = 3 !

(used only if MDISP = 1 or 5)

- 2 = dispersion coefficients from internally calculated sigma v, sigma w using micrometeorological variables (u\*, w\*, L, etc.)
- 3 = PG dispersion coefficients for RURAL areas (computed using the ISCST multi-segment approximation) and MP coefficients in urban areas
- 4 = same as 3 except PG coefficients computed using the MESOPUFF II eqns.

PG sigma-y,z adj. for roughness? Default: 0 ! MROUGH = 0 !  
(MROUGH)

- 0 = no
- 1 = yes

Partial plume penetration of elevated inversion? Default: 1 ! MPARTL = 1 !  
(MPARTL)

- 0 = no
- 1 = yes

Strength of temperature inversion provided in PROFILE.DAT extended records? Default: 0 ! MTINV = 0 !  
(MTINV)

- 0 = no (computed from measured/default gradients)
- 1 = yes

PDF used for dispersion under convective conditions? Default: 0 ! MPDF = 0 !  
(MPDF)

- 0 = no
- 1 = yes

Sub-Grid TIBL module used for shore line? Default: 0 ! MSGTIBL = 0 !  
(MSGTIBL)

- 0 = no
- 1 = yes

Boundary conditions (concentration) modeled? Default: 0 ! MBCON = 0 !  
(MBCON)

- 0 = no
- 1 = yes

Analyses of fogging and icing impacts due to emissions from arrays of mechanically-forced cooling towers can be performed using CALPUFF in conjunction with a cooling tower emissions processor (CTEMISS) and its associated postprocessors. Hourly emissions of water vapor and temperature from each cooling tower cell are computed for the current cell configuration and ambient conditions by CTEMISS. CALPUFF models the dispersion of these emissions and provides cloud information in a specialized format for further analysis. Output to FOG.DAT is provided in either 'plume mode' or 'receptor mode' format.

Configure for FOG Model output? Default: 0 ! MFOG = 0 !  
(MFOG)

- 0 = no
- 1 = yes - report results in PLUME Mode format
- 2 = yes - report results in RECEPTOR Mode format

Test options specified to see if  
they conform to regulatory  
values? (MREG)

Default: 1 ! MREG = 1 !

- 0 = NO checks are made
- 1 = Technical options must conform to USEPA
  - Long Range Transport (LRT) guidance
    - METEM 1 or 2
    - AVET 60. (min)
    - PGTIME 60. (min)
    - MGAUSS 1
    - MCTADJ 3
    - MTRANS 1
    - MTIP 1
    - MCHEM 1 or 3 (if modeling SOx, NOx)
    - MWET 1
    - MDRY 1
    - MDISP 2 or 3
    - MPDF 0 if MDISP=3  
1 if MDISP=2
    - MROUGH 0
    - MPARTL 1
    - SYTDEP 550. (m)
    - MHFTSZ 0

!END!

-----  
INPUT GROUP: 3a, 3b -- Species list  
-----

-----  
Subgroup (3a)  
-----

The following species are modeled:

```

! CSPEC =      SO2 !      !END!
! CSPEC =      SO4 !      !END!
! CSPEC =      NOX !      !END!
! CSPEC =      HNO3 !     !END!
! CSPEC =      NO3 !      !END!
! CSPEC =      PM0063 !    !END!
! CSPEC =      PM0100 !    !END!
! CSPEC =      PM0125 !    !END!
! CSPEC =      PM0250 !    !END!
! CSPEC =      PM0600 !    !END!
! CSPEC =      PM1000 !    !END!

```

SPECIES NAME (Limit: 12 Characters in length)	MODELED (0=NO, 1=YES)	EMITTED (0=NO, 1=YES)	Dry DEPOSITED (0=NO, 1=COMPUTED-GAS 2=COMPUTED-PARTICLE 3=USER-SPECIFIED)	OUTPUT GROUP NUMBER (0=NONE, 1=1st CGRUP, 2=2nd CGRUP, 3= etc.)
! SO2 =	1,	1,	1,	0 !
! SO4 =	1,	1,	2,	0 !
! NOX =	1,	1,	1,	0 !
! HNO3 =	1,	0,	1,	0 !
! NO3 =	1,	0,	2,	0 !
! PM0063 =	1,	1,	2,	1 !
! PM0100 =	1,	1,	2,	1 !
! PM0125 =	1,	1,	2,	1 !
! PM0250 =	1,	1,	2,	1 !
! PM0600 =	1,	1,	2,	1 !
! PM1000 =	1,	1,	2,	1 !

!END!

-----  
Subgroup (3b)  
-----

-----  
The following names are used for Species-Groups in which results for certain species are combined (added) prior to output. The CGRUP name will be used as the species name in output files. Use this feature to model specific particle-size distributions by treating each size-range as a separate species. Order must be consistent with 3(a) above..

! CGRUP = PM10 ! !END!

INPUT GROUP: 4 -- Map Projection and Grid control parameters  
-----

Projection for all (X,Y):  
-----

Map projection  
(PMAP)

Default: UTM ! PMAP = LCC !

UTM : Universal Transverse Mercator  
TTM : Tangential Transverse Mercator  
LCC : Lambert Conformal Conic  
PS : Polar Stereographic  
EM : Equatorial Mercator  
LAZA : Lambert Azimuthal Equal Area

False Easting and Northing (km) at the projection origin

(Used only if PMAP= TTM, LCC, or LAZA)

(FEAST) Default=0.0 ! FEAST = 0.000 !  
(FNORTH) Default=0.0 ! FNORTH = 0.000 !

UTM zone (1 to 60)

(Used only if PMAP=UTM)

(IUTMZN) No Default ! IUTMZN = 0 !

Hemisphere for UTM projection?

(Used only if PMAP=UTM)

(UTMHEM) Default: N ! UTMHEM = N !

N : Northern hemisphere projection  
S : Southern hemisphere projection

Latitude and Longitude (decimal degrees) of projection origin

(Used only if PMAP= TTM, LCC, PS, EM, or LAZA)

(RLATO) No Default ! RLATO = 40N !  
(RLONO) No Default ! RLONO = 97W !

TTM : RLONO identifies central (true N/S) meridian of projection  
RLATO selected for convenience  
LCC : RLONO identifies central (true N/S) meridian of projection  
RLATO selected for convenience  
PS : RLONO identifies central (grid N/S) meridian of projection  
RLATO selected for convenience  
EM : RLONO identifies central meridian of projection  
RLATO is REPLACED by 0.0N (Equator)  
LAZA: RLONO identifies longitude of tangent-point of mapping plane  
RLATO identifies latitude of tangent-point of mapping plane

Matching parallel(s) of latitude (decimal degrees) for projection

(Used only if PMAP= LCC or PS)

(XLAT1) No Default ! XLAT1 = 33N !  
(XLAT2) No Default ! XLAT2 = 45N !

LCC : Projection cone slices through Earth's surface at XLAT1 and XLAT2  
PS : Projection plane slices through Earth at XLAT1  
(XLAT2 is not used)

-----  
Note: Latitudes and longitudes should be positive, and include a letter N,S,E, or W indicating north or south latitude, and east or west longitude. For example,

35.9 N Latitude = 35.9N  
118.7 E Longitude = 118.7E

Datum-region

-----

The Datum-Region for the coordinates is identified by a character string. Many mapping products currently available use the model of the Earth known as the World Geodetic System 1984 (WGS-84). Other local models may be in use, and their selection in CALMET will make its output consistent with local mapping products. The list of Datum-Regions with official transformation parameters is provided by the National Imagery and Mapping Agency (NIMA).

NIMA Datum - Regions (Examples)

-----

WGS-84	WGS-84 Reference Ellipsoid and Geoid, Global coverage (WGS84)
NAS-C	NORTH AMERICAN 1927 Clarke 1866 Spheroid, MEAN FOR CONUS (NAD27)
NAR-C	NORTH AMERICAN 1983 GRS 80 Spheroid, MEAN FOR CONUS (NAD83)
NWS-84	NWS 6370KM Radius, Sphere
ESR-S	ESRI REFERENCE 6371KM Radius, Sphere

Datum-region for output coordinates  
 (DATUM) Default: WGS-G ! DATUM = NWS-84 !

METEOROLOGICAL Grid:

Rectangular grid defined for projection PMAP,  
 with X the Easting and Y the Northing coordinate

No. X grid cells (NX)	No default	! NX = 263 !
No. Y grid cells (NY)	No default	! NY = 206 !
No. vertical layers (NZ)	No default	! NZ = 10 !

Grid spacing (DGRIDKM)	No default	! DGRIDKM = 4. !
	Units: km	

Cell face heights (ZFACE(nz+1))	No defaults	
	Units: m	
! ZFACE = 0., 20., 40., 80., 160., 320., 640., 1200., 2000., 3000., 4000. !		

Reference Coordinates  
 of SOUTHWEST corner of  
 grid cell(1, 1):

X coordinate (XORIGKM)	No default	! XORIGKM = 721.995 !
Y coordinate (YORIGKM)	No default	! YORIGKM = -1598.000 !
	Units: km	

COMPUTATIONAL Grid:

The computational grid is identical to or a subset of the MET. grid. The lower left (LL) corner of the computational grid is at grid point (IBCOMP, JBCOMP) of the MET. grid. The upper right (UR) corner of the computational grid is at grid point (IECOMP, JECOMP) of the MET. grid. The grid spacing of the computational grid is the same as the MET. grid.

X index of LL corner (IBCOMP) (1 <= IBCOMP <= NX)	No default	! IBCOMP = 1 !
--	------------	----------------

Y index of LL corner (JBCOMP) (1 <= JBCOMP <= NY)	No default	! JBCOMP = 1 !
--	------------	----------------

X index of UR corner (IECOMP) (1 <= IECOMP <= NX)	No default	! IECOMP = 263 !
--	------------	------------------

Y index of UR corner (JECOMP) (1 <= JECOMP <= NY)	No default	! JECOMP = 206 !
--	------------	------------------

SAMPLING Grid (GRIDDED RECEPTORS):

The lower left (LL) corner of the sampling grid is at grid point (IBSAMP, JBSAMP) of the MET. grid. The upper right (UR) corner of the



sampling grid is at grid point (IESAMP, JESAMP) of the MET. grid.  
 The sampling grid must be identical to or a subset of the computational  
 grid. It may be a nested grid inside the computational grid.  
 The grid spacing of the sampling grid is DGRIDKM/MESH DN.

```

Logical flag indicating if gridded
receptors are used (LSAMP)          Default: T      ! LSAMP = F !
(T=yes, F=no)

X index of LL corner (IBSAMP)        No default     ! IBSAMP = 1 !
(IBCAMP <= IBSAMP <= IECOMP)

Y index of LL corner (JBSAMP)        No default     ! JBSAMP = 1 !
(JBCOMP <= JBSAMP <= JECOMP)

X index of UR corner (IESAMP)        No default     ! IESAMP = 263 !
(IBCAMP <= IESAMP <= IECOMP)

Y index of UR corner (JESAMP)        No default     ! JESAMP = 206 !
(JBCOMP <= JESAMP <= JECOMP)

Nesting factor of the sampling
grid (MESH DN)                       Default: 1     ! MESH DN = 1 !
(MESH DN is an integer >= 1)
  
```

!END!

-----  
 INPUT GROUP: 5 -- Output Options  
 -----

FILE	DEFAULT VALUE	VALUE THIS RUN
Concentrations (ICON)	1	! ICON = 1 !
Dry Fluxes (IDRY)	1	! IDRY = 0 !
Wet Fluxes (IWET)	1	! IWET = 0 !
Relative Humidity (IVIS) (relative humidity file is required for visibility analysis)	1	! IVIS = 0 !
Use data compression option in output file? (LCOMPRS)	Default: T	! LCOMPRS = T !

\*  
 0 = Do not create file, 1 = create file

DIAGNOSTIC MASS FLUX OUTPUT OPTIONS:

```

Mass flux across specified boundaries
for selected species reported hourly?
(IMFLX)                               Default: 0      ! IMFLX = 0 !
0 = no
1 = yes (FLUXBDY.DAT and MASSFLX.DAT filenames
are specified in Input Group 0)
  
```

```

Mass balance for each species
reported hourly?
(IMBAL)                               Default: 0      ! IMBAL = 0 !
0 = no
1 = yes (MASSBAL.DAT filename is
specified in Input Group 0)
  
```

LINE PRINTER OUTPUT OPTIONS:

```

Print concentrations (ICPRT)           Default: 0      ! ICPRT = 0 !
Print dry fluxes (IDPRT)              Default: 0      ! IDPRT = 0 !
Print wet fluxes (IWPRT)              Default: 0      ! IWPRT = 0 !
  
```

(0 = Do not print, 1 = Print)

Concentration print interval  
(ICFRQ) in hours Default: 1 ! ICFRQ = 24 !  
Dry flux print interval  
(IDFRQ) in hours Default: 1 ! IDFRQ = 1 !  
Wet flux print interval  
(IWFQR) in hours Default: 1 ! IWFQR = 1 !

Units for Line Printer Output  
(IPRTU) Default: 1 ! IPRTU = 3 !  
for Concentration for Deposition  
1 = g/m\*\*3 g/m\*\*2/s  
2 = mg/m\*\*3 mg/m\*\*2/s  
3 = ug/m\*\*3 ug/m\*\*2/s  
4 = ng/m\*\*3 ng/m\*\*2/s  
5 = Odour Units

Messages tracking progress of run  
written to the screen ?  
(IMESG) Default: 2 ! IMESG = 2 !  
0 = no  
1 = yes (advection step, puff ID)  
2 = yes (YYYYJJJHH, # old puffs, # emitted puffs)

SPECIES (or GROUP for combined species) LIST FOR OUTPUT OPTIONS

MASS FLUX -- SPECIES /GROUP ON DISK?	----- CONCENTRATIONS -----		----- DRY FLUXES -----		----- WET FLUXES -----		SAVED
	PRINTED?	SAVED ON DISK?	PRINTED?	SAVED ON DISK?	PRINTED?	SAVED ON DISK?	
! SO2 =	0,	1,	0,	1,	0,	1,	0 !
! SO4 =	0,	1,	0,	1,	0,	1,	0 !
! NOX =	0,	1,	0,	1,	0,	1,	0 !
! HNO3 =	0,	1,	0,	1,	0,	1,	0 !
! NO3 =	0,	1,	0,	1,	0,	1,	0 !
! PM10 =	0,	1,	0,	1,	0,	1,	0 !

OPTIONS FOR PRINTING "DEBUG" QUANTITIES (much output)

Logical for debug output  
(LDEBUG) Default: F ! LDEBUG = F !  
First puff to track  
(IPFDEB) Default: 1 ! IPFDEB = 1 !  
Number of puffs to track  
(NPFDEB) Default: 1 ! NPFDEB = 1 !  
Met. period to start output  
(NN1) Default: 1 ! NN1 = 1 !  
Met. period to end output  
(NN2) Default: 10 ! NN2 = 10 !

!END!

INPUT GROUP: 6a, 6b, & 6c -- Subgrid scale complex terrain inputs

Subgroup (6a)

Number of terrain features (NHILL) Default: 0 ! NHILL = 0 !  
Number of special complex terrain

```

receptors (NCTREC)                Default: 0      ! NCTREC = 0  !

Terrain and CTSG Receptor data for
CTSG hills input in CTDM format ?
(MHILL)                            No Default    ! MHILL = 2  !
1 = Hill and Receptor data created
  by CTDM processors & read from
  HILL.DAT and HILLRCT.DAT files
2 = Hill data created by OPTHILL &
  input below in Subgroup (6b);
  Receptor data in Subgroup (6c)

Factor to convert horizontal dimensions
to meters (MHILL=1)                Default: 1.0   ! XHILL2M = 1.  !

Factor to convert vertical dimensions
to meters (MHILL=1)                Default: 1.0   ! ZHILL2M = 1.  !

X-origin of CTDM system relative to
CALPUFF coordinate system, in Kilometers (MHILL=1)  No Default    ! XCTDMKM = 0.0E00 !

Y-origin of CTDM system relative to
CALPUFF coordinate system, in Kilometers (MHILL=1)  No Default    ! YCTDMKM = 0.0E00 !

```

! END !

-----  
Subgroup (6b)  
-----

1 \*\*  
HILL information

HILL AMAX1 NO. (m)	XC AMAX2 (km)	YC (km)	THETAH (deg.)	ZGRID (m)	RELIEF (m)	EXPO 1 (m)	EXPO 2 (m)	SCALE 1 (m)	SCALE 2 (m)	(m)
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

-----  
Subgroup (6c)  
-----

COMPLEX TERRAIN RECEPTOR INFORMATION

XRCT (km)	YRCT (km)	ZRCT (m)	XHH
-----	-----	-----	-----

1

Description of Complex Terrain Variables:

XC, YC = Coordinates of center of hill.  
THETAH = Orientation of major axis of hill (clockwise from North)  
ZGRID = Height of the 0 of the grid above mean sea level  
RELIEF = Height of the crest of the hill above the grid elevation  
EXPO 1 = Hill-shape exponent for the major axis  
EXPO 2 = Hill-shape exponent for the major axis  
SCALE 1 = Horizontal length scale along the major axis  
SCALE 2 = Horizontal length scale along the minor axis  
AMAX = Maximum allowed axis length for the major axis  
BMAX = Maximum allowed axis length for the major axis

XRCT, YRCT = Coordinates of the complex terrain receptors  
ZRCT = Height of the ground (MSL) at the complex terrain Receptor  
XHH = Hill number associated with each complex terrain receptor  
(NOTE: MUST BE ENTERED AS A REAL NUMBER)

\*\*

NOTE: DATA for each hill and CTSG receptor are treated as a separate input subgroup and therefore must end with an input group terminator.

-----  
 INPUT GROUP: 7 -- Chemical parameters for dry deposition of gases  
 -----

SPECIES COEFFICIENT NAME (dimensionless)	DIFFUSIVITY (cm**2/s)	ALPHA STAR	REACTIVITY	MESOPHYLL RESISTANCE (s/cm)	HENRY'S LAW
! SO2 =	0.1509,	1000,	8,	0,	0.04 !
! NOX =	0.1656,	1,	8,	5,	3.5 !
! HNO3 =	0.1628,	1,	18,	0,	0.00000008 !

!END!

-----  
 INPUT GROUP: 8 -- Size parameters for dry deposition of particles  
 -----

For SINGLE SPECIES, the mean and standard deviation are used to compute a deposition velocity for NINT (see group 9) size-ranges, and these are then averaged to obtain a mean deposition velocity.

For GROUPED SPECIES, the size distribution should be explicitly specified (by the 'species' in the group), and the standard deviation for each should be entered as 0. The model will then use the deposition velocity for the stated mean diameter.

SPECIES NAME	GEOMETRIC MASS MEAN DIAMETER (microns)	GEOMETRIC STANDARD DEVIATION (microns)
! SO4 =	0.48,	2. !
! NO3 =	0.48,	2. !
! PM0063 =	0.63,	0. !
! PM0100 =	1.00,	0. !
! PM0125 =	1.25,	0. !
! PM0250 =	2.50,	0. !
! PM0600 =	6.00,	0. !
! PM1000 =	10.00,	0. !

!END!

-----  
 INPUT GROUP: 9 -- Miscellaneous dry deposition parameters  
 -----

Reference cuticle resistance (s/cm)  
 (RCUTR) Default: 30 ! RCUTR = 30.0 !  
 Reference ground resistance (s/cm)  
 (RGR) Default: 10 ! RGR = 10.0 !  
 Reference pollutant reactivity  
 (REACTR) Default: 8 ! REACTR = 8.0 !

Number of particle-size intervals used to  
 evaluate effective particle deposition velocity  
 (NINT) Default: 9 ! NINT = 9 !

Vegetation state in unirrigated areas  
 (IVEG) Default: 1 ! IVEG = 1 !  
 IVEG=1 for active and unstressed vegetation  
 IVEG=2 for active and stressed vegetation

IVEG=3 for inactive vegetation

!END!

-----  
INPUT GROUP: 10 -- Wet Deposition Parameters  
-----

Scavenging Coefficient -- Units: (sec)\*\*(-1)

Pollutant	Liquid Precip.	Frozen Precip.
! SO2 =	3.0E-05,	0.0E00 !
! SO4 =	1.0E-04,	3.0E-05 !
! HNO3 =	6.0E-05,	0.0E00 !
! NO3 =	1.0E-04,	3.0E-05 !
! PM0063 =	1.0E-04,	3.0E-05 !
! PM0100 =	1.0E-04,	3.0E-05 !
! PM0125 =	1.0E-04,	3.0E-05 !
! PM0250 =	1.0E-04,	3.0E-05 !
! PM0600 =	1.0E-04,	3.0E-05 !
! PM1000 =	1.0E-04,	3.0E-05 !

!END!

-----  
INPUT GROUP: 11 -- Chemistry Parameters  
-----

Ozone data input option (MOZ) Default: 1 ! MOZ = 1 !  
(Used only if MCHM = 1, 3, or 4)  
0 = use a monthly background ozone value  
1 = read hourly ozone concentrations from  
the OZONE.DAT data file

Monthly ozone concentrations  
(Used only if MCHM = 1, 3, or 4 and  
MOZ = 0 or MOZ = 1 and all hourly O3 data missing)  
(BCKO3) in ppb Default: 12\*80.  
! BCKO3 = 12\*50. !

Monthly ammonia concentrations  
(Used only if MCHM = 1, or 3)  
(BCKNH3) in ppb Default: 12\*10.  
! BCKNH3 = 12\*0.5 !

Nighttime SO2 loss rate (RNITE1)  
in percent/hour Default: 0.2 ! RNITE1 = .2 !

Nighttime NOx loss rate (RNITE2)  
in percent/hour Default: 2.0 ! RNITE2 = 2.0 !

Nighttime HNO3 formation rate (RNITE3)  
in percent/hour Default: 2.0 ! RNITE3 = 2.0 !

H2O2 data input option (MH2O2) Default: 1 ! MH2O2 = 1 !  
(Used only if MAQCHEM = 1)  
0 = use a monthly background H2O2 value  
1 = read hourly H2O2 concentrations from  
the H2O2.DAT data file

Monthly H2O2 concentrations  
(Used only if MAQCHEM = 1 and  
MH2O2 = 0 or MH2O2 = 1 and all hourly H2O2 data missing)  
(BCKH2O2) in ppb Default: 12\*1.  
! BCKH2O2 = 12\*1 !

--- Data for SECONDARY ORGANIC AEROSOL (SOA) Option  
(used only if MCHEM = 4)

The SOA module uses monthly values of:

Fine particulate concentration in ug/m<sup>3</sup> (BCKPMF)  
Organic fraction of fine particulate (OFRAC)  
VOC / NOX ratio (after reaction) (VCNX)

to characterize the air mass when computing  
the formation of SOA from VOC emissions.

Typical values for several distinct air mass types are:

Month	1	2	3	4	5	6	7	8	9	10	11	12
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Clean Continental												
BCKPMF	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
OFRAC	.15	.15	.20	.20	.20	.20	.20	.20	.20	.20	.20	.15
VCNX	50.	50.	50.	50.	50.	50.	50.	50.	50.	50.	50.	50.
Clean Marine (surface)												
BCKPMF	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5
OFRAC	.25	.25	.30	.30	.30	.30	.30	.30	.30	.30	.30	.25
VCNX	50.	50.	50.	50.	50.	50.	50.	50.	50.	50.	50.	50.
Urban - low biogenic (controls present)												
BCKPMF	30.	30.	30.	30.	30.	30.	30.	30.	30.	30.	30.	30.
OFRAC	.20	.20	.25	.25	.25	.25	.25	.25	.20	.20	.20	.20
VCNX	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
Urban - high biogenic (controls present)												
BCKPMF	60.	60.	60.	60.	60.	60.	60.	60.	60.	60.	60.	60.
OFRAC	.25	.25	.30	.30	.30	.55	.55	.55	.35	.35	.35	.25
VCNX	15.	15.	15.	15.	15.	15.	15.	15.	15.	15.	15.	15.
Regional Plume												
BCKPMF	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
OFRAC	.20	.20	.25	.35	.25	.40	.40	.40	.30	.30	.30	.20
VCNX	15.	15.	15.	15.	15.	15.	15.	15.	15.	15.	15.	15.
Urban - no controls present												
BCKPMF	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.
OFRAC	.30	.30	.35	.35	.35	.55	.55	.55	.35	.35	.35	.30
VCNX	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
Default: Clean Continental												
! BCKPMF	= 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00, 1.00 !											
! OFRAC	= 0.15, 0.15, 0.20, 0.20, 0.20, 0.20, 0.20, 0.20, 0.20, 0.20, 0.20, 0.20, 0.15 !											
! VCNX	= 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00, 50.00 !											

!END!

-----  
INPUT GROUP: 12 -- Misc. Dispersion and Computational Parameters  
-----

Horizontal size of puff (m) beyond which  
time-dependent dispersion equations (Heffter)  
are used to determine sigma-y and  
sigma-z (SYTDEP) Default: 550. ! SYTDEP = 5.5E02 !

Switch for using Heffter equation for sigma z  
as above (0 = Not use Heffter; 1 = use Heffter  
(MHFTSZ) Default: 0 ! MHFTSZ = 0 !

Stability class used to determine plume  
growth rates for puffs above the boundary  
layer (JSUP) Default: 5 ! JSUP = 5 !

Vertical dispersion constant for stable  
conditions (kl in Eqn. 2.7-3) (CONK1) Default: 0.01 ! CONK1 = .01 !

Vertical dispersion constant for neutral/  
unstable conditions (k2 in Eqn. 2.7-4)  
(CONK2) Default: 0.1 ! CONK2 = .1 !

Factor for determining Transition-point from  
Schulman-Scire to Huber-Snyder Building Downwash  
scheme (SS used for Hs < Hb + TBD \* HL)  
(TBD) Default: 0.5 ! TBD = .5 !  
TBD < 0 ==> always use Huber-Snyder  
TBD = 1.5 ==> always use Schulman-Scire  
TBD = 0.5 ==> ISC Transition-point

Range of land use categories for which  
urban dispersion is assumed  
(IURB1, IURB2) Default: 10 ! IURB1 = 10 !  
19 ! IURB2 = 19 !

Site characterization parameters for single-point Met data files -----  
(needed for METFM = 2,3,4)

Land use category for modeling domain  
(ILANDUIN) Default: 20 ! ILANDUIN = 20 !

Roughness length (m) for modeling domain  
(ZOIN) Default: 0.25 ! ZOIN = .25 !

Leaf area index for modeling domain  
(XLAIIN) Default: 3.0 ! XLAIIN = 3.0 !

Elevation above sea level (m)  
(ELEVIN) Default: 0.0 ! ELEVIN = .0 !

Latitude (degrees) for met location  
(XLATIN) Default: -999. ! XLATIN = -999.0 !

Longitude (degrees) for met location  
(XLONIN) Default: -999. ! XLONIN = -999.0 !

Specialized information for interpreting single-point Met data files -----

Anemometer height (m) (Used only if METFM = 2,3)  
(ANEMHT) Default: 10. ! ANEMHT = 10.0 !

Form of lateral turbulence data in PROFILE.DAT file  
(Used only if METFM = 4 or MTURBVW = 1 or 3)  
(ISIGMAV) Default: 1 ! ISIGMAV = 1 !  
0 = read sigma-theta  
1 = read sigma-v

Choice of mixing heights (Used only if METFM = 4)  
(IMIXCTDM) Default: 0 ! IMIXCTDM = 0 !  
0 = read PREDICTED mixing heights  
1 = read OBSERVED mixing heights

Maximum length of a slug (met. grid units)  
(MXLEN) Default: 1.0 ! MXLEN = 1.0 !

Maximum travel distance of a puff/slug (in  
grid units) during one sampling step  
(XSAMLEN) Default: 1.0 ! XSAMLEN = 1.0 !

Maximum Number of slugs/puffs release from  
one source during one time step  
(MXNEW) Default: 99 ! MXNEW = 99 !

Maximum Number of sampling steps for  
one puff/slug during one time step  
(MXSAM) Default: 99 ! MXSAM = 99 !

Number of iterations used when computing  
the transport wind for a sampling step  
that includes gradual rise (for CALMET  
and PROFILE winds)  
(NCOUNT) Default: 2 ! NCOUNT = 2 !

Minimum sigma y for a new puff/slug (m)  
(SYMIN) Default: 1.0 ! SYMIN = 1.0 !

Minimum sigma z for a new puff/slug (m)  
(SZMIN) Default: 1.0 ! SZMIN = 1.0 !

Default minimum turbulence velocities sigma-v and sigma-w  
for each stability class over land and over water (m/s)  
(SVMIN(12) and SWMIN(12))

Stab Class	LAND						WATER					
	A	B	C	D	E	F	A	B	C	D	E	F
Default SVMIN	.50	.50	.50	.50	.50	.50	.37	.37	.37	.37	.37	.37
Default SWMIN	.20	.12	.08	.06	.03	.016	.20	.12	.08	.06	.03	.016

! SVMIN = 0.500, 0.500, 0.500, 0.500, 0.500, 0.500, 0.500, 0.370, 0.370, 0.370, 0.370, 0.370, 0.370!  
! SWMIN = 0.200, 0.120, 0.080, 0.060, 0.030, 0.016, 0.200, 0.120, 0.080, 0.060, 0.030, 0.016!

Divergence criterion for dw/dz across puff  
used to initiate adjustment for horizontal  
convergence (1/s)  
Partial adjustment starts at CDIV(1), and  
full adjustment is reached at CDIV(2)  
(CDIV(2))

Default: 0.0,0.0 ! CDIV = .0, .0 !

Minimum wind speed (m/s) allowed for  
non-calm conditions. Also used as minimum  
speed returned when using power-law  
extrapolation toward surface  
(WSCALM)

Default: 0.5 ! WSCALM = .5 !

Maximum mixing height (m)  
(XMAXZI)

Default: 3000. ! XMAXZI = 3000.0 !

Minimum mixing height (m)  
(XMINZI)

Default: 50. ! XMINZI = 50.0 !

Default wind speed classes --  
5 upper bounds (m/s) are entered;  
the 6th class has no upper limit  
(WSCAT(5))

Default :  
ISC RURAL : 1.54, 3.09, 5.14, 8.23, 10.8 (10.8+)

Wind Speed Class	1	2	3	4	5
! WSCAT	1.54	3.09	5.14	8.23	10.80

Default wind speed profile power-law  
exponents for stabilities 1-6  
(PLX0(6))

Default : ISC RURAL values  
ISC RURAL : .07, .07, .10, .15, .35, .55  
ISC URBAN : .15, .15, .20, .25, .30, .30

Stability Class	A	B	C	D	E	F
! PLX0	0.07	0.07	0.10	0.15	0.35	0.55

Default potential temperature gradient  
for stable classes E, F (degK/m)  
(PTG0(2))

Default: 0.020, 0.035  
! PTG0 = 0.020, 0.035 !

Default plume path coefficients for  
each stability class (used when option  
for partial plume height terrain adjustment  
is selected -- MCTADJ=3)  
(PPC(6))

Stability Class	A	B	C	D	E	F
Default PPC	.50	.50	.50	.50	.35	.35
! PPC	0.50	0.50	0.50	0.50	0.35	0.35

Slug-to-puff transition criterion factor  
equal to sigma-y/length of slug  
(SL2PF)

Default: 10. ! SL2PF = 10.0 !



Puff-splitting control variables -----

VERTICAL SPLIT  
-----

Number of puffs that result every time a puff  
is split - nsplit=2 means that 1 puff splits  
into 2

(NSPLIT) Default: 3 ! NSPLIT = 3 !

Time(s) of a day when split puffs are eligible to  
be split once again; this is typically set once  
per day, around sunset before nocturnal shear develops.

24 values: 0 is midnight (00:00) and 23 is 11 PM (23:00)

0=do not re-split 1=eligible for re-split

(IRESPLIT(24)) Default: Hour 17 = 1

! IRESPLIT = 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0 !

Split is allowed only if last hour's mixing  
height (m) exceeds a minimum value

(ZISPLIT) Default: 100. ! ZISPLIT = 100.0 !

Split is allowed only if ratio of last hour's  
mixing ht to the maximum mixing ht experienced  
by the puff is less than a maximum value (this  
postpones a split until a nocturnal layer develops)

(ROLDMAX) Default: 0.25 ! ROLDMAX = 0.25 !

HORIZONTAL SPLIT  
-----

Number of puffs that result every time a puff  
is split - nsplith=5 means that 1 puff splits  
into 5

(NSPLITH) Default: 5 ! NSPLITH = 5 !

Minimum sigma-y (Grid Cells Units) of puff  
before it may be split

(SYSPLITH) Default: 1.0 ! SYSPLITH = 1.0 !

Minimum puff elongation rate (SYSPLITH/hr) due to  
wind shear, before it may be split

(SHSPLITH) Default: 2. ! SHSPLITH = 2.0 !

Minimum concentration (g/m<sup>3</sup>) of each  
species in puff before it may be split  
Enter array of NSPEC values; if a single value is  
entered, it will be used for ALL species

(CNSPLITH) Default: 1.0E-07 ! CNSPLITH = 1.0E-07 !

Integration control variables -----

Fractional convergence criterion for numerical SLUG  
sampling integration

(EPSSLUG) Default: 1.0e-04 ! EPSSLUG = 1.0E-04 !

Fractional convergence criterion for numerical AREA  
source integration

(EPSAREA) Default: 1.0e-06 ! EPSAREA = 1.0E-06 !

Trajectory step-length (m) used for numerical rise  
integration

(DSRISE) Default: 1.0 ! DSRISE = 1.0 !

!END!

-----  
INPUT GROUPS: 13a, 13b, 13c, 13d -- Point source parameters  
-----

-----  
 Subgroup (13a)  
 -----

Number of point sources with  
 parameters provided below (NPT1) No default ! NPT1 = 1 !

Units used for point source  
 emissions below (IPTU) Default: 1 ! IPTU = 3 !

- 1 = g/s
- 2 = kg/hr
- 3 = lb/hr
- 4 = tons/yr
- 5 = Odour Unit \* m\*\*3/s (vol. flux of odour compound)
- 6 = Odour Unit \* m\*\*3/min
- 7 = metric tons/yr

Number of source-species  
 combinations with variable  
 emissions scaling factors  
 provided below in (13d) (NSPT1) Default: 0 ! NSPT1 = 0 !

Number of point sources with  
 variable emission parameters  
 provided in external file (NPT2) No default ! NPT2 = 0 !

(If NPT2 > 0, these point  
 source emissions are read from  
 the file: PTEMARB.DAT)

!END!

-----  
 Subgroup (13b)  
 -----

a  
 POINT SOURCE: CONSTANT DATA  
 -----

Source No.	X Coordinate (km)	Y Coordinate (km)	Stack Height (m)	Base Elevation (m)	Stack Diameter (m)	Exit Vel. (m/s)	Exit Temp. (deg. K)	b Bldg. Dwash	c Emission Rates

Project-Specific Source Input  
 -----

a  
 Data for each source are treated as a separate input subgroup  
 and therefore must end with an input group terminator.

- SRCNAM is a 12-character name for a source  
(No default)
- X is an array holding the source data listed by the column headings  
(No default)
- SIGYZI is an array holding the initial sigma-y and sigma-z (m)  
(Default: 0.,0.)
- FMFAC is a vertical momentum flux factor (0. or 1.0) used to represent  
 the effect of rain-caps or other physical configurations that  
 reduce momentum rise associated with the actual exit velocity.  
 (Default: 1.0 -- full momentum used)

b  
 0. = No building downwash modeled, 1. = downwash modeled  
 NOTE: must be entered as a REAL number (i.e., with decimal point)

c  
 An emission rate must be entered for every pollutant modeled.  
 Enter emission rate of zero for secondary pollutants that are  
 modeled, but not emitted. Units are specified by IPTU  
 (e.g. 1 for g/s).

-----  
 Subgroup (13c)  
 -----

-----  
 BUILDING DIMENSION DATA FOR SOURCES SUBJECT TO DOWNWASH  
 -----

Source No. Effective building width and height (in meters) every 10 degrees <sup>a</sup>

-----  
 1 ! SRCNAM = BLR2 !  
 1 ! HEIGHT = 11.28, 11.28, 11.28, 11.28, 11.28, 11.28,  
 11.28, 11.28, 11.28, 7.93, 7.93, 7.93,  
 7.93, 7.93, 7.93, 11.28, 11.28, 11.28,  
 11.28, 11.28, 11.28, 11.28, 11.28, 11.28,  
 11.28, 11.28, 11.28, 7.93, 7.93, 7.93,  
 7.93, 7.93, 7.93, 11.28, 11.28, 11.28 !  
 1 ! WIDTH = 45.44, 44.94, 43.07, 42.54, 44.67, 45.45,  
 44.85, 42.89, 39.62, 26.50, 21.73, 16.30,  
 13.98, 19.63, 24.68, 38.82, 42.34, 44.57,  
 45.44, 44.94, 43.07, 42.54, 44.67, 45.45,  
 44.85, 42.89, 39.62, 26.50, 21.73, 16.30,  
 13.98, 19.63, 24.68, 38.82, 42.34, 44.57 !  
 1 ! LENGTH = 35.15, 29.61, 23.18, 21.80, 28.39, 34.13,  
 38.82, 42.34, 44.57, 36.22, 36.50, 35.67,  
 35.03, 36.30, 36.47, 44.85, 42.89, 39.62,  
 35.15, 29.61, 23.18, 21.80, 28.39, 34.13,  
 38.82, 42.34, 44.57, 36.22, 36.50, 35.67,  
 35.03, 36.30, 36.47, 44.85, 42.89, 39.62 !  
 1 ! XBADJ = -42.73, -41.87, -39.73, -39.27, -41.93, -43.32,  
 -43.39, -42.14, -39.62, -19.16, -19.34, -18.93,  
 -18.59, -19.17, -19.16, -7.22, -2.31, 2.68,  
 7.58, 12.25, 16.55, 17.47, 13.54, 9.19,  
 4.57, -0.19, -4.95, -17.06, -17.16, -16.74,  
 -16.44, -17.13, -17.30, -37.63, -40.58, -42.30 !  
 1 ! YBADJ = 13.16, 8.60, 3.77, -1.18, -6.08, -10.81,  
 -15.20, -19.14, -22.49, 0.34, 0.15, -0.04,  
 -0.23, -0.41, -0.58, -23.98, -20.97, -17.33,  
 -13.16, -8.60, -3.77, 1.18, 6.08, 10.81,  
 15.20, 19.14, 22.49, -0.34, -0.15, 0.04,  
 0.23, 0.41, 0.58, 23.98, 20.97, 17.33 !  
 -----

!END!

-----  
<sup>a</sup>  
 Each pair of width and height values is treated as a separate input subgroup and therefore must end with an input group terminator.

-----  
 Subgroup (13d)  
 -----

-----  
<sup>a</sup>  
 POINT SOURCE: VARIABLE EMISSIONS DATA  
 -----

Use this subgroup to describe temporal variations in the emission rates given in 13b. Factors entered multiply the rates in 13b. Skip sources here that have constant emissions. For more elaborate variation in source parameters, use PTEMARB.DAT and NPT2 > 0.

IVARY determines the type of variation, and is source-specific:  
 (IVARY) Default: 0

- 0 = Constant
- 1 = Diurnal cycle (24 scaling factors: hours 1-24)
- 2 = Monthly cycle (12 scaling factors: months 1-12)
- 3 = Hour & Season (4 groups of 24 hourly scaling factors, where first group is DEC-JAN-FEB)
- 4 = Speed & Stab. (6 groups of 6 scaling factors, where first group is Stability Class A, and the speed classes have upper bounds (m/s) defined in Group 12)
- 5 = Temperature (12 scaling factors, where temperature classes have upper bounds (C) of: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 50+)

a

Data for each species are treated as a separate input subgroup and therefore must end with an input group terminator.

-----  
INPUT GROUPS: 14a, 14b, 14c, 14d -- Area source parameters  
-----

-----  
Subgroup (14a)  
-----

Number of polygon area sources with parameters specified below (NAR1)      No default !    NAR1 = 0 !

Units used for area source emissions below      (IARU)      Default: 1 !    IARU = 1 !

- 1 =            g/m\*\*2/s
- 2 =            kg/m\*\*2/hr
- 3 =            lb/m\*\*2/hr
- 4 =            tons/m\*\*2/yr
- 5 =            Odour Unit \* m/s (vol. flux/m\*\*2 of odour compound)
- 6 =            Odour Unit \* m/min
- 7 =            metric tons/m\*\*2/yr

Number of source-species combinations with variable emissions scaling factors provided below in (14d)      (NSAR1) Default: 0 !    NSAR1 = 0 !

Number of buoyant polygon area sources with variable location and emission parameters (NAR2)      No default !    NAR2 = 0 !  
(If NAR2 > 0, ALL parameter data for these sources are read from the file: BAEMARB.DAT)

!END!

-----  
Subgroup (14b)  
-----

a  
AREA SOURCE: CONSTANT DATA  
-----

Source No.	Effect. Height (m)	Base Elevation (m)	Initial Sigma z (m)	Emission Rates
-----	-----	-----	-----	-----

a

Data for each source are treated as a separate input subgroup and therefore must end with an input group terminator.

b

An emission rate must be entered for every pollutant modeled. Enter emission rate of zero for secondary pollutants that are modeled, but not emitted. Units are specified by IARU (e.g. 1 for g/m\*\*2/s).

-----  
Subgroup (14c)  
-----

COORDINATES (UTM-km) FOR EACH VERTEX(4) OF EACH POLYGON  
-----

Source:

a

No. Ordered list of X followed by list of Y, grouped by source

a  
Data for each source are treated as a separate input subgroup  
and therefore must end with an input group terminator.

-----  
Subgroup (14d)  
-----

a  
AREA SOURCE: VARIABLE EMISSIONS DATA  
-----

Use this subgroup to describe temporal variations in the emission rates given in 14b. Factors entered multiply the rates in 14b. Skip sources here that have constant emissions. For more elaborate variation in source parameters, use BAEMARB.DAT and NAR2 > 0.

IVARY determines the type of variation, and is source-specific:  
(IVARY) Default: 0

0 = Constant  
1 = Diurnal cycle (24 scaling factors: hours 1-24)  
2 = Monthly cycle (12 scaling factors: months 1-12)  
3 = Hour & Season (4 groups of 24 hourly scaling factors, where first group is DEC-JAN-FEB)  
4 = Speed & Stab. (6 groups of 6 scaling factors, where first group is Stability Class A, and the speed classes have upper bounds (m/s) defined in Group 12)  
5 = Temperature (12 scaling factors, where temperature classes have upper bounds (C) of: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 50+)

a  
Data for each species are treated as a separate input subgroup  
and therefore must end with an input group terminator.

-----  
INPUT GROUPS: 15a, 15b, 15c -- Line source parameters  
-----

-----  
Subgroup (15a)  
-----

Number of buoyant line sources  
with variable location and emission  
parameters (NLN2)

No default ! NLN2 = 0 !

(If NLN2 > 0, ALL parameter data for  
these sources are read from the file: LNEARB.DAT)

Number of buoyant line sources (NLINES)

No default ! NLINES = 0 !

Units used for line source  
emissions below

(ILNU)

Default: 1 ! ILNU = 1 !

1 = g/s  
2 = kg/hr  
3 = lb/hr  
4 = tons/yr  
5 = Odour Unit \* m\*\*3/s (vol. flux of odour compound)  
6 = Odour Unit \* m\*\*3/min  
7 = metric tons/yr

Number of source-species

combinations with variable  
emissions scaling factors  
provided below in (15c) (NSLNL) Default: 0 ! NSLNL = 0 !

Maximum number of segments used to model  
each line (MXNSEG) Default: 7 ! MXNSEG = 7 !

The following variables are required only if NLLINES > 0. They are  
used in the buoyant line source plume rise calculations.

Number of distances at which transitional rise is computed Default: 6 ! NLRISE = 6 !

Average building length (XL) No default ! XL = .0 !  
(in meters)

Average building height (HBL) No default ! HBL = .0 !  
(in meters)

Average building width (WBL) No default ! WBL = .0 !  
(in meters)

Average line source width (WML) No default ! WML = .0 !  
(in meters)

Average separation between buildings (DXL) No default ! DXL = .0 !  
(in meters)

Average buoyancy parameter (FPRIMEL) No default ! FPRIMEL = .0 !  
(in m\*\*4/s\*\*3)

!END!

-----  
Subgroup (15b)  
-----

BUOYANT LINE SOURCE: CONSTANT DATA  
-----

Source No.	Beg. X Coordinate (km)	Beg. Y Coordinate (km)	End. X Coordinate (km)	End. Y Coordinate (km)	Release Height (m)	Base Elevation (m)	Emission Rates
-----	-----	-----	-----	-----	-----	-----	-----

a  
Data for each source are treated as a separate input subgroup  
and therefore must end with an input group terminator.

b  
An emission rate must be entered for every pollutant modeled.  
Enter emission rate of zero for secondary pollutants that are  
modeled, but not emitted. Units are specified by ILNTU  
(e.g. 1 for g/s).

-----  
Subgroup (15c)  
-----

BUOYANT LINE SOURCE: VARIABLE EMISSIONS DATA  
-----

Use this subgroup to describe temporal variations in the emission  
rates given in 15b. Factors entered multiply the rates in 15b.  
Skip sources here that have constant emissions.

IVARY determines the type of variation, and is source-specific:  
(IVARY) Default: 0

- 0 = Constant
- 1 = Diurnal cycle (24 scaling factors: hours 1-24)
- 2 = Monthly cycle (12 scaling factors: months 1-12)
- 3 = Hour & Season (4 groups of 24 hourly scaling factors,  
where first group is DEC-JAN-FEB)

- 4 = Speed & Stab. (6 groups of 6 scaling factors, where first group is Stability Class A, and the speed classes have upper bounds (m/s) defined in Group 12)
- 5 = Temperature (12 scaling factors, where temperature classes have upper bounds (C) of: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 50+)

-----  
 a  
 Data for each species are treated as a separate input subgroup and therefore must end with an input group terminator.

-----  
 INPUT GROUPS: 16a, 16b, 16c -- Volume source parameters  
 -----

-----  
 Subgroup (16a)  
 -----

Number of volume sources with parameters provided in 16b,c (NVL1)      No default !    NVL1 = 0 !

Units used for volume source emissions below in 16b (IVLU)      Default: 1 !    IVLU = 1 !

- 1 = g/s
- 2 = kg/hr
- 3 = lb/hr
- 4 = tons/yr
- 5 = Odour Unit \* m\*\*3/s (vol. flux of odour compound)
- 6 = Odour Unit \* m\*\*3/min
- 7 = metric tons/yr

Number of source-species combinations with variable emissions scaling factors provided below in (16c) (NSVL1)      Default: 0 !    NSVL1 = 0 !

Number of volume sources with variable location and emission parameters (NVL2)      No default !    NVL2 = 0 !

(If NVL2 > 0, ALL parameter data for these sources are read from the VOLEMARB.DAT file(s) )

!END!

-----  
 Subgroup (16b)  
 -----

a  
 VOLUME SOURCE: CONSTANT DATA  
 -----

X UTM Coordinate (km)	Y UTM Coordinate (km)	Effect. Height (m)	Base Elevation (m)	Initial Sigma y (m)	Initial Sigma z (m)	Emission Rates
-----	-----	-----	-----	-----	-----	-----

-----  
 a  
 Data for each source are treated as a separate input subgroup and therefore must end with an input group terminator.

b  
 An emission rate must be entered for every pollutant modeled. Enter emission rate of zero for secondary pollutants that are

modeled, but not emitted. Units are specified by IVLU  
(e.g. 1 for g/s).

-----  
Subgroup (16c)  
-----

a  
VOLUME SOURCE: VARIABLE EMISSIONS DATA  
-----

Use this subgroup to describe temporal variations in the emission rates given in 16b. Factors entered multiply the rates in 16b. Skip sources here that have constant emissions. For more elaborate variation in source parameters, use VOLEMARB.DAT and NVL2 > 0.

IVARY determines the type of variation, and is source-specific:  
(IVARY) Default: 0

- 0 = Constant
- 1 = Diurnal cycle (24 scaling factors: hours 1-24)
- 2 = Monthly cycle (12 scaling factors: months 1-12)
- 3 = Hour & Season (4 groups of 24 hourly scaling factors, where first group is DEC-JAN-FEB)
- 4 = Speed & Stab. (6 groups of 6 scaling factors, where first group is Stability Class A, and the speed classes have upper bounds (m/s) defined in Group 12)
- 5 = Temperature (12 scaling factors, where temperature classes have upper bounds (C) of: 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 50+)

-----  
a  
Data for each species are treated as a separate input subgroup and therefore must end with an input group terminator.

-----  
INPUT GROUPS: 17a & 17b -- Non-gridded (discrete) receptor information  
-----

-----  
Subgroup (17a)  
-----

Number of non-gridded receptors (NREC) No default ! NREC = 744 !

!END!

-----  
Subgroup (17b)  
-----

a  
NON-GRIDDED (DISCRETE) RECEPTOR DATA  
-----

Receptor No.	X Coordinate (km)	Y Coordinate (km)	Ground Elevation (m)	Height Above Ground (m)
--------------	-------------------	-------------------	----------------------	-------------------------

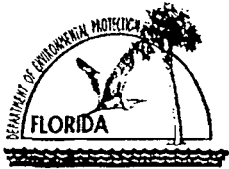
RECEPTORS OBTAINED FROM THE NPS/FWS EXTRACTION PROGRAM  
ALL RECEPTORS ARE LCC (KM)

PROJECT-SPECIFIC CLASS I AREA RECEPTORS

a  
Data for each receptor are treated as a separate input subgroup and therefore must end with an input group terminator.

b  
Receptor height above ground is optional. If no value is entered, the receptor is placed on the ground.





# Department of Environmental Protection

## Division of Air Resource Management

### APPLICATION FOR AIR PERMIT - LONG FORM

#### I. APPLICATION INFORMATION

**Air Construction Permit** – Use this form to apply for an air construction permit at a facility operating under a federally enforceable state air operation permit (FESOP) or Title V air permit. Also use this form to apply for an air construction permit:

- For a proposed project subject to prevention of significant deterioration (PSD) review, nonattainment area (NAA) new source review, or maximum achievable control technology (MACT) review; or
- Where the applicant proposes to assume a restriction on the potential emissions of one or more pollutants to escape a federal program requirement such as PSD review, NAA new source review, Title V, or MACT; or
- Where the applicant proposes to establish, revise, or renew a plantwide applicability limit (PAL).

**Air Operation Permit** – Use this form to apply for:

- An initial federally enforceable state air operation permit (FESOP); or
- An initial/revise/renewal Title V air operation permit.

**Air Construction Permit & Title V Air Operation Permit (Concurrent Processing Option)** – Use this form to apply for both an air construction permit and a revised or renewal Title V air operation permit incorporating the proposed project.

To ensure accuracy, please see form instructions.

#### Identification of Facility

1. Facility Owner/Company Name: <b>City of Tallahassee</b>	
2. Site Name: <b>Sam O. Purdom Generating Station</b>	
3. Facility Identification Number: <b>1290001</b>	
4. Facility Location...: Street Address or Other Locator: <b>667 Port Leon Drive</b> City: <b>St. Marks</b> County: <b>Wakulla County</b> Zip Code: <b>32355</b>	
5. Relocatable Facility? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6. Existing Title V Permitted Facility? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

#### Application Contact

1. Application Contact Name: <b>John K. Powell</b>	
2. Application Contact Mailing Address... Organization/Firm: <b>City of Tallahassee, Environmental Resources</b> Street Address: <b>3rd Floor, 300 South Adams Street</b> City: <b>Tallahassee</b> State: <b>FL</b> Zip Code: <b>32301</b>	
3. Application Contact Telephone Numbers... Telephone: <b>(850) 891-8851</b> ext.                      Fax: <b>(850) 891-8277</b>	
4. Application Contact Email Address: <b>PowellJ@talgov.com</b>	

#### Application Processing Information (DEP Use)

1. Date of Receipt of Application:	3. PSD Number (if applicable):
2. Project Number(s):	4. Siting Number (if applicable):

**Purpose of Application**

**This application for air permit is submitted to obtain: (Check one)**

**Air Construction Permit**

- Air construction permit.
- Air construction permit to establish, revise, or renew a plantwide applicability limit (PAL).
- Air construction permit to establish, revise, or renew a plantwide applicability limit (PAL), and separate air construction permit to authorize construction or modification of one or more emissions units covered by the PAL.

**Air Operation Permit**

- Initial Title V air operation permit.
- Title V air operation permit revision.
- Title V air operation permit renewal.
- Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is required.
- Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is not required.

**Air Construction Permit and Revised/Renewal Title V Air Operation Permit  
(Concurrent Processing)**

- Air construction permit and Title V permit revision, incorporating the proposed project.
- Air construction permit and Title V permit renewal, incorporating the proposed project.

**Note: By checking one of the above two boxes, you, the applicant, are requesting concurrent processing pursuant to Rule 62-213.405, F.A.C. In such case, you must also check the following box:**

- I hereby request that the department waive the processing time requirements of the air construction permit to accommodate the processing time frames of the Title V air operation permit.

**Application Comment**

**This application is for the purpose of obtaining a BART determination for the BART-eligible emissions unit at the Purdom Generating Station.**

**FACILITY INFORMATION**

Scope of Application

Emissions Unit ID Number	Description of Emissions Unit	Air Permit Type	Air Permit Proc. Fee
007	Boiler No. 7	AC1F	

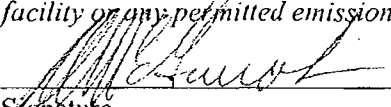
Application Processing Fee

Check one:  Attached - Amount: \$ \_\_\_\_\_  Not Applicable

**FACILITY INFORMATION**

**Owner/Authorized Representative Statement**

**Complete if applying for an air construction permit or an initial FESOP.**

1. Owner/Authorized Representative Name :
<b>Robert E. McGarrah, Manager Power Production</b>
2. Owner/Authorized Representative Mailing Address... Organization/Firm: <b>City of Tallahassee</b> Street Address: <b>2602 Jackson Bluff Road</b> City: <b>Tallahassee</b> State: <b>FL</b> Zip Code: <b>32304</b>
3. Owner/Authorized Representative Telephone Numbers... Telephone: <b>(850) 891-5534</b> ext. Fax: <b>(850) 891-5162</b>
4. Owner/Authorized Representative Email Address: <b>McGarraR@talgov.com</b>
5. Owner/Authorized Representative Statement:  <i>I, the undersigned, am the owner or authorized representative of the facility addressed in this air permit application. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof and all other requirements identified in this application to which the facility is subject. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department, and I will promptly notify the department upon sale or legal transfer of the facility or any permitted emissions unit.</i>   Signature _____ Date <u>1/31/07</u>

**FACILITY INFORMATION**

**Application Responsible Official Certification**

**Complete if applying for an initial/revised/renewal Title V permit or concurrent processing of an air construction permit and a revised/renewal Title V permit. If there are multiple responsible officials, the "application responsible official" need not be the "primary responsible official."**

1. Application Responsible Official Name:
2. Application Responsible Official Qualification (Check one or more of the following options, as applicable): <input type="checkbox"/> For a corporation, the president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit under Chapter 62-213, F.A.C. <input type="checkbox"/> For a partnership or sole proprietorship, a general partner or the proprietor, respectively. <input type="checkbox"/> For a municipality, county, state, federal, or other public agency, either a principal executive officer or ranking elected official. <input type="checkbox"/> The designated representative at an Acid Rain source.
3. Application Responsible Official Mailing Address... Organization/Firm: Street Address: <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <span>City:</span> <span>State:</span> <span>Zip Code:</span> </div>
4. Application Responsible Official Telephone Numbers... Telephone: (    ) -                      ext.                      Fax: (    ) -
5. Application Responsible Official Email Address:
6. Application Responsible Official Certification: <i>I, the undersigned, am a responsible official of the Title V source addressed in this air permit application. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof and all other applicable requirements identified in this application to which the Title V source is subject. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department, and I will promptly notify the department upon sale or legal transfer of the facility or any permitted emissions unit. Finally, I certify that the facility and each emissions unit are in compliance with all applicable requirements to which they are subject, except as identified in compliance plan(s) submitted with this application.</i>
<div style="display: flex; justify-content: space-between; margin-top: 20px;"> <span>_____</span> <span>_____</span> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>Signature</span> <span>Date</span> </div>

**FACILITY INFORMATION**

**Professional Engineer Certification**

1. Professional Engineer Name: <b>Kennard F. Kosky</b> Registration Number: <b>14996</b>
2. Professional Engineer Mailing Address... Organization/Firm: <b>Golder Associates Inc.**</b> Street Address: <b>6241 NW 23<sup>rd</sup> Street, Suite 500</b> City: <b>Gainesville</b> State: <b>FL</b> Zip Code: <b>32653</b>
3. Professional Engineer Telephone Numbers... Telephone: <b>(352) 336-5600</b> ext. <b>516</b> Fax: <b>(352) 336-6603</b>
4. Professional Engineer Email Address: <b>kkosky@golder.com</b>
5. Professional Engineer Statement:  <i>I, the undersigned, hereby certify, except as particularly noted herein*, that:</i>  <i>(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this application for air permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and</i>  <i>(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.</i>  <i>(3) If the purpose of this application is to obtain a Title V air operation permit (check here <input type="checkbox"/>, if so), I further certify that each emissions unit described in this application for air permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance plan and schedule is submitted with this application.</i>  <i>(4) If the purpose of this application is to obtain an air construction permit (check here <input checked="" type="checkbox"/>, if so) or concurrently process and obtain an air construction permit and a Title V air operation permit revision or renewal for one or more proposed new or modified emissions units (check here <input type="checkbox"/>, if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.</i>  <i>(5) If the purpose of this application is to obtain an initial air operation permit or operation permit revision or renewal for one or more newly constructed or modified emissions units (check here <input type="checkbox"/>, if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.</i>  Signature: <u><i>Kennard F. Kosky</i></u> Date: <u>1-31-07</u>  (seal) <u><i>264</i></u>

\* Attach any exception to certification statement.

\*\* Board of Professional Engineers Certificate of Authorization #00001670