Naughton Power Plant

Chapter 6, Section 2
Construction Permit Application

Submitted to the Wyoming Air Quality Division
And Prepared by

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1.0 Introduction

PacifiCorp Energy proposes to add new air pollution control devices that will significantly lower unit-specific emissions for particulate matter (PM_{10}), sulfur dioxide (SO_2) and nitrogen oxides (NO_X) at the Naughton Power Plant located near Kemmerer, in Lincoln County, Wyoming. The installation of this pollution control equipment, along with planned maintenance activities including a Unit 3 turbine upgrade in 2014, requires an analysis of the air quality impacts of the projects and submittal of this construction permit application to the Wyoming Air Quality Division. Through this application, PacifiCorp Energy is seeking to:

- Obtain a Chapter 6, Section 2 construction permit for proposed Naughton Plant projects including the installation of new pollution control devices.

- Establish plantwide applicability limits for nitrogen oxides (NO_X) and sulfur dioxide (SO_2). The plantwide applicability limits (PALs) will allow the facility to conduct ongoing plant maintenance while ensuring the facility remains in compliance with New Source Review requirements. The requested PALs include:

    - Establishing a NO_X PAL of 15,140 tons/year at issuance of the construction permit.
    - Establishing a NO_X PAL of 11,104.7 tons/year following completion of the Unit 1 and Unit 2 low-NO_X projects.
    - Establishing an SO_2 PAL of 8,924.1 tons/year following completion of the Unit 1 and Unit 2 flue gas desulfurization systems (SO_2 scrubbers).

- Obtain lower particulate matter emission rate limits for Units 1, 2 and 3. The requested PM_{10} limits include:
    - Establishment of a Unit 1 PM_{10} limit of 78 lb/hour following installation of the Unit 1 flue gas conditioning system.
    - Establishment of a Unit 2 PM_{10} limit of 130 lb/hour following installation of the Unit 2 flue gas conditioning system.
    - Establishment of a Unit 3 PM_{10} limit of 56 lb/hour following installation of the Unit 3 fabric filter baghouse.

- Obtain lower NO_X emission rate limits for Units 1, and 2. The requested NO_X limits include:
    - Establishment of a Unit 1 NO_X limit of 0.26 lb/MMBtu on a 12-month rolling average following installation of the Unit 1 low-NO_X system.
    - Establishment of a Unit 2 NO_X limit of 0.26 lb/MMBtu on a 12-month rolling average following installation of the Unit 2 low-NO_X system.

- Obtain lower SO_2 emission rate limits for Units 1 and 2. The requested SO_2 limits include:
    - Establishment of a Unit 1 SO_2 limit of 0.15 lb/MMBtu on a 12-month rolling average following installation of the Unit 1 scrubber.
    - Establishment of a Unit 1 SO_2 limit of 833 lb/hour (0.45 lb/MMBtu x 1,850 MM/hour) on a fixed 3-hour average basis following installation of the Unit 1 scrubber.
    - Establishment of a Unit 2 SO_2 limit of 0.15 lb/MMBtu on a 12-month rolling average following installation of the Unit 2 scrubber.
    - Establishment of a Unit 2 SO_2 limit of 1,080 lb/hour (0.45 lb/MMBtu x 2,400 MMBtu/hour) on a fixed 3-hour average basis following installation of the Unit 2 scrubber.

- Because the installation of the Unit 1 and Unit 2 low-NO_X control systems may increase emissions of carbon monoxide, and because the emissions evaluation indicates that the future potential CO emissions increase is above the PSD significance threshold of 100 tons/year, PacifiCorp requests that CO limits be established for Naughton Units 1 and 2. The requested limits are based on carbon monoxide emission rates utilizing good combustion control methods on Unit 1 and Unit 2 following the low-NO_X control system installations. The requested carbon monoxide limits include:

    - Establishment of a Unit 1 CO limit of 0.25 lb/MMBtu, 463 lb/hour, on a 30-day rolling average following completion of the Unit 1 low-NO_X control project.
    - Establishment of a Unit 2 CO limit of 0.25 lb/MMBtu, 600 lb/hour, on a 30-day rolling average following completion of the Unit 2 low-NO_X control project.

- Because the installation of the Unit 1 and Unit 2 flue gas conditioning systems and corresponding injection of sulfur trioxide (SO_3) may increase emissions of sulfuric acid (H_2SO_4), PacifiCorp requests that the following limits be implemented following completion of the flue gas conditioning system installations:

    - Establishment of a Unit 1 SO_3 injection rate limit of 8 ppm.
    - Establishment of a Unit 2 SO_3 injection rate limit of 8 ppm.

The planned Naughton pollution control equipment projects are identified in the following table:

Table 1.0: Naughton Pollution Control Equipment Projects

Unit 1	Unit 2	Unit 3
Installation of a flue gas desulfurization system (scrubber)	Installation of a flue gas desulfurization system (scrubber)	Installation of a fabric filter baghouse to replace an electrostatic precipitator
Installation of a flue gas conditioning system	Installation of a flue gas conditioning system	Retirement of the flue gas conditioning system following construction of the baghouse
Installation of a low-NO_X control system	Installation of a low-NO_X control system	

1.1 Existing Operations

PacifiCorp owns and operates the Naughton Power Plant which consists of one 160 net MW (nominal), one 210 net MW (nominal) and one 330 net MW (nominal) coal-fired electric generating units designated as Units 1, 2, and 3 respectively. Unit 1 went into commercial operation in 1963, Unit 2 in 1968, and Unit 3 in 1971. The Naughton Power Plant is an existing major stationary source of air emissions under both the New Source Review and Title V programs. Unit 1 has a maximum boiler heat input rate of 1,850 MMBtu/hour, Unit 2 has a maximum boiler heat input rate of 2,400 MMBtu/hour and Unit 3 has a maximum boiler heat input rate of 3,700 MMBtu/hour.

1.2 Emissions Analysis

The emission control projects proposed in this construction permit application include the installation of flue gas conditioning systems on Units 1 and 2; the installation of flue gas desulfurization SO_2 scrubbers on Units 1 and 2; the installation of low-NO_X control systems on Units 1 and 2; and the replacement of the existing Unit 3 electrostatic precipitator with a new fabric filter baghouse. These projects will result in improved particulate matter removal rates for Units 1, 2 and 3; reduced SO_2 emission rates for Units 1 and 2; and reduced NO_X emission rates for Units 1 and 2.

To establish a clear baseline for determining when PSD requirements may be triggered in the future, PacifiCorp is proposing to establish plantwide applicability limits for SO_2 and NO_X that would limit plantwide emissions of these pollutants at the facility to the "past actual baseline emissions" as defined by the Environmental Protection Agency's (EPA) "past actual to future actual emissions test." The plantwide applicability limits would be in addition to the new, lower unit-specific limits to be established as a result of adding the proposed air pollution control devices. Establishing plantwide limits for SO_2 and NO_X will ensure that any proposed project will not cause an associated emissions increase of these specific pollutants.

1.3 Prevention of Significant Deterioration Review

The Naughton Plant is located in an area classified as attainment for all criteria pollutants and is a listed PSD Source Category; therefore, the requirements of the federal PSD program, as administered by the Wyoming Department of Environmental Quality and the Wyoming Division of Air Quality will apply to the projects specified in this Chapter 6, Section 2 construction permit application.

As a result of the PSD review described in more detail below, PacifiCorp has concluded that there will not be a "significant net emissions increase" as defined in 40 CFR Part 52 and WAQSR Chapter 6 Section 4 for SO_2, NO_X, PM_{10}, lead, hydrogen fluoride, sulfuric acid, or VOCs; therefore, a BACT review for these pollutants will not be required. PacifiCorp has included a BACT review for carbon monoxide.

1.4 Compliance with National Ambient Air Quality Standards for Class I and Class II Areas and NSPS

After completing the planned projects the Naughton Power Plant will meet all National Ambient Air Quality Standards (NAAQS) and the Class I and Class II PSD increments in the vicinity of the facility. A dispersion modeling analysis will be performed for CO which has the potential of a significant net emissions increase. At the request of the Wyoming Department of Environmental Quality a NAAQS impact analysis for all criteria pollutants will be performed including SO_2, NO_X, HF, CO, PM_{10} and lead at post-pollution control equipment project emission rates. The facility will meet the applicable New Source Performance Standards (NSPS) defined in the federal regulations at 40 CFR 60 Subpart D and Wyoming Air Quality Standard and Regulations Chapter 5, Section 2.

2.0 Project Description

PacifiCorp plans to install pollution control equipment and implement other plant projects between May 2008 and December 2014 as reflected in the project timeline shown in Table 2.1. These projects are listed in Appendices A through C. The projects identified are based on current plans and may be refined as overhaul schedules and equipment status change. Additional information will be provided to the Wyoming Division of Air Quality as PacifiCorp further refines the project schedule and scope.

The planned Naughton Plant projects are summarized as follows:

Naughton Unit 1

- Installation of a flue gas conditioning system
- Installation of a flue gas desulfurization system (SO_2 scrubber)
- Installation of a boiler low-NO_X control system
- Steam turbine overhaul
- Plant projects listed in Appendix A

Naughton Unit 2

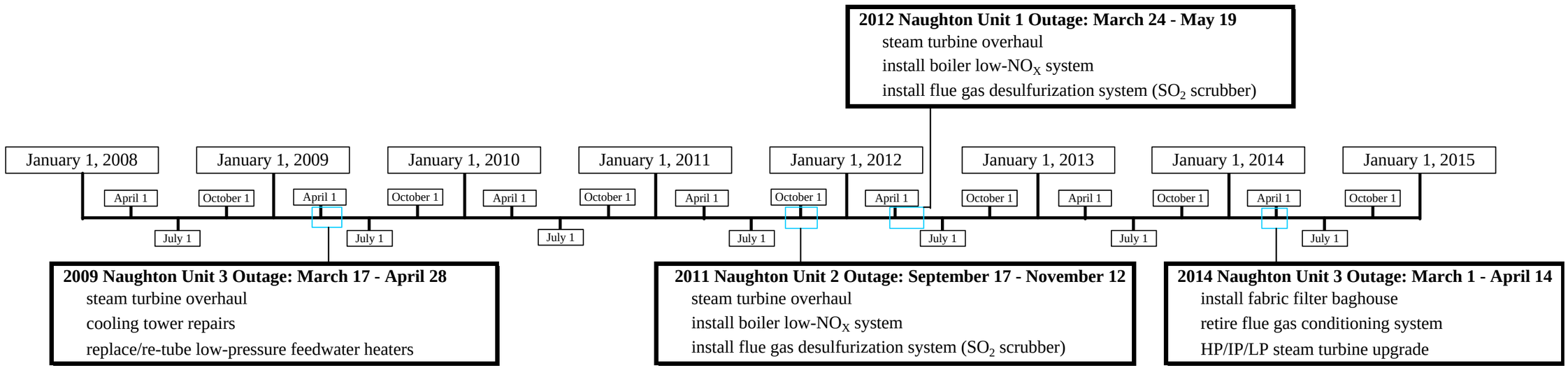
- Installation of a flue gas conditioning system
- Installation of a flue gas desulfurization system (SO_2 scrubber)
- Installation of a boiler low-NO_X control system
- Steam turbine overhaul
- Plant projects listed in Appendix B

Naughton Unit 3

- Installation of a fabric filter baghouse to replace the existing electrostatic precipitator
- Retirement of the existing flue gas conditioning system
- Steam turbine upgrade (high pressure, intermediate pressure and low pressure stages)
- Plant projects listed in Appendix C

Table 2.1 contained on the following page identifies the planned Naughton Power Plant project schedule from 2008 through 2014. Table 2.1 includes major plant maintenance projects as well as pollution control equipment installations.

Table 2.1: Naughton Project Schedule



Major 2008 Projects
- Install Unit 1 Flue Gas Conditioning System
- Install Unit 2 Flue Gas Conditioning System

Major 2009 Activities
- Overhaul Unit 3 Steam Turbine
- Repair Unit 3 Cooling Tower
- Replace or Re-Tube Low-Pressure Feedwater Heaters

Major 2011 Projects
- Overhaul Unit 2 Steam Turbine
- Install Unit 2 Low-NO_X System
- Install Unit 2 Flue Gas Desulfurization System (SO_2 Scrubber)

Major 2012 Projects
- Overhaul Unit 1 Steam Turbine
- Install Unit 1 Low-NO_X System
- Install Unit 1 Flue Gas Desulfurization System (SO_2 Scrubber)

Major 2014 Projects
- Upgrade Unit 3 HP/IP/LP Steam Turbine
- Install Unit 3 Fabric Filter Baghouse (Replace Existing Electrostatic Precipitator)
- Retire Unit 3 Flue Gas Conditioning System

3.0 List of Potential Air Emission Points and Air Contaminants Emissions Summary

The Naughton Power Plant currently operates under Title V operating permit 3-1-121-1. The operating permit has incorporated all applicable requirements contained in the following permits: MD-403, MD-867, MD-247, OP-122 and the April 9, 1998 Chapter 6, Section 2(k) permit waiver. The facility's Title V permit identifies the facility's emission points and potential air contaminants. There may be additional emission sources at the facility following the pollution control equipment installations, including scrubber reagent baghouses, etc.

4.0 Evaluation of Historic and Future Emission Rates

4.1 Project Description

This section presents the method for conducting various PSD evaluations, including:

- A determination of baseline actual emissions for SO_2, NO_X, PM_{10}, CO, ozone (as non-methane VOCs), fluoride (as hydrogen fluoride), lead, and sulfuric acid.
- A determination of projected actual emissions of SO_2, NO_X, PM_{10}, CO, VOCs, fluorides, lead, and sulfuric acid.
- A comparison between the CO, PM, VOCs, fluorides, lead, and sulfuric acid past actual baselines and future potential emissions to determine if PSD significance levels are triggered.

This section also sets forth the proposed plantwide applicability limits for SO_2 and NO_X.

The evaluation of historic (baseline) and future potential pollutant emission rates are contained in Appendix D of this permit application.

4.2 Baseline Actual Emissions

The pollutants of interest for this review are SO_2, NO_X, PM_{10}, CO, VOCs, fluorides, lead, and sulfuric acid.

4.2.1 Calculation of Baseline Actual Emissions

40 CFR 52.21(b)(48)(i) describes baseline actual emissions for the Naughton Power Plant as follows:

Baseline actual emissions means the rate of emissions, in tons per year, of a regulated NSR pollutant, as determined in accordance with paragraphs (b)(48)(i) through (iv) of this section.

(i) For any existing electric utility steam generating unit, baseline actual emissions means the average rate, in tons per year, at which the unit actually emitted the pollutant during any consecutive 24-month period selected by the owner or operator within the 5-year period immediately preceding when the owner or operator begins actual construction of the project. The Administrator shall allow the use of a different time period upon a determination that it is more representative of normal source operation.

(*a*) The average rate shall include fugitive emissions to the extent quantifiable, and emissions associated with startups, shutdowns, and malfunctions.

(*b*) The average rate shall be adjusted downward to exclude any non-compliant emissions that occurred while the source was operating above any emission limitation that was legally enforceable during the consecutive 24-month period.

(*c*) For a regulated NSR pollutant, when a project involves multiple emissions units, only one consecutive 24-month period must be used to determine the baseline actual emissions for the emissions units being changed. A different consecutive 24-month period can be used for each regulated NSR pollutant.

(*d*) The average rate shall not be based on any consecutive 24-month period for which there is inadequate information for determining annual emissions, in tons per year, and for adjusting this amount if required by paragraph (b)(48)(i)(*b*) of this section.

To identify and calculate baseline actual emissions, PacifiCorp has used data from the EPA Clean Markets Division's emissions database and annual emissions inventories. In order to comply with the EPA's acid rain program, PacifiCorp utilizes continuous emissions monitors (CEMs) to report hourly SO_2 and NO_X emissions for each unit at the Naughton facility. CEMs are also used to obtain and report the hourly heat input rates into each unit's boiler. The hourly emissions and heat input data is submitted to the EPA on a quarterly basis and is readily available on the EPA's website located at http://cfpub.epa.gov/gdm/. For purposes of this review the 5-year evaluation period is from January 2003 through December 2007. The baseline actual emissions are summarized in Table 4-1.

SO_2 Emissions

Appendix D, Table NAU-1 identifies the monthly SO_2 emissions for the relevant time period. This data was obtained from the Environmental Protection Agency's (EPA) Acid Rain Emissions database for the Units 1-3 stack emissions and from the Naughton Plant's annual emissions inventory for non-stack emissions. The monthly data and emissions inventory data was used to calculate the maximum past actual annual plant SO_2 emission rate of 22,310.3 tons/year. Appendix D, Table NAU-1a identifies the maximum past actual annual Unit 3 emission rate of 6,070.7 tons/year. The Unit 3 maximum past actual SO_2 emission rate of 6,070.7 tons/year does not include any SO_2 emissions in excess of the applicable 2-hour limit of 0.5 lb/MMBtu during the 24-month evaluation period from February 2005 through January 2007.

NO_X Emissions

Appendix D, Table NAU-3 identifies the monthly NO_X emissions for the relevant time period. This data was obtained from the Environmental Protection Agency's (EPA) Acid Rain Emissions database for the Units 1-3 stack emissions and from the Naughton Plant's annual emissions inventory for non-stack emissions. The monthly data and emissions inventory data was used to calculate the maximum past actual annual plant NO_X emission rate of 14,735.7 tons/year and the maximum past actual Unit 3 emission rate of 6,223.0 tons/year.

Particulate Matter Emissions

Appendix D, Table NAU-7 identifies the monthly PM_{10} emissions for the relevant time period. The facility PM_{10} emission rates are based on annual stack test data, in units of lb/MMBtu multiplied by the Unit-specific monthly boiler heat input values identified in the EPA's Acid Rain Emissions database to calculate the Units 1-3 stack emission rates. The Naughton Plant's annual emissions inventory database was used to identify the maximum non-stack emission rate. As indicated in Table NAU-7, the Naughton Plant had a maximum past actual 5-year PM_{10} emission rate of 1,831.7 tons/year.

Carbon Monoxide

Carbon monoxide emissions for Units 1-3 have been determined by multiplying the past annual coal consumption (Appendix D, Table NAU-6) by the AP-42 emission factor for carbon monoxide emissions from coal fired boilers. The maximum non-stack carbon monoxide emission rates were obtained from the Naughton Plant's annual emissions inventory database. The maximum past actual total Naughton CO emission rate was 693.6 tons/year. The result of the past actual CO emissions evaluation is contained in Appendix D, Table NAU-15.

Volatile Organic Compounds

Volatile organic compound emissions for Units 1-3 have been determined by multiplying the past annual coal consumption (Appendix D, Table NAU-6) by the AP-42 emission factor for volatile organic compounds emissions from coal fired boilers. The maximum non-stack VOC emission rates were obtained from the Naughton Plant's annual emissions inventory database. The maximum past actual total Naughton Plant VOC emission rate was 83.3 tons/year. The result of the past actual VOC emissions evaluation is contained in Appendix D, Table NAU-17.

Lead Emissions

Lead emissions have been determined from the average past annual lead concentrations in the coal burned, the average past annual coal ash concentrations, the annual particulate matter emission rates, the annual boiler heat input rates (Appendix D, Table NAU-5) and the Method specified in AP-42 for determining lead emissions from coal fired boilers. The maximum past actual total Units 1, 2 and 3 lead emission rate was 0.13 tons/year. The result of the past actual lead emissions evaluation is contained in Appendix D, Table NAU-13.

Fluoride Emissions

Fluoride emissions, as hydrogen fluoride, have been determined from the 5-year average annual fluorine concentrations contained in coal burned at the Naughton Plant and from the past actual annual coal burn rates as indicated in Table NAU-6. The Electric Power Research Institute (EPRI) LARK-TRIPP method for the determination of hydrogen fluoride (HF) emissions was used to calculate the maximum past actual annual HF emission rate of 43.4 tons/year as indicted in Table NAU-9.

Sulfuric Acid Emissions

Sulfuric acid emissions are calculated using past actual annual coal sulfur concentrations, past actual annual heat input rates (NAU-5), a Unit 3 flue gas conditioning system SO_3 injection rate of 8 ppm, and Electric Power Research Institute's *Estimating Total Sulfuric Acid Emissions from Stationary Power Plants, Technical Update, April 2007* method for calculating H_2SO_4 emissions. The maximum past actual total Units 1, 2 and 3 sulfuric acid emission rate was 32.0 tons/year. The result of the past actual sulfuric acid emissions evaluation is contained in Appendix D, Table NAU-11.

Table 4.2 indicates the annual past actual baseline emission rates for the Naughton Plant pollutants identified above.

Table 4.2: Summary of Naughton Baseline (Past Actual) Emissions

Naughton	SO_2 tons/year	NO_X tons/year	PM_{10} tons/year	HF tons/year	H_2SO_4 tons/year	Lead tons/year	CO tons/year	VOC tons/year
Units 1-3 Stack Emissions	22,289.2	14,733.9	1,301.4	43.4	32.0	0.13	693.2	83.2
Non-Stack Emissions[1]	21.1	1.8	530.3	0.0	0.0	0.00	0.4	0.1
Baseline Actual Emissions	22,310.3	14,735.7	1,831.7	43.4	32.0	0.13	693.6	83.3
Unit 3 Stack Emissions	6,070.7	6,223.0	638.1					

4.3 Projected Actual Emissions for Prevention of Significant Deterioration Pollutants

The next step in the emission rate evaluation is to projected actual emission rates for each pollutant. This is accomplished by determining the projected actual emissions based on coal quality, unit utilization, addition of pollution controls and expected emission rates.

Projected actual emissions are defined as follows:

> 40 CFR 52.21(b)(41)(i) *Projected actual emissions* means the maximum annual rate, in tons per year, at which an existing emissions unit is projected to emit a regulated NSR pollutant in any one of the 5 years (12-month period) following the date the unit resumes regular operation after the project, or in any one of the 10 years following that date, if the project involves increasing the emissions unit's design capacity or its potential to emit that regulated NSR pollutant and full utilization of the unit would result in a significant emissions increase or a significant net emissions increase at the major stationary source.
>
> (ii) In determining the projected actual emissions under paragraph (b)(41)(i) of this section (before beginning actual construction), the owner or operator of the major stationary source:
>
> (*a*) Shall consider all relevant information, including but not limited to, historical operational data, the company's own representations, the company's expected business activity and the company's highest projections of business activity, the company's filings with the State or Federal regulatory authorities, and compliance plans under the approved State Implementation Plan; and

[1] Maximum past non-stack emissions from 2002-2006 emissions inventories

(*b*) Shall include fugitive emissions to the extent quantifiable and emissions associated with startups, shutdowns, and malfunctions; and

(*c*) Shall exclude, in calculating any increase in emissions that results from the particular project, that portion of the unit's emissions following the project that an existing unit could have accommodated during the consecutive 24-month period used to establish the baseline actual emissions under paragraph (b)(48) of this section and that are also unrelated to the particular project, including any increased utilization due to product demand growth; or

(*d*) In lieu of using the method set out in paragraphs (a)(41)(ii)(a) through (c) of this section, may elect to use the emissions unit's potential to emit, in tons per year, as defined under paragraph (b)(4) of this section.

PacifiCorp has proposed to accept plantwide applicability limits (PALs) for SO_2 and NO_X which are based on the Naughton Plant's past actual baseline emission rates and on unit-specific future potential emission rates for Units 1 and 2 based on new, lower SO_2 and NO_X emission limitations. With these caps in place there is no potential that future emissions will be greater than past actual emissions, and no additional evaluation of future emissions is required.

4.3.1 Calculation Projected Annual Emissions

Under the provisions of 40 CFR 52.21(b)(41)(ii)(d) PacifiCorp has elected to determine the future emission rates of SO_2, NO_X, PM_{10}, fluoride (as HF), sulfuric acid, lead, CO and VOCs based on the facility's potential to emit these pollutants. The future annual emission rates are based on applicable pollutant emission limitations – at existing or requested future emission limits – as well as on a maximum annual boiler operating time of 8,760 hours/year, a Unit 1 boiler heat input rate of 1,850 MMBtu/hour, a Unit 2 boiler heat input rate of 2,400 MMBtu/hour, and a Unit 3 boiler heat input rate of 3,700 MMBtu/hour. The facility's average 5-year unit-specific coal heating values, in units of Btu/lb are used to calculate the maximum annual unit-specific coal burn rates based on the unit-specific Units 1-3 boiler heat input rates as indicated above. Finally, where applicable, EPA AP-42 emission factors are used to calculate future potential pollutant emission rates.

Boiler Heat Input

Unit-specific boiler heat input rates are used to calculate future potential emission rates at applicable pollutant emission limitations or, where appropriate, using EPA AP-42 emission factors. Other valid emission calculation methods, such as LARK-TRIPP was used to calculate HF and H_2SO_4 emission rates. A review of the EPA's Clean Air Markets Acid Rain database was used to identify the Naughton Plant's unit-specific maximum boiler heat input rates for the 5-year evaluation period used for this construction permit application. An evaluation of the Acid Rain database indicates a maximum Unit 1 boiler heat input rate of 1,850 MMBtu/hour; a Unit 2 boiler heat input rate of 2,400 MMBtu/hour; and a Unit 3 boiler heat input rate of 3,700 MMBtu/hour.

Coal Burn

Boiler coal burn rates are used to calculate some future potential emission rates – such as hydrogen fluoride and carbon monoxide – using appropriate AP-42 emission factors. Maximum future potential coal burn rates were calculated based on the 5-year average unit-specific coal heating content values and the unit-specific boiler heat input rates identified above. A 5-year review of Naughton's most recent (2002-2006) coal heating content data indicates that Unit 1 had an average coal heating value of 9,936.5 Btu/lb; Unit 2 had an average coal heating value of 9,931.2 Btu/lb; and Unit 3 had an average coal heating value of 9,942.0 Btu/lb. Maximum future annual coal burn rates can then be calculated using the average coal heating content values; the unit-specific boiler heat input rates; and a maximum annual boiler operating time of 8,760 hours/year. Using these data and appropriate conversion factors provides a maximum Unit 1 future annual coal burn rate of 815,476 tons/year; a maximum Unit 2 future annual coal burn rate of 1,058,479 tons/year; and a maximum Unit 3 future annual coal burn rate of 1,630,059 tons/year as indicated in Table NAU-10.

Sulfur Dioxide (SO_2) Emissions

In this construction permit application PacifiCorp is requesting that a PAL be established for SO_2 following construction of the Unit 1 and Unit 2 flue gas desulfurization systems (scrubbers). The future potential SO_2 emission rates for Units 1 and 2 (0.15 lb/MMBtu); the Unit 1 boiler heat input rate of 1,850 MMBtu/hour; the Unit 2 boiler heat input rate of 2,400 MMBtu/hour; the maximum past actual Unit 3 SO_2 emission rate of 6,070.7 tons/year; the maximum past actual non-stack emission rate of 21.1 tons/year; and the PSD significance level of 40 tons/year were used to establish the requested PAL value of 8,924.1 tons/year as indicated in Table NAU-2.

Nitrogen Oxides (NO_X) Emissions

In this application PacifiCorp is requesting that at issuance of the construction permit existing Naughton Plant operating permit 3-1-121-1 condition (F5)(b), which limits annual Units 1, 2 and 3 NO_X emissions at 15,140 tons/year be formally implemented as a plantwide applicability limitation (PAL). When implemented, the annual NO_X emission limitation will be calculated monthly on a 12-month rolling average basis. Furthermore, PacifiCorp requests that a revised NO_X PAL be implemented 12 months following completion of the Units 1 and 2 low-NO_X control projects. The future potential NO_X emission rates for Units 1 and 2 (0.26 lb/MMBtu); the Unit 1 boiler heat input rate of 1,850 MMBtu/hour; the Unit 2 boiler heat input rate of 2,400 MMBtu/hour; the maximum past actual Unit 3 NO_X emission rate of 6,223.0 tons/year; the maximum past actual non-stack emission rate of 1.8 tons/year; and the PSD significance level of 40 tons/year were used to establish the requested PAL value of 11,104.7 tons/year as indicated in Table NAU-4.

Particulate Matter Emissions

Post-pollution control project PM_{10} emission limits and boiler heat input values were used to calculate the future potential Units 1, 2 and 2 exhaust stack particulate matter emission rates. Following installation of the requested flue gas conditioning systems Unit 1 will have a PM_{10} limit of 78 lb/hour (based on an emission rate of 0.042 lb/MMBtu at a boiler heat input rate of 1,850 MMBtu/hour) and Unit 2 will have a PM_{10} limit of 130 lb/hour (based on an emission rate of 0.054 lb/MMBtu at a boiler heat input rate of 2,400 MMBtu/hour). Unit 3 will be subject to a PM_{10} emission limit of 56 lb/hour (based on an emission rate of 0.015 lb/MMBtu at a boiler heat input rate of 3,700 MMBtu/hour) following installation of the fabric filter baghouse.

Issuance of the requested Units 1-3 PM_{10} emission limits, on a lb/hour basis, will ensure that future potential PM_{10} emissions are equal-to-or-less-than the maximum past actual emission rates identified in the 5-year emissions evaluation performed for this construction permit application.

Following installation of the Units 1 and 2 flue gas conditioning systems and the Unit 3 fabric filter baghouse, Unit 1 will have a future potential PM_{10} emission rate of 340.3 tons/year based on a boiler heat input of 1,850 MMBtu/hour and an emission limit of 0.042 lb/MMBtu; Unit 2 will have a future potential PM_{10} emission rate of 567.6 tons/year based on a boiler heat input of 2,400 MMBtu/hour and an emission limit of 0.054 lb/MMBtu; and Unit 3 will have a future potential PM_{10} emission rate of 243.1 tons/year based on a boiler heat input of 3,700 MMBtu/hour and an emission limit of 0.015 lb/MMBtu. These unit-specific PM_{10} emission rates plus the maximum non-stack PM_{10} emission rate of 530.3 tons/year provide a future total particulate matter emission rate of 1,681.4 tons/year as indicated in Table NAU-8.

Carbon Monoxide Emissions

PacifiCorp is requesting that Unit 1 and Unit 2 carbon monoxide (CO) emission limits of 0.25 lb/MMBtu be established following installation of low-NO_X control systems on the Unit 1 and Unit 2 boilers. A maximum future potential Unit 1 CO emission rate of 2,025.8 tons/year was calculated based on the requested emission limit of 0.25 lb/MMBtu and a boiler heat input rate of 1,850 MMBtu/hour. A maximum future potential Unit 2 CO emission rate of 2,628.0 tons/year was calculated based on the requested emission limit of 0.25 lb/MMBtu and a boiler heat input rate of 2,400 MMBtu/hour. For Unit 3, a maximum future potential coal burn rate of 1,630,059 tons/year was established. The maximum future potential coal burn rate, indicated on Table NAU-10, was calculated based on a 5-year average coal heating content of 9,942.0 Btu/lb and a maximum boiler heat input rate of 3,700 MMBtu/hour. Using the maximum future potential Unit 3 coal burn rate of 1,630,059 tons/year and applicable AP-42 carbon monoxide emission factor of 0.5 lb/ton establishes a maximum future potential Unit 3 CO emission rate of 407.5 tons/year.

Summation of the unit-specific future potential CO emission rates plus the maximum non-stack CO emission rate of 0.4 tons/year establishes a total future potential Naughton Plant carbon monoxide emission rate of 5,061.7 tons/year as indicated in Table NAU-16.

Volatile Organic Compound Emissions

Maximum future potential volatile organic compound (VOC) emission rates were calculated based on the applicable AP-42 emission factor and on maximum future potential coal burn rates. The applicable VOC emission factor for coal-fired boilers is equivalent to 0.06 lb/ton of coal burned. The maximum future potential Unit 1 coal burn rate is equivalent to 815,476 tons/year; the maximum future potential Unit 2 coal burn rate is equivalent to 1,058,479 tons/year; and the maximum future potential Unit 3 coal burn rate is equivalent to 1,630,059 tons/year. Multiplying the 0.06 lb/ton VOC emission factor by the maximum coal burn rates establishes a maximum future potential Naughton Plant stack-only VOC emission rate of 105.1 tons/year. Adding the maximum non-stack VOC emission rate of 0.1 tons/year to the 105.1 tons/year stack emission rate established a total future potential Naughton VOC annual emission rate of 105.3 tons/year as indicated in Table NAU-18.

Lead Emissions

Maximum future potential lead emission rates were calculated based on the applicable AP-42 emission factor for coal-fired boilers and on 5-year average unit-specific data including coal lead concentrations, coal ash concentrations, post-pollution control project PM_{10} emission rates, and on future potential boiler heat input rates.

Utilizing the appropriate AP-42 emission factor from EPA Table 1.1-16 and an average Unit 1 coal lead concentration of 1.97 ppm; average coal ash content of 4.77%; PM_{10} emission rate of 0.042 lb/MMBtu; and future potential heat input rate of 16,206,000 MMBtu/year establishes a maximum future potential Unit 1 lead emission rate of 85.3 lb/year.

Utilizing the appropriate AP-42 emission factor from EPA Table 1.1-16 and an average Unit 2 coal lead concentration of 1.97 ppm; average coal ash content of 4.78%; PM_{10} emission rate of 0.054 lb/MMBtu; and future potential heat input rate of 21,024,000 MMBtu/year establishes a maximum future potential Unit 2 lead emission rate of 135.6 lb/year.

Utilizing the appropriate AP-42 emission factor from EPA Table 1.1-16 and an average Unit 3 coal lead concentration of 2.03 ppm; average coal ash content of 5.36%; PM_{10} emission rate of 0.015 lb/MMBtu; and future potential heat input rate of 32,412,000 MMBtu/year establishes a maximum future potential Unit 3 lead emission rate of 70.2 lb/year.

Summation of the unit-specific lead emission rates establishes a maximum future potential Naughton Plant lead emission rate of 291.4 lb/year or 0.15 tons/year as indicated in Table NAU-14.

Fluoride Emissions

Maximum future potential fluoride emission rates, as hydrogen fluoride, have been determined from the Naughton Plant's 5-year average annual coal fluoride concentrations, from the installation of new SO_2 scrubbers on Units 1 and 2, and from the maximum future potential unit-specific annual coal burn rates. The EPRI LARK-TRIPP method was used to calculate the maximum future potential HF emission rate of 11.3 tons/year as indicated in Table NAU-10.

Sulfuric Acid Emissions

EPRI's *Estimating Total Sulfuric Acid Emissions from Stationary Power Plants, Technical Update, April 2007* method was used to calculate the Naughton Plant's maximum future potential H_2SO_4 emission rate. Unit-specific future potential sulfuric acid emissions were calculated based on 5-year average annual coal sulfur concentrations; future potential boiler heat input values as indicated in Table NAU-10; the installation of SO_2 scrubbers on Units 1 and 2; and the installation of flue gas conditioning systems on Units 1 and 2 with maximum SO_3 injection rates of 8 ppm. (The Unit 3 flue gas conditioning system will be retired from service following installation of the Unit 3 fabric filter baghouse.) Using the EPRI calculation method and unit-specific future potential heat input values, average 5-year coal sulfur concentrations, and Units 1 and 2 SO_3 injection rates of 8 ppm provides a maximum future potential Naughton Plant H_2SO_4 emission rate of 12.5 tons/year as indicated in Table NAU-12.

Table 4.3 indicates the annual future potential emission rates for the Naughton Plant pollutants identified above.

Table 4.3: Summary of Naughton Future Potential Emissions

Naughton	SO_2 tons/year	NO_X tons/year	PM_{10} tons/year	HF tons/year	H_2SO_4 tons/year	Lead tons/year	CO tons/year	VOC tons/year
Units 1-3 Stack Emissions	8,863.0	11,062.9	1,151.1	11.3	12.5	0.15	5,061.3	105.1
Non-Stack Emissions[2]	21.1	1.8	530.3	0.0	0.0	0.00	0.4	0.1
Future Potential Emissions	8,884.1	11,064.7	1,681.4	11.3	12.5	0.15	5,061.7	105.3
Unit 3 Stack Emissions	6,070.7	6,223.0	632.0					

[2] Future potential non-stack emission rates obtained from maximum past actual emissions from 2002-2006 emissions inventories

4.3.2 Prevention of Significant Deterioration Significance Determination

In order to determine if a Prevention of Significant Deterioration (PSD) significance level has been reached the past actual baseline emissions for each pollutant is subtracted from the projected annual emissions. If a significance level has been exceeded for a pollutant then a Prevention of Significant Deterioration review must be performed for that pollutant.

PacifiCorp is requesting that the "past actual to future potential actual" emissions test specified in the December 2002 revisions to the New Source Review rules [40 CFR 52.21(aa) and WAQSR Chapter 6, Section 4] be used to establish Plantwide Applicability Limitations (PALs) for SO_2 and NO_X at the Naughton Plant. These plantwide annual emission limits will be imposed to assure, through federal enforceability, that the future Potential to Emit for the facility, as a whole, will be no greater than historical emissions. Therefore, there will be no net emissions increase of sulfur dioxide or nitrogen oxides as defined as "significant" [40 CFR 52.21(b)(23)] with respect to PSD review of these pollutants under the provisions of a PSD "major modification" [40 CFR 52.21(b)(2)(i)]. PSD review will apply to the other regulated pollutants for which there is a net increase defined as significant [40 CFR 52.21(b)(23)].

As noted in Section 1.0, at issuance of the construction permit PacifiCorp requests that the existing Naughton Plant annual NO_X emission limitation of 15,140 tons/year [Operating Permit 3-1-121-1 condition (F5)(b)] be established as a Plantwide Applicability Limitation (PAL). Furthermore, following completion of the Units 1 and 2 low-NO_X control projects, PacifiCorp requests that a new NO_X PAL of 11,104.7 tons/year be established. PacifiCorp also requests that an SO_2 PAL of 8,924.1 tons/year be established following completion of the Units 1 and 2 flue gas desulfurization (FGD) SO_2 scrubber installations.

In order to determine if a Prevention of Significant Deterioration significance level has been reached the past actual baseline emissions for each pollutant is subtracted from the projected annual emissions. If a significance level has been exceeded for a pollutant then a Prevention of Significant Deterioration review must be performed for that pollutant.

4.3.3 Contemporaneous Period and Pre-Project Actual Emissions

4.3.3.1 Definition of a "Major Modification"

An existing major source is subject to Prevention of Significant Deterioration review only if it undertakes a "major modification" [40 CFR 52.21(b)(2)(i)] and WAQSR Chapter 6, Section 2]. "Major modification" is defined as "any physical change in or change in the method of operation of a major stationary source that would result in a significant net emissions increase of any pollutant subject to regulation under Clean Air Act" [40 CFR 52.21(b)(23) and WAQSR Chapter 6, Section 2]. A major modification does not include: routine maintenance, repair and replacement [40 CFR 52.21(b)(2)(iii)(a) and WAQSR Chapter 6, Section 2] or an increase in the hours of operation or in the production rate [40 CFR 52.21(b)(2)(iii)(f) and WAQSR Chapter 6, Section 2].

To determine if a Prevention of Significant Deterioration significance level has been reached the baseline actual emissions are subtracted from the projected actual emissions. The results of this evaluation for each pollutant are shown in Table 4.3.

Table 4.4: Evaluation of Significance Level by Pollutant

Pollutant	Past Actual (Baseline) Emissions tons/year	Projected Actual (Future Annual) Emissions tons/year	Projected Actual minus Past Actual Emissions (Emission Increase) tons/year	PSD Review Significance Level tons/year	Is Emission Increase greater than PSD Significance Level
SO_2 (Unit 3 stack only)	6,070.7	6,070.7	0.0	40	No
SO_2 (Total: Units 1-3 stack and non-stack emissions)	22,310.3	8,912.0	-13,398.3	40	No
NO_X (Unit 3 stack only)	6,223.0	6,223.0	0.0	40	No
NO_X (Total: Units 1-3 stack and non-stack emissions)	14,735.7	11,064.7	-3,671.0	40	No
PM_{10} (Total: Units 1-3 stack and non-stack emissions)	1,831.7	1,681.4	-150.3	15	No
Hydrogen Fluoride (Total: Units 1-3 stack and non-stack emissions) (HF)	43.4	11.3	-32.1	3	No
Sulfuric Acid (Total: Units 1-3 stack and non-stack emissions) (H_2SO_4)	32.0	12.5	-19.5	7	No
Lead (Total: Units 1-3 stack and non-stack emissions)	0.13	0.15	0.02	0.6	No
Carbon Monoxide (Total: Units 1-3 stack and non-stack emissions) (CO)	693.6	5,061.7	4,368.1	100	Yes
VOC (Total: Units 1-3 stack and non-stack emissions)	83.3	105.3	22.0	40	No

4.3.3.2 Determination of Major Modification

Although the proposed projects may constitute a physical change at the plant, they will not result in significant net emissions increases of SO_2, NO_X, particulate matter, hydrogen fluoride, sulfuric acid, lead or VOCs and therefore are not major modifications for these pollutants. The results of the emissions evaluation indicate that future potential emissions of CO may increase above the PSD significance level.

4.4 Requested Emission Rate Limits

This section identifies the requested emission rate limits for Naughton Units 1, 2 and 3 following completion of the proposed pollution control equipment projects.

The following emission rate limits are requested for Unit 1:

Particulate matter = 10 microns (filterable):

- 78 lb/hour, annual average (1,850 MMBtu/hr x 0.042 lb/ MMBtu)

This limit will go into effect within 90 days following completion of the installation of the Unit 1 flue gas conditioning system. It is expected that the Unit 1 flue gas conditioning system will be installed in 2008.

Sulfur dioxide:

- 0.15 lb/MMBtu, 12-month rolling average
- 833 lb/hour, fixed 3-hour basis

These limits will go into effect within 90 days after the Unit 1 flue gas desulfurization system has been completed and deemed commercial. The expected commercial date is July 2012. After successful testing the equipment will be deemed commercial.

Nitrogen oxides:

- 0.26 lb/MMBtu, annual average

This limit will go into effect within 90 days after the low-NO_X burners have been installed, tested and deemed commercial. The expected installation date is July 2012. After successful testing the equipment will be deemed commercial.

Carbon monoxide:

- 0.25 lb/MMBtu, 463 lb/hour, 30-day rolling average

This limit will go into effect within 90 days after the low-NO_X burners have been installed, tested and deemed commercial. The expected installation date is July 2012. After successful testing the equipment will be deemed commercial.

Sulfuric Acid:

- 8 ppm SO_3 injection rate, 30-day rolling average

This limit will go into effect within 90 days after the Unit 1 flue gas conditioning system has been installed, tested and deemed commercial. The expected installation date is July 2008. After successful testing the equipment will be deemed commercial.

The following emission rate limits are requested for Unit 2:

Particulate matter = 10 microns (filterable):

- 130 lb/hour, annual average (2,400 MMBtu/hr x 0.054 lb/ MMBtu)

This limit will go into effect within 90 days following completion of the installation of the Unit 2 flue gas conditioning system. It is expected that the Unit 2 flue gas conditioning system will be installed in 2008.

Sulfur dioxide:

- 0.15 lb/MMBtu, 12-month rolling average
- 1,080 lb/hour, fixed 3-hour basis

These limits will go into effect within 90 days after the Unit 2 flue gas desulfurization system has been completed and deemed commercial. The expected commercial date is December 2011. After successful testing the equipment will be deemed commercial

Nitrogen oxides:

- 0.26 lb/MMBtu, annual average

This limit will go into effect within 90 days after the low-NO_X burners have been installed, tested and deemed commercial. The expected installation date is December 2011. After successful testing the equipment will be deemed commercial.

Carbon monoxide:

- 0.25 lb/MMBtu, 600 lb/hour, 30-day rolling average

This limit will go into effect within 90 days after the low-NO_X burners have been installed, tested and deemed commercial. The expected installation date is December 2011. After successful testing the equipment will be deemed commercial.

Sulfuric Acid:

- 8 ppm SO_3 injection rate, 30-day rolling average

This limit will go into effect within 90 days after the Unit 2 flue gas conditioning system has been installed, tested and deemed commercial. The expected installation date is July 2008. After successful testing the equipment will be deemed commercial.

The following emission rate limits are requested for Unit 3:

Particulate matter = 10 microns (filterable):

- 56 lb/hour, annual average (3,700 MMBtu/hr x 0.015 lb/ MMBtu)

This limit will go into effect within 90 days after the Unit 3 fabric filter baghouse has been installed, tested and deemed commercial. It is expected that the Unit 3 fabric filter baghouse will be deemed commercial in July 2014.

Plantwide Applicability Limitations

As indicated in Section 1.0 of this application, PacifiCorp Energy is requesting that SO_2 and NO_X Plantwide Applicability Limitations (PALs) be established at the Naughton Plant following issuance of the requested construction permit.

The following federally enforceable annual plantwide emission limits are requested for SO_2 and NO_X. These limits are based on an existing plant cap for NO_X; on the highest 24 consecutive month average Unit 3 NO_X and SO_2 emission rate in the previous 60 month period, future potential Unit 1 and Unit 2 NO_X and SO_2 emission rates; maximum past actual non-stack NO_X and SO_2 emission rates; and NO_X and SO_2 PSD significance threshold values of 40 tons/year.

- At issuance of the construction permit it is requested that existing Title V operating permit 3-1-121-1 condition (F5)(b) that limits total Naughton Plant Units 1, 2 and 3 boiler NO_X emissions at 15,140 tons/year, on an annual basis, be formally amended to a Plantwide Applicability Limitation of 15,140 tons/year. At issuance of the requested PAL the 15,140 ton/year NO_X limitation will be validated monthly on a 12-month rolling average basis.

- Following completion and certification of the Units 1 and 2 low-NO_X projects it is requested that a NO_X PAL be established at a rate of 11,104.7 tons/year.

- Following completion and certification of the Units 1 and 2 flue gas desulfurization systems (SO_2 scrubbers) it is requested that an SO_2 PAL be established at a rate of 8,924.1 tons/year.

The following page containing Table 4.5 summarizes the emissions data and PSD significance values used to establish the requested NO_X and SO_2 PAL values for the Naughton Power Plant.

Table 4.6 contained on page 26 provides a summary of the past actual and future potential stack emission rates for NO_X, SO_2, PM_{10}, HF, H_2SO_4, lead, CO and VOC at the Naughton Plant.

Table 4.7 contained on page 27 presents a chronology of the requested emission limits to be implemented at the Naughton Plant.

Table 4.5: Naughton Plant NO_X and SO_2 PAL Evaluation

Pollutant	Existing Cap tons/year	Maximum Past Actual Emission Rate tons/year	Boiler Heat Input MMBtu/hour	Emission Limit lb/MMBtu	Annual Emissions tons/year	PSD Significance Level tons/year	Requested PAL tons/year	Notes
NO_X (Plant Total)	15,140	14,735.7					15,140	PacifiCorp requests that the existing 15,140 ton/year annual NO_X limitation be amended to a PAL at issuance of the construction permit.
NO_X (Unit 1)			1,850	0.26	2,106.8	40	11,104.7	PacifiCorp requests that the NO_X PAL of 15,140 tons/year be lowered to 11,104.7 tons/year following completion of the Units 1 and 2 low-NO_X projects. The requested 11,104.7 ton/year value was set from future potential Units 1 and 2 emission rates, the maximum past actual Unit 3 rate, the maximum past actual non-stack emission rate, and the PSD significance threshold.
NO_X (Unit 2)			2,400	0.26	2,733.1			
NO_X (Unit 3)		6,223.0			6,223.0			
NO_X (Non-Stack)		1.8			1.8			
SO_2 (Unit 1)			1,850	0.15	1,215.5	40	8,924.1	PacifiCorp requests that an 8,924.1 ton/year SO_2 PAL be established following completion of the Units 1 and 2 scrubber projects. The requested 8,924.1 ton/year value was set from future potential Units 1 and 2 emission rates, the maximum past actual Unit 3 rate, the maximum past actual non-stack emission rate, and the PSD significance threshold.
SO_2 (Unit 2)			2,400	0.15	1,576.8			
SO_2 (Unit 3)		6,070.7			6,070.7			
SO_2 (Non-Stack)		21.1			21.1			

Table 4.6: Naughton Emissions Summary – Past Actual vs. Future Potential

Pollutant/Parameter	Table Reference	Maximum Past Actual Rate	Maximum Future Potential Rate	Emission Rate Increase/Decrease	PSD Significance Level	Is PSD Triggered
SO_2 * Maximum Future Potential Emission Rate Following Unit and Unit 2 FGD projects	Tables NAU-1 and NAU-2	22,310.3 tons/year	8,924.1* tons/year (post-project PAL)	-13,386.2 tons/year	40 tons/year	No
SO_2 (Unit 3 Only)	Tables NAU-1 and NAU-2	6,070.7 tons/year	NA (Setting a PAL)	NA (Setting a PAL)		
NO_X	Tables NAU-3 and NAU-4	14,735.7 tons/year	15,140.0 tons/year (pre-project PAL)	NA (Setting a PAL)		
NO_X * Maximum Future Potential Emission Rate Following Unit 1 and Unit 2 low-NO_X projects	Tables NAU-3 and NAU-4	14,735.7 tons/year	11,104.7* tons/year (post-project PAL)	-3,631.0 tons/year	40 tons/year	No
NO_X (Unit 3 Only)	Tables NAU-3 and NAU-4	6,223.0 tons/year	NA (Setting a PAL)	NA (Setting a PAL)		
Heat Input	Tables NAU-5 and NAU-10	58,799,851 MMBtu/year	69,642,000 MMBtu/year			
Coal Burn	Tables NAU-6 and NAU-10	2,772,677 tons/year	3,504,014 tons/year			
Particulate Matter (Stack and Non-Stack Total) Units 1-3 (Unit 1 Future at 0.042 lb/MMBtu) (Unit 2 Future at 0.054 lb/MMBtu) (Unit 3 Future at 0.015 lb/MMBtu)	Tables NAU-7 and NAU-8	1,831.7 tons/year	1,681.4 tons/year	-150.3 tons/year	25 tons/year (15 tons/year for PM_{10})	No
Hydrogen Fluoride	Tables NAU-9 and NAU-10	43.4 tons/year	11.3 tons/year	-32.1 tons/year	3 tons/year (fluoride)	No
Sulfuric Acid	Tables NAU-11 and NAU-12	32.0 tons/year	12.5 tons/year	-19.5 tons/year	7 tons/year	No
Lead	Tables NAU-13 and NAU-14	0.13 tons/year	0.15 tons/year	0.02 tons/year	0.6 tons/year	No
Carbon Monoxide	Tables NAU-15 and NAU-16	693.6 tons/year	5,061.7 tons/year	4,368.1 tons/year	100 tons/year	Yes
VOC	Tables NAU-17 and NAU-18	83.3 tons/year	105.3 tons/year	21.9 tons/year	40 tons/year	No

Note: Carbon monoxide is the only pollutant that has a post-project emission increase above its PSD significance level.

Table 4.7: Naughton Plant Emission Limit Chronology

2008: Upon Issuance of Construction Permit

(a) Upon issuance of the construction permit the existing annual NO_X cap of 15,140 tons/year, operating permit 3-1-121-1 condition (F5)(b), becomes a Plantwide Applicability Limitation (PAL) The 15,140 ton/year NO_X PAL will be calculated monthly on a 12-month rolling average basis

Upon Completion of the Unit 1 and Unit 2 Flue Gas Conditioning System Installations

(a) The Unit 1 flue gas conditioning system will be limited to a maximum sulfur trioxide (SO_3) injection rate of 8 ppm based on a 30-day rolling average

(b) The Unit 2 flue gas conditioning system will be limited to a maximum sulfur trioxide (SO_3) injection rate of 8 ppm based on a 30-day rolling average

(c) Unit 1 will be subject to a PM_{10} limitation of 78 lb/hour (0.042 lb/MMBtu) within 90 days following the completion of the Unit 1 flue gas conditioning system installation

(d) Unit 2 will be subject to a PM_{10} limitation of 130 lb/hour (0.054 lb/MMBtu) within 90 days following the completion of the Unit 2 flue gas conditioning system installation

2011: Upon Certification of Pollution Control Equipment following the Unit 2 Low-NO_X Burner and Flue Gas Desulfurization Projects

(a) Unit 2 will be subject to a 12-month rolling average NO_X limitation of 0.26 lb/MMBtu

(b) Unit 2 will be subject to a 12-month rolling average SO_2 limitation of 0.15 lb/MMBtu

(c) Unit 2 will be subject to a 3-hour fixed block average SO_2 limitation of 1,080 lb/hour

(d) Unit 2 will be subject to a 30-day rolling average CO limitation of 0.25 lb/MMBtu (600 lb/hour)

2012: Upon Certification of Pollution Control Equipment following Unit 1 Low-NO_X Burner and Flue Gas Desulfurization Projects

(a) Unit 1 will be subject to a 12-month rolling average NO_X limitation of 0.26 lb/MMBtu

(b) Unit 1 will be subject to a 12-month rolling average SO_2 limitation of 0.15 lb/MMBtu

(c) Unit 1 will be subject to a 3-hour fixed block average SO_2 limitation of 833 lb/hour

(d) Unit 1 will be subject to a 30-day rolling average CO limitation of 0.25 lb/MMBtu (463 lb/hour)

(e) The Naughton Plant will be subject to a NO_X PAL of 11,104.7 tons/year

(f) The Naughton Plant will be subject to an SO_2 PAL of 8,924.1 tons/year

2014: Upon Certification of Pollution Control Equipment follwong Unit 3 Fabric Filter Baghouse Project

(a) Unit 3 will be subject to a PM_{10} limitation of 56 lb/hour (0.015 lb/MMBtu) within 90 days following the completion of the Unit 3 fabric filter baghouse installation

5.0 Description of Pollution Control Equipment

5.1 Sulfur Dioxide

5.1.1 Unit 1 - Flue Gas Desulfurization (FGD)

PacifiCorp will install a wet flue gas desulfurization system on Naughton Unit 1 in 2012 which will be used to control sulfur dioxide (SO_2) emissions. In this application PacifiCorp requests that a 0.15 lb/MMBtu emission limit, on a 12-month rolling average basis, be implemented following construction of the FGD system. Furthermore, a 3-hour fixed block average limit of 833 lb/hour is requested for Naughton Unit 1 following completion of the FGD installation.

5.1.2 Unit 2 - Flue Gas Desulfurization (FGD)

PacifiCorp will install a wet flue gas desulfurization system on Naughton Unit 2 in 2011 which will be used to control sulfur dioxide (SO_2) emissions. In this application PacifiCorp requests that a 0.15 lb/MMBtu emission limit, on a 12-month rolling average basis, be implemented following construction of the FGD system. Furthermore, a 3-hour fixed block average limit of 1,080 lb/hour is requested for Naughton Unit 2 following completion of the FGD installation.

5.2 Nitrogen Oxides

5.2.1 Unit 1 – Low-NO_X Burners

PacifiCorp will install a low-NO_X boiler burner system on Naughton Unit 1 in 2012 which will be used to control nitrogen oxides (NO_X) emissions. In this application PacifiCorp requests that a 0.26 lb/MMBtu emission limit, on a 12-month rolling average basis, be implemented on Unit 1 following construction of the low-NO_X system.

5.2.2 Unit 2 – Low-NO_X Burners

PacifiCorp will install a low-NO_X boiler burner system on Naughton Unit 2 in 2011 which will be used to control nitrogen oxides (NO_X) emissions. In this application PacifiCorp requests that a 0.26 lb/MMBtu emission limit, on a 12-month rolling average basis, be implemented on Unit 2 following construction of the low-NO_X system.

5.3 Particulate Matter

5.3.1 Unit 1 - Flue Gas Conditioning

PacifiCorp requests that a flue gas conditioning system be installed on Unit 1 following issuance of a construction permit and that a PM_{10} limit of 78 lb/hour be established.

The installation of the Unit 1 flue gas conditioning project will result in improved electrostatic precipitator particulate matter removal efficiencies and will allow the Plant to meet the existing 40 percent opacity standard through the combustion of coal of varying resistivity and other fuel-specific characteristics. The project will include a burner unit that will combust sulfur feedstock to produce sulfur dioxide (SO_2) gas. The SO_2 will then be passed through a vanadium-based catalyst which converts the SO_2 to sulfur trioxide (SO_3).

The SO_3-containing gas is injected into the Unit 1 air preheater flue gas stream at a temperature of between 620°F and 700°F. The flue gas temperature at the point of SO_3 injection is in the range of between 250°F and 350°F, with the flue gas at a typical temperature of approximately 300°F.

The SO_3 reacts rapidly with moisture inherently contained in the flue gas stream to form sulfuric acid (H_2SO_4) which heterogeneously nucleates on the surfaces of fly ash particles. The sulfuric acid (and water vapor attracted by the sulfuric acid) conditions the fly ash particles by providing a path for electrical charge dissipation across the particle surfaces. This reduces the resistivity of the precipitated fly ash layer on the surfaces of the electrostatic precipitator collection plates.

The quantity of SO_3 injected into the air preheater effluent gas stream is equivalent to a concentration of up to 8 ppm (v/v). This supplements the SO_3 inherently in the air preheater effluent gas stream due to the oxidation of fuel sulfur to SO_3 in the boiler. While the formation rate of SO_3 from fuel sulfur is not known and is highly variable, the total concentration of SO_3 is estimated to be less than 10 ppm due to the combined result of fuel sulfur related SO_3 and FGC system injected SO_3. The large majority of the injected SO_3 is captured on the particle surfaces as H_2SO_4 and is removed with the fly ash in the Units 1 and 2 electrostatic precipitators.

Because the injection of SO_3 will result in the manufacture of sulfuric acid (H_2SO_4), PacifiCorp requests that an SO_3 injection limit of 8 ppm on a 30-day rolling average basis be established following completion of construction of the Unit 1 flue gas conditioning system.

5.3.2 Unit 2 - Flue Gas Conditioning

PacifiCorp requests that a flue gas conditioning system be installed on Unit 2 following issuance of a construction permit and that a PM_{10} limit of 130 lb/hour be established.

The installation of the Unit 2 flue gas conditioning project will result in improved electrostatic precipitator particulate matter removal efficiencies and will allow the Plant to meet the existing 40 percent opacity standard through the combustion of coal of varying resistivity and other fuel-specific characteristics. The project will include a burner unit that will combust sulfur feedstock to produce sulfur dioxide (SO_2) gas. The SO_2 will then be passed through a vanadium-based catalyst which converts the SO_2 to sulfur trioxide (SO_3).

The SO_3-containing gas is injected into the Unit 2 air preheater flue gas stream at a temperature of between 620°F and 700°F. The flue gas temperature at the point of SO_3 injection is in the range of between 250°F and 350°F, with the flue gas at a typical temperature of approximately 300°F.

The SO_3 reacts rapidly with moisture inherently contained in the flue gas stream to form sulfuric acid (H_2SO_4) which heterogeneously nucleates on the surfaces of fly ash particles. The sulfuric acid (and water vapor attracted by the sulfuric acid) conditions the fly ash particles by providing a path for electrical charge dissipation across the particle surfaces. This reduces the resistivity of the precipitated fly ash layer on the surfaces of the electrostatic precipitator collection plates.

The quantity of SO_3 injected into the air preheater effluent gas stream is equivalent to a concentration of up to 8 ppm (v/v). This supplements the SO_3 inherently in the air preheater effluent gas stream due to the oxidation of fuel sulfur to SO_3 in the boiler. While the formation rate of SO_3 from fuel sulfur is not known and is highly variable, the total concentration of SO_3 is estimated to be less than 10 ppm due to the combined result of fuel sulfur related SO_3 and FGC system injected SO_3. The large majority of the injected SO_3 is captured on the particle surfaces as H_2SO_4 and is removed with the fly ash in the Units 1 and 2 electrostatic precipitators.

Because the injection of SO_3 will result in the manufacture of sulfuric acid (H_2SO_4), PacifiCorp requests that an SO_3 injection limit of 8 ppm on a 30-day rolling average basis be established following completion of construction of the Unit 2 flue gas conditioning system.

5.3.3 Unit 3 – Fabric Filter Baghouse

PacifiCorp requests that a pulse jet fabric filter baghouse be installed on Unit 3 in 2014 to replace the existing electrostatic precipitator. The specification for the pulse jet fabric filter is being finalized at this time. The actual number of bags is currently undefined although the air-to-cloth ratio is specified at approximately 4 to 1 at a rated gas flow of 1,652,000 acfm.

PacifiCorp requests that a 56 lb/hour PM_{10} limit be established on Unit 3 following completion of construction of the pulse jet fabric filter baghouse.

6.0 Best Available Control Technology Determination

The Clean Air Act's PSD program provides that a Best Available Control Technology analysis must be conducted if a proposed project will result in a significant increase of a PSD pollutant.

Applicability

PacifiCorp has determined that the projects proposed for the Naughton Power Plant may result in a significant increase (as determined by the thresholds established in the regulations) of carbon monoxide (CO). Therefore, PacifiCorp has conducted a Best Available Control Technology analysis for CO in this construction permit application.

The EPA has developed a process for conducting Best Available Control Technology analyses. This method is referred to as the "top-down" method. The steps to conducting a "top-down" analysis are listed in Environmental Protection Agency's *New Source Review Workshop Manual"* Draft, October 1990. The steps are:

- Step 1 – Identify All Control Technologies
- Step 2 – Eliminate Technically Infeasible Options
- Step 3 – Rank Remaining Control Technologies by Control Effectiveness
- Step 4 – Evaluate Most Effective Controls and Document Results
- Step 5 – Select Best Available Control Technology

Carbon Monoxide Best Available Control Technology Analysis

Combustion controls designed to reduce NO_X emissions may increase carbon monoxide by creating oxygen deficient combustions zones in the boiler. These controls are balanced to provide the maximum NO_X reduction while minimizing carbon monoxide emission increases.

Step 1 - Identify All Control Technologies

Only two control technologies have been identified for control of carbon monoxide.

- Catalytic oxidation
- Combustion controls

The catalytic oxidation is a post-combustion control device that would be applied to the combustion system exhaust, while combustion controls are part of the combustion system design of the boiler.

Step 2 - Eliminate Technically Infeasible Options

Catalytic oxidation has been used to obtain the most stringent control of carbon monoxide emissions from combustion turbines firing natural gas. This alternative, however, has never been applied to a coal-fired boiler and has not been demonstrated to be a practical technology in this application.

For sulfur-containing fuels such as coal, an oxidation catalyst will convert SO_2 to SO_3, resulting in unacceptable levels of corrosion to the flue gas system as SO_3 is converted to H_2SO_4. Generally, oxidation catalysts are designed for a maximum particulate loading of 50 milligrams per cubic meter. Naughton units 1, 2 and 3 have particulate matter loadings upstream of their respective particulate matter control devices in excess of 5,000 milligrams per cubic meter. In addition, trace elements present in coal, particularly chlorine, are poisonous to oxidation catalysts. Catalysts have not been developed that have or can be applied to coal-fired boilers due to the high levels of particulate matter and trace elements present in the flue gas.

Although the catalyst could be installed downstream of the particulate matter pollution control devices (units 1, 2 and 3 electrostatic precipitators and unit 3 wet scrubber), the flue gas temperature at that point will be less than 300º F, which is well below the minimum temperature required (600ºF) for the operation of the oxidation catalyst. Utilization of a catalyst would require the flue gas to be reheated, resulting in significant negative energy and economic impacts.

For these reasons, as well as the low levels of CO in coal-fired units, no pulverized-coal-fired boilers have been equipped with oxidation catalysts. Use of an oxidation catalyst system is thus considered technically infeasible and this system cannot be considered to represent Best Available Control Technology for control of carbon monoxide.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

Based on the Step 2 analysis, combustion control is the only remaining technology for this application.

Step 4 - Evaluate Most Effective Controls and Document Results

There are no environmental or energy costs associated with combustion controls.

Step 5 - Select Best Available Control Technology

The EPA New Source Review, RACT, BACT, LAER Clearinghouse database for comparable sources related to CO is shown in Table 6.1. The final step in the top-down Best Available Control Technology analysis process is to select Best Available Control Technology. Based on the above analysis, good combustion control for CO is chosen as Best Available Control Technology for these projects. Because there is a balance between reducing NO_X emissions with advanced combustion controls and increasing CO emissions, i.e., the lower the NO_X emissions the greater the potential for an increase in CO emissions, a 30-day rolling average emission limit of 0.25 lb / MMBtu for CO is recommended for Naughton Units 1 and 2.

References

U.S. Environmental Protection Agency, 2007, RACT/BACT/LAER Clearinghouse Database http://cfpub1.epa.gov/rblc/htm/bl02.cfm.

Wyoming Department of Environmental Quality, Air Quality Division Standards and Regulations, Chapter 6 Permitting Requirements

Table 6.1: Review of EPA RACT/BACT/LAER Clearinghouse (RBLC) for Carbon Monoxide Emission Limits

Company	Plant	Heat Input	CO Emission Limit	Averaging Time	Boiler Construction Date/Permit Date	Emission Control Description	RBLC ID
[1]MidAmerican Energy Co., Iowa	George Neal North-Neal 1 Boiler	1,363 MMBtu / hr	1.26 lb / MMBtu	3-hour average	1961 01 / 17 / 2006	Good Combustion Practices	IA-0081
[2]MidAmerican Energy Co., Iowa	Neal Energy Center South-Unit 4 Boiler	6,900 MMBtu / hr	0.42 lb / MMBtu	1 calendar day	1977 / 2001 26 / 2006	Good Combustion Practices	IA-0080
[3]Reliant Energy, Texas	Washington Parish Electric Generating Station Unit 7	6,700 MMBtu / hr	0.33 lb / MMBtu	Unknown	Unknown 01 / 04 / 2005	Combustion Control	TX-0358

[1] CO was the only pollutant with a projected increase in emissions in the change to add an over fire air system, date of determination BACT-PSD 01 / 17 / 2006
[2] CO was the only pollutant with a projected increase in emissions in the change for installation of a new low NOx burner and the addition of over fire air system, date of determination BACT-PSD 01 / 26 / 2006
[3] Case-by-case BACT PSD

7.0 Regulatory Review

The Clean Air Act's PSD program provides that a Best Available Control Technology analysis must be conducted if a proposed project will result in a significant increase

This section provides a regulatory review of the applicability of state and federal air quality permitting requirements for the addition of the emission controls and other plant projects.

State of Wyoming Air Permitting Requirements

The State of Wyoming has been granted authority to implement and enforce the federal Clean Air Act (CAA) [pursuant to the State Implementation Plan review and approval process] and federal air permitting requirements which are embodied within the state rules. The Plant is a major stationary source of air emissions, as defined within Wyoming Air Quality Standards and Regulations (WAQSR), 40 CFR 70 (Title V Operating Permits) and 40 CFR Part 52.21 (PSD Program Requirements). The Wyoming Department of Environmental Quality, Air Quality Division, has previously issued permits and permit revisions as appropriate for existing Plant facilities. The general requirements for permits and permit revisions are codified under Chapter 6 of Wyoming Air Quality Standards and Regulations.

Construction Permit Requirements (WAQSR Chapter 6)

The replacement, addition or upgrade of existing emissions controls, including the Unit 1 and Unit 2 flue gas conditioning systems and low-NO_X burners will result in an increase of some air pollutant emissions, necessitating the issuance of a construction permit pursuant to WAQSR Chapter 6, Section 2; Permit Requirements for construction, modification and operation. PacifiCorp is required by WAQSR Chapter 6, Section 2 to obtain a construction permit from the State of Wyoming, Department of Environmental Quality, prior to any work at the facility. Appendices contained in this construction permit application include appropriate construction permit forms as required by WAQSR Chapter 6, Section 2.

Operating Permit Requirements (WAQSR Chapter 6)

The federal operating permit program (Title V) is implemented by regulations codified at 40 CFR Part 70 and 71. The State of Wyoming has been granted authority to implement and enforce the federal Title V program through state regulations outlined under WAQSR Chapter 6, Section 3. PacifiCorp currently has a Department of Environmental Quality issued Title V Operating Permit (Permit No. 3-1-121-1) for the Naughton Power Plant. The replacement, addition of, or upgrade to existing air emissions controls and other plant projects constitute a significant modification to the Plant and will therefore require a modification of the existing Title V permit.

Prevention of Significant Deterioration (WAQSR Chapter 6, Section 2)

Within the federal NSR regulations, a subset of rules, which apply to major sources and major modifications within attainment areas, is referred to as the PSD program. Since the planned projects are at a current PSD source, located in an area classified as attainment for all criteria pollutants, the PSD program will apply to the permitting of these projects. Wyoming Department of Environmental Quality has been delegated full authority from EPA for administering the federal PSD rules; consequently, these requirements are codified within the state's permitting rules at WAQSR Chapter 6, Section 4.

The PSD program defines a major stationary source as:

1. Any source type belonging to one of the 28 listed source categories that has a potential-to-emit (PTE) of 100 tons per year or more of any criteria pollutant regulated under the CAA, or

2. Any other (non-categorical) source type with a PTE of 250 tpy of any pollutant regulated under the CAA.

The Naughton Power Plant facility belongs to one of the 28 listed source categories (fossil fuel-fired steam electric plants of more than 250 million Btu/hour heat input) and is considered an existing major stationary source because the PTE for CO and sulfuric acid mist all exceed the limits listed in this section.

Modifications to an existing major source are considered major and subject to PSD review if the resulting net emissions increase is equal to or greater than the corresponding significant emissions increase threshold for each respective pollutant. A net emissions increase includes both of the following:

- The potential increase in emissions due to the modifications itself; and
- Contemporaneous net emissions increases and decreases of regulated air pollutants, under the PSD program

An emissions increase is considered significant if emissions meet or exceed any of the following rates:

- CO, 100 tpy
- NO_X, 40 tpy
- SO_2, 40 tpy
- PM_{10}, 15 tpy
- Particulate matter, 25 tpy
- Ozone, 40 tpy of VOCs
- Lead, 0.6 tpy
- Fluorides, 3 tpy

- Hydrogen sulfide, 10 tpy

The basic PSD permitting requirements and conditions for issuing a construction permit that must be met for a major modification include:

- The degree of pollution control for emissions, to include fugitive emissions and fugitive dust, is at least BACT, except as otherwise provided in Chapter 6, Section 2 [WAQSR Chapter 6, Section 2(c)(v)]
- Performing ambient air quality impacts analysis – air dispersion modeling [WAQSR Chapter 6, Section 4(b)(i)(A)(I)]
- Analysis of impact to soils, vegetation, and visibility
- Analysis of Class I area impacts

New and Modified Sources in Non-attainment Areas and Maintenance Areas

The plant is not located in a non-attainment or maintenance area. Therefore, a non-attainment New Source Review analysis is not required.

Emissions Impact Analysis (WAQSR Chapter 6, Section 2)

Because the addition of the Flue Gas Conditioning (FGC) systems and low-NO_X burners on Units 1 and Unit 2 may result in an increase in some emissions, PacifiCorp will conduct a comprehensive air quality modeling analysis for all criteria pollutants including SO_2, NO_X, PM_{10}, lead, hydrogen fluoride, CO and H_2SO_4.

Monitoring and Reporting

After a construction permit is received, PacifiCorp will be required to conduct monitoring, submit emission reports, ensure that equipment meets certain specifications, and conduct other activities as the Wyoming Department of Environmental Quality requests. Some of these requirements are enumerated below:

- Meet the reporting requirements specified in WAQSR Chapter 7 in the event of an unavoidable breakdown.
- Submit and retain air emission inventory and perform testing and monitoring as required in WAQSR Chapter 7.

Appendix A: Naughton Unit 1 Projects

Year	Unit	Project
2012	1	Major steam turbine overhaul
2012	1	Install low-NO_X control system
2012	1	Upgrade boiler draft system
2012	1	Install flue gas desulfurization system (SO_2 scrubber)
2012	1	Replace the boiler deflection arch
2012	1	Re-tube the steam condenser
2012	1	Replace bottom ash hopper refractory
2012	1	Install cooling tower motor variable frequency drives
2012	1	Replace the economizer hopper insulation
2012	1	Install forced draft fan variable frequency drive
2012	1	Replace a high pressure feedwater heater
2012	1	Rewind the generator field
2012	1	Replace the generator hydrogen coolers
2012	1	Rewind the electric generator stator
2012	1	Replace hot reheat steam lead piping
2012	1	Replace boiler superheater tubes
2012	1	Install intelligent sootblower control system
2012	1	Install mercury control system
2008	1	Install flue gas conditioning system
2012	1	Install boiler penthouse tube support clips
2012	1	Replace the boiler reheater
2012	1	Replace steam safety valves
2012	1	Rebuild steam control valves
2012	1	Replace boiler water wall tubes
2012	1	Replace air preheater baskets
2012	1	Upgrade the ash handling control system
2008	1	Rebuild coal mills (2)
2009	1	Rebuild coal mill
2010	1	Rebuild coal mill
2012	1	Rebuild coal mill
2013	1	Rebuild coal mill
2012	1	Replace 4160-volt relays

Appendix B: Naughton Unit 2 Projects

Year	Unit	Project
2011	2	Major steam turbine overhaul
2011	2	Install flue gas desulfurization system (SO_2 scrubber)
2011	2	Install low-NO_X control system
2011	2	Upgrade boiler draft system
2011	2	Replace/rebuild the high pressure turbine nozzle block
2011	2	Rebuild steam control valves
2012	2	Install mercury control system
2011	2	Replace the boiler reheater
2011	2	Replace boiler superheater tubes
2011	2	Rewind the generator field
2011	2	Rewind the electric generator stator
2011	2	Replace boiler water wall tubes
2011	2	Replace generator exciter
2011	2	Rebuild/replace auxiliary transformer
2011	2	Upgrade the ash handling control system
2012	2	Rebuild coal mill
2014	2	Rebuild coal mills (2)
2011	2	Replace 4160-volt relays
2011	2	Replace coal piping
2016	2	Replace cooling tower
2008	2	Install flue gas conditioning system

Appendix C: Naughton Unit 3 Projects

Year	Unit	Project
2014	3	Install fabric filter baghouse to replace electrostatic precipitator
2014	3	Upgrade the HP, IP and LP sections of the steam turbine
2009	3	Repair cooling tower
2009	3	Major steam turbine overhaul
2009	3	Upgrade steam turbine control system
2009	3	Rebuild steam control valves
2014	3	Boiler economizer replacement
2014	3	Install mercury control system
2009	3	Replace or re-tube 3 low-pressure feedwater heaters
2009	3	Replace bottom ash hopper refractory
2009	3	NO_X burner maintenance
2008	3	Replace boiler superheater tubes
2009	3	Replace boiler superheater tubes
2009	3	Replace or rewind the generator exciter
2011	3	Replace boiler superheater tubes
2009	3	Rewind the generator rotor
2009	3	Replace/rebuild cooling tower fire protection system
2008	3	Boiler burner replacement
2009	3	Boiler burner replacement
2011	3	Boiler burner replacement
2008	3	Replace boiler water wall tubes
2009	3	Replace boiler water wall tubes
2011	3	Replace boiler water wall tubes
2008	3	Install scrubber intelligent control system
2009	3	Replace air preheater baskets
2008	3	Rebuild/replace the startup boiler feed pump
2009	3	Upgrade boiler circulating pump mechanical seals
2008	3	Replace the 3-1 condensate pump
2010	3	Rebuild coal mill
2011	3	Rebuild coal mill
2012	3	Rebuild coal mill
2013	3	Rebuild coal mill
2014	3	Rebuild coal mill
2008	3	Replace coal piping
2013	3	Install forced draft fan variable frequency drives
2009	3	Replace coal piping
2011	3	Replace coal piping
2009	3	Replace 4160-volt relays

Appendix D: Emissions Calculations

This appendix contains maximum past actual and future potential annual emission rates for SO_2, NO_X, PM_{10}, HF, H_2SO_4, lead, CO and VOCs. Appendix D also contains maximum past actual and future potential boiler heat input rates and coal burn rates for the Naughton boilers for use in applicable pollutant emission rate calculations.

Naughton Emissions Summary

Past Actual vs. Future Potential Emissions Evaluation

Pollutant/Parameter	Table Reference	Maximum Past Actual Rate		Maximum Future Potential Rate		Emission Rate Increase/Decrease		PSD Significance Level	Is PSD Triggered
SO_2 * Maximum Future Potential Emission Rate Following Unit and Unit 2 FGD projects	Tables NAU-1 and NAU-2	22,310.3	tons/year	8,924.1*	tons/year (post-project PAL)	-13,386.2	tons/year	40 tons/year	No
SO_2 (Unit 3 Only)	Tables NAU-1 and NAU-2	6,070.7	tons/year	NA (Setting a PAL)		NA (Setting a PAL)			
NO_X	Tables NAU-3 and NAU-4	14,735.7	tons/year	15,140.0	tons/year (pre-project PAL)	NA (Setting a PAL)			
NO_X * Maximum Future Potential Emission Rate Following Unit 1 and Unit 2 low-NO_X projects	Tables NAU-3 and NAU-4	14,735.7	tons/year	11,104.7*	tons/year (post-project PAL)	-3,631.0	tons/year	40 tons/year	No
NO_X (Unit 3 Only)	Tables NAU-3 and NAU-4	6,223.0	tons/year	NA (Setting a PAL)		NA (Setting a PAL)			
Heat Input	Tables NAU-5 and NAU-10	58,799,851	MMBtu/year	69,642,000	MMBtu/year				
Coal Burn	Tables NAU-6 and NAU-10	2,772,677	tons/year	3,504,014	tons/year				
Particulate Matter (Stack and Non-Stack Total) Units 1-3 (Unit 1 Future at 0.042 lb/MMBtu) (Unit 2 Future at 0.054 lb/MMBtu) (Unit 3 Future at 0.015 lb/MMBtu)	Tables NAU-7 and NAU-8	1,831.7	tons/year	1,681.4	tons/year	-150.3	tons/year	25 tons/year (15 tons/year for PM_{10})	No
Hydrogen Fluoride	Tables NAU-9 and NAU-10	43.4	tons/year	11.3	tons/year	-32.1	tons/year	3 tons/year (fluoride)	No
Sulfuric Acid	Tables NAU-11 and NAU-12	32.0	tons/year	12.5	tons/year	-19.5	tons/year	7 tons/year	No
Lead	Tables NAU-13 and NAU-14	0.13	tons/year	0.15	tons/year	0.02	tons/year	0.6 tons/year	No
Carbon Monoxide	Tables NAU-15 and NAU-16	693.6	tons/year	5,061.7	tons/year	4,368.1	tons/year	100 tons/year	Yes
VOC	Tables NAU-17 and NAU-18	83.3	tons/year	105.3	tons/year	21.9	tons/year	40 tons/year	No

Note: Carbon monoxide is the only pollutant that has a post-project emission increase above its PSD significance level.

Permit Assumption Timeline:

2008: Upon Issuance of Construction Permit

(a) Upon issuance of the construction permit the existing annual NO_X cap of 15,140 tons/year, operating permit 3-1-121-1 condition (F5)(b), becomes a Plantwide Applicability Limitation (PAL) The 15,140 ton/year NO_X PAL will be calculated monthly on a 12-month rolling average basis

Upon Completion of the Unit 1 and Unit 2 Flue Gas Conditioning System Installations

(a) The Unit 1 flue gas conditioning system will be limited to a maximum sulfur trioxide (SO_3) injection rate of 8 ppm based on a 30-day rolling average

(b) The Unit 2 flue gas conditioning system will be limited to a maximum sulfur trioxide (SO_3) injection rate of 8 ppm based on a 30-day rolling average

(c) Unit 1 will be subject to a PM_{10} limitation of 78 lb/hour (0.042 lb/MMBtu) within 90 days following the completion of the Unit 1 flue gas conditioning system installation

(d) Unit 2 will be subject to a PM_{10} limitation of 130 lb/hour (0.054 lb/MMBtu) within 90 days following the completion of the Unit 2 flue gas conditioning system installation

2011: Upon Certification of Pollution Control Equipment following the Unit 2 Low-NO_X Burner and Flue Gas Desulfurization Projects

(a) Unit 2 will be subject to a 12-month rolling average NO_X limitation of 0.26 lb/MMBtu

(b) Unit 2 will be subject to a 12-month rolling average SO_2 limitation of 0.15 lb/MMBtu

(c) Unit 2 will be subject to a 3-hour fixed block average SO_2 limitation of 1,080 lb/hour

(d) Unit 2 will be subject to a 30-day rolling average CO limitation of 0.25 lb/MMBtu (600 lb/hour)

2012: Upon Certification of Pollution Control Equipment following Unit 1 Low-NO_X Burner and Flue Gas Desulfurization Projects

(a) Unit 1 will be subject to a 12-month rolling average NO_X limitation of 0.26 lb/MMBtu

(b) Unit 1 will be subject to a 12-month rolling average SO_2 limitation of 0.15 lb/MMBtu

(c) Unit 1 will be subject to a 3-hour fixed block average SO_2 limitation of 833 lb/hour

(d) Unit 1 will be subject to a 30-day rolling average CO limitation of 0.25 lb/MMBtu (463 lb/hour)

(e) The Naughton Plant will be subject to a NO_X PAL of 11,104.7 tons/year

(f) The Naughton Plant will be subject to an SO_2 PAL of 8,924.1 tons/year

2014: Upon Certification of Pollution Control Equipment follwong Unit 3 Fabric Filter Baghouse Project

(a) Unit 3 will be subject to a PM_{10} limitation of 56 lb/hour (0.015 lb/MMBtu) within 90 days following the completion of the Unit 3 fabric filter baghouse installation

Table NAU - 0

Naughton Past Actual Non-Stack Emissions Evaluation

PM (TSP) Emissions (tons/year)	Source ID	4	5	6	7	8	10	11	12	13	14	15	16	17	18	19	N/A (1)	N/A (2)	N/A (3)	N/A (4)	N/A (5)	N/A (6)	N/A (7)	Total Annual Non-Stack PM Emissions (tons/year)	
Year																									Year
2002		3.1	5.1	3.8	0.6	0.0	50.1	65.4	93.2	0.4	160.4		0.0	0.2	534.6	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	919.1	2002
2003		3.2	5.2	3.3	0.7	0.0	55.5	67.6	80.4	0.4	160.4		0.0	0.6	534.6	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	914.0	2003
2004		9.3	5.6	3.8	0.7	0.0	52.1	72.8	94.1	0.4	160.4		0.2	1.1	534.6	1.5	0.0	0.0	0.0	0.0	0.1	0.0	0.0	936.9	2004
2005		9.3	5.7	3.6	0.7	0.0	54.2	74.0	89.2	0.4	160.4		0.1	1.0	534.6	1.5	0.0	0.0	0.0	0.0	0.1	0.0	0.0	934.9	2005
2006		9.3	4.9	3.9	0.7	1.4	54.5	62.7	95.5	0.4	160.4		0.2	1.2	534.6	1.5	0.0	0.0	0.0	0.0	0.1	0.0	0.0	931.2	2006

Maximum Past Actual Non-Stack PM Emissions (tons/year)
936.9

PM_{10} Emissions (tons/year)	Source ID	4	5	6	7	8	10	11	12	13	14	15	16	17	18	19	N/A (1)	N/A (2)	N/A (3)	N/A (4)	N/A (5)	N/A (6)	N/A (7)	Total Annual Non-Stack PM_{10} Emissions (tons/year)	
Year																									Year
2002		3.1	5.1	3.8	0.6	0.0	50.1	65.4	93.2	0.1	66.8		0.0	0.1	222.8	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	513.2	2002
2003		3.2	5.2	3.3	0.7	0.0	55.5	67.6	80.4	0.1	66.8		0.0	0.2	222.8	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	507.9	2003
2004		9.3	5.6	3.8	0.7	0.0	52.1	72.8	94.1	0.2	66.8		0.1	0.4	222.8	1.5	0.0	0.0	0.0	0.0	0.1	0.0	0.0	530.3	2004
2005		9.3	5.7	3.6	0.7	0.0	54.2	74.0	89.2	0.1	66.8		0.0	0.3	222.8	1.5	0.0	0.0	0.0	0.0	0.1	0.0	0.0	528.4	2005
2006		9.3	4.9	3.9	0.7	1.4	54.5	62.7	95.5	0.1	66.8		0.1	0.4	222.8	1.5	0.0	0.0	0.0	0.0	0.1	0.0	0.0	524.6	2006

Maximum Past Actual Non-Stack PM_{10} Emissions (tons/year)
530.3

SO_2 Emissions (tons/year)	Source ID	4	5	6	7	8	10	11	12	13	14	15	16	17	18	19	N/A (1)	N/A (2)	N/A (3)	N/A (4)	N/A (5)	N/A (6)	N/A (7)	Total Annual Non-Stack SO_2 Emissions (tons/year)	
Year																									Year
2002												21.0					0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.1	2002
2003												21.0					0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.1	2003
2004												21.0					0.0	0.0	0.0	0.0	0.1	0.0	0.0	21.1	2004
2005												21.0					0.0	0.0	0.0	0.0	0.1	0.0	0.0	21.1	2005
2006												21.0					0.0	0.0	0.0	0.0	0.1	0.0	0.0	21.1	2006

Maximum Past Actual Non-Stack SO_2 Emissions (tons/year)
21.1

NO_X Emissions (tons/year)	Source ID	4	5	6	7	8	10	11	12	13	14	15	16	17	18	19	N/A (1)	N/A (2)	N/A (3)	N/A (4)	N/A (5)	N/A (6)	N/A (7)	Total Annual Non-Stack NO_X Emissions (tons/year)	
Year																									Year
2002																	0.1	0.1	0.3	0.1	0.1	0.0	0.0	0.6	2002
2003																	0.1	0.1	0.3	0.1	0.1	0.0	0.0	0.6	2003
2004																	0.1	0.1	0.2	0.1	1.2	0.0	0.0	1.8	2004
2005																	0.1	0.1	0.2	0.1	1.2	0.0	0.0	1.8	2005
2006																	0.1	0.1	0.2	0.1	1.2	0.0	0.0	1.8	2006

Maximum Past Actual Non-Stack NO_X Emissions (tons/year)
1.8

VOC Emissions (tons/year)	Source ID	4	5	6	7	8	10	11	12	13	14	15	16	17	18	19	N/A (1)	N/A (2)	N/A (3)	N/A (4)	N/A (5)	N/A (6)	N/A (7)	Total Annual Non-Stack VOC Emissions (tons/year)	
Year																									Year
2002																	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2002
2003																	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2003
2004																	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	2004
2005																	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	2005
2006																	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	2006

Maximum Past Actual Non-Stack VOC Emissions (tons/year)
0.1

Table NAU - 0 (continued)

Naughton Past Actual Non-Stack Emissions Evaluation

CO Emissions (tons/year)	Source ID	4	5	6	7	8	10	11	12	13	14	15	16	17	18	19	N/A (1)	N/A (2)	N/A (3)	N/A (4)	N/A (5)	N/A (6)	N/A (7)	Total Annual Non-Stack CO Emissions (tons/year)	
Year																									Year
2002																	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	2002
2003																	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	2003
2004																	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.4	2004
2005																	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.4	2005
2006																	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.4	2006

Maximum Past Actual Non-Stack CO Emissions (tons/year)
0.4

Source ID Description

4	Coal Stockpile Reclaim Tunnel (Baghouse)
5	Unit #2 Coal Bunker Exhauster and Conveyor Gallery Area (Baghouse)
6	Unit #3 Coal Bunker Exhauster and Conveyor Gallery Area (Baghouse)
7	Unit #1 Coal Bunker Exhauster (Baghouse)
8	Fly Ash Loadout Silo (Baghouse)
10	Unit #1 Cooling Tower
11	Unit #2 Cooling Tower
12	Unit #3 Cooling Tower
13	Coal Pile Stacker (Drop Operation)
14	Coal Pile Maintenance and Wind Erosion
15	Scrubber Pond SO_2 Emissions
16	Fly Ash Truck Loading (Fugitives)
17	Fly Ash Haul Road
18	Ash Ponds
19	Mine Conveyor Baghouse
N/A (1)	Diesel-Fired Emergency Generator Engine - Unit 1
N/A (2)	Diesel-Fired Emergency Generator Engine - Unit 2
N/A (3)	Diesel-Fired Emergency Generator Engine - Unit 3
N/A (4)	Diesel-Fired Emergency Generator Engine - FGD
N/A (5)	Diesel-Fired Emergency Fire Pump Engine
N/A (6)	Used Oil-Fired Space Heater (350,000 Btu/hour)
N/A (7)	Used Oil-Fired Space Heater (235,000 Btu/hour)

Note: Non-stack emission rates were obtained from 2002 through 2006 annual emission inventories.

Table NAU - 1

Naughton Past Actual SO_2 Emissions Evaluation

Past Actual Monthly SO_2 Emissions from CEMs/Clean Air Markets (tons/month)

UNIT NAME	Jan-03	Feb-03	Mar-03	Apr-03	May-03	Jun-03	Jul-03	Aug-03	Sep-03	Oct-03	Nov-03	Dec-03	Jan-04	Feb-04	Mar-04	Apr-04	May-04	Jun-04	Jul-04	Aug-04	Sep-04	Oct-04
Naughton 1	644.2	489.5	651.2	630.2	624.4	614.0	601.7	579.7	601.7	603.2	591.6	522.1	604.0	592.9	628.3	171.8	401.6	539.5	581.1	599.1	577.5	622.1
Naughton 2	788.0	717.1	861.7	759.2	754.4	804.7	831.3	759.5	468.2	352.0	448.9	715.6	753.1	776.7	774.6	738.5	568.9	754.0	770.0	787.4	691.9	820.1
Naughton 3	562.0	400.5	473.9	497.6	427.4	430.3	429.8	432.2	151.8	21.4	328.8	529.2	459.6	451.0	597.1	491.2	475.1	498.1	373.3	457.8	463.4	494.5
Naughton Totals	1,994.2	1,607.1	1,986.7	1,887.0	1,806.2	1,848.9	1,862.8	1,771.4	1,221.7	976.6	1,369.2	1,766.8	1,816.7	1,820.7	2,000.0	1,401.5	1,445.5	1,791.5	1,724.5	1,844.3	1,732.8	1,936.7

Past Actual Annual SO_2 Emission Rate Based on Rolling 24-Month Period (tons/year)

UNIT NAME	Jan-03	Feb-03	Mar-03	Apr-03	May-03	Jun-03	Jul-03	Aug-03	Sep-03	Oct-03	Nov-03	Dec-03	Jan-04	Feb-04	Mar-04	Apr-04	May-04	Jun-04	Jul-04	Aug-04	Sep-04	Oct-04
Naughton 1	This is based on a 24-month rolling average so there are no valid averages until December 2004																					
Naughton 2	This is based on a 24-month rolling average so there are no valid averages until December 2004																					
Naughton 3	This is based on a 24-month rolling average so there are no valid averages until December 2004																					
Naughton Totals																						

Table NAU - 1 (continued)

Naughton Past Actual SO_2 Emissions Evaluation

Past Actual Monthly SO_2 Emissions from CEMs/Clean Air Markets (tons/month)

Nov-04	Dec-04	Jan-05	Feb-05	Mar-05	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	May-06	Jun-06	Jul-06	Aug-06	Sep-06
613.7	686.2	697.8	626.1	643.1	659.5	679.9	665.8	454.1	673.4	623.7	555.3	703.0	680.1	603.0	617.4	637.7	541.4	604.8	544.4	517.5	590.9	508.3
660.4	736.8	952.1	769.0	826.3	760.6	808.3	764.9	765.1	715.5	736.4	817.7	735.0	813.4	807.1	681.3	754.4	177.8		590.1	644.5	800.5	794.0
491.3	470.5	461.6	515.8	499.9	574.8	514.8	611.3	615.3	607.9	343.2	516.0	401.5	441.0	551.4	528.5	632.8	486.3	479.1	504.3	494.3	537.3	412.2
1,765.4	1,893.5	2,111.5	1,910.9	1,969.2	1,994.9	2,003.0	2,042.0	1,834.5	1,996.8	1,703.3	1,889.0	1,839.6	1,934.6	1,961.6	1,827.1	2,024.8	1,205.5	1,083.9	1,638.8	1,656.3	1,928.7	1,714.4

Past Actual Annual SO_2 Emission Rate Based on Rolling 24-Month Period (tons/year)

Nov-04	Dec-04	Jan-05	Feb-05	Mar-05	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	May-06	Jun-06	Jul-06	Aug-06	Sep-06
	6,886	6,912	6,980.7	6,976.6	6,991.3	7,019.1	7,044.9	6,971.2	7,018.0	7,029.1	7,005.1	7,060.8	7,139.8	7,139.3	7,151.5	7,156.2	7,341.0	7,442.7	7,445.1	7,413.3	7,409.2	7,374.5
	8,546	8,628	8,654.4	8,636.7	8,637.4	8,664.4	8,644.5	8,611.4	8,589.4	8,723.5	8,956.3	9,099.4	9,148.3	9,175.3	9,127.6	9,117.5	8,837.2	8,552.7	8,470.8	8,408.0	8,414.6	8,465.6
	5,204	5,154	5,211.3	5,224.3	5,262.8	5,306.5	5,397.1	5,489.8	5,577.7	5,673.4	5,920.7	5,957.1	5,913.0	5,958.9	5,997.7	6,015.5	6,013.1	6,015.1	6,018.2	6,078.7	6,118.5	6,092.9
	20,636	20,695	20,846.4	20,837.6	20,891.6	20,990.0	21,086.5	21,072.4	21,185.1	21,425.9	21,882.1	22,117.3	22,201.2	22,273.6	22,276.8	22,289.2	22,191.2	22,010.4	21,934.1	21,900.0	21,942.2	21,933.0

Table NAU - 1 (continued)

Naughton Past Actual SO_2 Emissions Evaluation

Past Actual Monthly SO_2 Emissions from CEMs/Clean Air Markets (tons/month)

Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07	Jul-07	Aug-07	Sep-07	Oct-07	Nov-07	Dec-07
521.9	568.7	582.5	666.8	576.9	43.1	424.2	661.6	497.9	666.7	647.7	589.1	652.3	603.1	658.8
744.3	845.7	886.9	817.9	834.2	821.9	708.0	778.2	721.5	826.9	683.9	640.0	737.4	721.7	843.9
454.7	477.9	540.0	512.7	384.7	496.3	429.8	577.1	568.8	481.9	497.7	531.5	452.5	372.2	459.1
1,720.8	1,892.3	2,009.4	1,997.4	1,795.8	1,361.3	1,562.1	2,016.9	1,788.3	1,975.5	1,829.3	1,760.6	1,842.2	1,697.0	1,961.8

Past Actual Annual SO_2 Emission Rate Based on Rolling 24-Month Period (tons/year)

Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07	Jul-07	Aug-07	Sep-07	Oct-07	Nov-07	Dec-07	
7,324.4	7,301.9	7,250.0	7,234.5	7,210.0	6,910.0	6,792.4	6,783.2	6,699.3	6,805.6	6,792.7	6,775.4	6,823.9	6,774.0	6,763.3	
8,427.7	8,520.4	8,595.4	8,528.3	8,560.9	8,558.7	8,532.4	8,517.3	8,495.7	8,526.6	8,510.7	8,462.6	8,422.4	8,415.8	8,431.0	
6,073.0	6,066.3	6,101.0	6,126.6	6,061.1	6,059.3	5,986.8	6,017.9	5,996.7	5,930.0	5,874.9	5,969.0	5,937.2	5,922.6	5,931.6	**6,126.6 tons/year** Maximum Past Actual Unit 3 SO_2 Emission Rate*
21,825.1	21,888.6	21,946.5	21,889.5	21,831.9	21,527.9	21,311.5	21,318.5	21,191.6	21,262.1	21,178.4	21,207.0	21,183.6	21,112.3	21,125.9	**22,289.2 tons/year** Maximum Past Actual Stack SO_2 Emission Rate

Total Unit 3 SO_2 Emissions from February 2005 through January 2007: 12,253.2 tons

Maximum Past Actual Non-Stack SO_2 Emissions

Emissions Source	Maximum Past Actual Non-Stack Emission Rate (tons/year)
Scrubber Pond SO_2 Emissions	21.0
Diesel-Fired Emergency Generator Engine - Unit 1	0.0
Diesel-Fired Emergency Generator Engine - Unit 2	0.0
Diesel-Fired Emergency Generator Engine - Unit 3	0.0
Diesel-Fired Emergency Generator Engine - FGD	0.0
Diesel-Fired Emergency Fire Pump Engine	0.1
Used Oil-Fired Space Heater (350,000 Btu/hour)	0.0
Used Oil-Fired Space Heater (235,000 Btu/hour)	0.0
Total Maximum Non-Stack SO_2 Emission Rate (tons/year)	21.1

Total Maximum Past Actual SO_2 Emission Rate Stack and Non-Stack Emissions (tons/year)	22,310.3

* Note that maximum past actual Unit 3 SO_2 emission rate of 6,126.6 tons/year includes SO_2 emissions in excess of 2-hour SO_2 limit of 0.5 lb/MMBtu.
See Table NAU-1a for the calculation of the Unit 3 SO_2 emissions in excess of the 0.5 lb/MMBtu emission limit and calculation of the applicable maximum past actual Unit 3 SO_2 emission rate of 6,070.7 tons/year

Table NAU - 1a
Naughton Past Actual Sulfur Dioxide Emissions in Excess of Allowable Unit 3 Limit

Unit 3 SO_2 Emissions in Excess of 2-hour Average 0.5 lb/MMBtu Limit during 24-Month Evaluation Period from February 2005 through January 2007:

Date and Time	Duration of Excess Emissions (hours)	Excess Emission Rate (lb/MMBtu)	Heat Input (MMBtu/hour)	Excess Emissions Above 0.5 lb/MMBtu Limit (lbs)
2/12/05 2:00	2.0	2.67	263	1,143.0
2/13/05 4:00	2.0	1.19	437	602.2
2/13/05 6:00	2.0	2.04	384	1,185.8
2/13/05 10:00	2.0	0.60	327	64.1
2/13/05 12:00	2.0	2.16	714	2,373.3
2/13/05 14:00	2.0	2.61	1118	4,706.8
2/13/05 16:00	2.0	2.43	1495	5,767.7
3/20/05 8:00	2.0	0.81	386	240.1
3/20/05 10:00	2.0	1.81	1294	3,387.7
3/20/05 12:00	2.0	1.89	1965	5,482.3
3/20/05 14:00	2.0	0.65	3596	1,086.0
3/22/05 20:00	2.0	0.67	3653	1,234.7
5/3/05 22:00	2.0	1.30	1754	2,820.4
5/6/05 4:00	2.0	1.81	238	621.7
5/7/05 16:00	2.0	1.13	1124	1,405.0
5/7/05 18:00	2.0	1.57	2255	4,830.2
5/28/05 6:00	2.0	1.50	1308	2,605.5
5/28/05 8:00	2.0	2.67	2660	11,560.4
6/14/05 16:00	2.0	1.19	4431	6,105.9
6/14/05 18:00	2.0	2.04	4265	13,170.3

Table NAU - 1a (continued)
Naughton Past Actual Sulfur Dioxide Emissions in Excess of Allowable Unit 3 Limit

Date and Time	Duration of Excess Emissions (hours)	Excess Emission Rate (lb/MMBtu)	Heat Input (MMBtu/hour)	Excess Emissions Above 0.5 lb/MMBtu Limit (lbs)
6/29/05 0:00	2.0	0.60	1987	389.5
6/29/05 20:00	2.0	2.16	1082	3,596.6
6/29/05 22:00	2.0	2.61	3225	13,577.3
8/3/05 10:00	2.0	0.74	4077	1,948.8
8/5/05 14:00	2.0	0.61	4150	921.3
8/13/05 16:00	2.0	0.59	4024	692.1
8/14/05 20:00	2.0	0.74	4018	1,936.7
9/10/05 10:00	2.0	0.96	2330	2,148.3
9/10/05 12:00	2.0	0.71	1603	676.5
9/17/05 0:00	2.0	1.47	1063	2,068.6
9/27/05 18:00	2.0	1.66	408	947.4
9/27/05 20:00	2.0	1.57	719	1,538.7
10/1/05 0:00	2.0	0.99	638	621.4
10/2/05 8:00	2.0	1.03	297	315.4
10/2/05 10:00	2.0	1.33	976	1,626.0
10/19/05 10:00	2.0	0.56	4117	502.3
11/12/05 14:00	2.0	1.75	2439	6,097.5
11/18/05 20:00	2.0	0.71	1662	711.3
11/18/05 22:00	2.0	1.82	107	281.8
11/21/05 2:00	2.0	1.50	368	736.7
12/5/05 14:00	2.0	0.64	3197	876.0
12/10/05 0:00	2.0	0.99	2070	2,041.0
12/10/05 4:00	2.0	1.10	125	148.8

Table NAU - 1a (continued)
Naughton Past Actual Sulfur Dioxide Emissions in Excess of Allowable Unit 3 Limit

Date and Time	Duration of Excess Emissions (hours)	Excess Emission Rate (lb/MMBtu)	Heat Input (MMBtu/hour)	Excess Emissions Above 0.5 lb/MMBtu Limit (lbs)
12/11/05 4:00	2.0	1.99	793	2,366.3
12/11/05 6:00	2.0	1.52	2108	4,296.1
12/17/05 0:00	2.0	0.62	563	130.6
12/20/05 8:00	2.0	0.91	4199	3,468.4
12/22/05 12:00	2.0	0.68	328	120.0
12/22/05 14:00	2.0	1.90	1745	4,886.0
12/27/05 22:00	2.0	0.76	3380	1,791.4
1/18/06 8:00	2.0	0.54	3967	325.3
1/26/06 14:00	2.0	0.55	4019	361.7
2/9/06 18:00	2.0	0.86	383	271.9
2/10/06 14:00	2.0	0.76	2007	1,055.7
2/10/06 16:00	2.0	1.54	1004	2,080.3
2/10/06 18:00	2.0	0.60	3067	613.4
2/12/06 2:00	2.0	1.13	2378	3,010.5
2/14/06 10:00	2.0	0.64	3942	1,127.4
2/15/06 14:00	2.0	0.92	314	265.0
2/15/06 16:00	2.0	0.58	2308	392.4
3/8/06 6:00	2.0	0.61	4043	921.8
3/21/06 10:00	2.0	0.61	3850	862.4
3/21/06 12:00	2.0	0.54	3829	314.0
3/29/06 14:00	2.0	0.79	3729	2,133.0
3/30/06 8:00	2.0	0.55	3824	413.0
3/17/06 18:00	2.0	0.68	3659	1,317.2

Table NAU - 1a (continued)
Naughton Past Actual Sulfur Dioxide Emissions in Excess of Allowable Unit 3 Limit

Date and Time	Duration of Excess Emissions (hours)	Excess Emission Rate (lb/MMBtu)	Heat Input (MMBtu/hour)	Excess Emissions Above 0.5 lb/MMBtu Limit (lbs)
3/17/06 20:00	2.0	0.69	3664	1,377.7
3/18/06 16:00	2.0	0.63	3573	943.3
3/18/06 18:00	2.0	0.63	3505	911.3
3/18/06 20:00	2.0	0.65	3541	1,048.1
3/18/06 22:00	2.0	0.64	3711	1,024.2
3/19/06 0:00	2.0	0.68	3053	1,068.6
3/19/06 2:00	2.0	0.63	2787	730.2
3/19/06 4:00	2.0	0.63	3284	867.0
3/19/06 6:00	2.0	0.64	3373	924.2
3/19/06 8:00	2.0	0.62	3750	900.0
3/19/06 10:00	2.0	0.63	3727	961.6
3/19/06 12:00	2.0	0.62	3721	870.7
3/19/06 14:00	2.0	0.62	3710	875.6
3/19/06 16:00	2.0	0.63	3668	953.7
3/19/06 18:00	2.0	0.63	3456	870.9
3/19/06 20:00	2.0	0.62	3718	870.0
3/19/06 22:00	2.0	0.65	3506	1,023.8
3/20/06 0:00	2.0	0.63	3490	907.4
3/20/06 2:00	2.0	0.66	3822	1,200.1
3/20/06 4:00	2.0	0.68	3820	1,375.2
3/20/06 6:00	2.0	0.69	3848	1,477.6
3/20/06 8:00	2.0	0.74	3821	1,849.4
4/9/06 2:00	2.0	0.85	354	250.6

Table NAU - 1a (continued)
Naughton Past Actual Sulfur Dioxide Emissions in Excess of Allowable Unit 3 Limit

Date and Time	Duration of Excess Emissions (hours)	Excess Emission Rate (lb/MMBtu)	Heat Input (MMBtu/hour)	Excess Emissions Above 0.5 lb/MMBtu Limit (lbs)
4/9/06 4:00	2.0	2.29	939	3,365.4
4/9/06 6:00	2.0	2.21	1553	5,308.2
4/9/06 10:00	2.0	1.22	1913	2,743.2
5/9/06 2:00	2.0	0.60	3600	712.8
5/10/06 0:00	2.0	0.55	1419	130.5
5/26/06 18:00	2.0	0.59	586	110.2
5/28/06 6:00	2.0	0.75	694	349.8
5/28/06 8:00	2.0	1.12	1421	1,764.9
5/31/06 16:00	2.0	0.68	3496	1,286.5
5/31/06 20:00	2.0	0.70	3641	1,478.2
6/2/06 16:00	2.0	0.54	2138	179.6
6/3/06 12:00	2.0	0.66	2625	834.7
6/3/06 14:00	2.0	0.69	3477	1,314.3
6/4/06 0:00	2.0	0.54	3684	309.5
6/27/06 12:00	2.0	0.58	3576	550.7
6/27/06 22:00	2.0	1.04	2438	2,628.2
6/29/06 14:00	2.0	0.87	2440	1,805.6
7/2/06 22:00	2.0	0.85	2416	1,710.5
7/5/06 20:00	2.0	2.29	3772	13,518.8
7/14/06 8:00	2.0	2.21	3615	12,356.1
12/3/06 0:00	2.0	0.56	3968	492.0
Total Unit 3 SO_2 Emissions in Excess of Applicable Limit:				223,547.7 lbs

Table NAU - 1a (continued)
Naughton Past Actual Sulfur Dioxide Emissions in Excess of Allowable Unit 3 Limit

Total Unit 3 SO_2 Emissions in Excess of Applicable Limit:	111.8	tons

Total Unit 3 SO_2 Emissions During 24-Month Evaluation Period:	12,253.2	tons	(Ref. Table NAU-1)
Total Unit 3 SO_2 Emissions in Excess of Applicable Limit During 24-Month Evaluation Period:	111.8	tons	
Applicable Maximum Unit 3 SO_2 Emissions During 24-Month Evaluation Period:	12,141.4	tons	

Maximum Unit 3 SO_2 Annual Emission Rate:	6,070.7	tons/year

Note: The maximum Naughton Unit 3 past actual SO_2 emission rate (12,253.2 tons during the 24-month evaluation period), future potential Unit 1 emission rate, future potential Unit 2 emission rate, maximum non-stack SO_2 emission rate (21.1 tons/year), Unit 3 SO_2 excess emission rate (111.8 tons during the 24-month evaluation period) and PSD SO_2 significance level of 40 tons/year will be used to set the requested SO_2 PAL value.

The maximum Unit 3 SO_2 emission rate of 12,253.2 tons was established during the 24-month evaluation period from February 2005 through January 2007. (Reference Table NAU-1)

The Unit 3 SO_2 emissions in excess of the applicable 2-hour limit of 0.5 lb/MMBtu during the 24-month evaluation period (111.8 tons) was subtracted from the 12,253.2 tons Unit 3 emission rate during the same time period to establish the maximum past actual Unit 3 annual SO_2 emission rate of 6,070.7 tons/year which will be used in establishing the requested PAL value.

Table NAU - 2

Naughton Future Potential Sulfur Dioxide Emission Evaluation

Step 1: Calculate future potential Unit 1 and Unit 2 SO_2 emissions based on post-scrubber project emission limits

	Maximum Boiler Heat Input (MMBtu/hour)	Post-Project Sulfur Dioxide Emission Limit (lb/MMBtu)	Maximum Annual Boiler Operational Time (hours/year)	Post-Project Annual Sulfur Dioxide Emission Rate (tons/year)
Naughton Unit 1	1,850	0.15	8,760	1,215.5
Naughton Unit 2	2,400	0.15	8,760	1,576.8
Naughton Total (post-project Units 1 and 2 SO_2 emission rate):				2,792.3

Step 2: Identify maximum past actual Unit 3 SO_2 emission rate

	Maximum Past Actual SO_2 Emission Rate (tons/year)	Reference
Naughton Unit 3	6,070.7	Table NAU-1a

Step 3: Calculate total future potential Units 1, 2 and 3 SO_2 emission rate

	Post-Project Annual Sulfur Dioxide Emission Rate (tons/year)
Naughton Unit 1	1,215.5
Naughton Unit 2	1,576.8
Naughton Unit 3	6,070.7
Total	8,863.0

Table NAU - 2 (continued)

Naughton Future Potential Sulfur Dioxide Emission Evaluation

Step 4: Identify the maximum past actual non-stack SO_2 emission rate

Maximum non-stack SO_2 emission rate =	21.1	tons/year

Step 5: Establish Plantwide Applicability Limit (PAL)

PAL is equivalent to future potential stack and non-stack SO_2 emission rate plus PSD significance threshold

	Future Potential Sulfur Dioxide Emission Rate (tons/year)
Naughton Unit 1	1,215.5
Naughton Unit 2	1,576.8
Naughton Unit 3	6,070.7
Non-Stack	21.1
Total	8,884.1

PSD Significance Threshold for SO_2 =	40.0	tons/year
Future Potential SO_2 Emission Rate =	8,884.1	tons/year

SO_2 PAL =	8,924.1	tons/year

Table NAU - 3

Naughton Past Actual NO_X Emissions Evaluation

Past Actual Monthly NO_X Emissions from CEMs/Clean Air Markets (tons/month)

UNIT NAME	Jan-03	Feb-03	Mar-03	Apr-03	May-03	Jun-03	Jul-03	Aug-03	Sep-03	Oct-03	Nov-03	Dec-03	Jan-04	Feb-04	Mar-04	Apr-04	May-04	Jun-04	Jul-04	Aug-04	Sep-04	Oct-04
Naughton 1	350.7	261.3	356.9	330.9	322.2	336.2	345.4	280.7	279.6	302.6	284.4	270.2	323.3	312.4	341.8	104.5	232.7	318.0	344.2	378.2	383.7	396.3
Naughton 2	412.1	414.1	445.5	403.1	388.7	413.7	449.5	410.9	228.8	196.0	258.6	411.2	419.7	403.2	408.1	356.7	311.0	386.4	435.3	467.0	406.6	470.7
Naughton 3	501.5	354.2	444.2	421.0	366.8	382.3	400.2	403.9	134.7	2.7	182.6	439.1	477.3	429.2	434.1	475.1	474.1	502.5	388.0	468.6	466.5	522.4
Naughton Totals	1,264.2	1,029.5	1,246.6	1,155.1	1,077.6	1,132.1	1,195.1	1,095.4	643.0	501.3	725.6	1,120.5	1,220.3	1,144.8	1,183.9	936.3	1,017.7	1,207.0	1,167.5	1,313.7	1,256.9	1,389.3

Past Actual Annual NO_X Emission Rate Based on Rolling 24-Month Period (tons/year)

UNIT NAME	Jan-03	Feb-03	Mar-03	Apr-03	May-03	Jun-03	Jul-03	Aug-03	Sep-03	Oct-03	Nov-03	Dec-03	Jan-04	Feb-04	Mar-04	Apr-04	May-04	Jun-04	Jul-04	Aug-04	Sep-04	Oct-04
Naughton 1	This is based on a 24-month rolling average so there are no valid averages until December 2004																					
Naughton 2	This is based on a 24-month rolling average so there are no valid averages until December 2004																					
Naughton 3	This is based on a 24-month rolling average so there are no valid averages until December 2004																					
Naughton Totals																						

Table NAU - 3 (continued)

Naughton Past Actual NO_X Emissions Evaluation

Past Actual Monthly NO_X Emissions from CEMs/Clean Air Markets (tons/month)

Nov-04	Dec-04	Jan-05	Feb-05	Mar-05	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	May-06	Jun-06	Jul-06	Aug-06	Sep-06
356.8	369.5	355.2	321.9	342.1	369.7	385.7	365.9	262.0	381.2	342.4	306.2	370.9	385.0	342.4	361.7	373.3	282.2	305.8	273.4	246.9	279.1	256.8
385.0	363.6	404.0	301.7	379.8	372.2	374.8	441.7	460.1	432.0	440.8	494.3	414.7	472.1	460.6	332.4	432.3	99.6		305.8	331.0	424.8	432.8
472.8	491.9	486.0	445.0	450.4	566.8	402.3	521.9	586.7	572.1	315.6	509.5	334.7	369.0	543.4	539.3	618.3	498.2	521.2	544.5	581.2	616.6	522.6
1,214.6	1,225.0	1,245.1	1,068.6	1,172.3	1,308.6	1,162.8	1,329.5	1,308.7	1,385.3	1,098.8	1,310.0	1,120.3	1,226.1	1,346.3	1,233.3	1,423.9	880.1	826.9	1,123.7	1,159.1	1,320.6	1,212.2

Past Actual Annual NO_X Emission Rate Based on Rolling 24-Month Period (tons/year)

Nov-04	Dec-04	Jan-05	Feb-05	Mar-05	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	May-06	Jun-06	Jul-06	Aug-06	Sep-06
	3,791	3,793	3,823.8	3,816.4	3,835.8	3,867.6	3,882.4	3,840.7	3,890.9	3,922.4	3,924.1	3,967.4	4,024.8	4,034.3	4,059.0	4,074.7	4,163.6	4,200.1	4,177.8	4,129.2	4,079.6	4,016.2
	4,623	4,619	4,562.4	4,529.6	4,514.1	4,507.1	4,521.1	4,526.5	4,537.0	4,643.0	4,792.2	4,870.2	4,900.6	4,921.0	4,885.6	4,897.8	4,769.2	4,613.7	4,573.5	4,521.3	4,500.2	4,513.3
	4,818	4,810	4,855.4	4,858.6	4,931.4	4,949.2	5,019.0	5,112.2	5,196.3	5,286.8	5,540.2	5,616.3	5,581.2	5,614.3	5,669.3	5,761.4	5,773.0	5,796.5	5,817.5	5,914.1	5,988.1	6,016.1
	13,232	13,222	13,241.6	13,204.5	13,281.3	13,323.9	13,422.5	13,479.3	13,624.3	13,852.1	14,256.5	14,453.8	14,506.6	14,569.7	14,613.9	14,733.9	14,705.8	14,610.4	14,568.7	14,564.5	14,567.9	14,545.6

Table NAU - 3 (continued)

Naughton Past Actual NO_X Emissions Evaluation

Past Actual Monthly NO_X Emissions from CEMs/Clean Air Markets (tons/month)

Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07	Jul-07	Aug-07	Sep-07	Oct-07	Nov-07	Dec-07
229.5	262.8	248.4	288.4	284.0	21.5	240.4	361.2	254.0	327.8	327.0	298.4	334.9	302.6	327.2
389.0	450.5	442.9	331.3	448.4	404.3	380.4	403.7	384.8	418.5	343.9	318.5	363.7	361.9	435.0
506.7	520.5	591.6	611.5	462.7	553.0	451.6	553.7	468.3	458.8	469.2	465.3	427.6	392.2	481.6
1,125.2	1,233.9	1,282.9	1,231.2	1,195.1	978.8	1,072.4	1,318.6	1,107.1	1,205.1	1,140.0	1,082.1	1,126.2	1,056.7	1,243.8

Past Actual Annual NO_X Emission Rate Based on Rolling 24-Month Period (tons/year)

Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07	Jul-07	Aug-07	Sep-07	Oct-07	Nov-07	Dec-07		
3,932.8	3,885.8	3,825.2	3,791.9	3,772.9	3,612.6	3,548.0	3,535.7	3,479.7	3,512.7	3,485.6	3,463.6	3,477.9	3,443.7	3,414.8		
4,472.5	4,505.3	4,544.9	4,508.6	4,581.9	4,594.2	4,598.3	4,612.8	4,584.3	4,563.5	4,519.5	4,458.4	4,393.1	4,366.6	4,348.1		
6,008.2	6,032.1	6,082.0	6,144.7	6,153.6	6,204.9	6,147.3	6,223.0	6,196.2	6,132.3	6,080.8	6,155.6	6,114.7	6,143.4	6,199.7	**6,223.0 tons/year**	**Maximum Past Actual Unit 3 NO_X Emission Rate***
14,413.5	14,423.2	14,452.2	14,445.2	14,508.4	14,411.6	14,293.6	14,371.5	14,260.3	14,208.5	14,085.8	14,077.5	13,985.6	13,953.8	13,962.6	**14,733.9 tons/year**	**Maximum Past Actual Stack NO_X Emission Rate**

Maximum Past Actual Non-Stack NO_X Emissions

Emissions Source	Maximum Past Actual Non-Stack Emission Rate (tons/year)
Diesel-Fired Emergency Generator Engine - Unit 1	0.1
Diesel-Fired Emergency Generator Engine - Unit 2	0.1
Diesel-Fired Emergency Generator Engine - Unit 3	0.2
Diesel-Fired Emergency Generator Engine - FGD	0.1
Diesel-Fired Emergency Fire Pump Engine	1.2
Used Oil-Fired Space Heater (350,000 Btu/hour)	0.0
Used Oil-Fired Space Heater (235,000 Btu/hour)	0.0
Total Maximum Non-Stack NO_X Emission Rate (tons/year)	1.8

Total Maximum Past Actual NO_X Emission Rate	14,735.7

* Note that Unit 3 had no NO_X emissions in excess of the applicable 3-hour limit of 0.75 lb/MMBtu during the 24-month evaluation period from June 2005 through May 2007.

Table NAU - 4

Naughton Future Potential Nitrogen Oxides Emission Evaluation

Step 1: Calculate future potential Unit 1 and Unit 2 NO_X emissions based on post-low-NO_X project emission limits

	Maximum Boiler Heat Input (MMBtu/hour)	Post-Project Nitrogen Oxides Emission Limit (lb/MMBtu)	Maximum Annual Boiler Operational Time (hours/year)	Post-Project Annual Nitrogen Oxides Emission Rate (tons/year)
Naughton Unit 1	1,850	0.26	8,760	2,106.8
Naughton Unit 2	2,400	0.26	8,760	2,733.1
Naughton Total (post-project Units 1 and 2 NO_X emission rate):				4,839.9

Step 2: Identify maximum past actual Unit 3 NO_X emission rate

	Maximum Past Actual NO_X Emission Rate (tons/year)	Reference
Naughton Unit 3	6,223.0	Table NAU-3; May 2007

Step 3: Calculate future potential Units 1, 2 and 3 NO_X emission rate

	Post-Project Annual Nitrogen Oxides Emission Rate (tons/year)
Naughton Unit 1	2,106.8
Naughton Unit 2	2,733.1
Naughton Unit 3	6,223.0
Total	11,062.9

Table NAU - 4 (continued)

Naughton Future Potential Nitrogen Oxides Emission Evaluation

Step 4: Identify the maximum past actual non-stack NO_X emission rate

Maximum non-stack NO_X emission rate =	1.8	tons/year

Step 5: Establish Plantwide Applicability Limit (PAL)

PAL is equivalent to future potential stack and non-stack NO_X emission rate plus PSD significance threshold

	Future Potential NO_X Emission Rate (tons/year)
Naughton Unit 1	2,106.8
Naughton Unit 2	2,733.1
Naughton Unit 3	6,223.0
Non-Stack	1.8
Total	11,064.7

PSD Significance Threshold for NO_X =	40.0	tons/year
Future Potential NO_X Emission Rate =	11,064.7	tons/year

NO_X PAL =	11,104.7	tons/year

Notes: The Naughton Plant currently has an annual NO_X limitation of 15,140 tons/year (Operation Permit 3-1-121-1 condition (F5)(b))

It is requested at issuance of the construction permit that the 15,140 ton/year limit be formally implemented as a PAL on a monthly rolling average basis

It is requested that a PAL equivalent to 11,104.7 tons/year be implemented following completion of the Units 1 and 2 low-NO_X projects

Table NAU - 5
Naughton Past Actual Heat Input Evaluation

Past Actual Monthly Heat Input from CEMs/Clean Air Markets (MMBtu/month)

UNIT NAME	Jan-03	Feb-03	Mar-03	Apr-03	May-03	Jun-03	Jul-03	Aug-03	Sep-03	Oct-03	Nov-03	Dec-03	Jan-04	Feb-04	Mar-04	Apr-04	May-04	Jun-04	Jul-04	Aug-04	Sep-04
Naughton 1	1,294,944	1,003,584	1,273,102	1,230,672	1,277,089	1,207,853	1,209,574	1,191,120	1,178,838	1,254,367	1,242,887	1,041,059	1,160,593	1,176,046	1,226,941	361,462	803,938	1,075,053	1,147,567	1,174,991	1,168,374
Naughton 2	1,597,810	1,478,366	1,677,476	1,435,452	1,489,351	1,525,335	1,607,850	1,495,499	908,100	709,458	915,448	1,374,396	1,439,023	1,494,048	1,476,692	1,360,533	1,145,184	1,493,725	1,485,937	1,526,302	1,384,534
Naughton 3	2,635,252	1,846,594	2,183,646	2,260,171	2,145,359	1,974,465	2,074,575	2,145,215	730,587	85,599	966,882	2,106,129	2,345,306	2,020,169	2,169,526	2,323,089	2,230,939	2,316,064	1,905,625	2,353,271	2,268,220
Naughton Totals	5,528,006	4,328,544	5,134,224	4,926,295	4,911,799	4,707,653	4,891,999	4,831,834	2,817,525	2,049,424	3,125,217	4,521,584	4,944,922	4,690,263	4,873,159	4,045,084	4,180,061	4,884,842	4,539,129	5,054,564	4,821,128

Past Actual Annual Heat Input Rate Based on Rolling 24-Month Period (tons/year)

UNIT NAME	Jan-03	Feb-03	Mar-03	Apr-03	May-03	Jun-03	Jul-03	Aug-03	Sep-03	Oct-03	Nov-03	Dec-03	Jan-04	Feb-04	Mar-04	Apr-04	May-04	Jun-04	Jul-04	Aug-04	Sep-04
Naughton 1	This is based on a 24-month rolling average so there are no valid averages until December 2004																				
Naughton 2	This is based on a 24-month rolling average so there are no valid averages until December 2004																				
Naughton 3	This is based on a 24-month rolling average so there are no valid averages until December 2004																				
Naughton Totals																					

Table NAU - 5 (continued)
Naughton Past Actual Heat Input Evaluation

Past Actual Monthly Heat Input from CEMs/Clean Air Markets (MMBtu/month)

Oct-04	Nov-04	Dec-04	Jan-05	Feb-05	Mar-05	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	May-06	Jun-06	Jul-06	Aug-06
1,244,155	1,188,997	1,264,996	1,280,663	1,142,563	1,195,781	1,280,757	1,301,677	1,241,366	890,782	1,314,432	1,200,479	1,087,738	1,295,847	1,301,000	1,176,042	1,226,501	1,245,867	979,716	1,083,116	984,758	969,786	1,115,562
1,599,692	1,264,876	1,341,274	1,719,047	1,380,366	1,520,184	1,448,550	1,503,076	1,420,464	1,464,974	1,370,327	1,414,879	1,596,210	1,380,097	1,568,770	1,550,247	1,313,041	1,531,110	331,638		1,152,580	1,254,694	1,571,268
2,582,552	2,351,186	2,336,824	2,340,641	2,206,210	2,220,881	2,573,705	2,037,622	2,522,629	2,734,986	2,564,277	1,450,196	2,517,163	1,831,574	1,994,181	2,536,488	2,334,746	2,672,206	2,254,707	2,335,676	2,415,910	2,481,054	2,623,109
5,426,399	4,805,059	4,943,094	5,340,351	4,729,139	4,936,846	5,303,012	4,842,375	5,184,459	5,090,742	5,249,036	4,065,554	5,201,111	4,507,518	4,863,951	5,262,777	4,874,288	5,449,183	3,566,061	3,418,792	4,553,248	4,705,534	5,309,939

Past Actual Annual Heat Input Rate Based on Rolling 24-Month Period (tons/year)

Oct-04	Nov-04	Dec-04	Jan-05	Feb-05	Mar-05	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	May-06	Jun-06	Jul-06	Aug-06
		13,699,101	13,691,961	13,761,450	13,722,790	13,747,832	13,760,126	13,776,883	13,617,487	13,679,143	13,689,963	13,606,649	13,633,129	13,763,099	13,770,824	13,796,051	13,805,514	14,114,641	14,254,230	14,209,083	14,120,192	14,090,478
		16,613,181	16,673,799	16,624,799	16,546,153	16,552,702	16,559,565	16,507,129	16,435,691	16,373,105	16,626,495	17,069,871	17,302,195	17,399,382	17,454,994	17,364,491	17,391,700	16,877,252	16,304,660	16,134,088	16,018,466	16,040,949
		24,178,623	24,031,317	24,211,125	24,229,743	24,386,510	24,332,641	24,606,723	24,936,929	25,146,460	25,506,264	26,722,046	27,154,392	27,098,418	27,194,009	27,351,298	27,602,638	27,568,447	27,620,815	27,670,738	27,958,453	28,093,372
		54,490,904	54,397,077	54,597,374	54,498,685	54,687,044	54,652,332	54,890,735	54,990,106	55,198,707	55,822,722	57,398,565	58,089,716	58,260,899	58,419,827	58,511,839	58,799,851	58,560,340	58,179,705	58,013,908	58,097,111	58,224,798

Table NAU - 5 (continued)
Naughton Past Actual Heat Input Evaluation

Past Actual Monthly Heat Input from CEMs/Clean Air Markets (MMBtu/month)

Sep-06	Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07	Jul-07	Aug-07	Sep-07	Oct-07	Nov-07	Dec-07
974,531	973,309	1,022,240	1,031,650	1,179,272	1,053,101	88,931	858,055	1,262,235	962,238	1,279,550	1,222,662	1,119,029	1,247,237	1,168,470	1,236,937
1,561,862	1,421,013	1,571,711	1,622,385	1,496,528	1,567,524	1,632,879	1,413,787	1,496,735	1,436,939	1,585,002	1,303,218	1,249,838	1,426,226	1,416,288	1,576,050
2,384,202	2,350,146	2,368,781	2,732,835	2,705,513	2,006,625	2,428,674	2,056,551	2,728,582	2,630,559	2,467,283	2,602,624	2,652,347	2,443,353	2,172,911	2,304,276
4,920,595	4,744,468	4,962,732	5,386,870	5,381,313	4,627,250	4,150,484	4,328,393	5,487,552	5,029,736	5,331,835	5,128,504	5,021,214	5,116,815	4,757,669	5,117,264

Past Actual Annual Heat Input Rate Based on Rolling 24-Month Period (tons/year)

Sep-06	Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07	Jul-07	Aug-07	Sep-07	Oct-07	Nov-07	Dec-07
13,993,556	13,858,133	13,774,755	13,658,082	13,607,386	13,562,655	13,009,230	12,797,879	12,778,158	12,638,594	12,832,978	12,787,093	12,746,368	12,826,118	12,762,429	12,730,398
16,129,613	16,040,274	16,193,691	16,334,247	16,222,987	16,316,566	16,372,914	16,355,532	16,352,362	16,360,599	16,420,613	16,387,059	16,304,538	16,219,546	16,237,641	16,241,282
28,151,363	28,035,160	28,043,957	28,241,963	28,424,399	28,324,606	28,428,503	28,169,926	28,515,406	28,569,371	28,435,519	28,454,693	29,055,768	29,018,863	29,189,531	29,344,579
58,274,532	57,933,566	58,012,403	58,234,291	58,254,772	58,203,827	57,810,646	57,323,337	57,645,925	57,568,564	57,689,110	57,628,844	58,106,674	58,064,526	58,189,602	58,316,258

14,254,230 MMBtu/year Maximum Past Actual Unit 1 Heat Input

17,454,994 MMBtu/year Maximum Past Actual Unit 2 Heat Input

29,344,579 MMBtu/year Maximum Past Actual Unit 3 Heat Input

Maximum 12 month ave based on 24-month period 58,799,851 MMBtu/year Past Actual Heat Input

Table NAU - 6
Past Actual Coal Burn Evaluation

Past Actual Monthly Coal Burn (tons/month)

UNIT NAME	Jan-03	Feb-03	Mar-03	Apr-03	May-03	Jun-03	Jul-03	Aug-03	Sep-03	Oct-03	Nov-03	Dec-03	Jan-04	Feb-04	Mar-04	Apr-04	May-04	Jun-04	Jul-04	Aug-04	Sep-04
Naughton 1	63,339	46,772	61,366	58,893	60,016	58,437	58,184	57,589	57,091	59,303	55,476	47,016	56,738	56,245	63,211	14,794	39,219	53,336	55,623	57,467	57,387
Naughton 2	78,922	69,404	76,731	70,146	71,227	75,568	81,111	74,311	42,996	34,066	41,751	68,921	73,651	70,244	75,083	57,676	55,278	74,815	72,755	74,805	66,564
Naughton 3	123,121	82,921	113,015	119,614	117,041	108,360	112,089	115,919	37,348	732	57,137	109,052	123,298	99,652	116,518	98,490	111,465	120,295	98,559	123,205	114,006
Naughton Totals	265,382	199,097	251,112	248,653	248,284	242,365	251,383	247,819	137,435	94,102	154,364	224,989	253,686	226,141	254,812	170,960	205,962	248,447	226,938	255,477	237,957

Past Actual Annual Coal Burn Rate Based on Rolling 24-Month Period (tons/year)

UNIT NAME	Jan-03	Feb-03	Mar-03	Apr-03	May-03	Jun-03	Jul-03	Aug-03	Sep-03	Oct-03	Nov-03	Dec-03	Jan-04	Feb-04	Mar-04	Apr-04	May-04	Jun-04	Jul-04	Aug-04	Sep-04
Naughton 1	This is based on a 24-month rolling average so there are no valid averages until December 2004																				
Naughton 2	This is based on a 24-month rolling average so there are no valid averages until December 2004																				
Naughton 3	This is based on a 24-month rolling average so there are no valid averages until December 2004																				
Naughton Totals																					

Table NAU - 6 (continued)
Past Actual Coal Burn Evaluation

Past Actual Monthly Coal Burn (tons/month)

Oct-04	Nov-04	Dec-04	Jan-05	Feb-05	Mar-05	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	May-06	Jun-06	Jul-06	Aug-06
61,320	58,160	62,015	61,182	56,737	55,750	55,781	58,953	56,399	38,798	59,290	53,622	46,449	55,402	55,372	53,990	55,004	60,394	48,704	53,458	48,193	45,837	54,521
77,800	70,649	61,798	73,999	62,924	71,486	68,268	75,328	71,747	73,523	71,696	67,334	70,756	58,620	67,708	77,785	61,615	71,407	15,602	0	60,695	70,328	81,735
122,145	110,986	104,403	108,547	105,192	101,640	117,998	89,554	112,210	126,765	127,091	73,233	111,593	72,846	80,203	125,667	103,395	113,164	96,749	99,850	101,699	104,268	110,421
261,264	239,795	228,216	243,728	224,852	228,876	242,048	223,835	240,356	239,086	258,076	194,189	228,798	186,867	203,283	257,441	220,014	244,965	161,055	153,308	210,587	220,434	246,677

Past Actual Annual Coal Burn Rate Based on Rolling 24-Month Period (tons/year)

Oct-04	Nov-04	Dec-04	Jan-05	Feb-05	Mar-05	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	May-06	Jun-06	Jul-06	Aug-06
		659,499	658,420	663,403	660,595	659,039	658,507	657,488	647,796	648,646	646,911	640,484	640,447	644,625	643,251	642,630	641,222	658,177	665,296	662,725	657,832	656,359
		808,136	805,674	802,434	799,811	798,872	800,923	799,012	795,218	793,910	806,079	824,424	832,859	832,252	834,319	830,005	828,167	807,130	779,491	772,431	771,218	774,683
		1,219,685	1,212,398	1,223,533	1,217,846	1,217,038	1,203,294	1,205,219	1,212,558	1,218,144	1,236,086	1,291,516	1,299,371	1,284,946	1,286,131	1,288,002	1,286,325	1,285,455	1,279,648	1,270,350	1,273,204	1,266,812
		2,687,319	2,676,492	2,689,370	2,678,252	2,674,949	2,662,724	2,661,720	2,655,571	2,660,700	2,689,077	2,756,425	2,772,677	2,761,824	2,763,701	2,760,638	2,755,714	2,750,762	2,724,435	2,705,505	2,702,253	2,697,854

Table NAU - 6 (continued)
Past Actual Coal Burn Evaluation

Past Actual Monthly Coal Burn (tons/month)

Sep-06	Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07	Jul-07	Aug-07	Sep-07	Oct-07	Nov-07	Dec-07
44,961	45,289	49,289	47,969	54,109	48,082	3,830	37,925	55,935	42,189	55,852	55,140	49,639	57,109	54,251	57,396
78,379	71,338	77,708	79,175	68,855	77,016	84,245	73,828	74,167	70,361	78,670	73,988	66,568	74,332	72,572	77,995
100,672	101,056	106,162	122,424	115,294	77,803	96,676	89,282	124,795	121,340	106,944	112,320	116,016	115,475	101,236	113,591
224,012	217,683	233,158	249,568	238,258	202,901	184,751	201,034	254,897	233,890	241,466	241,449	232,222	246,915	228,059	248,982

Past Actual Annual Coal Burn Rate Based on Rolling 24-Month Period (tons/year)

Sep-06	Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07	Jul-07	Aug-07	Sep-07	Oct-07	Nov-07	Dec-07
650,146	642,131	637,695	630,672	627,135	622,808	596,848	587,920	586,411	579,306	587,833	585,758	583,766	589,096	588,521	589,533
780,591	777,360	780,889	789,578	787,006	794,052	800,432	803,212	802,631	801,938	804,512	805,658	805,275	807,063	814,039	819,182
1,260,145	1,249,601	1,247,189	1,256,199	1,259,573	1,245,878	1,243,396	1,229,038	1,246,658	1,251,223	1,241,313	1,233,928	1,255,319	1,257,260	1,271,455	1,288,149
2,690,882	2,669,091	2,665,772	2,676,449	2,673,714	2,662,739	2,640,676	2,620,169	2,635,700	2,632,467	2,633,657	2,625,343	2,644,360	2,653,419	2,674,014	2,696,864

Maximum 12 month ave based on 24-month period 2,772,677 tons/year Past Actual Coal Burn

Table NAU - 7
Naughton Past Actual Particulate Matter Emission Evaluation

Past Actual Monthly Heat Input from CEMs/Clean Air Markets (MMBtu/month)

UNIT NAME	Jan-03	Feb-03	Mar-03	Apr-03	May-03	Jun-03	Jul-03	Aug-03	Sep-03	Oct-03	Nov-03	Dec-03	Jan-04	Feb-04	Mar-04	Apr-04	May-04	Jun-04	Jul-04	Aug-04	Sep-04	Oct-04	Nov-04	Dec-04	Jan-05	Feb-05
Naughton 1	1,294,944	1,003,584	1,273,102	1,230,672	1,277,089	1,207,853	1,209,574	1,191,120	1,178,838	1,254,367	1,242,887	1,041,059	1,160,593	1,176,046	1,226,941	361,462	803,938	1,075,053	1,147,567	1,174,991	1,168,374	1,244,155	1,188,997	1,264,996	1,280,663	1,142,563
Naughton 2	1,597,810	1,478,366	1,677,476	1,435,452	1,489,351	1,525,335	1,607,850	1,495,499	908,100	709,458	915,448	1,374,396	1,439,023	1,494,048	1,476,692	1,360,533	1,145,184	1,493,725	1,485,937	1,526,302	1,384,534	1,599,692	1,264,876	1,341,274	1,719,047	1,380,366
Naughton 3	2,635,252	1,846,594	2,183,646	2,260,171	2,145,359	1,974,465	2,074,575	2,145,215	730,587	85,599	966,882	2,106,129	2,345,306	2,020,169	2,169,526	2,323,089	2,230,939	2,316,064	1,905,625	2,353,271	2,268,220	2,582,552	2,351,186	2,336,824	2,340,641	2,206,210
Naughton Totals	5,528,006	4,328,544	5,134,224	4,926,295	4,911,799	4,707,653	4,891,999	4,831,834	2,817,525	2,049,424	3,125,217	4,521,584	4,944,922	4,690,263	4,873,159	4,045,084	4,180,061	4,884,842	4,539,129	5,054,564	4,821,128	5,426,399	4,805,059	4,943,094	5,340,351	4,729,139

Past Actual Monthly Particulate Matter Emission Rate from Annual Stack Testing (lb/MMBtu)

UNIT NAME	Jan-03	Feb-03	Mar-03	Apr-03	May-03	Jun-03	Jul-03	Aug-03	Sep-03	Oct-03	Nov-03	Dec-03	Jan-04	Feb-04	Mar-04	Apr-04	May-04	Jun-04	Jul-04	Aug-04	Sep-04	Oct-04	Nov-04	Dec-04	Jan-05	Feb-05
Naughton 1	0.032	0.032	0.032	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030
Naughton 2	0.028	0.028	0.028	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022
Naughton 3	0.017	0.017	0.017	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021

Monthly Particulate Matter Emission Rate (obtained by multiplying monthly heat input times particulate matter emission rate) tons/month

UNIT NAME	Jan-03	Feb-03	Mar-03	Apr-03	May-03	Jun-03	Jul-03	Aug-03	Sep-03	Oct-03	Nov-03	Dec-03	Jan-04	Feb-04	Mar-04	Apr-04	May-04	Jun-04	Jul-04	Aug-04	Sep-04	Oct-04	Nov-04	Dec-04	Jan-05	Feb-05
Naughton 1	20.7	16.1	20.4	14.2	14.7	13.9	13.9	13.7	13.6	14.4	14.3	12.0	13.3	13.5	14.1	5.4	12.1	16.1	17.2	17.6	17.5	18.7	17.8	19.0	19.2	17.1
Naughton 2	22.4	20.7	23.5	14.4	14.9	15.3	16.1	15.0	9.1	7.1	9.2	13.7	14.4	14.9	14.8	15.0	12.6	16.4	16.3	16.8	15.2	17.6	13.9	14.8	18.9	15.2
Naughton 3	22.4	15.7	18.6	106.2	100.8	92.8	97.5	100.8	34.3	4.0	45.4	99.0	110.2	94.9	102.0	24.4	23.4	24.3	20.0	24.7	23.8	27.1	24.7	24.5	24.6	23.2
Naughton Totals	65.5	52.5	62.4	134.7	130.4	121.9	127.5	129.5	57.0	25.5	68.9	124.7	138.0	123.4	130.8	44.8	48.1	56.9	53.6	59.1	56.6	63.4	56.4	58.3	62.7	55.5

Past Actual Annual Particulate Matter Emission Rate Based on Rolling 24-Month Period (tons/year)

UNIT NAME	Jan-03	Feb-03	Mar-03	Apr-03	May-03	Jun-03	Jul-03	Aug-03	Sep-03	Oct-03	Nov-03	Dec-03	Jan-04	Feb-04	Mar-04	Apr-04	May-04	Jun-04	Jul-04	Aug-04	Sep-04	Oct-04	Nov-04	Dec-04	Jan-05	Feb-05
Naughton 1	This is based on a 24-month rolling average so there are no valid averages until December 2004																							182.1	181.3	181.9
Naughton 2	This is based on a 24-month rolling average so there are no valid averages until December 2004																							181.9	180.2	177.5
Naughton 3	This is based on a 24-month rolling average so there are no valid averages until December 2004																							630.9	632.0	635.7
Naughton Totals																								994.9	993.5	995.0

Table NAU - 7 (continued)
Naughton Past Actual Particulate Matter Emission Evaluation

Past Actual Monthly Heat Input from CEMs/Clean Air Markets (MMBtu/month)

Mar-05	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	May-06	Jun-06	Jul-06	Aug-06	Sep-06	Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07
1,195,781	1,280,757	1,301,677	1,241,366	890,782	1,314,432	1,200,479	1,087,738	1,295,847	1,301,000	1,176,042	1,226,501	1,245,867	979,716	1,083,116	984,758	969,786	1,115,562	974,531	973,309	1,022,240	1,031,650	1,179,272	1,053,101	88,931	858,055	1,262,235	962,238
1,520,184	1,448,550	1,503,076	1,420,464	1,464,974	1,370,327	1,414,879	1,596,210	1,380,097	1,568,770	1,550,247	1,313,041	1,531,110	331,638		1,152,580	1,254,694	1,571,268	1,561,862	1,421,013	1,571,711	1,622,385	1,496,528	1,567,524	1,632,879	1,413,787	1,496,735	1,436,939
2,220,881	2,573,705	2,037,622	2,522,629	2,734,986	2,564,277	1,450,196	2,517,163	1,831,574	1,994,181	2,536,488	2,334,746	2,672,206	2,254,707	2,335,676	2,415,910	2,481,054	2,623,109	2,384,202	2,350,146	2,368,781	2,732,835	2,705,513	2,006,625	2,428,674	2,056,551	2,728,582	2,630,559
4,936,846	5,303,012	4,842,375	5,184,459	5,090,742	5,249,036	4,065,554	5,201,111	4,507,518	4,863,951	5,262,777	4,874,288	5,449,183	3,566,061	3,418,792	4,553,248	4,705,534	5,309,939	4,920,595	4,744,468	4,962,732	5,386,870	5,381,313	4,627,250	4,150,484	4,328,393	5,487,552	5,029,736

Past Actual Monthly Particulate Matter Emission Rate from Annual Stack Testing (lb/MMBtu)

Mar-05	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	May-06	Jun-06	Jul-06	Aug-06	Sep-06	Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07
0.030	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.123	0.123	0.123	0.123
0.022	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.115	0.115	0.115	0.115
0.021	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.052	0.052	0.052	0.052

Monthly Particulate Matter Emission Rate (obtained by multiplying monthly heat input times particulate matter emission rate) tons/month

Mar-05	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	May-06	Jun-06	Jul-06	Aug-06	Sep-06	Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07
17.9	3.2	3.3	3.1	2.2	3.3	3.0	2.7	3.2	3.3	2.9	3.1	3.1	27.4	30.3	27.6	27.2	31.2	27.3	27.3	28.6	28.9	33.0	29.5	5.5	52.8	77.6	59.2
16.7	17.4	18.0	17.0	17.6	16.4	17.0	19.2	16.6	18.8	18.6	15.8	18.4	10.6	0.0	36.9	40.2	50.3	50.0	45.5	50.3	51.9	47.9	50.2	93.9	81.3	86.1	82.6
23.3	24.5	19.4	24.0	26.0	24.4	13.8	23.9	17.4	18.9	24.1	22.2	20.0	16.9	17.5	18.1	18.6	19.7	17.9	17.6	17.8	20.5	20.3	15.0	63.1	53.5	70.9	68.4
58.0	45.0	40.6	44.1	45.8	44.1	33.8	45.8	37.2	41.0	45.6	41.0	41.5	55.0	47.8	82.6	85.9	101.2	95.1	90.4	96.7	101.3	101.2	94.7	162.5	187.5	234.6	210.2

Past Actual Annual Particulate Matter Emission Rate Based on Rolling 24-Month Period (tons/year)

Mar-05	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	May-06	Jun-06	Jul-06	Aug-06	Sep-06	Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07
180.6	175.2	169.5	164.1	158.2	153.0	147.7	141.9	136.4	132.0	126.8	121.6	116.1	127.1	136.2	141.9	146.9	153.7	158.6	162.9	168.3	173.2	180.1	186.3	180.1	204.9	242.0	270.1
174.1	175.6	177.2	178.1	178.8	179.5	183.5	189.5	193.2	195.8	197.9	198.3	200.1	197.9	191.6	201.8	213.7	230.5	247.9	261.8	280.0	298.6	313.1	330.6	369.1	401.1	435.1	467.9
638.1	597.2	556.5	522.1	486.3	448.1	437.8	447.7	433.7	393.7	350.6	314.2	273.3	269.5	266.6	263.5	262.8	260.3	257.3	252.5	249.1	247.1	244.9	240.9	260.8	275.3	301.1	323.3
992.8	948.0	903.1	864.2	823.3	780.6	769.0	779.1	763.3	721.5	675.3	634.1	589.4	594.5	594.4	607.2	623.4	644.5	663.7	677.2	697.4	718.9	738.1	757.7	810.0	881.2	978.2	1,061.3

Table NAU - 7 (continued)
Naughton Past Actual Particulate Matter Emission Evaluation

Past Actual Monthly Heat Input from CEMs/Clean Air Markets (MMBtu/month)

Jul-07	Aug-07	Sep-07	Oct-07	Nov-07	Dec-07
1,279,550	1,222,662	1,119,029	1,247,237	1,168,470	1,236,937
1,585,002	1,303,218	1,249,838	1,426,226	1,416,288	1,576,050
2,467,283	2,602,624	2,652,347	2,443,353	2,172,911	2,304,276
5,331,835	5,128,504	5,021,214	5,116,815	4,757,669	5,117,264

Past Actual Monthly Particulate Matter Emission Rate from Annual Stack Testing (lb/MMBtu)

Jul-07	Aug-07	Sep-07	Oct-07	Nov-07	Dec-07
0.123	0.028	0.028	0.028	0.028	0.028
0.115	0.060	0.060	0.060	0.060	0.060
0.052	0.033	0.033	0.033	0.033	0.033

Monthly Particulate Matter Emission Rate (obtained by multiplying monthly heat input times particulate matter emission rate) tons/month

Jul-07	Aug-07	Sep-07	Oct-07	Nov-07	Dec-07
78.7	17.1	15.7	17.5	16.4	17.3
91.1	39.1	37.5	42.8	42.5	47.3
64.1	42.9	43.8	40.3	35.9	38.0
234.0	99.2	96.9	100.6	94.7	102.6

Past Actual Annual Particulate Matter Emission Rate Based on Rolling 24-Month Period (tons/year)

Jul-07	Aug-07	Sep-07	Oct-07	Nov-07	Dec-07	
308.3	315.2	321.6	328.9	335.5	342.5	**342.5** tons/year Past Actual Unit 1 Particulate Matter Emission Rate
504.7	516.0	526.3	538.1	551.0	565.3	**565.3** tons/year Past Actual Unit 2 Particulate Matter Emission Rate
342.4	351.7	366.7	374.9	384.1	393.6	**638.1** tons/year Past Actual Unit 3 Particulate Matter Emission Rate
1,155.4	1,182.9	1,214.5	1,241.9	1,270.6	1,301.4	

Maximum 12 month ave based on 24-month period **1,301.4** **tons/year Past Actual Stack PM_{10} Emission Rate**

Maximum Past Actual Non-Stack PM_{10} Emissions

Emissions Source	Maximum Past Actual Non-Stack PM_{10} Emission Rate (tons/year)
Coal Stockpile Reclaim Tunnel (Baghouse)	9.3
Unit #2 Coal Bunker Exhauster and Conveyor (Baghouse)	5.6
Unit #3 Coal Bunker Exhauster and Conveyor (Baghouse)	3.8
Unit #1 Coal Bunker Exhauster (Baghouse)	0.7
Fly Ash Loadout Silo (Baghouse)	0.0
Unit #1 Cooling Tower	52.1
Unit #2 Cooling Tower	72.8
Unit #3 Cooling Tower	94.1
Coal Pile Stacker (Drop Operation)	0.2
Coal Pile Maintenance and Wind Erosion	66.8
Fly Ash Truck Loading (Fugitives)	0.1
Fly Ash Haul Road	0.4
Ash Ponds	222.8
Mine Conveyor Baghouse	1.5
Diesel-Fired Emergency Generator Engine - Unit 1	0.0
Diesel-Fired Emergency Generator Engine - Unit 2	0.0
Diesel-Fired Emergency Generator Engine - Unit 3	0.0
Diesel-Fired Emergency Generator Engine - FGD	0.0
Diesel-Fired Emergency Fire Pump Engine	0.1
Used Oil-Fired Space Heater (350,000 Btu/hour)	0.0
Used Oil-Fired Space Heater (235,000 Btu/hour)	0.0
Total Maximum Non-Stack PM_{10} Emission Rate (tons/year)	530.3

Total Maximum Past Actual PM_{10} Emission Rate Stack and Non-Stack Emissions (tons/year)	1,831.7	(Past actual stack emission rate of 1,301.4 tons/year plus non-stack emission rate of 530.3 tons/year)

Table NAU - 8

Naughton Future Potential Particulate Matter Emission Evaluation

Maximum Potential Pre-Project Particulate Matter Emission Rates

(based on maximum boiler heat input rates and pre-project particulate matter emission limits)

	Maximum Boiler Heat Input (I) (MMBtu/hour)	Pre-Project Particulate Matter Emission Limit* (lb/MMBtu)	Maximum Annual Boiler Operational Time (hours/year)	Pre-Project Maximum Annual Particulate Matter Emission Rate (tons/year)
Naughton Unit 1	1,850	0.24	8,760	1,957.2
Naughton Unit 2	2,400	0.23	8,760	2,426.4
Naughton Unit 3	3,700	0.21	8,760	3,468.9
Non-Stack	NA	NA	NA	530.3
Naughton Total Potential Stack PM_{10} Emission Rate (pre-project PM_{10} rate):				8,382.8

* Particulate Matter Emission Limit = $0.8963/I^{0.1743}$

Requested Post-Project Particulate Matter Emission Rates

(following installation of Unit 1 and Unit 2 flue gas conditioning systems and Unit 3 fabric filter baghouse)

	Maximum Boiler Heat Input (MMBtu/hour)	Post-Project Particulate Matter Emission Limit (lb/MMBtu)	Maximum Annual Boiler Operational Time (hours/year)	Post-Project Annual Particulate Matter Emission Rate (tons/year)
Naughton Unit 1	1,850	0.042	8,760	340.3
Naughton Unit 2	2,400	0.054	8,760	567.6
Naughton Unit 3	3,700	0.015	8,760	243.1
Non-Stack	NA	NA	NA	530.3
Naughton Total (post-project PM_{10} rate):				1,681.4

Note: The future potential Unit 1, Unit 2 and Unit 3 PM_{10} annual emission rates (tons/year) are based on the requested annual PM_{10} emission limits (lb/MMBtu) and maximum boiler heat input rates (MMBtu/hour).

The requested Unit 1 PM_{10} emission limit of 0.042 lb/MMBtu and Unit 2 limit of 0.054 lb/MMBtu are based on the maximum past actual PM_{10} emission rates and boiler heat input rates.

Requested PM_{10} Emission Rate Summary:

A 0.042 lb/MMBtu Unit 1 PM_{10} limit is established following installation of Unit 1 flue gas conditioning system in 2008

A 0.054 lb/MMBtu Unit 2 PM_{10} limit is established following installation of Unit 2 flue gas conditioning system in 2008

A 0.015 lb/MMBtu Unit 3 PM_{10} limit is established following installation of Unit 3 baghouse in 2014

Table NAU - 9

Naughton Past Actual Hydrogen Fluoride Emission Evaluation

$M_{HF} = F_{comb} \times 2000 \text{ lb/ton} \times C_{HF} \times 1/10^6 \times F_{acid}$

Where:

Mfg_{HF} =	Manufacture of Hydrogen Fluoride, lb/year	
F_{comb} =	Coal combustion, tons/year	
F_{comb} =	640,447	tons/year (Unit 1)
F_{comb} =	832,859	tons/year (Unit 2)
F_{comb} =	1,299,371	tons/year (Unit 3)
C_{HF} =	50.47	Average Unit 1 fluoride concentration in coal, ppm (no scrubber, no bypass)
C_{HF} =	50.47	Average Unit 2 fluoride concentration in coal, ppm (no scrubber, no bypass)
C_{HF} =	51.79	Average Unit 3 fluoride concentration in coal, ppm (FGD scrubber, no bypass)
F_{Bypass} =	0.00	Unit 1
F_{Bypass} =	0.00	Unit 2
F_{Bypass} =	0.00	Unit 3
F_{acid} =	M_{HF}/M_F	Acid conversion factor: ratio of molecular weights, compound/parent chemical
M_F =	18.9984	Molecular weight of fluorine
M_{HF} =	20.0063	Molecular weight of hydrogen fluoride
F_{acid} =	1.053054	
AR =	Annual release of hydrogen fluoride, lb/year	
EF_{FGD} =	6%	HF emission factor for FGD systems
$EF_{No\ FGD}$ =	50%	HF emission factor without FGD

Note: Maximum annual coal burn rates from November 2005; Table NAU - 6

$AR = Mfg * (EF/100)$

$AR_{FGD\ Removal} = (1.0 - F_{Bypass}) \times E_{FGD} \times M_{HF}$

$AR_{Bypass} = F_{Bypass} \times EF_{NoFGD} \times M_{HF}$

$AR_{Total} = AR_{FGD\ Removal} + AR_{Bypass}$

Table NAU - 9 (continued)

Naughton Past Actual Hydrogen Fluoride Emission Evaluation

Historical Coal Fluoride Concentrations (Parts Per Million)

	2002	2003	2004	2005	2006	Average 2002-2006 Fluoride Concentration ppm
Naughton 1	33.81	33.81	72.50	55.00	57.25	50.47
Naughton 2	33.81	33.81	72.50	55.00	57.25	50.47
Naughton 3	39.85	39.85	85.00	53.00	41.25	51.79

Mfg_{HF} = (Coal, tons/year)*(2000 lb/ton)*(C_{HF} ppm)*($1/10^6$) F_{acid}

Mfg_{HF} Unit 1 = 68,081.9 lbs/year
Mfg_{HF} Unit 2 = 88,535.9 lbs/year
Mfg_{HF} Unit 3 = 141,729.3 lbs/year

AR = Mfg_{HF} Unit 1 * (EF/100)
AR = 34,041.0 Unit 1 lbs/year

AR = Mfg_{HF} Unit 2 * (EF/100)
AR = 44,268.0 Unit 2 lbs/year

$AR_{FGD\ Removal}$ = (1.0 - F_{Bypass}) x EF_{FGD} x Mfg_{HF}
$AR_{FGD\ Removal}$ = (1.0 - 0.0) x (0.06) x (141,729)
$AR_{FGD\ Removal}$ = 8,503.8 lbs/year
AR_{Bypass} = 0.0 lbs/year
AR_{Total} = $AR_{FGD\ Removal}$ + AR_{Bypass}
AR_{Total} = 8,503.8 Unit 3 lbs/year

Table NAU - 9 (continued)

Naughton Past Actual Hydrogen Fluoride Emission Evaluation

Maximum Past Actual Hydrogen Fluoride Emissions

Naughton Unit 1	34,041.0	lbs/year
Naughton Unit 2	44,268.0	lbs/year
Naughton Unit 3	8,503.8	lbs/year
Total Past HF Rate:	86,812.7	lbs/year
	43.4	tons/year

Calculation Method:

EPRI LARK-TRIPP *Calculation and Methods for Threshold Determination and Release Estimates*

HF Emission Factor with FGD System: 6%

Subbituminous Coal Emission Factor: 50%

(Table 5-1 Emission Factors for HCL and HF)

Table NAU - 10

Naughton Future Potential Coal Burn and Hydrogen Fluoride Emission Evaluation

	Annual Average Coal Heating Value (Btu/lb)					Average Coal Heating Value (Btu/lb)
	2002	2003	2004	2005	2006	
Naughton Unit 1	10,012.7	9,929.9	9,904.5	10,066.3	9,769.2	9,936.5
Naughton Unit 2	10,000.8	9,925.7	9,894.5	10,073.2	9,762.0	9,931.2
Naughton Unit 3	10,041.6	9,876.4	9,896.5	9,956.0	9,939.3	9,942.0

Maximum Potential Annual Coal Burn Rate

	Maximum Boiler Heat Input (MMBtu/hour)	Maximum Annual Heat Input at 8760 hours/year* (MMBtu/year)	Average 2002-2005 Coal Heating Value (Btu/lb)	Maximum Potential Annual Coal Burn* (tons/year)
Naughton Unit 1	1,850	16,206,000	9,936.5	815,476
Naughton Unit 2	2,400	21,024,000	9,931.2	1,058,479
Naughton Unit 3	3,700	32,412,000	9,942.0	1,630,059
Totals		69,642,000		3,504,014

* Maximum potential annual heat input and coal burn rates used in future potential H_2SO_4, lead and HF emission calculations

Table NAU - 10 (continued)

Naughton Future Potential Coal Burn and Hydrogen Fluoride Emission Evaluation

$M_{HF} = F_{comb}$ x 2000 lb/ton x C_{HF} x $1/10^6$ x F_{acid}

Where:	Mfg_{HF} =	Manufacture of Hydrogen Fluoride, lb/year	
	F_{comb} =	Coal combustion, tons/year	
	F_{comb} =	815,476	tons/year (Unit 1 future potential coal burn rate)
	F_{comb} =	1,058,479	tons/year (Unit 2 future potential coal burn rate)
	F_{comb} =	1,630,059	tons/year (Unit 3 future potential coal burn rate)
	C_{HF} =	50.47	Average Unit 1 fluoride concentration in coal, ppm (FGD scrubber, no bypass)
	C_{HF} =	50.47	Average Unit 2 fluoride concentration in coal, ppm (FGD scrubber, no bypass)
	C_{HF} =	51.79	Average Unit 3 fluoride concentration in coal, ppm (FGD scrubber, no bypass)
	F_{Bypass} =	0.00	Unit 1
	F_{Bypass} =	0.00	Unit 2
	F_{Bypass} =	0.00	Unit 3
	F_{acid} =	M_{HF}/M_F	Acid conversion factor: ratio of molecular weights, compound/parent chemical
	M_F =	18.9984	Molecular weight of fluorine
	M_{HF} =	20.0063	Molecular weight of hydrogen fluoride
	F_{acid} =	1.05305393	
	AR =	Annual release of hydrogen fluoride, lb/year	
	EF_{FGD} =	6%	HF emission factor for FGD systems
	$EF_{No\ FGD}$ =	50%	HF emission factor without FGD

AR = Mfg * (EF/100)

$AR_{FGD\ Removal} = (1.0 - F_{Bypass})$ x E_{FGD} x M_{HF}

$AR_{Bypass} = F_{Bypass}$ x EF_{NoFGD} x M_{HF}

$AR_{Total} = AR_{FGD\ Removal} + AR_{Bypass}$

Table NAU - 10 (continued)

Naughton Future Potential Coal Burn and Hydrogen Fluoride Emission Evaluation

Historical Coal Fluoride Concentrations (Parts Per Million)

	2002	2003	2004	2005	2006	Average 2002-2006 Fluoride Concentration ppm
Naughton 1	33.81	33.81	72.50	55.00	57.25	50.47
Naughton 2	33.81	33.81	72.50	55.00	57.25	50.47
Naughton 3	39.85	39.85	85.00	53.00	41.25	51.79

Mfg_{HF} = (Coal, tons/year)*(2000 lb/ton)*(C_{HF} ppm)*($1/10^6$) F_{acid}

Mfg_{HF} Unit 1 = 86,688.1 lbs/year
Mfg_{HF} Unit 2 = 112,520.3 lbs/year
Mfg_{HF} Unit 3 = 177,799.2 lbs/year

$AR_{FGD\ Removal}$ = (1.0 - F_{Bypass}) x EF_{FGD} x Mfg_{HF}
$AR_{FGD\ Removal}$ Unit 1 = (1.0 - 0.0) x (0.06) x (86,688)
$AR_{FGD\ Removal}$ = 5,201.3 lbs/year
AR_{Bypass} = 0.0 lbs/year
$AR_{Total} = AR_{FGD\ Removal} + AR_{Bypass}$
AR_{Total} = 5,201.3 Unit 1 lbs/year

$AR_{FGD\ Removal}$ Unit 2 = (1.0 - 0.0) x (0.06) x (112,520)
$AR_{FGD\ Removal}$ = 6,751.2 lbs/year
AR_{Bypass} = 0.0 lbs/year
$AR_{Total} = AR_{FGD\ Removal} + AR_{Bypass}$
AR_{Total} = 6,751.2 Unit 2 lbs/year

Table NAU - 10 (continued)

Naughton Future Potential Coal Burn and Hydrogen Fluoride Emission Evaluation

$AR_{FGD\ Removal}$ Unit 3 = (1.0 - 0.0) x (0.06) x (177,799)

$AR_{FGD\ Removal}$ = 10,668.0 lbs/year

AR_{Bypass} = 0.0 lbs/year

$AR_{Total} = AR_{FGD\ Removal} + AR_{Bypass}$

AR_{Total} =	10,668.0 Unit 3	lbs/year

Maximum Future Potential Hydrogen Fluoride Emissions

Naughton Unit 1	5,201.3	lbs/year
Naughton Unit 2	6,751.2	lbs/year
Naughton Unit 3	10,668.0	lbs/year
Total Future Potential HF Rate	22,620.5	lbs/year
	11.3	tons/year

Calculation Method:

EPRI LARK-TRIPP *Calculation and Methods for Threshold Determination and Release Estimates*

HF Emission Factor with FGD System: 6%

Subbituminous Coal Emission Factor: 50%

(Table 5-1 Emission Factors for HCL and HF)

Table NAU - 11

Naughton Past Actual Sulfuric Acid Emission Evaluation

Sulfuric Acid Mist Manufactured from Combustion (EPRI LARK-TRIPP method used to calculate sulfuric acid emission rate)

$EM_{Comb} = K*F1*E2$

Where:	EM_{Comb} =	total H_2SO_4 manufactured from combustion, lbs/year
	K =	molecular weight and units conversion constant = (98.07)/(64.04) * 2000
		98.07 = Molecular weight of H_2SO_4
		64.04 = Molecular weight of SO_2
	K =	3,063
	F1 =	Fuel Impact Factor
	F1 =	0.0018 (Subbituminous/PRB coal)
	E2 =	SO_2 mass rate, tons/year

E2 = K1 * K2 * C1 * S1

Where:	K1 =	molecular weight and units conversion constant = (64.04)/(100*32.06)
		64.04 = Molecular weight of SO_2
		32.06 = Molecular weight of S
		100 = conversion of % S to fraction
	K1 =	0.02
	K2 =	Sulfur conversion to SO_2; implicit from EPA AP-42
	K2 =	0.875 (Subbituminous coal)
	C1 =	Coal burn, tons/year
	C1 =	640,447 tons/year (Unit 1 max from NAU-6; November 2005)
	C1 =	832,859 tons/year (Unit 2 max from NAU-6; November 2005)
	C1 =	1,299,371 tons/year (Unit 3 max from NAU-6; November 2005)
	S1 =	Coal sulfur weighted, %

Table NAU - 11 (continued)

Naughton Past Actual Sulfuric Acid Emission Evaluation

	Annual Average Coal Sulfur Concentration (percent)					Average Coal Sulfur Concentration (percent)
	2002	2003	2004	2005	2006	
Naughton Unit 1	0.59	0.57	0.58	0.60	0.58	0.58
Naughton Unit 2	0.59	0.57	0.58	0.61	0.58	0.59
Naughton Unit 3	1.45	1.43	1.34	1.19	1.40	1.36

S1 = 0.58 % (Unit 1)
S1 = 0.59 % (Unit 2)
S1 = 1.36 % (Unit 3)

E2 = 6,543 tons/year (Unit 1)
E2 = 8,528 tons/year (Unit 2)
E2 = 30,949 tons/year (Unit 3)

EM_{Comb} = 36,074 lbs/year (Unit 1)
EM_{Comb} = 47,017 lbs/year (Unit 2)
EM_{Comb} = 170,636 lbs/year (Unit 3)

Table NAU - 11 (continued)

Naughton Past Actual Sulfuric Acid Emission Evaluation

$EM_{FGC} = K_e * B * f_e * I_s$ Total H_2SO_4 manufactured from flue gas conditioning system, lbs/year

Where:

EM_{FGC} = Total H_2SO_4 manufactured from flue gas conditioning system, lbs/year

K_e = 3,799 conversion factor

B = Coal burn in TBtu/year

B = 13.8 TBtu/year Naughton Unit 1 (From NAU-5; March 2006)

B = 17.4 TBtu/year Naughton Unit 2 (From NAU-5; March 2006)

B = 27.6 TBtu/year Naughton Unit 3 (From NAU-5; March 2006)

f_e = Operating factor of flue gas conditioning system (generally = 0.8)

f_e = 0.8 (Assume that FGC system operates 80% of boiler operating time)

I_s = SO_3 injection rate in ppmv at 6% O_2, wet;

I_s = 0 ppmv (Naughton Unit 1)

I_s = 0 ppmv (Naughton Unit 2)

I_s = 8 ppmv (Naughton Unit 3)

EM_{FGC} = 0 lbs/year (Unit 1: Sulfuric Acid Manufactured from Flue Gas Conditioning)

EM_{FGC} = 0 lbs/year (Unit 2: Sulfuric Acid Manufactured from Flue Gas Conditioning)

EM_{FGC} = 671,119 lbs/year (Unit 3: Sulfuric Acid Manufactured from Flue Gas Conditioning)

$ER_{Comb} = EM_{Comb} * F2$ (all that apply)

ER_{Comb} = Sulfuric acid released from combustion

F2 = Technology Impact Factors

F2 = 0.56 (Air Heater Removal of Sulfuric Acid - PRB Coal; Applicable to Naughton Boilers)

F2 = 0.73 (Cold-side ESP - Subbituminous (PRB) Coal; Applicable to Naughton Boilers)

F2 = 0.40 (Wet FGD - PRB Coal; Applicable to Naughton Unit 3)

Table NAU - 11 (continued)

Naughton Past Actual Sulfuric Acid Emission Evaluation

ER_{Comb} =	14,747	lbs/year (Unit 1 Sulfuric Acid Released from Combustion)
ER_{Comb} =	19,221	lbs/year (Unit 2 Sulfuric Acid Released from Combustion)
ER_{Comb} =	27,902	lbs/year (Unit 3 Sulfuric Acid Released from Combustion)

$ER_{FGC} = [EM_{FGC} - (K_e * B * f_e * I_{NH3})] * F3_{FGC} * F_2$ Total H2SO4 released from flue gas conditioning

Where:

ER_{FGC} = Sulfuric Acid Released from Flue Gas Conditioning

EM_{FGC} = Sulfuric acid manufactured from flue gas conditioning

EM_{FGC} = 0 lbs/year (Unit 1)

EM_{FGC} = 0 lbs/year (Unit 2)

EM_{FGC} = 671,119 lbs/year (Unit 3)

K_e = 3,799 conversion factor

B = Coal burn in TBtu/year

B = 13.8 TBtu/year Naughton Unit 1 (From NAU-5; March 2006)

B = 17.4 TBtu/year Naughton Unit 2 (From NAU-5; March 2006)

B = 27.6 TBtu/year Naughton Unit 3 (From NAU-5; March 2006)

f_e = 0.8 (Assume that FGC system operates 80% of boiler operating time)

I_{NH3} = NH_3 injection for dual flue gas conditioning, ppmv at 6% O_2, wet;

I_{NH3} = 0 ppmv Naughton Unit 1

I_{NH3} = 0 ppmv Naughton Unit 2

I_{NH3} = 0 ppmv Naughton Unit 3

$F3_{FGC}$ = Technology Impact Factors for FGC

$F3_{FGC}$ = 0.02 (Subbituminous coal with FGC injection downstream of APH)

Table NAU - 11 (continued)

Naughton Past Actual Sulfuric Acid Emission Evaluation

F2 = Technology Impact Factors

F2 = 0.56 (Air Heater Removal of Sulfuric Acid - PRB Coal; Applicable to Naughton Units)

F2 = 0.73 (Cold-side ESP - Subbituminous (PRB) Coal; Applicable to Naughton Units)

F2 = 0.40 (Wet FGD - PRB Coal; Applicable to Naughton Unit 3)

ER_{FGC} = 0 lbs/year (Unit 1 Sulfuric Acid Released from Flue Gas Conditioning)

0 lbs/year (Unit 2 Sulfuric Acid Released from Flue Gas Conditioning)

2,195 lbs/year (Unit 3 Sulfuric Acid Released from Flue Gas Conditioning)

$ER_{Total} = ER_{Comb} + ER_{FGC}$ Total sulfuric acid released from combustion and from flue gas conditioning

ER_{Total} = 14,747 lbs/year (Unit 1)

ER_{Total} = 19,221 lbs/year (Unit 2)

ER_{Total} = 30,097 lbs/year (Unit 3)

Total Past Actual Sulfuric Acid Emission Rate = 64,065 lbs/year

32.0 tons/year

	Pre-Project FGD (SO_2 scrubber)	Post-Project FGD (SO_2 scrubber)	Pre-Project FGC (flue gas conditioning)	Post-Project FGC (flue gas conditioning)
Naughton Unit 1	No	Yes	No	Yes at 8 ppm
Naughton Unit 2	No	Yes	No	Yes at 8 ppm
Naughton Unit 3	Yes	Yes	Yes at 8 ppm	No

Table NAU - 12

Naughton Future Potential Sulfuric Acid Emission Evaluation

Sulfuric Acid Mist Manufactured from Combustion (EPRI LARK-TRIPP method used to calculate sulfuric acid emission rate)

$EM_{Comb} = K*F1*E2$

Where:	EM_{Comb} =	total H_2SO_4 manufactured from combustion, lbs/year
	K =	molecular weight and units conversion constant = (98.07)/(64.04) * 2000
		98.07 = Molecular weight of H_2SO_4
		64.04 = Molecular weight of SO_2
	K =	3,063
	F1 =	Fuel Impact Factor
	F1 =	0.0018 (Subbituminous/PRB coal)
	E2 =	SO_2 mass rate, tons/year

$E2 = K1 * K2 * C1 * S1$

Where:	K1 =	molecular weight and units conversion constant = (64.04)/(100*32.06)
		64.04 = Molecular weight of SO_2
		32.06 = Molecular weight of S
		100 = conversion of % S to fraction
	K1 =	0.02
	K2 =	Sulfur conversion to SO_2; implicit from EPA AP-42
	K2 =	0.875 (Subbituminous coal)
	C1 =	Future Potential Coal burn, tons/year
	C1 =	815,476 tons/year (Unit 1 future max from page 1 of NAU-10)
	C1 =	1,058,479 tons/year (Unit 2 future max from page 1 of NAU-10)
	C1 =	1,630,059 tons/year (Unit 3 future max from page 1 of NAU-10)
	S1 =	Coal sulfur weighted, %

Table NAU - 12 (continued)

Naughton Future Potential Sulfuric Acid Emission Evaluation

	Annual Average Coal Sulfur Concentration (percent)					Average Coal Sulfur Concentration (percent)
	2002	2003	2004	2005	2006	
Naughton Unit 1	0.59	0.57	0.58	0.60	0.58	0.58
Naughton Unit 2	0.59	0.57	0.58	0.61	0.58	0.59
Naughton Unit 3	1.45	1.43	1.34	1.19	1.40	1.36

S1 = 0.58 % (Unit 1)
S1 = 0.59 % (Unit 2)
S1 = 1.36 % (Unit 3)

E2 = 8,331 tons/year (Unit 1)
E2 = 10,838 tons/year (Unit 2)
E2 = 38,826 tons/year (Unit 3)

EM_{Comb} = 45,933 lbs/year (Unit 1)
EM_{Comb} = 59,754 lbs/year (Unit 2)
EM_{Comb} = 214,062 lbs/year (Unit 3)

Table NAU - 12 (continued)

Naughton Future Potential Sulfuric Acid Emission Evaluation

$EM_{FGC} = K_e * B * f_e * I_s$ Total H_2SO_4 manufactured from flue gas conditioning system, lbs/year

Where:

EM_{FGC} = Total H_2SO_4 manufactured from flue gas conditioning system, lbs/year

K_e = 3,799 conversion factor

B = Future Potential Coal burn in TBtu/year

B = 16.2 TBtu/year (Naughton Unit 1 future maximum from NAU-10)

B = 21.0 TBtu/year (Naughton Unit 2 future maximum from NAU-10)

B = 32.4 TBtu/year (Naughton Unit 3 future maximum from NAU-10)

f_e = Operating factor of flue gas conditioning system (generally = 0.8)

f_e = 0.8 (Assume that FGC system operates 80% of boiler operating time)

I_s = SO_3 injection rate in ppmv at 6% O_2, wet;

I_s = 8 ppmv (Naughton Unit 1)

I_s = 8 ppmv (Naughton Unit 2)

I_s = 0 ppmv (Naughton Unit 3)

EM_{FGC} = 394,026 lbs/year (Unit 1: Sulfuric Acid Manufactured from Flue Gas Conditioning)

EM_{FGC} = 511,169 lbs/year (Unit 2: Sulfuric Acid Manufactured from Flue Gas Conditioning)

EM_{FGC} = 0 lbs/year (Unit 3: Sulfuric Acid Manufactured from Flue Gas Conditioning)

$ER_{Comb} = EM_{Comb} * F2$ (all that apply)

ER_{Comb} = Sulfuric acid released from combustion

F2 = Technology Impact Factors

F2 = 0.56 (Air Heater Removal of Sulfuric Acid - PRB Coal; Applicable to Naughton Boilers)

F2 = 0.73 (Cold-side ESP - Subbituminous (PRB) Coal; Applicable to Unit 1 and Unit 2 Boilers)

F2 = 0.10 (Baghouse - Subbituminous Coal; Applicable to Unit 3 Boiler)

F2 = 0.40 (Wet FGD - PRB Coal; Applicable to Unit 1, Unit 2 and Unit 3 Boilers)

Table NAU - 12 (continued)

Naughton Future Potential Sulfuric Acid Emission Evaluation

ER_{Comb} =	7,511	lbs/year (Unit 1 Sulfuric Acid Released from Combustion)
ER_{Comb} =	9,771	lbs/year (Unit 2 Sulfuric Acid Released from Combustion)
ER_{Comb} =	4,795	lbs/year (Unit 3 Sulfuric Acid Released from Combustion)

$ER_{FGC} = [EM_{FGC} - (K_e * B * f_e * I_{NH3})] * F3_{FGC} * F_2$ Total H2SO4 released from flue gas conditioning

Where:

ER_{FGC} = Sulfuric Acid Released from Flue Gas Conditioning

EM_{FGC} = Sulfuric acid manufactured from flue gas conditioning

EM_{FGC} = 394,026 lbs/year (Unit 1: Sulfuric Acid Manufactured from Flue Gas Conditioning)

EM_{FGC} = 511,169 lbs/year (Unit 2: Sulfuric Acid Manufactured from Flue Gas Conditioning)

EM_{FGC} = 0 lbs/year (Unit 3: Sulfuric Acid Manufactured from Flue Gas Conditioning)

K_e = 3,799 conversion factor

B = Coal burn in TBtu/year

B = 16.2 TBtu/year (Naughton Unit 1 future maximum from NAU-10)

B = 21.0 TBtu/year (Naughton Unit 2 future maximum from NAU-10)

B = 32.4 TBtu/year (Naughton Unit 3 future maximum from NAU-10)

f_e = 0.8 (Assume that FGC system operates 80% of boiler operating time)

I_{NH3} = NH_3 injection for dual flue gas conditioning, ppmv at 6% O_2, wet;

I_{NH3} = 0 ppmv Naughton Unit 1

I_{NH3} = 0 ppmv Naughton Unit 2

I_{NH3} = 0 ppmv Naughton Unit 3

$F3_{FGC}$ = Technology Impact Factors for FGC

$F3_{FGC}$ = 0.02 (Subbituminous coal with FGC injection downstream of APH)

Table NAU - 12 (continued)

Naughton Future Potential Sulfuric Acid Emission Evaluation

F2 = Technology Impact Factors

F2 = 0.56 (Air Heater Removal of Sulfuric Acid - PRB Coal; Applicable to Naughton Boilers)

F2 = 0.73 (Cold-side ESP - Subbituminous (PRB) Coal; Applicable to Unit 1 and Unit 2 Boilers)

F2 = 0.10 (Baghouse - Subbituminous Coal; Applicable to Unit 3 Boiler)

F2 = 0.40 (Wet FGD - PRB Coal; Applicable to Unit 1, Unit 2 and Unit 3 Boilers)

ER_{FGC} = 1,289 lbs/year (Unit 1 Sulfuric Acid Released from Flue Gas Conditioning)

1,672 lbs/year (Unit 2 Sulfuric Acid Released from Flue Gas Conditioning)

0 lbs/year (Unit 3 Sulfuric Acid Released from Flue Gas Conditioning)

$ER_{Total} = ER_{Comb} + ER_{FGC}$ Total sulfuric acid released from combustion and from flue gas conditioning

ER_{Total} = 8,800 lbs/year (Unit 1)

ER_{Total} = 11,443 lbs/year (Unit 2)

ER_{Total} = 4,795 lbs/year (Unit 3)

Total Future Potential Sulfuric Acid Emission Rate = 25,037 lbs/year

12.5 tons/year

	Pre-Project FGD (SO_2 scrubber)	Post-Project FGD (SO_2 scrubber)	Pre-Project FGC (flue gas conditioning)	Post Project FGC (flue gas cond.)
Naughton Unit 1	No	Yes	No	Yes at 8 ppm
Naughton Unit 2	No	Yes	No	Yes at 8 ppm
Naughton Unit 3	Yes	Yes	Yes at 8 ppm	No

Table NAU - 13

Naughton Past Actual Lead Emission Evaluation

Lead emissions calculated using AP-42 Table 1.1-16 9/98

Lead emissions (lb/10^{12} Btu) = 3.4 * (C/A * PM)$^{0.80}$

C = milligrams/kilogram (lead cncentration in coal)

A= percent ash in coal

PM = average particulate matter emission rate lb/MMBtu

	Annual Average Coal Lead Concentration (C) (ppm)					Average Coal Lead Concentration (C) (ppm)
	2002	2003	2004	2005	2006	
Naughton Unit 1	1.92	1.92	2.00	2.00	2.00	1.97
Naughton Unit 2	1.92	1.92	2.00	2.00	2.00	1.97
Naughton Unit 3	1.92	1.92	2.00	2.33	2.00	2.03

	Annual Average Coal Ash Concentration (A) (percent)					Average Coal Ash Concentration (A) (percent)
	2002	2003	2004	2005	2006	
Naughton Unit 1	4.34%	5.02%	5.20%	4.32%	4.97%	4.77%
Naughton Unit 2	4.38%	5.01%	5.22%	4.27%	5.01%	4.78%
Naughton Unit 3	4.88%	5.19%	5.62%	5.60%	5.53%	5.36%

Table NAU - 13 (continued)

Naughton Past Actual Lead Emission Evaluation

	Annual Average Particulate Matter Emission Rate (PM) (lb/MMBtu)					Average PM Emission Rate (PM) (lb/MMBtu)
	2003	2004	2005	2006	2007	
Naughton Unit 1	0.023	0.030	0.005	0.056	0.028	0.028
Naughton Unit 2	0.020	0.022	0.024	0.064	0.060	0.038
Naughton Unit 3	0.094	0.021	0.019	0.015	0.033	0.036

	Maximum Past Annual Heat Input (MMBtu/year)	Reference
Naughton Unit 1	13,805,514	NAU-5; March 2006
Naughton Unit 2	17,391,700	NAU-5; March 2006
Naughton Unit 3	27,602,638	NAU-5; March 2006

	Average Lead Concentration (C) (ppm)	Average Coal Ash Concentration (A) (weight fraction)	Average Particulate Matter Emission Rate (PM) (lb/MMBtu)	Annual Lead Emission Rate ($lb/10^{12}Btu$)
Naughton Unit 1	1.97	0.0477	0.028	3.86
Naughton Unit 2	1.97	0.0478	0.038	4.87
Naughton Unit 3	2.03	0.0536	0.036	4.40

Table NAU - 13 (continued)

Naughton Past Actual Lead Emission Evaluation

	Annual Lead Emission Rate ($lb/10^{12}$ Btu)	Annual Heat Input (10^{12} Btu/year)	Annual Lead Emission Rate (lb/year)	Annual Lead Emission Rate (tons/year)
Naughton Unit 1	3.86	13.8	53.3	0.03
Naughton Unit 2	4.87	17.4	84.6	0.04
Naughton Unit 3	4.40	27.6	121.5	0.06
Total			259.4	0.13

Maximum Past Actual Lead Emission Rate:	0.13 tons/year

Table NAU - 14

Naughton Future Potential Lead Emission Evaluation

Lead emissions calculated using AP-42 Table 1.1-16 9/98

Lead emissions ($lb/10^{12}$ Btu) = $3.4 * (C/A * PM)^{0.80}$

C = milligrams/kilogram (lead cncentration in coal)

A= percent ash in coal

PM = average particulate matter emission rate lb/MMBtu

	Annual Average Coal Lead Concentration (C) (ppm)					Average Coal Lead Concentration (C) (ppm)
	2002	2003	2004	2005	2006	
Naughton Unit 1	1.92	1.92	2.00	2.00	2.00	1.97
Naughton Unit 2	1.92	1.92	2.00	2.00	2.00	1.97
Naughton Unit 3	1.92	1.92	2.00	2.33	2.00	2.03

	Annual Average Coal Ash Concentration (A) (percent)					Average Coal Ash Concentration (A) (percent)
	2002	2003	2004	2005	2006	
Naughton Unit 1	4.34%	5.02%	5.20%	4.32%	4.97%	4.77%
Naughton Unit 2	4.38%	5.01%	5.22%	4.27%	5.01%	4.78%
Naughton Unit 3	4.88%	5.19%	5.62%	5.60%	5.53%	5.36%

Table NAU - 14 (continued)

Naughton Future Potential Lead Emission Evaluation

	Future Post-Project Particulate Matter Emission Rate (PM) (lb/MMBtu)
Naughton Unit 1	0.042
Naughton Unit 2	0.054
Naughton Unit 3	0.015

	Future Potential Annual Heat Input (MMBtu/year)	Reference
Naughton Unit 1	16,206,000	Table NAU-10
Naughton Unit 2	21,024,000	Table NAU-10
Naughton Unit 3	32,412,000	Table NAU-10

	Average Lead Concentration (C) (ppm)	Average Coal Ash Concentration (A) (weight fraction)	Post-Project Particulate Matter Emission Rate (PM) (lb/MMBtu)	Annual Lead Emission Rate ($lb/10^{12}Btu$)
Naughton Unit 1	1.97	0.0477	0.042	5.28
Naughton Unit 2	1.97	0.0478	0.054	6.45
Naughton Unit 3	2.03	0.0536	0.015	2.17

Table NAU - 14 (continued)

Naughton Future Potential Lead Emission Evaluation

	Annual Lead Emission Rate ($lb/10^{12}$ Btu)	Annual Heat Input (10^{12} Btu/year)	Annual Lead Emission Rate (lb/year)	Annual Lead Emission Rate (tons/year)
Naughton Unit 1	5.28	16.2	85.6	0.04
Naughton Unit 2	6.45	21.0	135.6	0.07
Naughton Unit 3	2.17	32.4	70.2	0.04
Total			291.4	0.15

Maximum Future Potential Lead Emission Rate: 0.15 tons/year

Table NAU - 15

Naughton Past Actual Carbon Monoxide Emission Evaluation

Carbon monoxide emissions calculated using AP-42 Table 1.1-3 9/98

Carbon monoxide AP-42 emission factor = 0.5 lb/ton (0.5 lb of CO emitted per ton of coal burned)

	Maximum Past Actual Annual Coal Burn Rate (tons/year)	Reference	Carbon Monoxide Emission Factor lb/ton	Annual CO Emission Rate lb/year	Annual CO Emission Rate tons/year
Naughton Unit 1	640,447	NAU-6; November 2005	0.5	320,224	160.1
Naughton Unit 2	832,859	NAU-6; November 2005	0.5	416,429	208.2
Naughton Unit 3	1,299,371	NAU-6; November 2005	0.5	649,685	324.8
Total				1,386,338	693.2

Maximum Past Actual Units 1-3 Stack Carbon Monoxide Emission	693.2 tons/year

Maximum Past Actual Non-Stack CO Emissions

Emissions Source	Maximum Past Actual Non-Stack CO Emission Rate (tons/year)
Diesel-Fired Emergency Generator Engine - Unit 1	0.0
Diesel-Fired Emergency Generator Engine - Unit 2	0.0
Diesel-Fired Emergency Generator Engine - Unit 3	0.0
Diesel-Fired Emergency Generator Engine - FGD	0.0
Diesel-Fired Emergency Fire Pump Engine	0.3
Used Oil-Fired Space Heater (350,000 Btu/hour)	0.0
Used Oil-Fired Space Heater (235,000 Btu/hour)	0.0
Total Maximum Non-Stack CO Emission Rate (tons/year)	0.4

Total Maximum Past Actual CO Emission Rate Stack and Non-Stack Emissions (tons/year)	693.6

Table NAU - 16

Naughton Future Potential Carbon Monoxide Emission Evaluation

Step 1: Calculate future potential Unit 1 and Unit 2 CO emissions based on post-low-NO_X project emission limits

	Maximum Boiler Heat Input Rate (MMBtu/hour)	Post-Project Carbon Monoxide Emission Limit (lb/MMBtu)	Maximum Annual Boiler Operational Time (hours/year)	Post-Project Annual Carbon Monoxide Emission Rate (tons/year)
Naughton Unit 1	1,850	0.25	8,760	2,025.8
Naughton Unit 2	2,400	0.25	8,760	2,628.0

Step 2: Identify maximum future potential Unit 3 CO emission rate

	Maximum Future Potential Coal Burn Rate (from NAU-10) (tons/year)	Carbon Monoxide AP-42 Emission Factor (lb/ton)	Post-Project Annual Carbon Monoxide Emission Rate (tons/year)
Naughton Unit 3	1,630,059	0.5	407.5

Step 3: Identify total annual post-low-NO_X control project annual carbon monoxide emission rate

	Post-Project Annual Carbon Monoxide Emission Rate (tons/year)
Naughton Unit 1	2,025.8
Naughton Unit 2	2,628.0
Naughton Unit 3	407.5
Non-Stack	0.4
Total	5,061.7

Table NAU - 17

Naughton Past Actual VOC Emission Evaluation

Volatile Organic Compound emissions calculated using AP-42 Table 1.1-19 9/98

VOC AP-42 emission factor = 0.06 lb/ton (0.06 lb of VOC emitted per ton of coal burned)

	Maximum Past Actual Annual Coal Burn Rate (tons/year)	Reference	VOC Emission Factor lb/ton	Annual VOC Emission Rate lb/year	Annual VOC Emission Rate tons/year
Naughton Unit 1	640,447	NAU-6; November 2005	0.06	38,427	19.2
Naughton Unit 2	832,859	NAU-6; November 2005	0.06	49,972	25.0
Naughton Unit 3	1,299,371	NAU-6; November 2005	0.06	77,962	39.0
Total				166,361	83.2

Maximum Past Actual Units 1-3 Stack VOC Emission Rate:	83.2 tons/year

Maximum Past Actual Non-Stack VOC Emissions

Emissions Source	Maximum Past Actual Non-Stack CO Emission Rate (tons/year)
Diesel-Fired Emergency Generator Engine - Unit 1	0.0
Diesel-Fired Emergency Generator Engine - Unit 2	0.0
Diesel-Fired Emergency Generator Engine - Unit 3	0.0
Diesel-Fired Emergency Generator Engine - FGD	0.0
Diesel-Fired Emergency Fire Pump Engine	0.1
Used Oil-Fired Space Heater (350,000 Btu/hour)	0.0
Used Oil-Fired Space Heater (235,000 Btu/hour)	0.0
Total Maximum Non-Stack VOC Emission Rate (tons/year)	0.1

Total Maximum Past Actual VOC Emission Rate Stack and Non-Stack Emissions (tons/year)	83.3

Table NAU - 18

Naughton Future Potential VOC Emission Evaluation

Volatile Organic Compound emissions calculated using AP-42 Table 1.1-19 9/98

VOC AP-42 emission factor = 0.06 lb/ton (0.06 lb of VOC emitted per ton of coal burned)

	Maximum Future Potential Annual Coal Burn Rate (tons/year)	Reference	VOC Emission Factor lb/ton	Annual VOC Emission Rate lb/year	Annual VOC Emission Rate tons/year
Naughton Unit 1	815,476	from NAU-10	0.06	48,929	24.5
Naughton Unit 2	1,058,479	from NAU-10	0.06	63,509	31.8
Naughton Unit 3	1,630,059	from NAU-10	0.06	97,804	48.9
Non-Stack	NA	NA	NA	285	0.1
Total				210,526	105.3

Maximum Future Potential VOC Emission Rate:	105.3 tons/year

Appendix E: Permit Application Form

This appendix includes a completed Wyoming Department of Environmental Quality Air Quality Division permit application form.

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION

PERMIT APPLICATION FORM

Date of Application: March 7, 2008

1. Name of Firm or Institution: PacifiCorp Energy - Naughton Power Plant

2. Mailing Address

P.O. Box 191		Kemmerer	Wyoming
Number	Street	City	State
Lincoln	83101	(307) 828-4211	
County	Zip	Telephone	

3. Plant Location

6 Miles Southwest of Kemmerer		Kemmerer	Wyoming
Number	Street	City	State
Lincoln	83101	(307) 828-4211	
County	Zip	Telephone	

4. Name of owner or company official to contact regarding air pollution matters

Bill Lawson	Director- Engineering and Environmental	(801) 220-4581
Name	Title	Telephone

1407 West North Temple		Salt Lake City	Utah	84116
Number	Street	City	State	Zip

5. General nature of business

The Naughton facility is a coal-fired plant used to generate electricity

6. Permit application is made for: ___ New Construction _X_ Modification
___ Relocation ___ Operation

7. Type of equipment to be constructed, modified, or relocated. (List each major piece of equipment separately.)

PacifiCorp plans to install flue gas conditioning systems (FGC) on Unit 1 and Unit 2, replace the existing Unit 3 electrostatic precipitator (ESP) with a new pulse jet fabric filter baghouse, rebuild and upgrade the Unit 3 steam turbine, install flue gas desulfurization systems (FGD) on Unit 1 and Unit 2, and install low-NO_X burner systems on the Unit 1 and Unit 2 boilers.

The purpose of the Unit 1 and Unit 2 flue gas conditioning systems is to lower fly ash resistivity and enhance ESP efficiency and particulate matter collection; the replacement of the Unit 3 electrostatic precipitator with a fabric filter baghouse will significantly reduce the particulate matter emission rate of Unit 3; the Unit 3 turbine upgrade project will improve the thermodynamic efficiency of the Unit 3 steam turbine without an increase of steam flow or boiler heat input (coal combustion); the Unit 1 and Unit 2 FGD systems will result in lower sulfur dioxide emission rates; and the Unit 1 and Unit 2 low-NO_X burner projects will result in lower NO_X emission rates.

8. If application is being made for operation of an existing source in a new location, list previous location and new location:

Previous Location: Not Applicable

New Location:

9. If application is being made for a crushing unit, is there: (mark all appropriate boxes)

Not applicable. Identified projects are being constructed to:

- Enhance Unit 1 electrostatic precipitator particulate matter collection efficiency (Unit 1 flue gas conditioning system)
- Enhance Unit 2 electrostatic precipitator particulate matter collection efficiency (Unit 2 flue gas conditioning system)
- Reduce Unit 3 particulate matter emission rate (Unit 3 pulse jet fabric filter baghouse)
- Improve thermodynamic efficiency of the Unit 3 turbine-generator (Unit 3 turbine upgrade)
- Reduce Unit 1 SO_2 emission rate (Unit 1 FGD scrubber)
- Reduce Unit 2 SO_2 emission rate (Unit 2 FGD scrubber)
- Reduce Unit 1 NO_X emission rate (Unit 1 low-NO_X burners)
- Reduce Unit 2 NO_X emission rate (Unit 2 low-NO_X burners)

No material crushing equipment is associated with the listed projects.

10. Materials used in unit or process (include solid fuels): Not applicable. The listed projects are being installed to enhance the performance of the Unit 1 and Unit 2 electrostatic precipitators to facilitate continuous compliance with the applicable 40 percent opacity standard; to reduce the particulate matter emission rate from Unit 3; to increase the Unit 3 electro-generator output through thermodynamic efficiencies gained from the turbine upgrade; and to reduce the Unit 1 and Unit 2 SO_2 and NO_X emission rates. The listed projects will not alter the coal throughput or heat input capacities of the boiler units.

Type of Material	Process Weight Average (lb/hr)	Process Weight Maximum (lb/hr)	Quantity/Year
Coal (Unit 1)			815,476 tons (maximum)
Coal (Unit 2)			1,058,479 tons (maximum)
Coal (Unit 3)			1,630,059 tons (maximum)

11. Air contaminants emitted:

The flue gas conditioning projects have the potential to change the characteristics of the air pollutants being discharged from the Naughton Unit 1 and Unit 2 stacks, including a potential increase in H_2SO_4 emissions. The replacement of the Unit 3 ESP with a pulse jet fabric filter will not change the characteristics of the pollutants being discharged from the Unit 3 stack; however, the project will result in a reduction of the particulate matter emission rate from the source. The Unit 3 turbine upgrade will have no effect on the characteristics of the pollutants being discharged from the Unit 3 stack. The Units 1 and 2 flue gas desulfurization systems will reduce SO_2 pollutants being emitted from the Units 1 and 2 stacks. The Units 1 and 2 low-NO_X burners will reduce NO_X pollutants being emitted from the Units 1 and 2 stacks and may result in an increase in CO emissions.

The Unit 1 and Unit 2 flue gas conditioning system installations will assist each emission source in meeting its applicable 40 percent opacity standard. Each FGC system includes a combustion unit that will incinerate elemental sulfur to produce sulfur dioxide gas (SO_2). After formation, the SO_2 flows through a vanadium-based catalyst with converts the SO_2 to sulfur trioxide (SO_3). The SO_3 gas is emitted into the boiler coal combustion flue gas stream and reacts with the water vapor inherent in the flue gas to form sulfuric acid (H_2SO_4). The sulfuric acid nucleates on the particulate matter (fly ash) entrained in the flue gas stream and lowers its resistivity, enhancing collection in the electrostatic precipitators. Although the majoring of the sulfuric acid formed from the combustion of elemental sulfur in the flue gas conditioning systems is co-collected with fly ash in the electrostatic precipitators, a fraction of the H_2SO_4 "slips" by the ESP and is emitted to atmosphere.

Unit 1 currently has a particulate matter emission rate equivalent to 0.24 lb/MMBtu heat input and Unit 2 has a particulate matter emission rate equivalent to 0.23 lb/MMBtu heat input. Following installation of the Units 1 and 2 flue gas conditioning systems the emission rate from Unit 1 will be equivalent to 0.042 lb/MMBtu heat input (78 lb/hour) and the emission rate from Unit 2 will be equivalent to 0.054 lb/MMBtu (130 lb/hour).

Unit 3, which currently utilizes an electrostatic precipitator as pollution control for particulate matter, has a particulate matter emission rate equivalent to 0.21 lb/MMBtu heat input. Following the installation of the fabric filter baghouse the emission rate from Unit 3 will be equivalent to an annual limit of 0.015 lb/MMBtu (56 lb/hour).

Following completion of the low-NO_X burner projects Unit 1 and Unit 2 will each have an annual NO_X emission rate of 0.26 lb/MMBtu. Furthermore, PacifiCorp requests that existing Naughton Title V operating permit 3-1-121-1 condition (F5)(b) that caps annual Units 1, 2 and 3 NO_X emissions at 15,140 tons/year be amended to a plantwide applicability limitation (PAL) at issuance of the requested construction permit. The 15,140 ton/year PAL will be reduced to 11,104.7 tons/year following completion of the Unit 1 and Unit 2 low-NO_X control projects.

Because the installation of the Units 1 and 2 low-NO_X control projects may increase emissions of carbon monoxide, a 30-day rolling average CO limit of 0.25 lb/MMBtu (463 lb/hour) is requested for Unit 1 and a 30-day rolling average CO limit of 0.25 lb/MMBtu (600 lb/hour) is requested for Unit 2 following completion of the respective boiler low-NO_X projects.

Following completion of the Unit 1 and Unit 2 FGD installations it is requested that a 12-month rolling average SO_2 limit of 0.15 lb/MMBtu be applied to each unit. Furthermore, it is requested that a 3-hour fixed block average SO_2 limit of 833 lb/hour be applied to Unit 1 and a 1,080 lb/hour 3-hour fixed block average SO_2 limit be applied to Unit 2 following completion of the Unit 1 and Unit 2 FGD scrubber installations.

Following completion of the Unit 1 and Unit 2 FGD installations it is requested that an SO_2 PAL be established at a 12-month rolling average limit of 8,924.1 tons/year.

Because the installation of the Unit 1 and Unit 2 flue gas conditioning systems may increase the emission rate of sulfuric acid (H_2SO_4), it is requested that an SO_3 injection rate limit of 8 ppm on a 30-day rolling average basis be applied to Units 1 and 2 following installation of the flue gas conditioning systems. The existing Unit 3 flue gas conditioning system will be retired from service following completion of the fabric filter baghouse installation scheduled to occur in 2014.

Calculations of the Emission Estimates

Summary of Past Actual Annual Emissions

Naughton	SO_2 tons/yr	NO_x tons/yr	PM_{10} tons/yr	VOC tons/yr	CO tons/yr	H_2SO_4 tons/yr	Lead tons/yr	Fluorides tons/yr
Stack Emissions Units 1-3	22,289.2	14,733.9	1,301.4	83.2	693.2	32.0	0.13	43.4
Non-Stack Emissions	21.1	1.8	530.3	0.1	0.4	0.0	0.00	0.0
Total Past Actual Emissions	22,310.3	14,735.7	1,831.7	83.3	693.6	32.0	0.13	43.4
Stack Emissions Unit 3 Only	6,070.7	6,223.0	638.1					

Summary of Projected Annual Emissions

	SO_2 tons/yr	NO_x tons/yr	PM_{10} tons/yr	VOC tons/yr	CO tons/yr	H_2SO_4 tons/yr	Lead tons/yr	Fluorides tons/yr
Stack Emissions Units 1-3	8,903.0[c]	11,102.9[c]	1,151.1	105.2	5,061.3	12.5	0.15	11.3
Non-Stack Emissions	21.1	1.8	530.3	0.1	0.4	0.0	0.00	0.0
Total Future Potential Emissions	8,924.1	11,104.7	1,681.4	105.3	5,061.7	12.5	0.15	11.3
Stack Emission Unit 3 Only	6,070.7	6,223.0	632.0					

[c] NO_X and SO_2 stack emission rates include 40 ton / year PSD significance threshold values used in setting requested PALs

Evaluation of significance levels by pollutant

To determine if a Prevention of Significant Deterioration significance level has been reached the past actual annual emissions are subtracted from the Projected Annual Emissions

Units 1-3

Naughton Permitted Projects: • **Units 1 and 2 flue gas conditioning systems** • **Units 1 and 2 flue gas desulfurization systems** • **Unit 3 fabric filter baghouse** • **Units 1 and 2 low-NOX burners** • **Unit 3 turbine upgrade** • **Other plant projects**	**Past Actual tons/year**	**Future Potential tons/year**	**Future Potential minus Past Actual tons/year**	**PSD Review Significance Level tons/year**	**Is Emission Increase greater than Significance Level**
SO_2	22,310.3	8,924.1	-13,386.2	40	No
NO_X	14,735.7	11,104.7	-3,631.0	40	No
PM_{10}	1,831.7	1,681.4	-150.3	25	No
CO	693.6	5,061.7	4,368.1	100	Yes
Ozone (as VOC)	83.3	105.3	22.0	40	No
Fluoride (as HF)	43.4	11.3	-32.1	3	No
Lead	0.13	0.15	0.02	0.6	No
H_2SO_4	32.0	12.5	-19.5	7	No

12. Air contaminant control equipment:

Emission Point	Type	Pollutant Removed	Efficiency
Unit 1 Stack	• Electrostatic Precipitator • Flue Gas Conditioning System • Low-NO_X Burners • FGD System	Particulate Matter NO_X SO_2	This equipment is expected to reduce particulate matter emissions from 0.24 lb/MMBtu heat input (pre-project emission rate) to 0.042 lb/MMBtu heat input (post-Unit 1 flue gas conditioning project emission rate); reduce NO_X emissions to 0.26 lb/MMBtu and reduce SO_2 emissions to 0.15 lb/MMBtu on an annual average basis
Unit 2 Stack	• Electrostatic Precipitator • Flue Gas Conditioning System • Low-NO_X Burners • FGD System	Particulate Matter	This equipment is expected to reduce particulate matter emissions from 0.23 lb/MMBtu heat input (pre-project emission rate) to 0.054 lb/MMBtu heat input (post-Unit 2 flue gas conditioning project emission rate); reduce NO_X emissions to 0.26 lb/MMBtu and reduce SO_2 emissions to 0.15 lb/MMBtu on an annual average basis
Unit 3 Stack	Pulse Jet Fabric Filter Baghouse	Particulate Matter	This equipment is expected to reduce particulate matter emissions from 0.21 lb/MMBtu heat input (pre-project emission rate) to 0.015 lb/MMBtu heat input (post-project emission rate) on an annual average basis

13. Type of combustion unit: (check if applicable):

A. Coal

1. *Pulverized* _X_:
General ___; Dry Bottom X; Wet Bottom _; With Flyash Reinjection __;
Without Flyash Reinjection ___; Other _Tangentially-Fired
2. *Spreader Stoker* ___:
With Flyash Reinjection ___; Without Flyash Reinjection ___; Cyclone ___;
Hand-Fired ___; Other

B. Fuel Oil
Horizontally Fired ___ Tangentially Fired

Type of combustion unit:(check if applicable):

C. Natural Gas

D. If other, please specify

Hourly fuel consumption (estimate for new equipment) Not Applicable

Size of combustion unit 1,850 MMBtu/hour (Naughton Unit 1)
2,400 MMBtu/hour (Naughton Unit 2)
3,700 MMBtu/hour (Naughton Unit 3)

14. Operating Schedule: ___24__ hours/day; ___7___ days/week; __52___ weeks/year.

Peak production season (if any):

15. Fuel analysis: Not applicable. The planned projects include the installation of pollution control equipment (Units 1 and 2 flue gas conditioning systems; low-NO_X burners and flue gas desulfurization systems; and Unit 3 fabric filter baghouse) to control particulate matter emissions, SO_2 emissions and NO_X emissions. The requested projects will not change the amount of fuel burned or the capacity of the generating units.

	COAL	FUEL OIL	NATURAL GAS
% Sulfur			
% Ash			
BTU Value			

16. Not applicable. The planned projects include the installation of pollution control equipment (Units 1 and 2 flue gas conditioning systems; low-NO_X burners and flue gas desulfurization systems; and Unit 3 fabric filter baghouse) to control particulate matter emissions, SO_2 emissions and NO_X emissions. The requested projects will not change the amount of fuel burned or the capacity of the generating units.

Products	Quantity/Year

17. Emissions to the atmosphere (each point of emission should be listed separately and numbered so that it can be located on the flow sheet):

Emission Point	Stack Height (ft)	Stack Diameter (ft)	Gas Discharge SCFM	Exit Temp (^{O}F)	Gas Velocity (ft/s)
Unit 1 Stack	200	14 (exit I.D.)	780,000	130	84
Unit 2 Stack	225	16 (exit I.D.)	840,000	130	70
Unit 3 Stack	475	27.5 (exit I.D.)	1,500,000	130	42

18. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

X Yes ___ No

Is this material stored in piles or in some other way as to make possible the creation of dust problems?

X Yes ___ No

Not applicable. The planned projects include the installation of pollution control equipment (Units 1 and 2 flue gas conditioning systems; low-NO_X burners and flue gas desulfurization systems; and Unit 3 fabric filter baghouse) to control particulate matter emissions, SO_2 emissions and NO_X emissions. The requested projects will not change the amount of fuel burned or the capacity of the generating units.

18. Continued:
List storage pile (if any):

Type of Material	Particle Size (Diameter or Screen Size)	Pile Size (Average Tons on Pile)	Pile Wetted (Yes or No)	Pile Covered (Yes or No)

19. Using a flow diagram:

(1) Illustrate input of raw materials.

(2) Label production processes, process fuel combustion, process equipment, and air pollution control equipment.

(3) Illustrate locations of air contaminant release so that emission points under items 11, 12 and 17 can be identified. For refineries show normal pressure relief and venting systems. Attach extra pages as needed.

20. A site map should be included indicating the layout of facility at the site. All buildings, pieces of equipment, roads, pits, rivers and other such items should be shown on the layout.

21. A location drawing should be included indicating location of the facility with respect to prominent highways, cities, towns, or other facilities (include UTM coordinates).

"I certify to the accuracy of the plans, specifications, and supplementary data submitted with this application. It is my Opinion that any new equipment installed in accordance with these submitted plans and operated in accordance with the manufacturer's recommendations will meet emission limitations specified in the Wyoming Air Quality Standards and Regulations."

Signature		Typed Name	John Schreurs
Title	Plant Managing Director	Company	PacifiCorp Energy
Mailing Address	P. O. Box 191	Telephone No.	(307) 828-4211
City	Kemmerer	State	Wyoming Zip 83101
P.E. Registration (if applicable)			
State where registered			