Appendix 9-11: Documentation of Emission Reductions

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Table 9-11.1 Changes in Emissions

Acct	Company	note	unit	PTE level NOX (tpy)	PTE level SO2 (tpy)	PTE level PM10 (tpy)	2002 NOX actual (tpy)	2002 SO2 actual (tpy)	2002 PM_{10} actual (tpy)	NOX Change (tpy)	SO2 change (tpy)	PM_{10} change (tpy)
CY0019H	Targa	shutdown all BART	c-20	0	0		96.44	0.12	0.215			
		equipment	c-21	0	0		119.7	0.15	0.267			
			c-22	0	0		113.28	0.008	0.015			
			c-23	0	0		6.64	0.025	0.04	336.06	0.30	0.54
JE0039N	Goodyear	PTE reductions	040flare	1.94	0.01		0	0	0			
			070flare	0	0		0	0	0			
			116p-gcmp	2.24	0.15		0.118	0.119				
			116p-gtrk	0.55	0.03		0.229	0.118				
			116s-b104	40.01	5.28		187.9	0.51	2.88			
			116s-b105	34.16	5.28		0.08	0.001	0.01			
			116s-b501	0.1286	0.0119		1.13	0.091				
			116s-g305	10.86	0.72		0.09	0.006				
			116s-g307	10.86	0.72		0.319	0.02		89.12	(11.34)	2.89
HR0018T	Valence	shutdown		0	0	0	247.1	2743.47	5.56	247.10	2,743.47	5.56
WH0014S	Saint Gobain	shutdown unit	f-22	0	0	0	62.59	16.41	59.9	62.59	16.41	59.90
MC0002H	Tilden Gas	Tilden	SULP1&2	0	0		2	2276	0.2	2.00	2,276.00	0.20
HH0019H	Norit	Norit	Mainstack, k2ererstk, k3emerstk, k4emerstk									
HG0126Q	Celanese	ownership transfer of incinerators; shutdown of FIN 55MH1 in 2005	60MN108, 60mn109, 63mn460; 55MH1				694					
JE0067I	Exxon	estimate based on EA reductions in 24-hr rates applied to 2002 EI		2204	1815	668	3870.554	9747.265	573.6395	1,666.55	7,932.27	(94.36)
BG0045E	Capital Cement	shutdown wet kiln	KS-1B	0	0	0	1328	1193	100	1,328.00	1,193.00	100.00
		sum		2304.7486	1827.2019	668	6730.17	15977.313	742.7265	4,425.42	14,150.11	74.73

note 1 permit limits S02+NOx to 841 tpy on grandfathered BART sources. Actual 2002emissions from these units are 8 tpy

Capital Aggregates, Capital Cement Plant

BG0045E

CAPITOL CEMENT
P.O. BOX 33240, SAN ANTONIO, TEXAS 78265-3240, AREA CODE 210 871-7000

RECEIVED
DEC 28 2006
AIR QUALITY PLANNING

December 22, 2006

Mr. Richard Hyde, P.E.
Director, Air Permits Division
Texas Commission on Environmental Quality
12100 Park 35 Circle, MC-163
Austin, Texas 78753

Subject: Best Available Retrofit Technology
Capitol Aggregates, Ltd
Capitol Cement Plant
Regulated Entity Number: RN100211507
Customer Reference Number: CN601600802

Dear Mr. Hyde:

Capitol Aggregates, Ltd owns and operates the Capitol Cement Plant (San Antonio Plant) in San Antonio, Bexar County, Texas. The San Antonio Plant was identified by the Texas Commission on Environmental Quality (TCEQ) as a facility operating a source that contributes to the Regional Haze Issue in a Class I area. This letter is being submitted to notify the TCEQ that the only source (Wet Kiln) subject to the additional analysis for NO_x and SO_x was permanently shutdown on December 15, 2006. Therefore, the Engineering Analysis required to be submitted by April 31, 2007 is no longer required.

Should you have any questions regarding this notification, please don't hesitate to call me at (210) 871-7033 or Gary Burgess at (210) 871-7214.

Sincerely,

Capitol Aggregates, Ltd.

Tom Spaits
Plant Manager

cc: Ms. Margaret Earnest, TCEQ – Austin
Ms. Kathy Pendleton, TCEQ - Austin
Mr. Gary Burgess, Capitol – San Antonio
Mr. Joseph Marini, RMT - Austin

Celanese Ltd., Clear Lake Plant

HG0126Q

Clear Lake Plant

Celanese LTD
9502 Bayport Blvd.
Pasadena, TX 77507
Mailing Address:
P.O. Box 58190
Houston, TX 77258-8190

Telephone: 281-474-6200

Celanese
CHEMICALS

August 1, 2006
RSP-020-06

Texas Commission on Environmental Quality (TCEQ)
Office of Permitting, Remediation, and Registration
Air Permits Division (MC-162)
P.O. Box 13087
Austin, TX 78711-3087

Re: Celanese Ltd., Clear Lake Plant
Air Permit No. 264
Acrylates I Incinerators
Pasadena, Texas; Harris County
TCEQ Account No. HG-0126-Q
RN100227016

On June 28, 2006, the three (3) on-site incinerators (60MN108INC; 60MN109INC and 63MN460INC) were officially transferred to The Dow Chemical Company (Dow). In a letter dated July 26, 2006, Dow submitted a Change of Ownership Notification for the three (3) incinerators to be transferred from Permit 264 to Dow issued air permits. For your convenience, a copy of the notifications has been provided as Attachment 1. Given the assets will be transferred into Dow's issued permits, Celanese authorizes the TCEQ to complete the transfer. Once complete, Celanese respectfully requests that the TCEQ denote the Celanese issued permit 264 as VOID.

Should you have any questions concerning this submittal, please contact Mrs. Jan Day at (281) 474-8802.

Sincerely,

Rhonda S. Perry for Jan Day

Jan Day
Environmental Affairs

cc: TCEQ Region 12
HCPCD
City of Pasadena

NSR	26477	EXEMPTION OR PERMIT BY RULE	ISSUED	116109	0352,0512	CHEVRON USA INC	CN600132
NSR	26423	STANDARD EXEMPTION OR PERMIT BY RULE	ISSUED	117484	0352	DUKE ENERGY FIELD SERVICES LP	CN601229
NSR	26414	STANDARD EXEMPTION OR PERMIT BY RULE	ISSUED	124062	0005	TEMIC AUTOMOTIVE OF NORTH AMERICA INC	CN603069
NSR	264	CONSTRUCTION PERMIT	VOID	124092	0000	CELANESE LTD	CN600130
NSR	2642	CONSTRUCTION PERMIT	ISSUED	124181	0000	TIN INC DBA TEMPLE-INLAND	CN602787
NSR	26404	STANDARD EXEMPTION OR PERMIT BY RULE		127735	0000	EXXON MOBIL CORPORATION	CN600123

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Clear Lake Plant

Celanese LTD
9502 Bayport Blvd.
Pasadena, TX 77507
Mailing Address:
P.O. Box 58190
Houston, TX 77258-8190

Celanese
CHEMICALS

August 7, 2006
RSP-018-06

Mr. Frank Muser
Texas Commission on Environmental Quality
Office of Permitting, Remediation, and Registration
Air Permits Division, Operating Permits MC-163
12100 Park 35 Circle
Austin, Texas 78753

Re: Celanese Ltd. – Clear Lake Plant
Title V Permit Number O-1893
Regulated Entity Number: RN100227016
Customer Reference Number: CN600130850

Dear Mr. Muser:

On June 28, 2006, the three (3) on-site incinerators (60MN108INC; 60MN109INC and 63MN460INC) were officially transferred to the Dow Chemical Company. In a letter dated July 26, 2006, the Dow Chemical Company requested a minor revision to incorporate the incinerators into their existing Title V permits. This letter requests the removal of the incinerators from the Celanese Consolidated Title V permit (O-~~1983~~ 1893). The following attachments are submitted to facilitate the request:

- Form OP-CRO1
- Form OP-2
- Form OP-SUMR
- Form OP-UA15 (Strike Out)
- Form OP-UA58 (Strike Out)

If there are questions about this submittal or if clarification of any of the information is needed, please contact Rhonda S. Perry at (281) 474-6257.

Sincerely,

William A. Chidester
Utilities Section Leader

Rhonda S. Perry
Environmental Affairs

Perr-6

Kathleen Hartnett White, *Chairman*
Larry R. Soward, *Commissioner*
Martin A. Hubert, *Commissioner*
Glenn Shankle, *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

January 30, 2007

Mr. L. G. Tackett
Site Manager
Celanese, Ltd.
P.O. Box 58190
Houston, Texas 77258-8190

Re: Final Revised Permit Approval
Minor Revision
Permit Number: O1893
Celanese, Ltd.
Clear Lake Plant
Pasadena, Harris County
Regulated Entity Number: RN100227016
Customer Reference Number: CN600130850
Account Number: HG-0126-Q

Dear Mr. Tackett:

The revised effective federal operating permit (FOP) for Celanese, Ltd., Clear Lake Plant, is enclosed. Additionally, the permit has been updated after the U.S. Environmental Protection Agency review period to include Title 30 Texas Administrative Code §§ 106.511 and 106.512 (30 TAC §§ 106.511 and 106.512) in the "New Source Review Authorizations" section of the permit. This letter constitutes authority to operate the changes identified in the FOP revision application.

Consistent with 30 TAC Chapter 122, Subchapter C, the permit holder shall submit an application to the Air Permits Division (APD) for a revision to an FOP for those activities at a site which change, add, or remove one or more FOP terms or conditions. The permit holder shall also submit an application to the APD for a revision to a permit to address the following: the adoption of an applicable requirement previously designated as federally enforceable only; the promulgation of a new applicable requirement; the adoption of a new state-only requirement; or a change in a state-only designation.

New Source Review Authorization References

The New Source Review authorizations listed in the table below are applicable requirements under 30 TAC Chapter 122 and enforceable under this operating permit.

PSD Permits	NA Permits
PSD Permit No.:	NA Permit No.:
Title 30 TAC Chapter 116 Permits, Special Permits, and Other Authorizations (Other Than Permits By Rule, PSD Permits, or NA Permits) for the Application Area.	
Authorization No.: 38296	
Authorization No.: 52041	
Authorization No.: 53313	
Permits By Rule (30 TAC Chapter 106) for the Application Area	
Number: 106.263	Version No./Date: 11/01/2001
Number: 106.473	Version No./Date: 09/04/2000
Number: 106.124	Version No./Date: 03/14/1997
Number: 106.124	Version No./Date: 09/04/2000
Number: 106.261	Version No./Date: 11/01/2003
Number: 106.262	Version No./Date: 11/01/2003
Number: 106.262	Version No./Date: 09/04/2000
Number: 106.371	Version No./Date: 03/14/1997
Number: 106.371	Version No./Date: 09/04/2000
Number: 106.433	Version No./Date: 09/04/2000
Number: 106.454	Version No./Date: 03/14/1997
Number: 106.472	Version No./Date: 03/14/1997
Number: 106.472	Version No./Date: 09/04/2000
Number: 106.476	Version No./Date: 09/04/2000
Number: 106.478	Version No./Date: 03/14/1997
Number: 106.478	Version No./Date: 09/04/2000
Number: 106.492	Version No./Date: 09/04/2000
Number: 106.373	Version No./Date: 09/04/2000
Number: 106.452	Version No./Date: 09/04/2000

ENVIRON

Best Available Retrofit Technology Modeling Analysis

ExxonMobil Beaumont Refinery TCEQ Account Number JE0067I

Prepared for:

ExxonMobil Oil Corporation
Beaumont, Texas

Prepared by:

Steven H. Ramsey, P.E., BCEE
Christopher J. Colville, EIT, EPI

ENVIRON International Corporation

October 2007
Project No. 26-17391A

C O N T E N T S

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TEXAS PROFESSIONAL ENGINEER'S STATEMENT
BART MODELING

30 TAC 116.1520(a) requires that the Best Available Retrofit Technology (BART) analysis include an assessment of "the degree of visibility improvement in affected Class I areas resulting from the use of the control technology." In support of this requirement, ENVIRON International Corporation performed an evaluation of visibility impacts at Class I areas due to emissions from the ExxonMobil Beaumont Refinery prior to and following implementation of BART controls. This modeling was performed using the CALPUFF model and according to the protocol submitted to the TCEQ for review and approval.

By this statement, I hereby certify that the dispersion modeling analysis described and documented within this report was performed by me or under my direct supervision and that the model inputs used and results presented are true and correct to the best of my knowledge. Any limitations with respect to sources or availability of information and assumptions used in the analysis are noted within the report.

10/9/2007

Steven Hunter Ramsey, P.E.

Date

Texas Licensed Professional Engineer
Number 69070

1. INTRODUCTION

1.1 Statement of Purpose

The ExxonMobil Oil Corporation retained ENVIRON International Corporation (ENVIRON) to perform a source-specific Best Available Retrofit Technology (BART) modeling analysis using the CALPUFF model for the ExxonMobil Beaumont Refinery. The source-specific BART refined modeling analysis presented within this report follows the modeling protocol submitted electronically by ExxonMobil to the Texas Commission on Environmental Quality (TCEQ) for review and approval on September 20, 2007. The modeling protocol followed TCEQ and Central States Regional Air Planning Association (CENRAP) guidance.[1,2]

1.2 Background information

In 1999, the EPA promulgated rules to address visibility impairment – often referred to as "regional haze" – at designated federal Class I areas. These include areas such as national parks and wilderness areas where visibility is considered to be an important part of the visitor experience.[3] There are two Class I areas in Texas – Big Bend and Guadalupe National Parks – as well as a number in surrounding states in close proximity to Texas. Guidelines providing direction to the states for implementing the regional haze rules were issued by EPA in July 2005. Affected states, including Texas, are required to develop plans for addressing visibility impairment. This includes a requirement that certain existing sources be equipped with Best Available Retrofit Technology, or BART. Texas is required to submit a regional haze plan to EPA no later than December 17, 2007.

1.3 Potentially Affected Sources

The Texas Commission on Environmental Quality (TCEQ) regional haze rule adopted on January 10, 2007, identifies potentially affected sources as those:[4]

- Belonging to one of 26 industry source categories;[5]

---

[1] *Best Available Retrofit Technology (BART) Modeling Protocol to Determine Sources Subject to BART in the State of Texas*, January 2007, prepared by the TCEQ.

[2] Alpine Geophysics, LLC.2005. *CENRAP BART Modeling Guidelines*.

[3] 40 CFR 51, Subpart P

[4] 30 TAC Chapter 116, Subchapter M, effective February 7, 2007.

[5] (1) fossil fuel-fired steam electric plants of more than 250 MMBtu/hour heat input; (2) coal-cleaning plants (thermal dryers); (3) Kraft pulp mills; (4) Portland cement plants; (5) primary zinc smelters; (6) iron and steel mill plants; (7) primary aluminum ore reduction plants; (8) primary copper smelters; (9) municipal incinerators capable of charging more than 250 tons of refuse per day; (10) hydrofluoric, sulfuric, and nitric acid plants; (11) petroleum refineries; (12) lime plants; (13) phosphate rock processing plants; (14) coke oven batteries; (15) sulfur recovery plants; (16) carbon black plants (furnace process); (17) primary lead smelters; (18) fuel conversion plants; (19) sintering plants; (20) secondary metal production facilities; (21) chemical process plants; (22) fossil fuel-fired boilers of more than 250 MMBtu/hour heat input; (23) petroleum storage and transfer facilities with capacity exceeding 300,000 barrels; (24) taconite ore processing facilities; (25) glass fiber processing plants; and (26) charcoal production facilities.

- Having the potential to emit (PTE) 250 tons per year or more of any visibility-impairing pollutant;[6] and
- Not in operation prior to August 7, 1962, and in existence on August 7, 1977.

Based on results of a survey completed by potential BART-eligible sources and submitted to the TCEQ in 2005, 126 accounts were identified as potentially BART-eligible. This includes the ExxonMobil Beaumont Refinery.

[6] *Visibility-impairing air pollutant* is defined in 30 TAC 116.1500((2) as "Any of the following: nitrogen oxides, sulfur dioxide, or particulate matter."

2. CALPUFF MODELING APPROACH

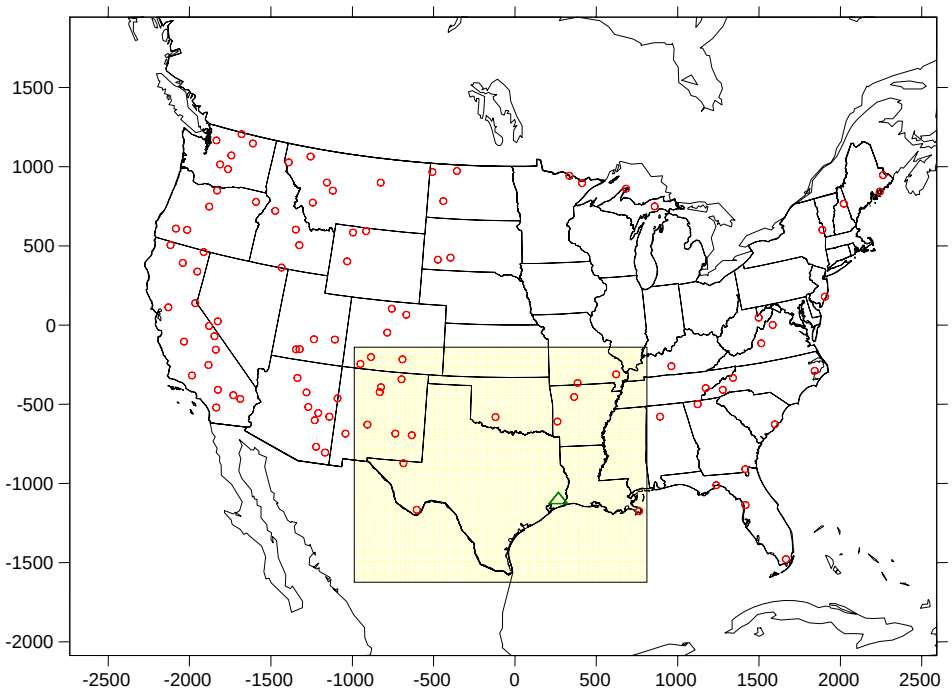
2.1 Overview

One of the air quality modeling approaches in EPA's BART guidance is an individual source attribution approach. Specifically, this entails modeling source-specific BART-eligible units and comparing modeled impacts to the deciview threshold. The modeling approach discussed here is specifically designed for conducting a source-specific BART refined modeling analysis.

2.2 Class I Areas to Assess

The refined CALPUFF analysis conducted for the ExxonMobil Beaumont Refinery encompasses the entire CENRAP South Domain. Figure 2-1 shows the location of the CENRAP South Domain (yellow box), Class I areas (red circles) and the ExxonMobil Beaumont Refinery (green triangle). Lambert Conformal Projection (LCP) coordinates are shown.

Figure 2-1. CENRAP South Domain



Class I areas within the CENRAP South Domain are as follows:

- Bandelier National Monument, New Mexico
- Big Bend National Park, Texas
- Bosque del Apache National Wildlife Refuge, New Mexico

- Breton Wilderness Area, Louisiana
- Caney Creek Wilderness Area, Arkansas
- Carlsbad Caverns National Park, New Mexico
- Great Sand Dunes Wilderness Area, Colorado
- Guadalupe Mountains National Park, Texas
- Hercules-Glade Wilderness Area, Missouri
- La Garita Wilderness Area, Colorado
- Mesa Verde National Park, Colorado
- Mingo Wilderness Area, Missouri
- Pecos Wilderness Area, New Mexico
- Salt Creek Wilderness Area, New Mexico
- San Pedro Parks Wilderness Area, New Mexico
- Upper Buffalo Wilderness Area, Arkansas
- Weminuche Wilderness Area, Colorado
- Wheeler Peak Wilderness Area, New Mexico
- White Mountain Wilderness Area, New Mexico
- Wichita Mountains National Wildlife Refuge, Oklahoma

The ExxonMobil Beaumont Refinery is located approximately 478 km from the closest Class I Area: the Caney Creek Wilderness Area in Arkansas.

2.3 Air Quality Model and Inputs

2.3.1 Modeling Domain

The CALPUFF source-specific refined modeling analysis for the ExxonMobil Beaumont Refinery is conducted with the CENRAP South Domain 6 km grid as shown in Figure 2-1. The domain extents are as follows.

- SW Corner (1,1): -1008.0 km, -1620.0 km
- NX, NY: 306, 246
- DX, DY: 6 km, 6 km

2.3.2 CALPUFF System Implementation

There are three main components to the CALPUFF model:

- Meteorological Data Modeling (CALMET);
- Dispersion Modeling (CALPUFF); and
- Post-processing (POSTUTIL / CALPOST).

Versions of the modeling components that are used in the source-specific subject-to-BART refined modeling analysis for the ExxonMobil Beaumont Refinery are presented in Table 2-1. Note that the following processors are not used in this analysis because the ExxonMobil Beaumont Refinery analysis utilizes the existing CENRAP-developed geophysical data file: TERREL, CTGCOMP, CTGPROC, and MAKEGEO. CALMM5 data is provided by CENRAP.

Table 2-1. CALPUFF Modeling Components

Processor	Version	Level
TERREL	3.311	030709
CTGCOMP	2.42	030709
CTGPROC	2.42	030709
MAKEGEO	2.22	030709
CALMM5	2.4	050413
CALMET	5.53a	040716
CALPUFF	5.711a	040716
POSTUTIL	1.3	030402
CALPOST	5.51	030709

2.3.3 Meteorological Data Modeling (CALMET)

TCEQ guidance recommends using the 2001-2003 CENRAP-developed CALMET dataset in source-specific subject-to-BART screening analyses. Because observational data is not used in the CALMET outputs developed by CENRAP, the prognostic meteorological dataset from MM5 is not supplemented with surface or upper air observations during the CALMET processing. However, in their review of the draft CENRAP guidelines, both the EPA and Federal Land Managers (FLMs) commented that observations should be used in refined CALPUFF modeling. Since a refined modeling analysis is conducted for the ExxonMobil Beaumont Refinery, observational data are incorporated during CALMET processing. CALMET control file inputs used in this analysis are presented in Attachment A.

The CALMM5 dataset is obtained from CENRAP for use in creating the CALMET outputs. The CALMET outputs consist of 10 vertical layers (11 layer interfaces). The top interface in the CALMET simulation is 4,000 meters. For the ExxonMobil Beaumont Refinery analysis, surface, precipitation, and upper air

observational data are incorporated during CALMET processing. Meteorological stations are selected from within the CENRAP south domain. A listing of the surface and precipitation stations is presented in Attachment B. Table 2-2 presents the Upper Air Stations used in CALMET processing. At a minimum, the upper air data file from each station contains data from mandatory sounding levels.

Table 2-2. Upper Air Stations

Station Name	Initials	Latitude (deg)	Longitude (deg)
Albuquerque, New Mexico	ABQ	35.05 N	106.62 W
Amarillo, Texas	AMA	35.23 N	101.70 W
Brownsville, Texas	BRO	25.90 N	97.43 W
Corpus Christi, Texas	CRP	27.77 N	97.50 W
Del Rio, Texas	DRT	29.37 N	100.92 W
Dodge City, Kansas	DDC	37.77 N	99.97 W
Fort Worth, Texas	FWD	32.80 N	97.30 W
Jackson, Mississippi (Thompson Field)	JAN	32.32 N	90.07 W
Lake Charles, Louisiana	LCH	30.12 N	93.22 W
Midland, Texas	MAF	31.93 N	102.20 W
Norman, Oklahoma	OUN	35.23 N	97.47 W
North Little Rock, Arkansas	LZK	34.83 N	92.27 W
Santa Teresa, New Mexico	EPZ	31.90 N	106.70 W
Shreveport, Louisiana	SHV	32.45 N	93.83 W
Slidell, Louisiana	SIL	30.33 N	89.82 W
Springfield, Missouri (Regional Airport)	SGF	37.23 N	93.40 W

Surface observations from the seven Western Gulf of Mexico National Oceanic and Atmospheric Administration's National Data Buoy Center (NDBC) Buoys are used in CALMET processing. These buoys are listed in Table 2-3.

Table 2-3. NDBC Buoys

Buoy Number	Latitude (deg)	Longitude (deg)
42001	25.90 N	89.67 W
42002	25.17 N	94.42 W
42007	30.09 N	88.77 W
42019	27.91 N	95.36 W
42020	26.96 N	96.70 W
42035	29.22 N	94.40 W
42040	29.18 N	88.21 W

For the ExxonMobil Beaumont Refinery refined BART analysis, CALPUFF is run with three annual simulations spanning the years 2001 through 2003.

2.3.4 Source Parameters

Source parameters required for modeling BART-eligible units are height of the stack opening from ground, inside stack diameter, exit gas flow rate, exit gas temperature, base elevation above sea level, and source location coordinates. Source parameters used in modeling the ExxonMobil Beaumont Refinery are presented in Attachment C.

2.3.5 Emission Rates

TCEQ and CENRAP guidance identifies the following priority approach for determining maximum 24-hour actual emission rates to be used in a BART visibility impairment modeling analysis:

1. Continuous emission monitoring (CEM) data;
2. Facility emissions tests;
3. Emission factors;
4. Permit limits; or lastly,
5. Potential to emit.

Only emissions from BART-eligible emission units are included in the evaluation. There are 28 BART-eligible emission units at the ExxonMobil Beaumont Refinery that emit or have the potential to emit under normal operations one or more visibility-impairing pollutants: NO_X, SO_2, and/or PM_{10}. Except as noted, worst-case 24-hour pre-BART emissions are estimated using permit allowable 1-hour emission limits. Since these limits are never to be exceeded during any one-hour period, their use to estimate worst-case 24-hour emissions is highly conservative. The exception to use of permit allowable emission rates are site flares. These flares have very high short-term emission limits that are not representative of worst-case 24-hour emissions. Therefore, worst-case NO_X and SO_2 (well-operated flares should not emit PM_{10}) for the flares are calculated using continuous emission monitoring data for flare headers for the period 2002 through 2006.

As part of the global consent decree settlement with EPA, ExxonMobil has agreed to very large reductions in emissions of both SO_2 and NO_X from the Beaumont Refinery. While the specific projects and emission unit reductions remain in development, ExxonMobil anticipates meeting the requirements of the consent decree as follows:

- Flare gas recovery for reuse in the refinery from four flare systems: 60FLR#002, 60FLR#003, 60FLR#005 and 60FLR#008. It is generally expected that recovery will be via compression then treatment to achieve the 160 ppm refinery gas sulfur limit specified in NSPS Subpart J. However, the specific engineering approach remains in development.

- Reduction of SO_2 and NO_X emissions from the Fluid Catalytic Cracking Unit (FCCU) regenerator (FIN 06SCB#001) through enhancements of the existing wet gas scrubbing system and installation of a Selective Catalytic Reduction (SCR) unit.

In addition, sources 25HTR#002 and 56BLR#022 are being permanently shutdown. A summary of pre- and post-BART emission rates included in this analysis is presented in Attachment D.

Species included in the modeling analysis are listed in Table 2-4. For purposes of modeling the ExxonMobil Beaumont Refinery, it is conservatively assumed that all particulate matter is PM-fine ($PM_{2.5}$). Source Classification Codes (SCC) and output from the Sparse Matrix Operator Kernel Emissions (SMOKE) program is used to further refine the estimate of PM species into sulfate (SO_4), nitrate (NO_3), elemental carbon (EC), organic carbon (OC) and unspeciated fine particulates (PMF).[7] CALPUFF computes concentrations of HNO_3; it is not emitted directly.

Table 2-4. Species Included in BART Refined Modeling Analysis

Species	Modeled	Directly Emitted	Dry Deposited
SO_2	Yes	Yes	Computed-gas
SO_4	Yes	Yes	Computed-particle
NO_X	Yes	Yes	Computed-gas
HNO_3	Yes	No	Computed-gas
NO_3	Yes	Yes	Computed-particle
EC	Yes	Yes	Computed-particle
OC (SOA)	Yes	Yes	Computed-particle
PM-fine ($PM_{2.5}$)	Yes	Yes	Computed-particle
PM-coarse ($PM_{10-2.5}$)	Yes	Yes	Computed-particle

Particle size parameters are entered in the CALPUFF input file for dry and wet deposition of particles. For the ExxonMobil Beaumont Refinery modeling analysis, default values for "aerosol" species (e.g., SO_4, NO_3, and $PM_{2.5}$) of 0.48 μm geometric mass mean diameter and 2.0 μm geometric standard deviation are used.

2.3.6 Dispersion Model (CALPUFF)

CALMET output is used as input to the CALPUFF model. CALMET simulates the effects of meteorological conditions on the transport and dispersion of pollutants from an individual source. In general, the default options are used in the CALPUFF analysis (Appendix B values in TCEQ BART guidance document). CALPUFF control file inputs to be used in this analysis are presented in Attachment E.

[7] ENVIRON followed this particulate matter speciation approach in the CAMx BART screening modeling performed for the TCEQ as well as in source-specific BART modeling.

2.3.6.1 Building Downwash

CENRAP guidance recognizes that downwash is important only at short distances (within 20 km) and recommends use of building downwash algorithms for consistency purposes only if the data are available. For the ExxonMobil Beaumont Refinery, downwash data is not readily available and, given the distance to the nearest Class I area (478 km), there is no technical reason to include the effects of building downwash. Therefore, building downwash affects are not be included in this analysis.

2.3.6.2 Puff-Splitting

As stated on page 18 of the EPA's Interagency Workgroup on Air Quality Modeling report, "*IWAQM recommends use of CALPUFF for transport distances of order 200 km and less. Use of CALPUFF for characterizing transport beyond 200 to 300 km should be done cautiously with an awareness of the likely problems involved*."[8] In theory, puff-splitting may improve the performance of CALPUFF at distances beyond 200 km. CENRAP, however, is non-committal on the topic. As stated in Section 6.4.2 of CENRAP Guidance: "*If CALPUFF is viewed to be a suitable model for use over such distances (say 300 – 600 km), states may wish to consider the use of puff splitting despite the lack of quantitative measurements demonstrating that puff splitting actually reduces CALPUFF model over-prediction at large scales. Implementation of puff splitting, coupled with fine grid resolution (~ 12 km or less) might be considered as an approach for distant Class I receptors*." In ENVIRON's experience, use of the puff-splitting option has little or no impact on modeled concentrations. However, use of the option does significantly increase model run time. Therefore, in consideration of these points, puff-splitting is not used in the ExxonMobil Beaumont Refinery modeling analysis.

2.3.6.3 Background Ozone Concentrations

Ozone (O_3) background concentrations are obtained from the Texas Commission on Environmental Quality (TCEQ) in the form of OZONE.DAT files. Hourly concentration data for 2001 - 2003 from ambient monitors located within Texas are used in this modeling analysis. Only non-urban ozone stations are used in the OZONE.DAT files. A listing of the ozone monitors included in this analysis is presented in Table 2-5.

[8] U. S. Environmental Protection Agency, *Interagency Workgroup on Air Quality Modeling (IWAQM) Phase 2 Summary Report and Recommendations for Modeling Long Range Transport Impacts*, EPA-454/R-98-019, December 1998.

Table 2-5. Ozone Monitoring Stations

Station	LCP X-Coordinate (km)	LCP Y-Coordinate (km)
Longview	215.529	-840.002
Northwest Houston	128.701	-1102.158
Kaufman	64.039	-821.801

2.3.6.4 Background Ammonia Concentrations

As specified by TCEQ guidance, background ammonia (NH_3) concentrations are assumed to be temporally and spatially invariant and are fixed at 3 ppb across the entire domain for all months.

2.3.6.5 Receptors

Receptors are locations where model results are calculated and provided in the CALPUFF output files. Receptor locations are derived from the National Park Service (NPS) Class I area receptor database.[9] The receptors are kept at the one (1) km spacing provided by the NPS.

2.3.6.6 Model Output

CALPUFF modeling results are displayed in units of micrograms per cubic meter ($\mu g/m^3$). CALPUFF output files are post-processed using CALPOST to determine visibility impacts in deciviews.

2.3.7 Post-Processing (POSTUTIL and CALPOST)

Hourly concentration outputs from CALPUFF are processed using POSTUTIL and CALPOST to determine impacts on visibility. POSTUTIL takes the concentration file output from CALPUFF and recalculates the nitric acid and nitrate partition based on total available sulfate and ammonia. CALPOST uses the concentration file processed through POSTUTIL, along with relative humidity data, to perform visibility calculations. POSTUTIL and CALPOST control file inputs are presented in Attachment F and G, respectively.

Light extinction must be determined in order to calculate visibility. CALPOST has seven methods for computing light extinction. The ExxonMobil Beaumont Refinery analysis uses Method 6 which computes extinction from speciated particulate matter with monthly Class I area-specific relative humidity adjustment factors. Relative humidity correction factors [*f*(RH)s] are applied to sulfate and nitrate concentration outputs from CALPUFF. Relative humidity correction factors are obtained from EPA's "Guidance for Estimating

[9] http://www2.nature.nps.gov/air/maps/receptors/index.cfm.

Natural Visibility Conditions under the Regional Haze Rule."[10] The $PM_{2.5}$ concentrations are considered part of the dry light extinction equation and do not have a humidity adjustment factor. The light extinction equation is the sum of the wet sulfate and nitrate and dry components ($PM_{2.5}$ plus Rayleigh scattering) which is 10 inverse megameters (Mm^{-1}).

Perceived visibility in deciviews is derived from the light extinction coefficient. The visibility change related to background is calculated using the modeled and established natural visibility conditions. For the ExxonMobil Beaumont Refinery evaluation, daily visibility is expressed as a change in deciviews compared to natural visibility conditions. Natural visibility conditions are based on the annual average natural levels of aerosol components at each Class I area taken from the EPA's "Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Rule."[11]

To determine whether or not a source may significantly contribute to visibility impairment at a Class I area, in a refined CALPUFF analysis the 98th percentile (8th highest value in any year) is compared to a threshold value of 0.5 dv. If the 8th highest impacts for each of the three modeled years are less than 0.5 dv, the source is considered to have an insignificant impact on visibility in the Class I area and is exempt from the requirement to perform a BART analysis or install BART controls. This approach is used in determining if the ExxonMobil Beaumont Refinery has a potentially significant impact at any Class I area.

2.3.8 Model Code Recompilation

To ensure compatibility with the CENRAP-developed files, CALMET, CALPUFF, POSTUTIL and CALPOST model codes are recompiled using the Lahey-Fujitsu FORTRAN Express v7.1 compiler after making changes to the respective parameter files as follows (new parameter value provided).

- *CALMET (modified params.met)*
  - MXNX = 306
  - MXNY = 246
  - MXSS = 375
  - MXPS = 375
  - MXNXP = 228
  - NXNYP = 236
- *CALPUFF (modified params.puf):*
  - MXNX = 306
  - MXNXG = 306

[10] U.S. EPA (September 2003). *Regional Haze: Estimating Natural Visibility Conditions Under the Regional Haze Rule*. EPA-454/B-03-005.

[11] Ibid.

  - MXSS = 375
  - MXPUFF = 100500

- *POSTUTIL (modified params.utl):*
  - MXGX = 306
  - MXGY = 246
  - MXSS = 375
  - MXPS = 375

- *CALPOST (modified params.pst):*
  - MXGX = 306
  - MXGY = 246
  - MXSS = 375

Updated executables for each program are created using the Lahey-Fujitsu FORTRAN Express v7.1 compiler following changes to the parameter files. These updated executables are used in this CALPUFF analysis. The updated parameter files are presented in the electronic archive submitted with this modeling analysis (Attachment H).

3. CALPUFF MODELING RESULTS

Table 3-1 and 3-2 presents the results of the refined CALPUFF analysis for current and future ExxonMobil Beaumont Refinery emission scenarios, respectively. As shown, maximum visibility impacts for the future emission scenario are greater than 0.5 dv at multiple Class I areas in 2001 (Breton Wilderness Area, Caney Creek Wilderness Area, and Wichita Mountains National Wildlife Refuge), 2002 (Caney Creek Wilderness Area, Hercules-Glade Wilderness Area, Upper Buffalo Wilderness Area, and Wichita Mountains National Wildlife Refuge) and 2003 (Big Bend National Park, Breton Wilderness Area, Caney Creek Wilderness Area, Hercules-Glade Wilderness Area, Mingo Wilderness Area, Upper Buffalo Wilderness Area, and Wichita Mountains National Wildlife Refuge). The eighth highest impacts for the future emission scenario at Class I areas with maximum visibility impacts at or above 0.5 dv are shown in Table 3-3. As shown, the 8th highest values (98th percentiles) are less than 0.5 dv. Therefore, it is determined that following implementation of proposed BART emission control projects (outlined in Section 2.3.5), emissions from BART-eligible emission units at the ExxonMobil Beaumont Refinery will not have the potential to significantly contribute to visibility impairment at any Class I area.

Table 3-1. Modeling Results – Current Emission Scenario

Class I area	Maximum Visibility Impacts (dv)		
	2001	2002	2003
Bandelier National Monument	0.321	**0.688**	0.305
Big Bend National Park	**1.654**	**2.230**	**3.583**
Bosque del Apache National Wildlife Refuge	**0.787**	**0.844**	0.275
Breton Wilderness Area	**3.551**	**2.197**	**4.824**
Caney Creek Wilderness Area	**3.152**	**2.765**	**3.673**
Carlsbad Caverns National Park	**1.019**	**1.522**	**1.195**
Great Sand Dunes Wilderness Area	0.156	**0.787**	0.284
Guadalupe Mountains National Park	**1.085**	**1.495**	**1.271**
Hercules-Glade Wilderness Area	**1.643**	**2.406**	**2.783**
La Garita Wilderness Area	0.106	0.414	0.195
Mesa Verde National Park	0.096	0.131	0.113
Mingo Wilderness Area	**1.843**	**1.814**	**2.348**
Pecos Wilderness Area	0.407	**1.034**	0.409
Salt Creek Wilderness Area	**0.730**	**1.239**	**0.609**
San Pedro Parks Wilderness Area	0.216	0.492	0.252
Upper Buffalo Wilderness Area	**1.620**	**2.325**	**3.352**
Weminuche Wilderness Area	0.117	0.401	0.198
Wheeler Peak Wilderness Area	**0.980**	**1.049**	0.381
White Mountain Wilderness Area	0.300	**1.031**	0.377
Wichita Mountains National Wildlife Refuge	**5.075**	**2.208**	**2.874**

Table 3-2. Modeling Results – Future Emission Scenario

Class I area	Maximum Visibility Impacts (dv)		
	2001	**2002**	**2003**
Bandelier National Monument	0.068	0.137	0.053
Big Bend National Park	0.382	0.479	**0.834**
Bosque del Apache National Wildlife Refuge	0.157	0.159	0.048
Breton Wilderness Area	**0.776**	0.425	**1.066**
Caney Creek Wilderness Area	**0.763**	**0.663**	**0.885**
Carlsbad Caverns National Park	0.221	0.289	0.266
Great Sand Dunes Wilderness Area	0.029	0.153	0.050
Guadalupe Mountains National Park	0.238	0.330	0.284
Hercules-Glade Wilderness Area	0.353	**0.638**	**0.690**
La Garita Wilderness Area	0.018	0.079	0.035
Mesa Verde National Park	0.016	0.025	0.019
Mingo Wilderness Area	0.403	0.424	**0.553**
Pecos Wilderness Area	0.084	0.210	0.073
Salt Creek Wilderness Area	0.158	0.261	0.105
San Pedro Parks Wilderness Area	0.046	0.095	0.043
Upper Buffalo Wilderness Area	0.349	**0.649**	**0.931**
Weminuche Wilderness Area	0.019	0.076	0.035
Wheeler Peak Wilderness Area	0.055	0.204	0.066
White Mountain Wilderness Area	0.196	0.201	0.064
Wichita Mountains National Wildlife Refuge	**1.473**	**0.518**	**0.737**

Table 3-3. Modeling Results - Future Emission Scenario, 8th Highest Visibility Impacts at Class I Areas with Maximum Visibility Impacts Equal to or Greater than 0.5 dv

Class I area	Eighth Highest Visibility Impacts (dv)		
	2001	2002	2003
Bandelier National Monument	--	--	--
Big Bend National Park	--	--	0.166
Bosque del Apache National Wildlife Refuge	--	--	--
Breton Wilderness Area	0.292	--	0.341
Caney Creek Wilderness Area	0.412	0.364	0.490
Carlsbad Caverns National Park	--	--	--
Great Sand Dunes Wilderness Area	--	--	--
Guadalupe Mountains National Park	--	--	--
Hercules-Glade Wilderness Area	--	0.211	0.269
La Garita Wilderness Area	--	--	--
Mesa Verde National Park	--	--	--
Mingo Wilderness Area	--	--	0.281
Pecos Wilderness Area	--	--	--
Salt Creek Wilderness Area	--	--	--
San Pedro Parks Wilderness Area	--	--	--
Upper Buffalo Wilderness Area	--	0.258	0.340
Weminuche Wilderness Area	--	--	--
Wheeler Peak Wilderness Area	--	--	--
White Mountain Wilderness Area	--	--	--
Wichita Mountains National Wildlife Refuge	0.361	0.227	0.359

An archive of modeling files is included as Attachment H. Within the attachment are disks with electronic copies of model input and output files used and created in the modeling analysis. Also included is a table explaining the file naming convention.

A T T A C H M E N T A

CALMET Control File Inputs

CALMET Group	CALMET Parameter	Description	Default Setting [1]	CENRAP Value [2]	Value Used by ENVIRON	Discussion
1 = General Run Control Parameters	LCALGRD	Are w-components and temperature needed?	T	F	F	CALGRID simulation not used.
2 = Map Projection and Grid Control Parameters	NX	Number of east-west grid cells	User Defined	306	306	Defines boundary of CENRAP South Domain.
	NY	Number of north-south grid cells	User Defined	246	246	Defines boundary of CENRAP South Domain.
	DGRIDKM	Grid spacing (km)	User Defined	6	6	Consistency with CENRAP-supplied MM5 data.
	XORIGKM	Southwest grid cell X coordinate	User Defined	-1008	-1008	Defines southwest corner of CENRAP South Domain.
	YORIGKM	Southwest grid cell Y coordinate	User Defined	-1620	-1620	Defines southwest corner of CENRAP South Domain.
	NZ	Number of vertical layers	User Defined	10	10	Followed CENRAP guidance in using 10 layers.
	ZFACE	Vertical cell face heights (NZ + 1 values)(m)	User Defined	0, 20, 40, 80, 160, 320, 640, 1200, 2000, 3000, 4000	0, 20, 40, 80, 160, 320, 640, 1200, 2000, 3000, 4000	Used CENRAP default values; designed to reduce the need for vertical interpolation while simultaneously improving vertical resolution within the planetary boundary layer (PBL).
4 = Metorological Data Options	NOOBS	Use of surface, overwater, or upper air observations?	0 = Yes	2 = No, use MM5 for surface, overwater and upper air data	0	Surface, overwater and upper air observations used in CALMET processing for refined analysis.
	NSSTA	Number of meteorological surface stations	User Defined	0	347 (2001), 351 (2002), 375 (2003)	Stations located within CENRAP South Domain used.
	NPSTA	Number of precipitation stations	User Defined	0	347 (2001), 351 (2002), 375 (2003)	Stations located within CENRAP South Domain used.
	ICLOUD	Is cloud data to be input as gridded fields?	0 = No	3 = Yes	0	Used observed precipitation from precipitation stations and observed cloud cover from surface stations.
5 = Windfield Options and Parameters	IFWCOD	Generate winds by diagnostic wind model?	1 = Yes	1	1	Used CALPUFF and CENRAP default value.
	IFRADJ	Adjust winds using Froude number effect?	1 = Yes	1	1	Used CALPUFF and CENRAP default value.
	IKINE	Adjust winds using kinematic effects?	0 = No	0	0	Used CALPUFF and CENRAP default value.
	IOBR	Use O'Briend procedure for vertical winds?	0 = No	0	0	Used CALPUFF and CENRAP default value.
	ISLOPE	Compute slope flows?	1 = Yes	1	1	Used CALPUFF and CENRAP default value.
	IEXTRP	Extrapolate surface winds to upper layers?	-4	-1	-4	-4 = ignore layer 1 of upper air data (EPA regulatory default).
	ICALM	Extrapolate surface calms to upper air?	0 = No	0	0	Used CALPUFF and CENRAP default value.
	BIAS	Surface/upper-air weighting factors	NZ*0	NZ*0	NZ*0	Used CALPUFF and CENRAP default value.
	IPROG	Using prognostic or MM-FDDA data?	0 = No	14 = Yes	0	Observational data used.
	LVARY	Use varying radius to develop surface winds?	F	T	F	Surface observations used in CALMET processing.
	RMAX1	Max. surface over-land extrapolation radius (km)	User Defined	30	30	Followed CENRAP guidance.
	RMAX2	Max. aloft over-land extrapolation radius (km)	User Defined	30	60	CENRAP default was set to a nominal value; used 2x CENRAP default.
	RMAX3	Max. over-water extrapolation radius (km)	User Defined	50	50	Followed CENRAP guidance.
	RMIN	Minimum extrapolation radius (km)	0.1	0.1	0.1	Used CALPUFF and CENRAP default value.
	RMIN2	Distance around upper air station where vertical extrapolation is excluded (km)	4	4	4	Used CALMET default value of 4 km to exclude surface stations located within 4 km of upper air station with valid data.
	TERRAD	Radius of influence of terrain features (km)	User Defined	12	12	Followed CENRAP guidance.
	R1	Relative weight at surface of Step 1 field and obs	User Defined	1	6 (2001), 18 (2002 and 2003)	Used one-half of MM5 grid resolution; appropriate values based on 6 km CALMET domain and 36/12 km MM5 domain.
	R2	Relative weight aloft of Step 1 field and obs	User Defined	1	12 (2001), 36 (2002 and 2003)	Used MM5 grid resolution; appropriate values based on 6 km CALMET domain and 36/12 km MM5 domain.
	RPROG	MM5 windfield weighting parameter	Not Given	0	0	Followed CENRAP guidance.
	DIVLIM	Maximum acceptable divergence	$5x10^{-6}$	5x10-6	5x10-6	Followed CENRAP guidance.
	NITER	Max. number of passes in divergence minimization	50	50	50	Used CALPUFF and CENRAP default value.
	NSMTH	Number of passes in smoothing	2, 4*(NZ-1)	2, 4*(NZ-1)	2, 4*(NZ-1)	Used CALPUFF and CENRAP default value.
	NINTR2	Maximum number of stations for interpolation	99	50 (5 in each of 10 layers)	99	Used CALPUFF default; closest stations to grid location receives more weight.
	CRITFN	Critical Froude number	1	1	1	Used CALPUFF and CENRAP default value.
	ALPHA	Emperical factor triggering kinematic effects	0.1	0.1	0.1	Used CALPUFF and CENRAP default value.

CALMET Group	CALMET Parameter	Description	Default Setting [1]	CENRAP Value [2]	Value Used by ENVIRON	Discussion
	IDIOPT1	Compute temperatures from observations?	0 = Yes	0	0	Used CALPUFF and CENRAP default value.
	ISURFT	Number of surface station to use for temperature calculations (between 1 and NSSTA)	User Defined	4	1	Initial station; temperaure is interpolated.
	IDIOPT2	Compute domain average lapse rates?	0 = Yes	0	0	Used CALPUFF and CENRAP default value.
	IUPT	Station for lapse rates (between 1 and NUSTA)	User Defined	2	1	Initial station; lapse rate is interpolated
	ZUPT	Depth of domain-average lapse rate (m)	200	200	200	Used CALPUFF and CENRAP default value.
	IDIOPT3	Compute internally initial guess winds?	0 = Yes	0	0	Used CALPUFF and CENRAP default value.
	IUPWND	Upper air station for domain winds	-1	-1	-1	- 1 = 1/r2 interpolation for all stations.
	ZUPWND	Bottom and top layers for first guess winds (m)	1, 1000	1, 1000	1, 1000	Used CALPUFF and CENRAP default value.
	IDIOPT4	Read surface winds from SURF.DAT?	0 = Yes	0	0	Used CALPUFF and CENRAP default value.
	IDIOPT5	Read aloft winds from UPN.DAT?	0 = Yes	0	0	Used CALPUFF and CENRAP default value.
	LLBREZE	Use Lake Breeze Module?	No	No	No	Used CALPUFF and CENRAP default value.
6 = Mixing Height, Temperature and Precipitation	CONSTB	Neutral mixing height B constant	1.41	1.41	1.41	Used CALPUFF and CENRAP default value.
	CONSTE	Convective mixing height E constant	0.15	0.15	0.15	Used CALPUFF and CENRAP default value.
	CONSTN	Stable mixing height N constant	2400	2400	2400	Used CALPUFF and CENRAP default value.
	CONSTW	Over-water mixing height W constant	0.16	0.16	0.16	Used CALPUFF and CENRAP default value.
	FCORIOL	Absolute value of Coriolis parameter	$1x10^{-4}$	$1x10^{-4}$	$1x10^{-4}$	Used CALPUFF and CENRAP default value.
	IAVEZI	Spatial averaging of mixing heights?	1 = Yes	1	1	Used CALPUFF and CENRAP default value.
	MNMDAV	Max. averaging radius (number of grid cells)	1	10	10	Not used because not conducting spatial averaging of temperature.
	HAFANG	Half angle for looking upwind (degrees)	30	30	30	Used CALPUFF and CENRAP default value.
	ILEVZI	Layer to use in upwind averaging (between 1 and NZ)	1	1	1	Used CALPUFF and CENRAP default value.
	DPTMIN	Minimum capping potential temperature lapse rate	0.001	0.001	0.001	Used CALPUFF and CENRAP default value.
	DZZI	Depth for computing capping lapse rate (m)	200	200	200	Used CALPUFF and CENRAP default value.
	ZIMIN	Minimum over-land mixing height (m)	50	50	50	Used CALPUFF and CENRAP default value.
	ZIMAX	Maximum over-land mixing height (m)	3000	3000	3000	Used CALPUFF and CENRAP default value.
	ZIMINW	Minimum over-water mixing height (m)	50	50	50	Used CALPUFF and CENRAP default value.
	ZIMAXW	Maximum over-water mixing height (m)	3000	3000	3000	Used CALPUFF and CENRAP default value.
	ITPROG	Source of 3d temperatures?	0 = Observations	2 = MM5	0	Observations used in CALMET processing.
	IRAD	Form of temperature interpolation (1 = 1/r)	1	1	1	Used CALPUFF and CENRAP default value.
	TRADKM	Temperature interpolation radius of influence	500	36	500	Used CALPUFF default value.
	NUMTS	Max. number of stations in temperature interpolations	5	5	5	Used CALPUFF and CENRAP default value.
	IAVET	Conduct spatial averaging of temperature?	1 = Yes	1	0	Spatial averaging is not necessary.
	TGDEFB	Default over-water mixing layer lapse rate (K/m)	-0.0098	-0.0098	-0.0098	Used CALPUFF and CENRAP default value.
	TGDEFA	Default over-water capping lapse rate (K/m)	-0.0045	-0.0045	-0.0045	Used CALPUFF and CENRAP default value.
	JWAT1	Beginning landuse type defining water	999	55	55	Followed CENRAP guidance.
	JWAT2	Ending landuse type defining water	999	55	55	Followed CENRAP guidance.
	NFLAGP	Method for precipitation interpolation	2	2	2	2 = $1/r^2$; used CALPUFF and CENRAP default value.
	SIGMAP	Precipitation radius for interpolations (km)	100	50	100	Used CALPUFF default value.
	CUTP	Minimum cut-off precipitation rate	0.01	0.01	0.01	Used CALPUFF and CENRAP default value.

Notes:

[1] CALMET default settings recommended in the *Interagency Work Group on Air Quality Modeling Phase 2 Summary Report* (December 1998)

[2] CALMET configurations used in developing 6-km meteorological fields over CENRAP modeling domains.

A T T A C H M E N T B

Surface and Precipitation Stations

Table B-1. CENRAP South Surface Stations - 2001

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
K11R	1	60.89	-1084.966
K1F0	2	-11.018	-645.265
K4BL	3	-1088.794	-188.74
K4CR	4	-796.753	-614.946
K4MY	5	-820.552	-514.181
K6R6	6	-504.682	-1089.929
KAAO	7	-19.239	-248.771
KABI	8	-252.073	-836.385
KABQ	9	-870.967	-501.552
KACT	10	-20.572	-929.193
KADH	11	30.04	-574.23
KADS	12	15.55	-778.91
KAEG	13	-886.431	-489.863
KAEX	14	424.008	-951.083
KAFW	15	-29.84	-864.178
KAIZ	16	387.096	-200.609
KALI	17	-103.042	-1363.706
KALM	18	-839.633	-752.147
KALN	19	597.6	-100.613
KALS	20	-777.382	-244.023
KAMA	21	-425.225	-516.367
KARA	22	495.794	-1092.463
KARG	23	543.544	-409.481
KASD	24	691.97	-1044.068
KASG	25	257.655	-419.895
KATS	26	-699.341	-756.355
KATT	27	-67.189	-1077.024
KAUS	28	-64.44	-1085.31
KBAZ	29	-102.133	-1140.919
KBFM	30	857.496	-996.792
KBGD	31	-395.603	-466.083
KBLV	32	617.659	-136.018
KBMG	33	888.591	-45.013
KBMQ	34	-118.107	-1027.37
KBNA	35	920.716	-377.2
KBPK	36	404.476	-391.372
KBPT	37	289.282	-1110.638
KBRO	38	-44.198	-1571.387
KBTR	39	562.77	-1032.028
KBVE	40	741.254	-1153.502
KBVO	41	88.664	-358.933
KBVX	42	480.71	-457.819
KCAO	43	-547.124	-374.102
KCDS	44	-300.324	-610.634
KCEZ	45	-1020.893	-233.136
KCFV	46	126.511	-320.682
KCGI	47	652.519	-279.306

Table B-1. CENRAP South Surface Stations - 2001

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KCLL	48	60.926	-1044.347
KCNK	49	-55.418	-49.561
KCNM	50	-682.759	-822.078
KCNU	51	132.781	-256.9
KCNY	52	-1095.593	-59.385
KCOS	53	-663.999	-102.631
KCOT	54	-219.067	-1280.964
KCOU	55	411.894	-119.997
KCPS	56	591.654	-136.172
KCQC	57	-775.182	-516.728
KCRP	58	-49.841	-1360.392
KCRS	59	56.76	-882.852
KCSM	60	-198.798	-512.028
KCVN	61	-556.268	-599.276
KCVS	62	-577.834	-601.516
KCXO	63	153.025	-1068.554
KDAL	64	14.014	-791.889
KDCU	65	915.854	-541.281
KDDC	66	-259.327	-242.715
KDFW	67	-3.109	-786.339
KDHT	68	-496.517	-424.942
KDLF	69	-369.535	-1173.036
KDMN	70	-1006.923	-798.125
KDMO	71	336.438	-136.522
KDRO	72	-945.713	-259.162
KDRT	73	-382.557	-1172.484
KDTN	74	304.839	-822.047
KDTO	75	-18.599	-752.969
KDWH	76	140.407	-1100.838
KDYR	77	679.855	-412.145
KEAX	78	235.703	-128.032
KEFD	79	178.542	-1150.911
KEHA	80	-431.288	-320.167
KEHR	81	812.8	-199.338
KELP	82	-888.697	-862.785
KEMP	83	69.39	-183.984
KEND	84	-81.725	-403.278
KEVV	85	822.902	-172.718
KEWK	86	-24.383	-215.58
KF39	87	30.792	-697.387
KFAM	88	573.877	-225.83
KFDR	89	-181.762	-623.071
KFLP	90	404.266	-399.14
KFMN	91	-993.475	-297.941
KFOE	92	114.644	-115.26
KFSM	93	237.996	-512.835
KFST	94	-566.391	-988.873
KFTW	95	-32.713	-795.542

Table B-1. CENRAP South Surface Stations - 2001

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KFWD	96	-27.846	-793.612
KFYV	97	253.764	-438.483
KGAG	98	-246.79	-405.469
KGBD	99	-162.152	-180.775
KGCK	100	-324.1	-221.895
KGDP	101	-737.521	-873.407
KGGG	102	214.599	-841.127
KGKY	103	-8.972	-812.595
KGLD	104	-401.583	-59.64
KGLH	105	557.042	-703.065
KGLS	106	208.675	-1189.492
KGNT	107	-985.121	-475.597
KGOK	108	-37.305	-458.997
KGPM	109	-4.681	-808.583
KGPT	110	764.04	-1031.678
KGTR	111	779.037	-689.11
KGTU	112	-65.338	-1033.51
KGUC	113	-855.846	-113.585
KGUP	114	-1060.45	-427.996
KGUY	115	-399.88	-356.694
KGWO	116	640.075	-695.287
KHBG	117	737.58	-936.506
KHBR	118	-186.121	-551.122
KHDO	119	-211.719	-1180.077
KHEZ	120	545.517	-911.954
KHGX	121	187.376	-1166.957
KHKA	122	642.067	-423.71
KHKS	123	636.926	-825.191
KHLC	124	-242.098	-64.417
KHNB	125	870.668	-145.447
KHOP	126	841.754	-324.602
KHOT	127	356.463	-602.864
KHOU	128	167.118	-1147.403
KHRL	129	-67.728	-1533.473
KHRO	130	343.012	-405.722
KHUM	131	616.723	-1136.814
KHUT	132	-75.456	-213.411
KHYI	133	-84.429	-1120.581
KHYS	134	-195.165	-124.724
KIAB	135	-23.366	-263.504
KIAH	136	159.982	-1112.067
KICT	137	-36.491	-259.771
KIER	138	369.594	-908.657
KILE	139	-65.316	-988.473
KINK	140	-586.879	-890.621
KITR	141	-451.837	-69.8
KIXD	142	180.857	-126.914
KJAN	143	650.08	-826.487

Table B-1. CENRAP South Surface Stations - 2001

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KJBR	144	569.655	-440.988
KJCT	145	-264.805	-1049.863
KJEF	146	417.469	-143.696
KJLN	147	220.368	-310.284
KLAA	148	-494.483	-198.304
KLAW	149	-129.378	-600.254
KLBB	150	-445.079	-691.2
KLBL	151	-350.15	-318.583
KLBX	152	150.63	-1207.65
KLCH	153	366.039	-1089.113
KLFK	154	214.642	-969.288
KLFT	155	483.139	-1074.12
KLHX	156	-567.01	-195.279
KLIC	157	-573.7	-69.147
KLIT	158	434.161	-571.401
KLIX	159	691.695	-1044.752
KLLQ	160	485.203	-691.199
KLRD	161	-246.569	-1383.486
KLRF	162	440.656	-550.693
KLRU	163	-917.261	-803.759
KLSX	164	544.697	-124.925
KLVJ	165	172.567	-1160.745
KLVS	166	-731.441	-447.785
KLWC	167	153.636	-108.143
KLWV	168	809.107	-95.154
KMAF	169	-489.696	-878.105
KMCB	170	622.67	-955.341
KMCI	171	195.298	-73.101
KMDH	172	676.591	-216.245
KMEG	173	651.863	-512.89
KMEI	174	774.908	-814.191
KMEM	175	634.534	-523.229
KMFE	176	-125.361	-1538.535
KMHK	177	28.579	-93.934
KMKC	178	205.861	-94.951
KMKL	179	727.077	-454.381
KMKO	180	146.966	-478.029
KMLC	181	110.644	-565.417
KMOB	182	839.42	-992.943
KMRF	183	-676.239	-1042.652
KMSL	184	853.332	-536.843
KMSY	185	653.767	-1087.37
KMTJ	186	-939.546	-109.53
KMVN	187	704.695	-154.57
KMWA	188	698.685	-218.021
KMWL	189	-99.741	-798.734
KNEW	190	674.286	-1080.207
KNGP	191	-28.264	-1368

Table B-1. CENRAP South Surface Stations - 2001

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KNQA	192	643.986	-489.146
KOCH	193	216.534	-930.592
KODO	194	-509.4	-880.305
KOJC	195	180.815	-125.068
KOKC	196	-54.186	-508.715
KOUN	197	-41.707	-526.861
KOWB	198	858.23	-202.317
KP28	199	-139.317	-297.355
KP92	200	557.13	-1172.603
KPAH	201	725.844	-291.476
KPBF	202	464.795	-631.204
KPIB	203	728.391	-915.201
KPIL	204	-33.55	-1540.831
KPNC	205	-8.868	-361.264
KPOF	206	591.592	-335.455
KPPF	207	130.459	-293.82
KPQL	208	814.856	-1019.221
KPRX	209	143.317	-703.629
KPSX	210	73.879	-1253.364
KPTN	211	551.151	-1123.941
KPUB	212	-651.703	-162.851
KPWA	213	-57.09	-493.927
KPWG	214	-30.433	-944.406
KRBD	215	12.481	-810.433
KRKP	216	-4.965	-1324.879
KRND	217	-125.115	-1161.171
KROG	218	258.441	-397.719
KROW	219	-698.85	-712.895
KRQE	220	-1083.18	-409.162
KRSL	221	-156.389	-123.748
KRSN	222	413.677	-819.685
KRTN	223	-664.239	-331.996
KRUE	224	352.817	-517.944
KRVS	225	90.474	-437.23
KSAF	226	-816.558	-444.045
KSAT	227	-142.994	-1160.901
KSET	228	564.392	-97.842
KSGF	229	318.465	-299.61
KSGR	230	131.473	-1151.365
KSGT	231	495.691	-582.749
KSHV	232	298.831	-829.307
KSJT	233	-333.267	-950.677
KSKX	234	-812.696	-797.619
KSLG	235	224.802	-417.183
KSLN	236	-56.011	-132.485
KSPD	237	-493.802	-285.159
KSPS	238	-136.546	-666.72
KSRC	239	475.987	-516.167

Table B-1. CENRAP South Surface Stations - 2001

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KSRR	240	-789.624	-686.256
KSSF	241	-144.978	-1183.291
KSTL	242	570.065	-117.452
KSUS	243	549.336	-130.02
KSVC	244	-1043.578	-751.807
KSWO	245	-7.445	-423.979
KSZL	246	297.567	-136.247
KTAD	247	-645.048	-278.061
KTBN	248	423.924	-237.479
KTCC	249	-597.363	-511.501
KTCL	250	870.684	-704.299
KTCS	251	-952.322	-695.439
KTIK	252	-34.608	-506.971
KTKI	253	38.139	-755.127
KTOP	254	117.322	-102.315
KTPL	255	-39.799	-981.183
KTRL	256	68.48	-806.796
KTUL	257	98.267	-419.701
KTUP	258	753.906	-600.367
KTVR	259	560.687	-829.118
KTXK	260	278.022	-720.622
KTYR	261	150.418	-844.347
KUNO	262	450.268	-332.422
KUTS	263	136.314	-1024.869
KVBT	264	247.807	-399.9
KVCT	265	8.192	-1238.695
KVIH	266	454.952	-193.303
KWDG	267	-71.289	-399.691
KWLD	268	0	-320.695
KXNA	269	240.016	-407.886
MMCL	270	-1072.535	-1632.775
KCWF	271	371.999	-1077.296
KHOB	272	-580.048	-790.648
KPOE	273	364.89	-984.772
MMIO	274	-715.54	-1595.056
MMMY	275	-316.613	-1579.702
KGRK	276	-79.671	-990.206
KMLU	277	466.016	-816.792
KTEX	278	-948.259	-169.74
MMRX	279	-125.617	-1557.41
KESF	280	447.345	-943.674
KLZK	281	431.199	-560.297
KADM	282	-1.531	-630.847
MMNL	283	-257.222	-1394.843
KE33	284	-846.39	-298.154
MMAN	285	-329.872	-1569.4
MMCS	286	-893.759	-880.938
MMMA	287	-54.487	-1586.451

Table B-1. CENRAP South Surface Stations - 2001

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KMWT	288	312.521	-597.597
K4SL	289	-889.332	-391.854
KSKF	290	-154.653	-1177.521
KBIX	291	778.283	-1028.545
KCBM	292	789.252	-665.842
KDYS	293	-267.671	-834.062
KAFF	294	-671.158	-85.372
KLTS	295	-206.759	-589.446
KNBG	296	677.608	-1102.405
KBYH	297	631.187	-421.631
KHMN	298	-848.745	-749.371
KLAM	299	-831.464	-412.856
KNMM	300	789.841	-788.597
MMPG	301	-346.402	-1248.84
MMTC	302	-660.346	-1590.033
KFSI	303	-127.711	-591.042
KFCS	304	-669.55	-116.96
KNFW	305	-40.525	-801.069
KNQI	306	-81.68	-1390.219
KBAD	307	312.771	-825.1
KFRI	308	20.033	-105.018
KGVT	309	86.944	-767.36
KHLR	310	-68.45	-981.004
KELD	311	390.361	-742.112
MMCU	312	-882.35	-1211.961
MMMV	313	-444.934	-1449.379
KEPZ	314	-915.897	-851.724
KAVK	315	-148.023	-355.847
KGMJ	316	200.75	-372.417
KPVJ	317	-20.054	-585.348
KRKR	318	216.017	-548.175
KCKV	319	849.69	-329.329
KOLV	320	654.146	-529.476
KDEQ	321	239.058	-655.169
KSLO	322	692.8	-118.63
KWWR	323	-225.565	-391.327
KAQR	324	77.8	-619.389
KCHK	325	-87.955	-541.668
KCQB	326	16.186	-473.43
KDUA	327	56.176	-670.61
KDUC	328	-87.786	-611.524
KENL	329	683.539	-134.985
KFOA	330	735.051	-91.448
KFWC	331	743.489	-143.961
KGCM	332	135.617	-409.198
KGLE	333	-18.489	-702.977
KHSB	334	737.259	-207.858
KJSV	335	198.556	-502.06

Table B-1. CENRAP South Surface Stations - 2001

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KJWG	336	-127.44	-456.946
KOKM	337	94.479	-478.439
KOLY	338	759.691	-104.636
KSAR	339	634.139	-179.076
KSNL	340	5.421	-513.325
KTQH	341	179.315	-448.216
K1H2	342	726.033	-68.974
KCPW	343	-858.907	-235.621
KMYP	344	-805.328	-126.737
KVTP	345	-715.975	-244.241
KHDC	346	632.988	-1028.708
KMNH	347	-652.817	-58.825

Table B-2. CENRAP South Surface Stations - 2002

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
K11R	1	60.89	-1084.966
K1F0	2	-11.018	-645.265
K4BL	3	-1088.794	-188.74
K4CR	4	-796.753	-614.946
K4MY	5	-820.552	-514.181
K4SL	6	-902.016	-397.882
K6R6	7	-504.682	-1089.929
KAAO	8	-19.239	-248.771
KABI	9	-252.073	-836.385
KABQ	10	-870.967	-501.552
KACT	11	-20.572	-929.193
KADH	12	30.04	-574.23
KADM	13	-1.531	-630.847
KADS	14	15.55	-778.91
KAEG	15	-886.431	-489.863
KAEX	16	424.008	-951.083
KAFW	17	-29.67	-778.139
KAIZ	18	387.096	-200.609
KALI	19	-102.174	-1362.836
KALM	20	-839.633	-752.147
KALN	21	597.6	-100.613
KALS	22	-777.382	-244.023
KAMA	23	-425.225	-516.367
KAQR	24	77.8	-619.389
KARA	25	495.794	-1092.463
KARG	26	543.544	-409.481
KASD	27	691.97	-1044.068
KASG	28	257.655	-419.895
KATS	29	-699.341	-756.355
KATT	30	-67.189	-1077.024
KAUS	31	-64.44	-1085.31
KAVK	32	-148.023	-355.847
KBAZ	33	-102.133	-1140.919
KBFM	34	857.496	-996.792
KBGD	35	-395.603	-466.083
KBMG	36	888.591	-45.013
KBMQ	37	-118.107	-1027.37
KBNA	38	920.716	-377.2
KBPK	39	404.476	-391.372
KBPT	40	289.282	-1110.638
KBRO	41	-44.198	-1571.387
KBTR	42	562.77	-1032.028
KBVE	43	741.254	-1153.502
KBVO	44	88.664	-358.933
KBVX	45	480.71	-457.819
KCAO	46	-547.124	-374.102
KCDS	47	-300.324	-610.634

Table B-2. CENRAP South Surface Stations - 2002

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KCEZ	48	-1020.893	-233.136
KCFV	49	126.511	-320.682
KCGI	50	652.519	-279.306
KCHK	51	-87.955	-541.668
KCKV	52	850.158	-329.28
KCLL	53	60.926	-1044.347
KCNK	54	-55.418	-49.561
KCNM	55	-681.361	-822.067
KCNU	56	132.781	-256.9
KCNY	57	-1095.593	-59.385
KCOS	58	-663.999	-102.631
KCOT	59	-219.079	-1280.593
KCOU	60	411.894	-119.997
KCPS	61	591.654	-136.172
KCQB	62	16.186	-473.43
KCQC	63	-775.182	-516.728
KCRP	64	-49.841	-1360.392
KCRS	65	56.76	-882.852
KCSM	66	-198.798	-512.028
KCVN	67	-556.268	-599.276
KCVS	68	-577.834	-601.516
KCXO	69	153.025	-1068.554
KDAL	70	14.014	-791.889
KDCU	71	915.854	-541.281
KDDC	72	-259.327	-242.715
KDEQ	73	238.943	-655.661
KDFW	74	-3.109	-786.339
KDHT	75	-496.517	-424.942
KDMN	76	-1006.923	-798.125
KDMO	77	336.438	-136.522
KDRO	78	-945.713	-259.162
KDRT	79	-382.557	-1172.484
KDTN	80	304.839	-822.047
KDTO	81	-18.599	-752.969
KDUA	82	56.176	-670.61
KDUC	83	-87.786	-611.524
KDWH	84	140.407	-1100.838
KDYR	85	679.855	-412.145
KEFD	86	178.542	-1150.911
KEHA	87	-431.288	-320.167
KEHR	88	812.8	-199.338
KELP	89	-888.697	-862.785
KEMP	90	69.39	-183.984
KENL	91	683.539	-134.985
KESF	92	447.345	-943.674
KEVV	93	822.902	-172.718
KEWK	94	-24.383	-215.58
KFAM	95	573.877	-225.83

Table B-2. CENRAP South Surface Stations - 2002

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KFDR	96	-181.762	-623.071
KFLP	97	404.266	-399.14
KFMN	98	-993.475	-297.941
KFOA	99	735.051	-91.448
KFOE	100	114.644	-115.26
KFSM	101	237.996	-512.835
KFST	102	-566.391	-988.873
KFTW	103	-32.713	-795.542
KFWC	104	743.489	-143.961
KFWD	105	-27.846	-793.612
KFYV	106	253.764	-438.483
KGAG	107	-246.79	-405.469
KGBD	108	-162.152	-180.775
KGCK	109	-324.1	-221.895
KGCM	110	135.617	-409.198
KGDP	111	-737.521	-873.407
KGGG	112	214.599	-841.127
KGKY	113	-8.972	-812.595
KGLD	114	-401.583	-59.64
KGLE	115	-18.489	-702.977
KGLH	116	557.167	-701.877
KGLS	117	208.675	-1189.492
KGMJ	118	200.75	-372.417
KGNT	119	-985.121	-475.597
KGOK	120	-37.305	-458.997
KGPM	121	-4.681	-808.583
KGPT	122	764.04	-1031.678
KGRK	123	-79.671	-990.206
KGTR	124	779.037	-689.11
KGTU	125	-65.338	-1033.51
KGUC	126	-855.846	-113.585
KGUP	127	-1060.45	-427.996
KGUY	128	-399.88	-356.694
KGWO	129	640.075	-695.287
KHBG	130	737.58	-936.506
KHBR	131	-186.121	-551.122
KHDO	132	-211.719	-1180.077
KHEZ	133	545.517	-911.954
KHGX	134	187.376	-1166.957
KHKA	135	642.067	-423.71
KHKS	136	636.926	-825.191
KHLC	137	-242.098	-64.417
KHNB	138	870.668	-145.447
KHOB	139	-580.048	-790.648
KHOP	140	841.754	-324.602
KHOT	141	356.115	-603.71
KHOU	142	167.118	-1147.403
KHRL	143	-67.728	-1533.473

Table B-2. CENRAP South Surface Stations - 2002

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KHRO	144	343.012	-405.722
KHSB	145	737.259	-207.858
KHUM	146	616.723	-1136.814
KHUT	147	-75.456	-213.411
KHYI	148	-84.429	-1120.581
KHYS	149	-195.165	-124.724
KIAH	150	159.982	-1112.067
KICT	151	-36.491	-259.771
KIER	152	369.594	-908.657
KILE	153	-65.316	-988.473
KINK	154	-586.978	-890.95
KITR	155	-451.837	-69.8
KIXD	156	180.857	-126.914
KJAN	157	650.08	-826.487
KJBR	158	569.655	-440.988
KJCT	159	-264.805	-1049.863
KJEF	160	417.469	-143.696
KJLN	161	220.368	-310.284
KJSV	162	198.556	-502.06
KJWG	163	-127.44	-456.946
KLAA	164	-494.483	-198.304
KLAW	165	-129.378	-600.254
KLBB	166	-445.079	-691.2
KLBL	167	-350.15	-318.583
KLBX	168	150.63	-1207.65
KLCH	169	366.039	-1089.113
KLFK	170	214.642	-969.288
KLFT	171	483.139	-1074.12
KLHX	172	-567.01	-195.279
KLIC	173	-573.7	-69.147
KLIT	174	434.161	-571.401
KLLQ	175	485.203	-691.199
KLRD	176	-246.569	-1383.486
KLRU	177	-917.261	-803.759
KLSX	178	544.697	-124.925
KLVJ	179	172.567	-1160.745
KLVS	180	-731.441	-447.785
KLWC	181	153.636	-108.143
KLWV	182	809.107	-95.154
KMAF	183	-489.696	-878.105
KMCB	184	622.67	-955.341
KMCI	185	195.298	-73.101
KMDH	186	676.591	-216.245
KMEI	187	774.908	-814.191
KMEM	188	634.534	-523.229
KMFE	189	-125.361	-1538.535
KMHK	190	28.579	-93.934
KMKC	191	205.861	-94.951

Table B-2. CENRAP South Surface Stations - 2002

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KMKL	192	727.077	-454.381
KMKO	193	146.966	-478.029
KMLC	194	110.644	-565.417
KMLU	195	466.016	-816.792
KMOB	196	839.42	-992.943
KMRF	197	-676.239	-1042.652
KMSL	198	853.332	-536.843
KMSY	199	653.767	-1087.37
KMTJ	200	-939.546	-109.53
KMVN	201	704.695	-154.57
KMWA	202	698.685	-218.021
KMWL	203	-99.247	-798.862
KMWT	204	312.521	-597.597
KNEW	205	674.286	-1080.207
KNFW	206	-40.525	-801.069
KNGP	207	-28.264	-1368
KNQA	208	643.986	-489.146
KNQI	209	-81.68	-1390.219
KOCH	210	216.534	-930.592
KODO	211	-509.4	-880.305
KOJC	212	180.815	-125.068
KOKC	213	-54.186	-508.715
KOKM	214	94.479	-478.439
KOLV	215	654.146	-529.476
KOLY	216	759.691	-104.636
KOUN	217	-41.707	-526.861
KOWB	218	858.23	-202.317
KP28	219	-139.317	-297.355
KP92	220	557.13	-1172.603
KPAH	221	725.844	-291.476
KPBF	222	464.795	-631.204
KPIB	223	728.391	-915.201
KPIL	224	-33.55	-1540.831
KPNC	225	-9.037	-360.887
KPOF	226	591.592	-335.455
KPPF	227	130.459	-293.82
KPQL	228	814.856	-1019.221
KPRX	229	143.317	-703.629
KPSX	230	73.863	-1251.5
KPTN	231	551.151	-1123.941
KPUB	232	-651.703	-162.851
KPVJ	233	-20.054	-585.348
KPWA	234	-57.09	-493.927
KPWG	235	-30.433	-944.406
KRBD	236	12.481	-810.433
KRKP	237	-4.965	-1324.879
KRKR	238	216.017	-548.175
KROG	239	258.441	-397.719

Table B-2. CENRAP South Surface Stations - 2002

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KROW	240	-698.85	-712.895
KRQE	241	-1083.18	-409.162
KRSL	242	-156.389	-123.748
KRSN	243	413.677	-819.685
KRTN	244	-664.239	-331.996
KRUE	245	352.817	-517.944
KRVS	246	90.474	-437.23
KSAF	247	-816.558	-444.045
KSAR	248	634.139	-179.076
KSAT	249	-142.994	-1160.901
KSET	250	564.392	-97.842
KSGF	251	318.465	-299.61
KSGR	252	130.817	-1151.128
KSGT	253	495.691	-582.749
KSHV	254	298.831	-829.307
KSJT	255	-333.267	-950.677
KSKX	256	-770.438	-355.856
KSLG	257	224.802	-417.183
KSLN	258	-56.011	-132.485
KSLO	259	692.8	-118.63
KSNL	260	5.421	-513.325
KSPD	261	-493.802	-285.159
KSPS	262	-136.546	-666.72
KSRC	263	475.987	-516.167
KSRR	264	-789.624	-686.256
KSSF	265	-144.978	-1183.291
KSTL	266	570.065	-117.452
KSUS	267	549.336	-130.02
KSVC	268	-1043.578	-751.807
KSWO	269	-7.445	-423.979
KSZL	270	297.567	-136.247
KTAD	271	-644.899	-276.219
KTBN	272	423.924	-237.479
KTCC	273	-597.363	-511.501
KTCL	274	870.684	-704.299
KTCS	275	-952.322	-695.439
KTEX	276	-948.259	-169.74
KTIK	277	-34.608	-506.971
KTKI	278	38.139	-755.127
KTOP	279	117.322	-102.315
KTPL	280	-39.799	-981.183
KTQH	281	179.315	-448.216
KTRL	282	68.48	-806.796
KTUL	283	98.267	-419.701
KTUP	284	753.906	-600.367
KTVR	285	560.687	-829.118
KTXK	286	278.022	-720.622
KUNO	287	450.268	-332.422

Table B-2. CENRAP South Surface Stations - 2002

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KUTS	288	136.314	-1024.869
KVBT	289	247.807	-399.9
KVCT	290	8.192	-1238.695
KVIH	291	454.952	-193.303
KWLD	292	0	-320.695
KWWR	293	-225.565	-391.327
KXNA	294	240.016	-407.886
MMAN	295	-329.872	-1569.4
MMCL	296	-1072.535	-1632.775
MMMA	297	-54.487	-1586.451
MMMY	298	-316.613	-1579.702
MMNL	299	-257.222	-1394.843
MMPG	300	-346.402	-1248.84
MMRX	301	-125.617	-1557.41
KBLV	302	617.659	-136.018
KELD	303	389.07	-742.171
KF39	304	30.792	-697.387
KIAB	305	-23.366	-263.504
KSKF	306	-154.653	-1177.521
KTYR	307	150.418	-844.347
KWDG	308	-71.289	-399.691
KEAX	309	235.703	-128.032
KMEG	310	651.863	-512.89
KNBG	311	677.608	-1102.405
KLZK	312	431.199	-560.297
MMCS	313	-893.759	-880.938
KE33	314	-846.39	-298.154
KBIX	315	778.283	-1028.545
KLRF	316	440.656	-550.693
KFCS	317	-669.55	-116.96
KEND	318	-81.725	-403.278
KPOE	319	364.89	-984.772
KDYS	320	-267.671	-834.062
KHMN	321	-848.745	-749.371
KRND	322	-125.115	-1161.171
MMCU	323	-882.35	-1211.961
KBYH	324	631.187	-421.631
KFSI	325	-127.711	-591.042
KGVT	326	86.944	-767.36
KHLR	327	-68.45	-981.004
KNMM	328	789.841	-788.597
KLTS	329	-206.759	-589.446
KAFF	330	-671.158	-85.372
KCWF	331	371.999	-1077.296
KCBM	332	789.252	-665.842
KBAD	333	312.771	-825.1
KDLF	334	-369.535	-1173.036
MMTC	335	-660.346	-1590.033

Table B-2. CENRAP South Surface Stations - 2002

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
MMMV	336	-444.934	-1449.379
KFRI	337	20.033	-105.018
K1H2	338	726.033	-68.974
KCPW	339	-858.907	-235.621
KMYP	340	-805.328	-126.737
KVTP	341	-715.975	-244.241
KHDC	342	632.988	-1028.708
KMNH	343	-652.817	-58.825
K3T5	344	4.852	-1119.865
KLXT	345	226.086	-111.723
KFWS	346	-28.156	-830.79
KJAS	347	284.559	-1005.649
KLIX	348	691.695	-1044.752
KSWW	349	-325.719	-827.955
KERV	350	-201.944	-1109.346
KBWD	351	-184.672	-906.806

Table B-3. CENRAP South Surface Stations - 2003

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
K11R	1	60.89	-1084.966
K1F0	2	-11.018	-645.265
K1H2	3	726.033	-68.974
K3T5	4	4.852	-1119.865
K4BL	5	-1088.794	-188.74
K4CR	6	-796.753	-614.946
K4MY	7	-820.552	-514.181
K4SL	8	-902.016	-397.882
K6R6	9	-504.682	-1089.929
KAAO	10	-19.239	-248.771
KABI	11	-252.073	-836.385
KABQ	12	-870.967	-501.552
KACT	13	-20.572	-929.193
KADH	14	30.04	-574.23
KADM	15	-1.531	-630.847
KADS	16	15.55	-778.91
KAEG	17	-886.431	-489.863
KAEX	18	424.008	-951.083
KAFW	19	-29.67	-778.139
KAIZ	20	387.096	-200.609
KALI	21	-102.174	-1362.836
KALM	22	-839.633	-752.147
KALN	23	597.6	-100.613
KALS	24	-777.382	-244.023
KAMA	25	-425.225	-516.367
KAQR	26	77.8	-619.389
KARA	27	495.794	-1092.463
KARG	28	543.544	-409.481
KASD	29	691.97	-1044.068
KASG	30	257.655	-419.895
KATS	31	-699.341	-756.355
KATT	32	-67.189	-1077.024
KAUS	33	-64.44	-1085.31
KAVK	34	-148.023	-355.847
KBAZ	35	-102.133	-1140.919
KBFM	36	857.496	-996.792
KBGD	37	-395.603	-466.083
KBLV	38	617.659	-136.018
KBMG	39	888.591	-45.013
KBMQ	40	-118.107	-1027.37
KBNA	41	920.716	-377.2
KBPK	42	404.476	-391.372
KBPT	43	289.282	-1110.638
KBRO	44	-44.198	-1571.387
KBTR	45	562.77	-1032.028
KBVE	46	741.254	-1153.502
KBVO	47	88.664	-358.933

Table B-3. CENRAP South Surface Stations - 2003

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KBVX	48	480.71	-457.819
KBWD	49	-184.672	-906.806
KCAO	50	-547.124	-374.102
KCDS	51	-300.324	-610.634
KCEZ	52	-1020.893	-233.136
KCFV	53	126.511	-320.682
KCGI	54	652.519	-279.306
KCHK	55	-87.955	-541.668
KCKV	56	850.158	-329.28
KCLL	57	60.926	-1044.347
KCNK	58	-55.418	-49.561
KCNM	59	-681.361	-822.067
KCNU	60	132.781	-256.9
KCNY	61	-1095.593	-59.385
KCOS	62	-663.999	-102.631
KCOT	63	-219.079	-1280.593
KCOU	64	411.894	-119.997
KCPS	65	591.654	-136.172
KCPW	66	-858.907	-235.621
KCQB	67	16.186	-473.43
KCQC	68	-775.182	-516.728
KCRP	69	-49.841	-1360.392
KCRS	70	56.76	-882.852
KCSM	71	-198.798	-512.028
KCVN	72	-556.268	-599.276
KCVS	73	-577.834	-601.516
KCXO	74	153.025	-1068.554
KDCU	75	915.854	-541.281
KDDC	76	-259.327	-242.715
KDEQ	77	238.943	-655.661
KDFW	78	-3.109	-786.339
KDHT	79	-496.517	-424.942
KDMN	80	-1006.923	-798.125
KDMO	81	336.438	-136.522
KDRO	82	-945.713	-259.162
KDRT	83	-382.557	-1172.484
KDTN	84	304.839	-822.047
KDTO	85	-18.599	-752.969
KDUA	86	56.176	-670.61
KDUC	87	-87.786	-611.524
KDWH	88	140.407	-1100.838
KDYR	89	679.855	-412.145
KEFD	90	178.542	-1150.911
KEHA	91	-431.288	-320.167
KEHR	92	812.8	-199.338
KELD	93	389.07	-742.171
KELP	94	-888.697	-862.785
KEMP	95	69.39	-183.984

Table B-3. CENRAP South Surface Stations - 2003

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KENL	96	683.539	-134.985
KERV	97	-201.944	-1109.346
KESF	98	447.345	-943.674
KEVV	99	822.902	-172.718
KEWK	100	-24.383	-215.58
KF39	101	30.792	-697.387
KFAM	102	573.877	-225.83
KFDR	103	-181.762	-623.071
KFLP	104	404.266	-399.14
KFMN	105	-993.475	-297.941
KFOA	106	735.051	-91.448
KFOE	107	114.644	-115.26
KFSM	108	237.996	-512.835
KFST	109	-566.391	-988.873
KFTW	110	-32.713	-795.542
KFWC	111	743.489	-143.961
KFWS	112	-28.156	-830.79
KFYV	113	253.764	-438.483
KGAG	114	-246.79	-405.469
KGBD	115	-162.152	-180.775
KGCK	116	-324.1	-221.895
KGCM	117	135.617	-409.198
KGDP	118	-737.521	-873.407
KGGG	119	214.599	-841.127
KGKY	120	-8.972	-812.595
KGLD	121	-401.583	-59.64
KGLE	122	-18.489	-702.977
KGLH	123	557.167	-701.877
KGLS	124	208.675	-1189.492
KGMJ	125	200.75	-372.417
KGNT	126	-985.121	-475.597
KGOK	127	-37.305	-458.997
KGPM	128	-4.681	-808.583
KGPT	129	764.04	-1031.678
KGRK	130	-79.671	-990.206
KGTR	131	779.037	-689.11
KGTU	132	-65.338	-1033.51
KGUC	133	-855.846	-113.585
KGUP	134	-1060.45	-427.996
KGUY	135	-399.88	-356.694
KGWO	136	640.075	-695.287
KHBG	137	737.58	-936.506
KHBR	138	-186.121	-551.122
KHDC	139	632.988	-1028.708
KHDO	140	-211.719	-1180.077
KHEZ	141	545.517	-911.954
KHKA	142	642.067	-423.71
KHKS	143	636.926	-825.191

Table B-3. CENRAP South Surface Stations - 2003

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KHLC	144	-242.098	-64.417
KHNB	145	870.668	-145.447
KHOB	146	-580.048	-790.648
KHOP	147	841.754	-324.602
KHOT	148	356.115	-603.71
KHOU	149	167.118	-1147.403
KHRL	150	-67.728	-1533.473
KHRO	151	343.012	-405.722
KHSB	152	737.259	-207.858
KHUM	153	616.723	-1136.814
KHUT	154	-75.456	-213.411
KHYI	155	-84.429	-1120.581
KHYS	156	-195.165	-124.724
KIAB	157	-23.366	-263.504
KIAH	158	159.982	-1112.067
KICT	159	-36.491	-259.771
KIER	160	369.594	-908.657
KILE	161	-65.316	-988.473
KINK	162	-586.978	-890.95
KITR	163	-451.837	-69.8
KIXD	164	180.857	-126.914
KJAN	165	650.08	-826.487
KJAS	166	284.559	-1005.649
KJBR	167	569.655	-440.988
KJCT	168	-264.805	-1049.863
KJEF	169	417.469	-143.696
KJLN	170	220.368	-310.284
KJSV	171	198.556	-502.06
KJWG	172	-127.44	-456.946
KLAA	173	-494.483	-198.304
KLAW	174	-129.378	-600.254
KLBB	175	-445.079	-691.2
KLBL	176	-350.15	-318.583
KLBX	177	150.63	-1207.65
KLCH	178	366.039	-1089.113
KLFK	179	214.642	-969.288
KLFT	180	483.139	-1074.12
KLHX	181	-567.01	-195.279
KLIC	182	-573.7	-69.147
KLIT	183	434.161	-571.401
KLIX	184	691.695	-1044.752
KLLQ	185	485.203	-691.199
KLRD	186	-246.569	-1383.486
KLRU	187	-917.261	-803.759
KLVJ	188	172.567	-1160.745
KLVS	189	-731.441	-447.785
KLWC	190	153.636	-108.143
KLWV	191	809.107	-95.154

Table B-3. CENRAP South Surface Stations - 2003

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KLXT	192	226.086	-111.723
KLZK	193	431.199	-560.297
KMAF	194	-489.696	-878.105
KMCB	195	622.67	-955.341
KMCI	196	195.298	-73.101
KMDH	197	676.591	-216.245
KMEG	198	651.863	-512.89
KMEI	199	774.908	-814.191
KMEM	200	634.534	-523.229
KMFE	201	-125.361	-1538.535
KMHK	202	28.579	-93.934
KMKC	203	205.861	-94.951
KMKL	204	727.077	-454.381
KMKO	205	146.966	-478.029
KMLC	206	110.644	-565.417
KMLU	207	466.016	-816.792
KMNH	208	-652.817	-58.825
KMOB	209	839.42	-992.943
KMRF	210	-676.239	-1042.652
KMSL	211	853.332	-536.843
KMSY	212	653.767	-1087.37
KMTJ	213	-939.546	-109.53
KMVN	214	704.695	-154.57
KMWA	215	698.685	-218.021
KMWL	216	-99.247	-798.862
KMWT	217	312.521	-597.597
KMYP	218	-805.328	-126.737
KNEW	219	674.286	-1080.207
KNFW	220	-40.525	-801.069
KNGP	221	-28.264	-1368
KNQI	222	-81.68	-1390.219
KOCH	223	216.534	-930.592
KODO	224	-509.4	-880.305
KOJC	225	180.815	-125.068
KOKC	226	-54.186	-508.715
KOKM	227	94.479	-478.439
KOLV	228	654.146	-529.476
KOLY	229	759.691	-104.636
KOUN	230	-41.707	-526.861
KOWB	231	858.23	-202.317
KP28	232	-139.317	-297.355
KP92	233	557.13	-1172.603
KPAH	234	725.844	-291.476
KPBF	235	464.795	-631.204
KPIB	236	728.391	-915.201
KPIL	237	-33.55	-1540.831
KPNC	238	-9.037	-360.887
KPOF	239	591.592	-335.455

Table B-3. CENRAP South Surface Stations - 2003

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KPPF	240	130.459	-293.82
KPQL	241	814.856	-1019.221
KPRX	242	143.317	-703.629
KPSX	243	73.863	-1251.5
KPTN	244	551.151	-1123.941
KPUB	245	-651.703	-162.851
KPVJ	246	-20.054	-585.348
KPWA	247	-57.09	-493.927
KPWG	248	-30.433	-944.406
KRBD	249	12.481	-810.433
KRKP	250	-4.965	-1324.879
KRKR	251	216.017	-548.175
KROG	252	258.441	-397.719
KROW	253	-698.85	-712.895
KRQE	254	-1083.18	-409.162
KRSL	255	-156.389	-123.748
KRTN	256	-664.239	-331.996
KRUE	257	352.817	-517.944
KRVS	258	90.474	-437.23
KSAF	259	-816.558	-444.045
KSAR	260	634.139	-179.076
KSAT	261	-142.994	-1160.901
KSET	262	564.392	-97.842
KSGF	263	318.465	-299.61
KSGR	264	130.817	-1151.128
KSGT	265	495.691	-582.749
KSHV	266	298.831	-829.307
KSJT	267	-333.267	-950.677
KSKF	268	-154.653	-1177.521
KSKX	269	-770.438	-355.856
KSLG	270	224.802	-417.183
KSLN	271	-56.011	-132.485
KSLO	272	692.8	-118.63
KSNL	273	5.421	-513.325
KSPD	274	-493.802	-285.159
KSPS	275	-136.546	-666.72
KSRC	276	475.987	-516.167
KSRR	277	-789.624	-686.256
KSSF	278	-144.978	-1183.291
KSTL	279	570.065	-117.452
KSUS	280	549.336	-130.02
KSVC	281	-1043.578	-751.807
KSWO	282	-7.445	-423.979
KSWW	283	-325.719	-827.955
KTAD	284	-644.899	-276.219
KTBN	285	423.924	-237.479
KTCC	286	-597.363	-511.501
KTCL	287	870.684	-704.299

Table B-3. CENRAP South Surface Stations - 2003

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KTCS	288	-952.322	-695.439
KTEX	289	-948.259	-169.74
KTIK	290	-34.608	-506.971
KTKI	291	38.139	-755.127
KTOP	292	117.322	-102.315
KTPL	293	-39.799	-981.183
KTQH	294	179.315	-448.216
KTRL	295	68.48	-806.796
KTUL	296	98.267	-419.701
KTUP	297	753.906	-600.367
KTVR	298	560.687	-829.118
KTXK	299	278.022	-720.622
KTYR	300	150.418	-844.347
KUNO	301	450.268	-332.422
KUTS	302	136.314	-1024.869
KVBT	303	247.807	-399.9
KVCT	304	8.192	-1238.695
KVIH	305	454.952	-193.303
KVTP	306	-715.975	-244.241
KWDG	307	-71.289	-399.691
KWLD	308	0	-320.695
KWWR	309	-225.565	-391.327
KXNA	310	240.016	-407.886
MMRX	311	-125.617	-1557.41
KDAL	312	14.014	-791.889
KNQA	313	643.986	-489.146
MMCL	314	-1072.535	-1632.775
MMMA	315	-54.487	-1586.451
KCWF	316	371.999	-1077.296
KEAX	317	235.703	-128.032
KFWD	318	-27.846	-793.612
MMMY	319	-316.613	-1579.702
KSZL	320	297.567	-136.247
MMNL	321	-257.222	-1394.843
MMPG	322	-346.402	-1248.84
MMCS	323	-893.759	-880.938
KE33	324	-846.39	-298.154
MMAN	325	-329.872	-1569.4
MMTC	326	-660.346	-1590.033
KEND	327	-81.725	-403.278
KLRF	328	440.656	-550.693
KHMN	329	-848.745	-749.371
KAFF	330	-671.158	-85.372
KBIX	331	778.283	-1028.545
KFCS	332	-669.55	-116.96
KBAD	333	312.771	-825.1
KBYH	334	631.187	-421.631
KDYS	335	-267.671	-834.062

Table B-3. CENRAP South Surface Stations - 2003

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KFSI	336	-127.711	-591.042
KHLR	337	-68.45	-981.004
KGVT	338	86.944	-767.36
KNMM	339	789.841	-788.597
KLTS	340	-206.759	-589.446
KRND	341	-125.115	-1161.171
MMCU	342	-882.35	-1211.961
KNBG	343	677.608	-1102.405
KCBM	344	789.252	-665.842
KPOE	345	364.89	-984.772
KDLF	346	-369.535	-1173.036
KRSN	347	413.677	-819.685
KLSX	348	544.697	-124.925
MMMV	349	-444.934	-1449.379
MMIO	350	-715.54	-1595.056
KSEP	351	-111.464	-861.645
K4T6	352	8.451	-835.284
K7F6	353	179.475	-707.745
KAWM	354	612.739	-515.624
KBKS	355	-112.415	-1422.608
KBPG	356	-425.646	-852.529
KBYY	357	111.937	-1224.526
KOSA	358	189.947	-761.973
KPYX	359	-333.955	-390.158
KT82	360	-184.545	-1081
KPVW	361	-432.871	-634.402
K25R	362	-114.5	-1509.609
K5T5	363	-9.437	-877.587
KE38	364	-643.74	-1043.615
KF05	365	-209.141	-635.991
KGYI	366	30.479	-695.167
KHHF	367	-304.913	-447.807
KHQZ	368	43.967	-802.91
KJSO	369	168.422	-899.337
KJWY	370	8.451	-835.284
KLBR	371	179.475	-707.745
KLUD	372	-53.902	-747.262
KSNK	373	-369.685	-801.662
KT53	374	-68.769	-1358.77
KRPH	375	-145.239	-761.747

Table B-4. CENRAP South Precipitation Stations - 2001

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
K11R	1	60.89	-1084.966
K1F0	2	-11.018	-645.265
K4BL	3	-1088.794	-188.74
K4CR	4	-796.753	-614.946
K4MY	5	-820.552	-514.181
K6R6	6	-504.682	-1089.929
KAAO	7	-19.239	-248.771
KABI	8	-252.073	-836.385
KABQ	9	-870.967	-501.552
KACT	10	-20.572	-929.193
KADH	11	30.04	-574.23
KADS	12	15.55	-778.91
KAEG	13	-886.431	-489.863
KAEX	14	424.008	-951.083
KAFW	15	-29.84	-864.178
KAIZ	16	387.096	-200.609
KALI	17	-103.042	-1363.706
KALM	18	-839.633	-752.147
KALN	19	597.6	-100.613
KALS	20	-777.382	-244.023
KAMA	21	-425.225	-516.367
KARA	22	495.794	-1092.463
KARG	23	543.544	-409.481
KASD	24	691.97	-1044.068
KASG	25	257.655	-419.895
KATS	26	-699.341	-756.355
KATT	27	-67.189	-1077.024
KAUS	28	-64.44	-1085.31
KBAZ	29	-102.133	-1140.919
KBFM	30	857.496	-996.792
KBGD	31	-395.603	-466.083
KBLV	32	617.659	-136.018
KBMG	33	888.591	-45.013
KBMQ	34	-118.107	-1027.37
KBNA	35	920.716	-377.2
KBPK	36	404.476	-391.372
KBPT	37	289.282	-1110.638
KBRO	38	-44.198	-1571.387
KBTR	39	562.77	-1032.028
KBVE	40	741.254	-1153.502
KBVO	41	88.664	-358.933
KBVX	42	480.71	-457.819
KCAO	43	-547.124	-374.102
KCDS	44	-300.324	-610.634
KCEZ	45	-1020.893	-233.136
KCFV	46	126.511	-320.682
KCGI	47	652.519	-279.306

Table B-4. CENRAP South Precipitation Stations - 2001

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KCLL	48	60.926	-1044.347
KCNK	49	-55.418	-49.561
KCNM	50	-682.759	-822.078
KCNU	51	132.781	-256.9
KCNY	52	-1095.593	-59.385
KCOS	53	-663.999	-102.631
KCOT	54	-219.067	-1280.964
KCOU	55	411.894	-119.997
KCPS	56	591.654	-136.172
KCQC	57	-775.182	-516.728
KCRP	58	-49.841	-1360.392
KCRS	59	56.76	-882.852
KCSM	60	-198.798	-512.028
KCVN	61	-556.268	-599.276
KCVS	62	-577.834	-601.516
KCXO	63	153.025	-1068.554
KDAL	64	14.014	-791.889
KDCU	65	915.854	-541.281
KDDC	66	-259.327	-242.715
KDFW	67	-3.109	-786.339
KDHT	68	-496.517	-424.942
KDLF	69	-369.535	-1173.036
KDMN	70	-1006.923	-798.125
KDMO	71	336.438	-136.522
KDRO	72	-945.713	-259.162
KDRT	73	-382.557	-1172.484
KDTN	74	304.839	-822.047
KDTO	75	-18.599	-752.969
KDWH	76	140.407	-1100.838
KDYR	77	679.855	-412.145
KEAX	78	235.703	-128.032
KEFD	79	178.542	-1150.911
KEHA	80	-431.288	-320.167
KEHR	81	812.8	-199.338
KELP	82	-888.697	-862.785
KEMP	83	69.39	-183.984
KEND	84	-81.725	-403.278
KEVV	85	822.902	-172.718
KEWK	86	-24.383	-215.58
KF39	87	30.792	-697.387
KFAM	88	573.877	-225.83
KFDR	89	-181.762	-623.071
KFLP	90	404.266	-399.14
KFMN	91	-993.475	-297.941
KFOE	92	114.644	-115.26
KFSM	93	237.996	-512.835
KFST	94	-566.391	-988.873
KFTW	95	-32.713	-795.542

Table B-4. CENRAP South Precipitation Stations - 2001

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KFWD	96	-27.846	-793.612
KFYV	97	253.764	-438.483
KGAG	98	-246.79	-405.469
KGBD	99	-162.152	-180.775
KGCK	100	-324.1	-221.895
KGDP	101	-737.521	-873.407
KGGG	102	214.599	-841.127
KGKY	103	-8.972	-812.595
KGLD	104	-401.583	-59.64
KGLH	105	557.042	-703.065
KGLS	106	208.675	-1189.492
KGNT	107	-985.121	-475.597
KGOK	108	-37.305	-458.997
KGPM	109	-4.681	-808.583
KGPT	110	764.04	-1031.678
KGTR	111	779.037	-689.11
KGTU	112	-65.338	-1033.51
KGUC	113	-855.846	-113.585
KGUP	114	-1060.45	-427.996
KGUY	115	-399.88	-356.694
KGWO	116	640.075	-695.287
KHBG	117	737.58	-936.506
KHBR	118	-186.121	-551.122
KHDO	119	-211.719	-1180.077
KHEZ	120	545.517	-911.954
KHGX	121	187.376	-1166.957
KHKA	122	642.067	-423.71
KHKS	123	636.926	-825.191
KHLC	124	-242.098	-64.417
KHNB	125	870.668	-145.447
KHOP	126	841.754	-324.602
KHOT	127	356.463	-602.864
KHOU	128	167.118	-1147.403
KHRL	129	-67.728	-1533.473
KHRO	130	343.012	-405.722
KHUM	131	616.723	-1136.814
KHUT	132	-75.456	-213.411
KHYI	133	-84.429	-1120.581
KHYS	134	-195.165	-124.724
KIAB	135	-23.366	-263.504
KIAH	136	159.982	-1112.067
KICT	137	-36.491	-259.771
KIER	138	369.594	-908.657
KILE	139	-65.316	-988.473
KINK	140	-586.879	-890.621
KITR	141	-451.837	-69.8
KIXD	142	180.857	-126.914
KJAN	143	650.08	-826.487

Table B-4. CENRAP South Precipitation Stations - 2001

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KJBR	144	569.655	-440.988
KJCT	145	-264.805	-1049.863
KJEF	146	417.469	-143.696
KJLN	147	220.368	-310.284
KLAA	148	-494.483	-198.304
KLAW	149	-129.378	-600.254
KLBB	150	-445.079	-691.2
KLBL	151	-350.15	-318.583
KLBX	152	150.63	-1207.65
KLCH	153	366.039	-1089.113
KLFK	154	214.642	-969.288
KLFT	155	483.139	-1074.12
KLHX	156	-567.01	-195.279
KLIC	157	-573.7	-69.147
KLIT	158	434.161	-571.401
KLIX	159	691.695	-1044.752
KLLQ	160	485.203	-691.199
KLRD	161	-246.569	-1383.486
KLRF	162	440.656	-550.693
KLRU	163	-917.261	-803.759
KLSX	164	544.697	-124.925
KLVJ	165	172.567	-1160.745
KLVS	166	-731.441	-447.785
KLWC	167	153.636	-108.143
KLWV	168	809.107	-95.154
KMAF	169	-489.696	-878.105
KMCB	170	622.67	-955.341
KMCI	171	195.298	-73.101
KMDH	172	676.591	-216.245
KMEG	173	651.863	-512.89
KMEI	174	774.908	-814.191
KMEM	175	634.534	-523.229
KMFE	176	-125.361	-1538.535
KMHK	177	28.579	-93.934
KMKC	178	205.861	-94.951
KMKL	179	727.077	-454.381
KMKO	180	146.966	-478.029
KMLC	181	110.644	-565.417
KMOB	182	839.42	-992.943
KMRF	183	-676.239	-1042.652
KMSL	184	853.332	-536.843
KMSY	185	653.767	-1087.37
KMTJ	186	-939.546	-109.53
KMVN	187	704.695	-154.57
KMWA	188	698.685	-218.021
KMWL	189	-99.741	-798.734
KNEW	190	674.286	-1080.207
KNGP	191	-28.264	-1368

Table B-4. CENRAP South Precipitation Stations - 2001

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KNQA	192	643.986	-489.146
KOCH	193	216.534	-930.592
KODO	194	-509.4	-880.305
KOJC	195	180.815	-125.068
KOKC	196	-54.186	-508.715
KOUN	197	-41.707	-526.861
KOWB	198	858.23	-202.317
KP28	199	-139.317	-297.355
KP92	200	557.13	-1172.603
KPAH	201	725.844	-291.476
KPBF	202	464.795	-631.204
KPIB	203	728.391	-915.201
KPIL	204	-33.55	-1540.831
KPNC	205	-8.868	-361.264
KPOF	206	591.592	-335.455
KPPF	207	130.459	-293.82
KPQL	208	814.856	-1019.221
KPRX	209	143.317	-703.629
KPSX	210	73.879	-1253.364
KPTN	211	551.151	-1123.941
KPUB	212	-651.703	-162.851
KPWA	213	-57.09	-493.927
KPWG	214	-30.433	-944.406
KRBD	215	12.481	-810.433
KRKP	216	-4.965	-1324.879
KRND	217	-125.115	-1161.171
KROG	218	258.441	-397.719
KROW	219	-698.85	-712.895
KRQE	220	-1083.18	-409.162
KRSL	221	-156.389	-123.748
KRSN	222	413.677	-819.685
KRTN	223	-664.239	-331.996
KRUE	224	352.817	-517.944
KRVS	225	90.474	-437.23
KSAF	226	-816.558	-444.045
KSAT	227	-142.994	-1160.901
KSET	228	564.392	-97.842
KSGF	229	318.465	-299.61
KSGR	230	131.473	-1151.365
KSGT	231	495.691	-582.749
KSHV	232	298.831	-829.307
KSJT	233	-333.267	-950.677
KSKX	234	-812.696	-797.619
KSLG	235	224.802	-417.183
KSLN	236	-56.011	-132.485
KSPD	237	-493.802	-285.159
KSPS	238	-136.546	-666.72
KSRC	239	475.987	-516.167

Table B-4. CENRAP South Precipitation Stations - 2001

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KSRR	240	-789.624	-686.256
KSSF	241	-144.978	-1183.291
KSTL	242	570.065	-117.452
KSUS	243	549.336	-130.02
KSVC	244	-1043.578	-751.807
KSWO	245	-7.445	-423.979
KSZL	246	297.567	-136.247
KTAD	247	-645.048	-278.061
KTBN	248	423.924	-237.479
KTCC	249	-597.363	-511.501
KTCL	250	870.684	-704.299
KTCS	251	-952.322	-695.439
KTIK	252	-34.608	-506.971
KTKI	253	38.139	-755.127
KTOP	254	117.322	-102.315
KTPL	255	-39.799	-981.183
KTRL	256	68.48	-806.796
KTUL	257	98.267	-419.701
KTUP	258	753.906	-600.367
KTVR	259	560.687	-829.118
KTXK	260	278.022	-720.622
KTYR	261	150.418	-844.347
KUNO	262	450.268	-332.422
KUTS	263	136.314	-1024.869
KVBT	264	247.807	-399.9
KVCT	265	8.192	-1238.695
KVIH	266	454.952	-193.303
KWDG	267	-71.289	-399.691
KWLD	268	0	-320.695
KXNA	269	240.016	-407.886
MMCL	270	-1072.535	-1632.775
KCWF	271	371.999	-1077.296
KHOB	272	-580.048	-790.648
KPOE	273	364.89	-984.772
MMIO	274	-715.54	-1595.056
MMMY	275	-316.613	-1579.702
KGRK	276	-79.671	-990.206
KMLU	277	466.016	-816.792
KTEX	278	-948.259	-169.74
MMRX	279	-125.617	-1557.41
KESF	280	447.345	-943.674
KLZK	281	431.199	-560.297
KADM	282	-1.531	-630.847
MMNL	283	-257.222	-1394.843
KE33	284	-846.39	-298.154
MMAN	285	-329.872	-1569.4
MMCS	286	-893.759	-880.938
MMMA	287	-54.487	-1586.451

Table B-4. CENRAP South Precipitation Stations - 2001

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KMWT	288	312.521	-597.597
K4SL	289	-889.332	-391.854
KSKF	290	-154.653	-1177.521
KBIX	291	778.283	-1028.545
KCBM	292	789.252	-665.842
KDYS	293	-267.671	-834.062
KAFF	294	-671.158	-85.372
KLTS	295	-206.759	-589.446
KNBG	296	677.608	-1102.405
KBYH	297	631.187	-421.631
KHMN	298	-848.745	-749.371
KLAM	299	-831.464	-412.856
KNMM	300	789.841	-788.597
MMPG	301	-346.402	-1248.84
MMTC	302	-660.346	-1590.033
KFSI	303	-127.711	-591.042
KFCS	304	-669.55	-116.96
KNFW	305	-40.525	-801.069
KNQI	306	-81.68	-1390.219
KBAD	307	312.771	-825.1
KFRI	308	20.033	-105.018
KGVT	309	86.944	-767.36
KHLR	310	-68.45	-981.004
KELD	311	390.361	-742.112
MMCU	312	-882.35	-1211.961
MMMV	313	-444.934	-1449.379
KEPZ	314	-915.897	-851.724
KAVK	315	-148.023	-355.847
KGMJ	316	200.75	-372.417
KPVJ	317	-20.054	-585.348
KRKR	318	216.017	-548.175
KCKV	319	849.69	-329.329
KOLV	320	654.146	-529.476
KDEQ	321	239.058	-655.169
KSLO	322	692.8	-118.63
KWWR	323	-225.565	-391.327
KAQR	324	77.8	-619.389
KCHK	325	-87.955	-541.668
KCQB	326	16.186	-473.43
KDUA	327	56.176	-670.61
KDUC	328	-87.786	-611.524
KENL	329	683.539	-134.985
KFOA	330	735.051	-91.448
KFWC	331	743.489	-143.961
KGCM	332	135.617	-409.198
KGLE	333	-18.489	-702.977
KHSB	334	737.259	-207.858
KJSV	335	198.556	-502.06

Table B-4. CENRAP South Precipitation Stations - 2001

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KJWG	336	-127.44	-456.946
KOKM	337	94.479	-478.439
KOLY	338	759.691	-104.636
KSAR	339	634.139	-179.076
KSNL	340	5.421	-513.325
KTQH	341	179.315	-448.216
K1H2	342	726.033	-68.974
KCPW	343	-858.907	-235.621
KMYP	344	-805.328	-126.737
KVTP	345	-715.975	-244.241
KHDC	346	632.988	-1028.708
KMNH	347	-652.817	-58.825

Table B-5. CENRAP South Precipitation Stations - 2002

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
K11R	1	60.89	-1084.966
K1F0	2	-11.018	-645.265
K4BL	3	-1088.794	-188.74
K4CR	4	-796.753	-614.946
K4MY	5	-820.552	-514.181
K4SL	6	-902.016	-397.882
K6R6	7	-504.682	-1089.929
KAAO	8	-19.239	-248.771
KABI	9	-252.073	-836.385
KABQ	10	-870.967	-501.552
KACT	11	-20.572	-929.193
KADH	12	30.04	-574.23
KADM	13	-1.531	-630.847
KADS	14	15.55	-778.91
KAEG	15	-886.431	-489.863
KAEX	16	424.008	-951.083
KAFW	17	-29.67	-778.139
KAIZ	18	387.096	-200.609
KALI	19	-102.174	-1362.836
KALM	20	-839.633	-752.147
KALN	21	597.6	-100.613
KALS	22	-777.382	-244.023
KAMA	23	-425.225	-516.367
KAQR	24	77.8	-619.389
KARA	25	495.794	-1092.463
KARG	26	543.544	-409.481
KASD	27	691.97	-1044.068
KASG	28	257.655	-419.895
KATS	29	-699.341	-756.355
KATT	30	-67.189	-1077.024
KAUS	31	-64.44	-1085.31
KAVK	32	-148.023	-355.847
KBAZ	33	-102.133	-1140.919
KBFM	34	857.496	-996.792
KBGD	35	-395.603	-466.083
KBMG	36	888.591	-45.013
KBMQ	37	-118.107	-1027.37
KBNA	38	920.716	-377.2
KBPK	39	404.476	-391.372
KBPT	40	289.282	-1110.638
KBRO	41	-44.198	-1571.387
KBTR	42	562.77	-1032.028
KBVE	43	741.254	-1153.502
KBVO	44	88.664	-358.933
KBVX	45	480.71	-457.819
KCAO	46	-547.124	-374.102
KCDS	47	-300.324	-610.634

Table B-5. CENRAP South Precipitation Stations - 2002

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KCEZ	48	-1020.893	-233.136
KCFV	49	126.511	-320.682
KCGI	50	652.519	-279.306
KCHK	51	-87.955	-541.668
KCKV	52	850.158	-329.28
KCLL	53	60.926	-1044.347
KCNK	54	-55.418	-49.561
KCNM	55	-681.361	-822.067
KCNU	56	132.781	-256.9
KCNY	57	-1095.593	-59.385
KCOS	58	-663.999	-102.631
KCOT	59	-219.079	-1280.593
KCOU	60	411.894	-119.997
KCPS	61	591.654	-136.172
KCQB	62	16.186	-473.43
KCQC	63	-775.182	-516.728
KCRP	64	-49.841	-1360.392
KCRS	65	56.76	-882.852
KCSM	66	-198.798	-512.028
KCVN	67	-556.268	-599.276
KCVS	68	-577.834	-601.516
KCXO	69	153.025	-1068.554
KDAL	70	14.014	-791.889
KDCU	71	915.854	-541.281
KDDC	72	-259.327	-242.715
KDEQ	73	238.943	-655.661
KDFW	74	-3.109	-786.339
KDHT	75	-496.517	-424.942
KDMN	76	-1006.923	-798.125
KDMO	77	336.438	-136.522
KDRO	78	-945.713	-259.162
KDRT	79	-382.557	-1172.484
KDTN	80	304.839	-822.047
KDTO	81	-18.599	-752.969
KDUA	82	56.176	-670.61
KDUC	83	-87.786	-611.524
KDWH	84	140.407	-1100.838
KDYR	85	679.855	-412.145
KEFD	86	178.542	-1150.911
KEHA	87	-431.288	-320.167
KEHR	88	812.8	-199.338
KELP	89	-888.697	-862.785
KEMP	90	69.39	-183.984
KENL	91	683.539	-134.985
KESF	92	447.345	-943.674
KEVV	93	822.902	-172.718
KEWK	94	-24.383	-215.58
KFAM	95	573.877	-225.83

Table B-5. CENRAP South Precipitation Stations - 2002

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KFDR	96	-181.762	-623.071
KFLP	97	404.266	-399.14
KFMN	98	-993.475	-297.941
KFOA	99	735.051	-91.448
KFOE	100	114.644	-115.26
KFSM	101	237.996	-512.835
KFST	102	-566.391	-988.873
KFTW	103	-32.713	-795.542
KFWC	104	743.489	-143.961
KFWD	105	-27.846	-793.612
KFYV	106	253.764	-438.483
KGAG	107	-246.79	-405.469
KGBD	108	-162.152	-180.775
KGCK	109	-324.1	-221.895
KGCM	110	135.617	-409.198
KGDP	111	-737.521	-873.407
KGGG	112	214.599	-841.127
KGKY	113	-8.972	-812.595
KGLD	114	-401.583	-59.64
KGLE	115	-18.489	-702.977
KGLH	116	557.167	-701.877
KGLS	117	208.675	-1189.492
KGMJ	118	200.75	-372.417
KGNT	119	-985.121	-475.597
KGOK	120	-37.305	-458.997
KGPM	121	-4.681	-808.583
KGPT	122	764.04	-1031.678
KGRK	123	-79.671	-990.206
KGTR	124	779.037	-689.11
KGTU	125	-65.338	-1033.51
KGUC	126	-855.846	-113.585
KGUP	127	-1060.45	-427.996
KGUY	128	-399.88	-356.694
KGWO	129	640.075	-695.287
KHBG	130	737.58	-936.506
KHBR	131	-186.121	-551.122
KHDO	132	-211.719	-1180.077
KHEZ	133	545.517	-911.954
KHGX	134	187.376	-1166.957
KHKA	135	642.067	-423.71
KHKS	136	636.926	-825.191
KHLC	137	-242.098	-64.417
KHNB	138	870.668	-145.447
KHOB	139	-580.048	-790.648
KHOP	140	841.754	-324.602
KHOT	141	356.115	-603.71
KHOU	142	167.118	-1147.403
KHRL	143	-67.728	-1533.473

Table B-5. CENRAP South Precipitation Stations - 2002

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KHRO	144	343.012	-405.722
KHSB	145	737.259	-207.858
KHUM	146	616.723	-1136.814
KHUT	147	-75.456	-213.411
KHYI	148	-84.429	-1120.581
KHYS	149	-195.165	-124.724
KIAH	150	159.982	-1112.067
KICT	151	-36.491	-259.771
KIER	152	369.594	-908.657
KILE	153	-65.316	-988.473
KINK	154	-586.978	-890.95
KITR	155	-451.837	-69.8
KIXD	156	180.857	-126.914
KJAN	157	650.08	-826.487
KJBR	158	569.655	-440.988
KJCT	159	-264.805	-1049.863
KJEF	160	417.469	-143.696
KJLN	161	220.368	-310.284
KJSV	162	198.556	-502.06
KJWG	163	-127.44	-456.946
KLAA	164	-494.483	-198.304
KLAW	165	-129.378	-600.254
KLBB	166	-445.079	-691.2
KLBL	167	-350.15	-318.583
KLBX	168	150.63	-1207.65
KLCH	169	366.039	-1089.113
KLFK	170	214.642	-969.288
KLFT	171	483.139	-1074.12
KLHX	172	-567.01	-195.279
KLIC	173	-573.7	-69.147
KLIT	174	434.161	-571.401
KLLQ	175	485.203	-691.199
KLRD	176	-246.569	-1383.486
KLRU	177	-917.261	-803.759
KLSX	178	544.697	-124.925
KLVJ	179	172.567	-1160.745
KLVS	180	-731.441	-447.785
KLWC	181	153.636	-108.143
KLWV	182	809.107	-95.154
KMAF	183	-489.696	-878.105
KMCB	184	622.67	-955.341
KMCI	185	195.298	-73.101
KMDH	186	676.591	-216.245
KMEI	187	774.908	-814.191
KMEM	188	634.534	-523.229
KMFE	189	-125.361	-1538.535
KMHK	190	28.579	-93.934
KMKC	191	205.861	-94.951

Table B-5. CENRAP South Precipitation Stations - 2002

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KMKL	192	727.077	-454.381
KMKO	193	146.966	-478.029
KMLC	194	110.644	-565.417
KMLU	195	466.016	-816.792
KMOB	196	839.42	-992.943
KMRF	197	-676.239	-1042.652
KMSL	198	853.332	-536.843
KMSY	199	653.767	-1087.37
KMTJ	200	-939.546	-109.53
KMVN	201	704.695	-154.57
KMWA	202	698.685	-218.021
KMWL	203	-99.247	-798.862
KMWT	204	312.521	-597.597
KNEW	205	674.286	-1080.207
KNFW	206	-40.525	-801.069
KNGP	207	-28.264	-1368
KNQA	208	643.986	-489.146
KNQI	209	-81.68	-1390.219
KOCH	210	216.534	-930.592
KODO	211	-509.4	-880.305
KOJC	212	180.815	-125.068
KOKC	213	-54.186	-508.715
KOKM	214	94.479	-478.439
KOLV	215	654.146	-529.476
KOLY	216	759.691	-104.636
KOUN	217	-41.707	-526.861
KOWB	218	858.23	-202.317
KP28	219	-139.317	-297.355
KP92	220	557.13	-1172.603
KPAH	221	725.844	-291.476
KPBF	222	464.795	-631.204
KPIB	223	728.391	-915.201
KPIL	224	-33.55	-1540.831
KPNC	225	-9.037	-360.887
KPOF	226	591.592	-335.455
KPPF	227	130.459	-293.82
KPQL	228	814.856	-1019.221
KPRX	229	143.317	-703.629
KPSX	230	73.863	-1251.5
KPTN	231	551.151	-1123.941
KPUB	232	-651.703	-162.851
KPVJ	233	-20.054	-585.348
KPWA	234	-57.09	-493.927
KPWG	235	-30.433	-944.406
KRBD	236	12.481	-810.433
KRKP	237	-4.965	-1324.879
KRKR	238	216.017	-548.175
KROG	239	258.441	-397.719

Table B-5. CENRAP South Precipitation Stations - 2002

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KROW	240	-698.85	-712.895
KRQE	241	-1083.18	-409.162
KRSL	242	-156.389	-123.748
KRSN	243	413.677	-819.685
KRTN	244	-664.239	-331.996
KRUE	245	352.817	-517.944
KRVS	246	90.474	-437.23
KSAF	247	-816.558	-444.045
KSAR	248	634.139	-179.076
KSAT	249	-142.994	-1160.901
KSET	250	564.392	-97.842
KSGF	251	318.465	-299.61
KSGR	252	130.817	-1151.128
KSGT	253	495.691	-582.749
KSHV	254	298.831	-829.307
KSJT	255	-333.267	-950.677
KSKX	256	-770.438	-355.856
KSLG	257	224.802	-417.183
KSLN	258	-56.011	-132.485
KSLO	259	692.8	-118.63
KSNL	260	5.421	-513.325
KSPD	261	-493.802	-285.159
KSPS	262	-136.546	-666.72
KSRC	263	475.987	-516.167
KSRR	264	-789.624	-686.256
KSSF	265	-144.978	-1183.291
KSTL	266	570.065	-117.452
KSUS	267	549.336	-130.02
KSVC	268	-1043.578	-751.807
KSWO	269	-7.445	-423.979
KSZL	270	297.567	-136.247
KTAD	271	-644.899	-276.219
KTBN	272	423.924	-237.479
KTCC	273	-597.363	-511.501
KTCL	274	870.684	-704.299
KTCS	275	-952.322	-695.439
KTEX	276	-948.259	-169.74
KTIK	277	-34.608	-506.971
KTKI	278	38.139	-755.127
KTOP	279	117.322	-102.315
KTPL	280	-39.799	-981.183
KTQH	281	179.315	-448.216
KTRL	282	68.48	-806.796
KTUL	283	98.267	-419.701
KTUP	284	753.906	-600.367
KTVR	285	560.687	-829.118
KTXK	286	278.022	-720.622
KUNO	287	450.268	-332.422

Table B-5. CENRAP South Precipitation Stations - 2002

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KUTS	288	136.314	-1024.869
KVBT	289	247.807	-399.9
KVCT	290	8.192	-1238.695
KVIH	291	454.952	-193.303
KWLD	292	0	-320.695
KWWR	293	-225.565	-391.327
KXNA	294	240.016	-407.886
MMAN	295	-329.872	-1569.4
MMCL	296	-1072.535	-1632.775
MMMA	297	-54.487	-1586.451
MMMY	298	-316.613	-1579.702
MMNL	299	-257.222	-1394.843
MMPG	300	-346.402	-1248.84
MMRX	301	-125.617	-1557.41
KBLV	302	617.659	-136.018
KELD	303	389.07	-742.171
KF39	304	30.792	-697.387
KIAB	305	-23.366	-263.504
KSKF	306	-154.653	-1177.521
KTYR	307	150.418	-844.347
KWDG	308	-71.289	-399.691
KEAX	309	235.703	-128.032
KMEG	310	651.863	-512.89
KNBG	311	677.608	-1102.405
KLZK	312	431.199	-560.297
MMCS	313	-893.759	-880.938
KE33	314	-846.39	-298.154
KBIX	315	778.283	-1028.545
KLRF	316	440.656	-550.693
KFCS	317	-669.55	-116.96
KEND	318	-81.725	-403.278
KPOE	319	364.89	-984.772
KDYS	320	-267.671	-834.062
KHMN	321	-848.745	-749.371
KRND	322	-125.115	-1161.171
MMCU	323	-882.35	-1211.961
KBYH	324	631.187	-421.631
KFSI	325	-127.711	-591.042
KGVT	326	86.944	-767.36
KHLR	327	-68.45	-981.004
KNMM	328	789.841	-788.597
KLTS	329	-206.759	-589.446
KAFF	330	-671.158	-85.372
KCWF	331	371.999	-1077.296
KCBM	332	789.252	-665.842
KBAD	333	312.771	-825.1
KDLF	334	-369.535	-1173.036
MMTC	335	-660.346	-1590.033

Table B-5. CENRAP South Precipitation Stations - 2002

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
MMMV	336	-444.934	-1449.379
KFRI	337	20.033	-105.018
K1H2	338	726.033	-68.974
KCPW	339	-858.907	-235.621
KMYP	340	-805.328	-126.737
KVTP	341	-715.975	-244.241
KHDC	342	632.988	-1028.708
KMNH	343	-652.817	-58.825
K3T5	344	4.852	-1119.865
KLXT	345	226.086	-111.723
KFWS	346	-28.156	-830.79
KJAS	347	284.559	-1005.649
KLIX	348	691.695	-1044.752
KSWW	349	-325.719	-827.955
KERV	350	-201.944	-1109.346
KBWD	351	-184.672	-906.806

Table B-6. CENRAP South Precipitation Stations - 2003

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
K11R	1	60.89	-1084.966
K1F0	2	-11.018	-645.265
K1H2	3	726.033	-68.974
K3T5	4	4.852	-1119.865
K4BL	5	-1088.794	-188.74
K4CR	6	-796.753	-614.946
K4MY	7	-820.552	-514.181
K4SL	8	-902.016	-397.882
K6R6	9	-504.682	-1089.929
KAAO	10	-19.239	-248.771
KABI	11	-252.073	-836.385
KABQ	12	-870.967	-501.552
KACT	13	-20.572	-929.193
KADH	14	30.04	-574.23
KADM	15	-1.531	-630.847
KADS	16	15.55	-778.91
KAEG	17	-886.431	-489.863
KAEX	18	424.008	-951.083
KAFW	19	-29.67	-778.139
KAIZ	20	387.096	-200.609
KALI	21	-102.174	-1362.836
KALM	22	-839.633	-752.147
KALN	23	597.6	-100.613
KALS	24	-777.382	-244.023
KAMA	25	-425.225	-516.367
KAQR	26	77.8	-619.389
KARA	27	495.794	-1092.463
KARG	28	543.544	-409.481
KASD	29	691.97	-1044.068
KASG	30	257.655	-419.895
KATS	31	-699.341	-756.355
KATT	32	-67.189	-1077.024
KAUS	33	-64.44	-1085.31
KAVK	34	-148.023	-355.847
KBAZ	35	-102.133	-1140.919
KBFM	36	857.496	-996.792
KBGD	37	-395.603	-466.083
KBLV	38	617.659	-136.018
KBMG	39	888.591	-45.013
KBMQ	40	-118.107	-1027.37
KBNA	41	920.716	-377.2
KBPK	42	404.476	-391.372
KBPT	43	289.282	-1110.638
KBRO	44	-44.198	-1571.387
KBTR	45	562.77	-1032.028
KBVE	46	741.254	-1153.502
KBVO	47	88.664	-358.933

Table B-6. CENRAP South Precipitation Stations - 2003

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KBVX	48	480.71	-457.819
KBWD	49	-184.672	-906.806
KCAO	50	-547.124	-374.102
KCDS	51	-300.324	-610.634
KCEZ	52	-1020.893	-233.136
KCFV	53	126.511	-320.682
KCGI	54	652.519	-279.306
KCHK	55	-87.955	-541.668
KCKV	56	850.158	-329.28
KCLL	57	60.926	-1044.347
KCNK	58	-55.418	-49.561
KCNM	59	-681.361	-822.067
KCNU	60	132.781	-256.9
KCNY	61	-1095.593	-59.385
KCOS	62	-663.999	-102.631
KCOT	63	-219.079	-1280.593
KCOU	64	411.894	-119.997
KCPS	65	591.654	-136.172
KCPW	66	-858.907	-235.621
KCQB	67	16.186	-473.43
KCQC	68	-775.182	-516.728
KCRP	69	-49.841	-1360.392
KCRS	70	56.76	-882.852
KCSM	71	-198.798	-512.028
KCVN	72	-556.268	-599.276
KCVS	73	-577.834	-601.516
KCXO	74	153.025	-1068.554
KDCU	75	915.854	-541.281
KDDC	76	-259.327	-242.715
KDEQ	77	238.943	-655.661
KDFW	78	-3.109	-786.339
KDHT	79	-496.517	-424.942
KDMN	80	-1006.923	-798.125
KDMO	81	336.438	-136.522
KDRO	82	-945.713	-259.162
KDRT	83	-382.557	-1172.484
KDTN	84	304.839	-822.047
KDTO	85	-18.599	-752.969
KDUA	86	56.176	-670.61
KDUC	87	-87.786	-611.524
KDWH	88	140.407	-1100.838
KDYR	89	679.855	-412.145
KEFD	90	178.542	-1150.911
KEHA	91	-431.288	-320.167
KEHR	92	812.8	-199.338
KELD	93	389.07	-742.171
KELP	94	-888.697	-862.785
KEMP	95	69.39	-183.984

Table B-6. CENRAP South Precipitation Stations - 2003

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KENL	96	683.539	-134.985
KERV	97	-201.944	-1109.346
KESF	98	447.345	-943.674
KEVV	99	822.902	-172.718
KEWK	100	-24.383	-215.58
KF39	101	30.792	-697.387
KFAM	102	573.877	-225.83
KFDR	103	-181.762	-623.071
KFLP	104	404.266	-399.14
KFMN	105	-993.475	-297.941
KFOA	106	735.051	-91.448
KFOE	107	114.644	-115.26
KFSM	108	237.996	-512.835
KFST	109	-566.391	-988.873
KFTW	110	-32.713	-795.542
KFWC	111	743.489	-143.961
KFWS	112	-28.156	-830.79
KFYV	113	253.764	-438.483
KGAG	114	-246.79	-405.469
KGBD	115	-162.152	-180.775
KGCK	116	-324.1	-221.895
KGCM	117	135.617	-409.198
KGDP	118	-737.521	-873.407
KGGG	119	214.599	-841.127
KGKY	120	-8.972	-812.595
KGLD	121	-401.583	-59.64
KGLE	122	-18.489	-702.977
KGLH	123	557.167	-701.877
KGLS	124	208.675	-1189.492
KGMJ	125	200.75	-372.417
KGNT	126	-985.121	-475.597
KGOK	127	-37.305	-458.997
KGPM	128	-4.681	-808.583
KGPT	129	764.04	-1031.678
KGRK	130	-79.671	-990.206
KGTR	131	779.037	-689.11
KGTU	132	-65.338	-1033.51
KGUC	133	-855.846	-113.585
KGUP	134	-1060.45	-427.996
KGUY	135	-399.88	-356.694
KGWO	136	640.075	-695.287
KHBG	137	737.58	-936.506
KHBR	138	-186.121	-551.122
KHDC	139	632.988	-1028.708
KHDO	140	-211.719	-1180.077
KHEZ	141	545.517	-911.954
KHKA	142	642.067	-423.71
KHKS	143	636.926	-825.191

Table B-6. CENRAP South Precipitation Stations - 2003

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KHLC	144	-242.098	-64.417
KHNB	145	870.668	-145.447
KHOB	146	-580.048	-790.648
KHOP	147	841.754	-324.602
KHOT	148	356.115	-603.71
KHOU	149	167.118	-1147.403
KHRL	150	-67.728	-1533.473
KHRO	151	343.012	-405.722
KHSB	152	737.259	-207.858
KHUM	153	616.723	-1136.814
KHUT	154	-75.456	-213.411
KHYI	155	-84.429	-1120.581
KHYS	156	-195.165	-124.724
KIAB	157	-23.366	-263.504
KIAH	158	159.982	-1112.067
KICT	159	-36.491	-259.771
KIER	160	369.594	-908.657
KILE	161	-65.316	-988.473
KINK	162	-586.978	-890.95
KITR	163	-451.837	-69.8
KIXD	164	180.857	-126.914
KJAN	165	650.08	-826.487
KJAS	166	284.559	-1005.649
KJBR	167	569.655	-440.988
KJCT	168	-264.805	-1049.863
KJEF	169	417.469	-143.696
KJLN	170	220.368	-310.284
KJSV	171	198.556	-502.06
KJWG	172	-127.44	-456.946
KLAA	173	-494.483	-198.304
KLAW	174	-129.378	-600.254
KLBB	175	-445.079	-691.2
KLBL	176	-350.15	-318.583
KLBX	177	150.63	-1207.65
KLCH	178	366.039	-1089.113
KLFK	179	214.642	-969.288
KLFT	180	483.139	-1074.12
KLHX	181	-567.01	-195.279
KLIC	182	-573.7	-69.147
KLIT	183	434.161	-571.401
KLIX	184	691.695	-1044.752
KLLQ	185	485.203	-691.199
KLRD	186	-246.569	-1383.486
KLRU	187	-917.261	-803.759
KLVJ	188	172.567	-1160.745
KLVS	189	-731.441	-447.785
KLWC	190	153.636	-108.143
KLWV	191	809.107	-95.154

Table B-6. CENRAP South Precipitation Stations - 2003

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KLXT	192	226.086	-111.723
KLZK	193	431.199	-560.297
KMAF	194	-489.696	-878.105
KMCB	195	622.67	-955.341
KMCI	196	195.298	-73.101
KMDH	197	676.591	-216.245
KMEG	198	651.863	-512.89
KMEI	199	774.908	-814.191
KMEM	200	634.534	-523.229
KMFE	201	-125.361	-1538.535
KMHK	202	28.579	-93.934
KMKC	203	205.861	-94.951
KMKL	204	727.077	-454.381
KMKO	205	146.966	-478.029
KMLC	206	110.644	-565.417
KMLU	207	466.016	-816.792
KMNH	208	-652.817	-58.825
KMOB	209	839.42	-992.943
KMRF	210	-676.239	-1042.652
KMSL	211	853.332	-536.843
KMSY	212	653.767	-1087.37
KMTJ	213	-939.546	-109.53
KMVN	214	704.695	-154.57
KMWA	215	698.685	-218.021
KMWL	216	-99.247	-798.862
KMWT	217	312.521	-597.597
KMYP	218	-805.328	-126.737
KNEW	219	674.286	-1080.207
KNFW	220	-40.525	-801.069
KNGP	221	-28.264	-1368
KNQI	222	-81.68	-1390.219
KOCH	223	216.534	-930.592
KODO	224	-509.4	-880.305
KOJC	225	180.815	-125.068
KOKC	226	-54.186	-508.715
KOKM	227	94.479	-478.439
KOLV	228	654.146	-529.476
KOLY	229	759.691	-104.636
KOUN	230	-41.707	-526.861
KOWB	231	858.23	-202.317
KP28	232	-139.317	-297.355
KP92	233	557.13	-1172.603
KPAH	234	725.844	-291.476
KPBF	235	464.795	-631.204
KPIB	236	728.391	-915.201
KPIL	237	-33.55	-1540.831
KPNC	238	-9.037	-360.887
KPOF	239	591.592	-335.455

Table B-6. CENRAP South Precipitation Stations - 2003

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KPPF	240	130.459	-293.82
KPQL	241	814.856	-1019.221
KPRX	242	143.317	-703.629
KPSX	243	73.863	-1251.5
KPTN	244	551.151	-1123.941
KPUB	245	-651.703	-162.851
KPVJ	246	-20.054	-585.348
KPWA	247	-57.09	-493.927
KPWG	248	-30.433	-944.406
KRBD	249	12.481	-810.433
KRKP	250	-4.965	-1324.879
KRKR	251	216.017	-548.175
KROG	252	258.441	-397.719
KROW	253	-698.85	-712.895
KRQE	254	-1083.18	-409.162
KRSL	255	-156.389	-123.748
KRTN	256	-664.239	-331.996
KRUE	257	352.817	-517.944
KRVS	258	90.474	-437.23
KSAF	259	-816.558	-444.045
KSAR	260	634.139	-179.076
KSAT	261	-142.994	-1160.901
KSET	262	564.392	-97.842
KSGF	263	318.465	-299.61
KSGR	264	130.817	-1151.128
KSGT	265	495.691	-582.749
KSHV	266	298.831	-829.307
KSJT	267	-333.267	-950.677
KSKF	268	-154.653	-1177.521
KSKX	269	-770.438	-355.856
KSLG	270	224.802	-417.183
KSLN	271	-56.011	-132.485
KSLO	272	692.8	-118.63
KSNL	273	5.421	-513.325
KSPD	274	-493.802	-285.159
KSPS	275	-136.546	-666.72
KSRC	276	475.987	-516.167
KSRR	277	-789.624	-686.256
KSSF	278	-144.978	-1183.291
KSTL	279	570.065	-117.452
KSUS	280	549.336	-130.02
KSVC	281	-1043.578	-751.807
KSWO	282	-7.445	-423.979
KSWW	283	-325.719	-827.955
KTAD	284	-644.899	-276.219
KTBN	285	423.924	-237.479
KTCC	286	-597.363	-511.501
KTCL	287	870.684	-704.299

Table B-6. CENRAP South Precipitation Stations - 2003

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KTCS	288	-952.322	-695.439
KTEX	289	-948.259	-169.74
KTIK	290	-34.608	-506.971
KTKI	291	38.139	-755.127
KTOP	292	117.322	-102.315
KTPL	293	-39.799	-981.183
KTQH	294	179.315	-448.216
KTRL	295	68.48	-806.796
KTUL	296	98.267	-419.701
KTUP	297	753.906	-600.367
KTVR	298	560.687	-829.118
KTXK	299	278.022	-720.622
KTYR	300	150.418	-844.347
KUNO	301	450.268	-332.422
KUTS	302	136.314	-1024.869
KVBT	303	247.807	-399.9
KVCT	304	8.192	-1238.695
KVIH	305	454.952	-193.303
KVTP	306	-715.975	-244.241
KWDG	307	-71.289	-399.691
KWLD	308	0	-320.695
KWWR	309	-225.565	-391.327
KXNA	310	240.016	-407.886
MMRX	311	-125.617	-1557.41
KDAL	312	14.014	-791.889
KNQA	313	643.986	-489.146
MMCL	314	-1072.535	-1632.775
MMMA	315	-54.487	-1586.451
KCWF	316	371.999	-1077.296
KEAX	317	235.703	-128.032
KFWD	318	-27.846	-793.612
MMMY	319	-316.613	-1579.702
KSZL	320	297.567	-136.247
MMNL	321	-257.222	-1394.843
MMPG	322	-346.402	-1248.84
MMCS	323	-893.759	-880.938
KE33	324	-846.39	-298.154
MMAN	325	-329.872	-1569.4
MMTC	326	-660.346	-1590.033
KEND	327	-81.725	-403.278
KLRF	328	440.656	-550.693
KHMN	329	-848.745	-749.371
KAFF	330	-671.158	-85.372
KBIX	331	778.283	-1028.545
KFCS	332	-669.55	-116.96
KBAD	333	312.771	-825.1
KBYH	334	631.187	-421.631
KDYS	335	-267.671	-834.062

Table B-6. CENRAP South Precipitation Stations - 2003

Initials	Station No.	LCP X-Coord (km)	LCP Y-Coord (km)
KFSI	336	-127.711	-591.042
KHLR	337	-68.45	-981.004
KGVT	338	86.944	-767.36
KNMM	339	789.841	-788.597
KLTS	340	-206.759	-589.446
KRND	341	-125.115	-1161.171
MMCU	342	-882.35	-1211.961
KNBG	343	677.608	-1102.405
KCBM	344	789.252	-665.842
KPOE	345	364.89	-984.772
KDLF	346	-369.535	-1173.036
KRSN	347	413.677	-819.685
KLSX	348	544.697	-124.925
MMMV	349	-444.934	-1449.379
MMIO	350	-715.54	-1595.056
KSEP	351	-111.464	-861.645
K4T6	352	8.451	-835.284
K7F6	353	179.475	-707.745
KAWM	354	612.739	-515.624
KBKS	355	-112.415	-1422.608
KBPG	356	-425.646	-852.529
KBYY	357	111.937	-1224.526
KOSA	358	189.947	-761.973
KPYX	359	-333.955	-390.158
KT82	360	-184.545	-1081
KPVW	361	-432.871	-634.402
K25R	362	-114.5	-1509.609
K5T5	363	-9.437	-877.587
KE38	364	-643.74	-1043.615
KF05	365	-209.141	-635.991
KGYI	366	30.479	-695.167
KHHF	367	-304.913	-447.807
KHQZ	368	43.967	-802.91
KJSO	369	168.422	-899.337
KJWY	370	8.451	-835.284
KLBR	371	179.475	-707.745
KLUD	372	-53.902	-747.262
KSNK	373	-369.685	-801.662
KT53	374	-68.769	-1358.77
KRPH	375	-145.239	-761.747

A T T A C H M E N T C

Emission Source Parameters

Table C-1. Emission Source Parameters

Emission Point	LCP Coordinates		Height (m)	Base Elevation (m)	Diameter (m)	Velocity (m/s)	Temperature (°K)
	X (km)	Y (km)					
16HTR#001	283.779	-1097.848	48.2	5.8	2.44	4.2	513
16HTR#002	283.779	-1097.848	48.2	5.8	2.44	4.2	513
05HTR#001	283.605	-1097.481	39.6	5.8	4.27	6.6	729
27HTR#004	283.450	-1097.704	39.6	5.8	3.66	6.0	529
06HTR#002	283.618	-1097.885	51.8	5.8	3.20	7.5	601
25HTR#001	283.563	-1098.664	45.7	5.8	1.83	4.4	690
25HTR#003	283.565	-1098.726	30.5	5.8	1.52	3.2	811
56BLR#022	283.052	-1098.680	61.0	5.8	3.05	14.3	450
57BLR#033	283.828	-1097.723	24.7	5.8	3.05	7.8	407
57BLR#034	283.318	-1097.739	24.7	5.8	3.05	7.8	409
27HTR#001	283.445	-1097.548	39.6	5.8	1.68	11.8	620
05HTR#002	283.605	-1097.481	39.6	5.8	2.13	5.1	557
27HTR#003	283.088	-1096.471	39.6	5.8	1.37	5.5	639
25HTR#004	283.565	-1098.726	15.2	5.8	0.91	19.6	978
20HTR#005	283.473	-1097.578	39.6	5.8	1.22	6.6	603
20HTR#004	283.416	-1097.456	39.6	5.8	2.44	5.3	671
20HTR#003	283.416	-1097.456	39.6	5.8	1.22	3.2	611
27HTR#002	283.447	-1097.610	39.6	5.8	1.52	5.5	715
06SCB#001	283.621	-1097.874	61.0	5.8	4.42	14.4	339
05HTR#004	282.819	-1096.480	45.7	5.8	1.98	8.2	625
25HTR#002	284.028	-1096.410	45.7	5.8	1.83	7.4	767
20HTR#001	282.819	-1096.480	39.6	5.8	1.22	4.2	614
20HTR#002	282.873	-1096.478	33.5	5.8	1.59	5.7	573
60FLR#002	284.326	-1098.142	54.9	5.8	0.56	20.0	1273
60FLR#003	284.061	-1097.435	61.0	5.8	0.95	20.0	311
60FLR#005	283.981	-1097.469	61.0	5.8	0.80	20.0	333
60FLR#008	283.979	-1097.407	61.0	5.8	0.64	20.0	339
60FLR#010	284.105	-1098.802	59.4	5.8	0.76	20.0	366

A T T A C H M E N T D

Emission Rates

Table D-1. Pre- and Post-BART Emission Rates

FIN	Pre-BART Emission Rate (lbs/24 hours)			Post-BART Emission Rate (lbs/24 hours)		
	NO_X	SO_2	PM_{10}	NO_X	SO_2	PM_{10}
05HTR#001	2,264	528	113	2,264	528	103
05HTR#002	430	96	19	430	96	19
05HTR#004	346	77	14	346	77	14
06HTR#002	484	208	64	484	208	64
27HTR#001	265	55	43	265	55	43
27HTR#003	1,858	420	47	1,858	420	47
27HTR#002	201	52	31	201	52	31
27HTR#004	130	63	20	130	63	20
20HTR#004	282	136	28	282	136	28
20HTR#005	192	78	17	192	78	17
16HTR#001	252	1	9	252	1	9
16HTR#002	249	1	8	299	1	8
25HTR#001	122	53	15	122	53	15
25HTR#002	242	56	16	0	0	0
20HTR#001	33	24	4	33	24	4
20HTR#002	72	18	3	72	18	3
20HTR#003	72	18	3	72	18	3
25HTR#003	60	16	5	60	16	5
25HTR#004	10	2	1	10	2	1
57BLR#033	1,027	447	128	1,027	447	128
57BLR#034	1,027	447	128	1,027	447	128
56BLR#022	4,050	466	2,025	0	0	0
06SCB#001	23,616	19,991	3,360	10,776	19,991	4,769
60FLR#002	32	3,610	0	44	5,080	0
60FLR#003	803	67,839	0	531	5,630	0
60FLR#005	1,608	203,284	0	1,329	16,993	0
60FLR#008	535	37,580	0	177	1,559	0
60FLR#010	481	8,686	0	921	2,822	0
TOTAL	**40,740**	**344,252**	**6,103**	**23,204**	**54,815**	**5,459**

Table D-2. Pre-BART Emission Rates

Emission Point	Emission Rate (g/s)[1]								
	SO_2	SO_4	NO_X	HNO_3	NO_3	EC	OC	PMC	PMF
16HTR#001	0.01	0.0225	1.32	0.0000	0.0003	0.0000	0.0040	0.0000	0.0211
16HTR#002	0.01	0.0201	1.31	0.0000	0.0002	0.0000	0.0036	0.0000	0.0189
05HTR#001	2.77	0.2795	11.88	0.0000	0.0033	0.0000	0.0500	0.0000	0.2620
27HTR#004	0.33	0.0492	0.68	0.0000	0.0006	0.0000	0.0088	0.0000	0.0461
06HTR#002	1.09	0.1569	2.54	0.0000	0.0018	0.0000	0.0280	0.0000	0.1471
25HTR#001	0.28	0.0379	0.64	0.0000	0.0004	0.0000	0.0068	0.0000	0.0355
25HTR#003	0.08	0.0113	0.32	0.0000	0.0001	0.0000	0.0020	0.0000	0.0105
56BLR#022	2.45	2.1261	21.26	0.0000	0.0585	0.0000	6.3784	0.0000	2.0677
57BLR#033	2.34	0.1348	5.39	0.0000	0.0037	0.0000	0.4045	0.0000	0.1311
57BLR#034	2.34	0.1348	5.39	0.0000	0.0037	0.0000	0.4045	0.0000	0.1311
27HTR#001	0.29	0.1054	1.39	0.0000	0.0012	0.0000	0.0188	0.0000	0.0988
05HTR#002	0.50	0.0474	2.26	0.0000	0.0006	0.0000	0.0085	0.0000	0.0444
27HTR#003	2.21	0.1161	9.75	0.0000	0.0014	0.0000	0.0207	0.0000	0.1088
25HTR#004	0.01	0.0018	0.05	0.0000	0.0000	0.0000	0.0003	0.0000	0.0017
20HTR#005	0.41	0.0420	1.01	0.0000	0.0005	0.0000	0.0075	0.0000	0.0394
20HTR#004	0.72	0.0699	1.48	0.0000	0.0008	0.0000	0.0125	0.0000	0.0655
20HTR#003	0.09	0.0077	0.38	0.0000	0.0001	0.0000	0.0014	0.0000	0.0072
27HTR#002	0.27	0.0776	1.05	0.0000	0.0009	0.0000	0.0139	0.0000	0.0727
06SCB#001	104.95	3.5280	123.98	0.0000	0.0970	0.0000	10.5840	0.0000	3.4310
05HTR#004	0.40	0.0355	1.81	0.0000	0.0004	0.0000	0.0064	0.0000	0.0333
25HTR#002	0.30	0.0403	1.27	0.0000	0.0005	0.0000	0.0072	0.0000	0.0377
20HTR#001	0.12	0.0107	0.17	0.0000	0.0001	0.0000	0.0019	0.0000	0.0100
20HTR#002	0.09	0.0077	0.38	0.0000	0.0001	0.0000	0.0014	0.0000	0.0072
60FLR#002	18.95	0.0000	0.17	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
60FLR#003	356.16	0.0000	4.22	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
60FLR#005	1067.24	0.0000	8.44	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
60FLR#008	197.30	0.0000	2.81	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
60FLR#010	45.60	0.0000	2.52	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

[1]SO_2 = gaseous sulfur dioxide SO_4 = particulate sulfate NO_X = gaseous nitrogen oxides
HNO_3 = gaseous nitric acid NO_3 = particulate nitrate EC = particulate elemental carbon
OC = particulate organic carbon PMC = coarse particulate matter PMF = fine particulate matter

Table D-3. Post-BART Emission Rates

Emission Point	Emission Rate (g/s)[1]								
	SO_2	SO_4	NO_X	HNO_3	NO_3	EC	OC	PMC	PMF
16HTR#001	0.0052	0.0222	1.3230	0.0000	0.0003	0.0000	0.0040	0.0000	0.0208
16HTR#002	0.0052	0.0197	1.5697	0.0000	0.0002	0.0000	0.0035	0.0000	0.0185
05HTR#001	2.7720	0.2541	11.8858	0.0000	0.0030	0.0000	0.0454	0.0000	0.2382
27HTR#004	0.3307	0.0493	0.6825	0.0000	0.0006	0.0000	0.0088	0.0000	0.0463
06HTR#002	1.0920	0.1579	2.5410	0.0000	0.0018	0.0000	0.0282	0.0000	0.1480
25HTR#001	0.2782	0.0370	0.6405	0.0000	0.0004	0.0000	0.0066	0.0000	0.0347
25HTR#003	0.0840	0.0123	0.3150	0.0000	0.0001	0.0000	0.0022	0.0000	0.0116
56BLR#022	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
57BLR#033	2.3467	0.1344	5.3917	0.0000	0.0037	0.0000	0.4032	0.0000	0.1307
57BLR#034	2.3467	0.1344	5.3917	0.0000	0.0037	0.0000	0.4032	0.0000	0.1307
27HTR#001	0.2887	0.1061	1.3912	0.0000	0.0012	0.0000	0.0190	0.0000	0.0994
05HTR#002	0.5040	0.0469	2.2575	0.0000	0.0005	0.0000	0.0084	0.0000	0.0439
27HTR#003	2.2050	0.1160	9.7543	0.0000	0.0014	0.0000	0.0207	0.0000	0.1087
25HTR#004	0.0105	0.0025	0.0525	0.0000	0.00003	0.0000	0.0004	0.0000	0.0023
20HTR#005	0.4095	0.0419	1.0080	0.0000	0.0005	0.0000	0.0075	0.0000	0.0393
20HTR#004	0.7140	0.0691	1.4805	0.0000	0.0008	0.0000	0.0123	0.0000	0.0648
20HTR#003	0.0945	0.0074	0.3780	0.0000	0.0001	0.0000	0.0013	0.0000	0.0069
27HTR#002	0.2730	0.0765	1.0552	0.0000	0.0009	0.0000	0.0137	0.0000	0.0717
06SCB#001	104.951	11.6246	56.5731	0.0000	0.0000	0.2303	0.8287	0.0000	12.3532
05HTR#004	0.4042	0.0345	1.8165	0.0000	0.0004	0.0000	0.0062	0.0000	0.0324
25HTR#002	0.00	0.0000	0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
20HTR#001	0.1260	0.0099	0.1732	0.0000	0.0001	0.0000	0.0018	0.0000	0.0093
20HTR#002	0.0945	0.0074	0.3780	0.0000	0.0001	0.0000	0.0013	0.0000	0.0069
60FLR#002	26.6696	0.0000	0.2310	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
60FLR#003	29.5570	0.0000	2.7881	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
60FLR#005	89.2118	0.0000	6.9778	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
60FLR#008	8.1846	0.0000	0.9288	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
60FLR#010	14.8152	0.0000	4.8352	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

[1]SO_2 = gaseous sulfur dioxide SO_4 = particulate sulfate NO_X = gaseous nitrogen oxides
HNO_3 = gaseous nitric acid NO_3 = particulate nitrate EC = particulate elemental carbon
OC = particulate organic carbon PMC = coarse particulate matter PMF = fine particulate matter

A T T A C H M E N T E

CALPUFF Control File Inputs

Group	Paramater	Description	CALPUFF Input	Default	Comments	Source
1	METRUN	Control parameter for running all periods in met. File (0=no; 1=yes)	0	0		1
	IBYR	Starting year of the CALPUFF run	2002	N.A.	2001 and 2003 are the other years modeled	1
	IBMO	Starting month	1	N.A.		1
	IBDY	Starting day	1	N.A.		1
	IBHR	Starting hour	0	N.A.		2
	XBTZ	Base time zone	0	N.A.	Greenwich Mean Time	2
	IRLG	Length of the run (hours)	8760	N.A.	2001=8760hrs, 2003=8748hrs only 12 hrs on 12/31	1
	NSPEC	Total number of species modeled	9	5	SO2, SO4, NOx, HNO3, NO3, EC, OC (SOA), PM25, PM10. To improve accuracy of analysis, provided more refined speciation of PM.	2
	NSE	Number of species emitted	9	3	SO2, SO4, NOx, HNO3, NO3, EC, OC (SOA), PM25, PM10. To improve accuracy of analysis, provided more refined speciation of PM.	2
	METFM	Meteorological data format	1	1	CALMET unformatted file	1
	AVET	Averaging time (minutes)	60	60		1
	PGTIME	Averaging time (minutes) for PG - σ	60	60		1
2	MGAUSS	Control variable determining the vertical distribution used in the near field	1	1	Gaussian	1
	MCTADJ	Terrain adjustment method	3	3	Partial plume path adjustment	1
	MCTSG	CALPUFF sub-grid scale complex terrain module (CTSG) flag	0	0	CTSG not modeled	1
	MSLUG	Near-field puffs are modeled as elongated "slugs"?	0	0	No	1
	MTRANS	Transitional plume rise modeled?	1	1	Transitional plume rise computed	1
	MTIP	Stack tip downwash modeled?	1	1	Yes	1
	MBDW	Method used to simulate building downwash?	1	1	ISC method	1
	MSHEAR	Vertical wind shear above stack top modeled in plume rise?	0	0	No	1
	MSPLIT	Puff splitting allowed?	0	0	0=No	1
	MCHEM	Chemical mechanism flag	1	1	Transformation rates computed internally (MESOPUFF II scheme)	1
	MAQCHEM	Aqueous phase transformation flag	0	0	Aqueous phase not modeled	1
	MWET	Wet removal modeled?	1	1	Yes	1
	MDRY	Dry deposition modeled?	1	1	Yes	1
	MDISP	Method used to compute dispersion coefficients	3	3	PG dispersion coefficients in RURAL & MP coefficients in urban areas	1
	MTURBVW	Sigma-v/sigma theta, sigma-w measurements used?	3	3	Use both sigma-(v/theta) and sigma-w from PROFILE.DAT Note: not provided	1
	MDISP2	Backup method used to compute dispersion when measured turbulence data are missing	3	3	PG dispersion coefficients in RURAL & MP coefficients in urban areas	1
	MROUGH	PG sigma-y,z adj. for roughness?	0	0	No	1
	MPARTL	Partial plume penetration of elevated inversion?	1	1	Yes	1
	MTINV	Strength of temperature inversion	0	0	No	1
	MPDF	PDF used for dispersion under convective conditions?	0	0	No	1
	MSGTIBL	Sub-Grid TIBL module used for shoreline?	0	0	No	1
	MBCON	Boundary conditions (concentration) modeled?	0	0	No	1
	MFOG	Configure for FOG model output	0	0	No	1
	MREG	TEST options specified to see if they conform to regulatory values?	1	1	Checks made	1
3	CSPEC	Species modeled	SO2, SO4, NOX, HNO3, NO3, EC, OC (SOA), PM25, PM10	N.A.		2

Group	Paramater	Description	CALPUFF Input	Default	Comments	Source
4	PMAP	Map projection	LCC	Lat Long	Used Lambert conformal conic per CENRAP guidance	1
	FEAST	False Easting	0	0		1
	FNORT	False Northing	0	0		1
	RLATO	Latitude	40N	N.A.		1
	RLONG	Longitude	97W	N.A.		1
	XLAT1 XLAT2	Matching parallel(s) of latitude for projection	33N 45N	N.A.		1
	DATUM	Datum region for the coordinates	WGS-G		WGS-84 GRS 80 spheroid, global coverage (WGS84)	1
	NX NY NZ	Meteorological grid: No. X grid cells in meteorological grid No. Y grid cells in meteorological grid No. vertical layers in meteorological grid	306 246 10	N.A.		1
	DGRIDKM	Grid spacing (km)	6	N.A.		1
	ZFACE	Cell face heights (m)	0, 20, 40, 80, 160, 320, 640, 1200, 2000, 3000, 4000	N.A.		1
	XORIGKM YORIGKM	Reference coordinates of SW corner of grid cell (1,1) (km)	-1008 -1620	N.A.		1
	IBCOMP JBCOMP IECOMP JECOMP	Computational grid: X index of LL corner Y index of LL corner X index of UR corner Y index of UR corner	1 1 306 246	N.A.		1
	LSAMP IBSAMP JBSAMP IESAMP JESAMP MESHDN	- Logical flag indicating if gridded receptors are used - X index of LL corner - Y index of LL corner - X index of UR corner - Y index of UR corner - Nesting factor of the sampling grid	F 1	F	Receptors are only in the Class I areas assessed	1
5	SPECIES	Species (or group) list for output options	1	0	Concentrations saved for SO2, SO4, NOx, HNO3, NO3, EC, SOA, PM25, PM10	1
6	NHILL	Number of terrain features	0	0		1
	NCTREC	Number of special complex terrain receptors	0	0		1
	MHILL	Terrain and CTSG receptor data for CTSG hills input in CTDM format?	2	N.A.	Hill data created by OPTHILL & input below in subgroup (6b); receptor data in subgroup (6c) note: no data provided	1
	XHILL2M	Factor to convert horizontal dimensions to meters	1	1		1
	ZHILL2M	Factor to convert vertical dimensions to meters	1	1		1
	XCTDMKM	X-origin of CTDM system relative to CALPUFF coordinate system, in Km	0	N.A.		1
	YCTDMKM	Y-origin of CTDM system relative to CALPUFF coordinate system, in Km	0	N.A.		1
7	SPECIES DIFFUSVTY ALPHA STR REACTVTY MESO RES HENRYS C	Chemical parameters for dry deposition of gases	SO2 NOX HNO3 .1509 .1656 .1628 1000 1 1 8 8 18 0 5 0 .04 3.5 8.0*E-8	SO2 NOX HNO3 .1509 .1656 .1628 1000 1 1 8 8 18 0 5 0 .04 3.5 8.0*E-8		1
8	SPECIES GEO. MASS DIA. GEO. SDEV.	Single species: mean and standard deviation used to compute deposition velocity for NINT size-ranges; averaged to obtain mean deposition velocity. Grouped species: size distribution specified, standard deviation as "0". Model uses deposition velocity for stated mean	SO4,NO3, EC, SOA, PM10, PM25 0.48 micron (all species) 2 microns (all species)	SO4,NO3, EC, SOA, PM10, PM25 0.48 micron (all species) 2 microns (all species)		1,2
9	RCUTR	Reference cuticle resistance	30	30		1
	RGR	Reference ground resistance	10	10		1
	REACTR	Reference pollutant reactivity	8	8		1
	NINT	Number of particle-size intervals to evaluate effective particle deposition velocity	9	9		1
	IVEG	Vegetation state in unirrigated areas	1	1		1
10	SPECIES LIQ. PRECIP. FROZ. PRECIP.	Scavenging coefficients	LIQ FROZ SO2: 3E-5 0 SO4: 1E-4 3E-5 NOX: 0 0 HNO3: 6E-5 0 NO3: 1E-4 3E-5 EC: 1E-4 3E-5 SOA: 1E-4 3E-5 PM10: 1E-4 3E-5 PM25: 1E-4 3E-5	LIQ FROZ SO2: 3E-5 0 SO4: 1E-4 3E-5 NOX: 0 0 HNO3: 6E-5 0 NO3: 1E-4 3E-5 EC: 1E-4 3E-5 SOA: 1E-4 3E-5 PM10: 1E-4 3E-5 PM25: 1E-4 3E-5		1,2
	MOZ	Ozone data input option	1	0		2

Group	Paramater	Description	CALPUFF Input	Default	Comments	Source
11	BCKO3	Monthly ozone concentrations	40 (12 months)			2
	BCKNH3	Monthly ammonia concentrations	3 (12 months)			1
	RNITE1	Nighttime SO2 loss rate	0.2	0.2		1
	RNITE2	Nighttime Nox loss rate	2	2		1
	RNITE3	Nighttime HNO3 formation rate	2	2		1
	MH2O2	H2O2 data input option	1	1		1
	BCKH2O2	Monthly H2O2 concentrations	-	-	MQACHEM = 0; not used	1
	BCKPMF OFRAC VCNX	Secondary Organic Aerosol options	-	-	MCHEM = 1; thus, not used	1
12	SYTDEP	Horizontal size of puff beyond which time-dependent dispersion equations (Heffter) are used	550	550		1
	MHFTSZ	Switch for using Heffter equation for sigma z as above	0	0		1
	JSUP	Stability class used to determine plume growth rates for puffs above boundary layer	5	5		1
	CONK1	Vertical dispersion constant for stable conditions	0.01	0.01		1
	CONK2	Vertical dispersion constant for neutral/unstable conditions	0.1	0.1		1
	TBD	Factor determining transition-point from Schulman-Scire to Huber-Snyder building downwash scheme	0.5	-	No building downwash used	1
	IURB1 IURB2	Range of land use categories for which urban dispersion is assumed	10 19	-	METFM=1; not used	1
	ILANDUIN	Land use category for modeling domain	20	-	METFM=1; not used	1
	ZOIN	Roughness length (m) for modeling domain	0.25	-	METFM=1; not used	1
	XLAIIN	Leaf area index for modeling domain	3	-	METFM=1; not used	1
	ELEVIN	Elevation above sea level	0	-	METFM=1; not used	1
	XLATIN	Latitude (degrees) for met location	-	-	METFM=1; not used	1
	XLONIN	Longitude (degrees) for met location	-	-	METFM=1; not used	1
	ANEMHT	Anemometer height (m)	10	-	METFM=1; not used	1
	ISIGMAV	Form of lateral turbulence data in PROFILE.DAT	1	1	Read sigma-v	1
	IMIXCTDM	Choice of mixing heights	-	-	METFM=1; not used	1
	XMXLEN	Maximum length of a slug	1	1		1
	XSAMLEN	Maximum travel distance of a puff/slug during one sampling step	1	1		1
	MXNEW	Maximum number of slugs/puffs released from one source during one time step	99	99		1
	MXSAM	Maximum number of sampling steps for one puff/slug during one time step	99	99		1
	NCOUNT	Number of iterations used when computing the transport wind for a sampling step that includes gradual rise	2	2		1
	SYMIN	Minimum sigma y for a new puff/slug	1	1		1
	SZMIN	Minimum sigma z for a new puff/slug	1	1		1
	SVMIN SWMIN	Default minimum turbulence velocities sigma-v and sigma-w for each stability class	.5 .5 .5 .5 .5 .5 .2 .12.08 .06 .03 .016	.5 .5 .5 .5 .5 .5 .2 .12.08 .06 .03 .016		1
	CDIV	Divergence criterion for dw/dz across puff used to initiate adjustment for horizontal convergence	0, 0	0, 0		1
	WSCALM	Minimum wind speed allowed for non-calm conditions. Used as minimum speed returned when using power-law extrapolation toward surface	0.5	0.5		1
	XMAXZI	Maximum mixing height (m)	4000		Top interface in CALMET simulation	1
	XMINZI	Minimum mixing height (m)	20			1
	WSCAT	Default wind speed classes	1.54 3.09 5.14 8.23 10.80	1.54 3.09 5.14 8.23 10.80		1
	PLXO	Default wind speed profile power-law exponents for stabilities 1-6	.07 .07 .10 .15 .35 .55	.07 .07 .10 .15 .35 .55		1
	PTGO	Default potential temperature gradient for stable classes E, F (deg k/m)	.020 .035	.020 .035		1
	PPC	Default plume path coefficients for each stability class	.5 .5 .5 .5 .35 .35	.5 .5 .5 .5 .35 .35		1
	SL2PF	Slug-to-puff transitions criterion factor equal to sigma-v/length of slug	10	10		1
	NSPLIT	Number of puffs that result every time a puff is split	3	3	May vary with simulation period (either 1 or 2)	1
	IRESPLIT	Time of day when split puffs are eligible to be split once again; this is typically set once per day, around sunset before nocturnal shear develops	Hour 18 = 1, All others = 0			1

Group	Paramater	Description	CALPUFF Input	Default	Comments	Source
	ZISPLIT	Split is allowed only if last hour's mixing height (m) exceeds a minimum value	100	100		1
	ROLDMAX	Split is allowed only if ratio of last hour's mixing ht to the maximum mixing ht experienced by the puff is less than a maximum value	0.25	0.25		1
	NSPLITH	Number of puffs that result every time a puff is split	5	5		1
	SYSPLITH	Minimum sigma-y of puff before it may be split	1	1		1
	SHSPLITH	Minimum puff elongation rate due to wind shear, before it may be split	2	2		1
	CNSPLITH	Minimum concentration of each species in puff before it may be split	1E-7	1E-7		1
	EPSSLUG	Fractional convergence criterion for numerical SLUG sampling integration	1E-4	1E-4		1
	EPSAREA	Fractional convergence criterion for numerical AREA source integration	1E-6	1E-6		1
	DSRISE	Trajectory step-length (m) used for numerical rise integration	1	1		1
	HTMINBC	Minimum height (m) to which BC puffs are mixed as they are emitted. Actual height is reset to the current mixing height at the release point if greater than this minimum	500	500		1
	RSAMPBC	Search radius (in BC segment lengths) about a receptor for sampling nearest BC puff. BC puffs are emitted with a spacing of one segment length, so the search radius should be greater than 1	10			1
	MDEPBC	Near-surface depletion adjustment to concentration profile used when sampling BC puffs?	1	1	Adjust concentration for depletion	1
13	NPT1	Number of point sources with parameters	28	N.A.		2
	IPTU	Units used for point source emissions	1	1		1
	NSPT1	Number of source-species combinations with variable emissions scaling factors	0	0		1
	NPT2	Number of point sources with variable emission parameters provided in external file	0	N.A.		1
17	NREC	Number of non-gridded receptors	3831	N.A.	147 Bandelier 480 Big Bend 168 Bosque del Apache 40 Breton 80 Caney Creek 256 Carlsbad Caverns 195 Great Sand Dunes 127 Guadalupe Mountains 80 Hercules-Glades 187 La Garita 147 Mesa Verde* 47 Mingo 321 Pecos 55 Salt Creek 247 San Pedro Parks 72 Upper Buffalo 744 Weminuche 109 Wheeler Peak 270 White Mountain 59 Wichita Mountains	1,2

Notes:

* Removed 165 receptors from Mesa Verde because they were located outside the limits of the meteorological grid.

[1] TCEQ, Best Available Retrofit Technology (BART) Modeling Protocol to Determine Sources Subject to BART in the State of Texas, January 2007

[2] User-specified input based on CENRAP guidance (CENRAP BART Modeling Guidelines, December 2005)

A T T A C H M E N T F

POSTUTIL Control File Inputs

Group	Paramater	Description	POSTUTIL Input	Default	Comments	Source
1	ISYR	Starting year	2002	N.A.	2001 and 2003 also modeled	1
	ISMO	Starting month	1	N.A.		1
	IDY	Starting day	1	N.A.		1
	ISHR	Starting hour	0	N.A.	CALMET and CALPUFF in GMT; therefore, starting hour of POSTUTIL must correspond to 0 GMT	2
	NPER	Number of periods to process	8760	N.A.	2001=8760 hrs, 2003=8748 hrs (only 12 hrs on 12/31)	1
	NSPECINP	Number of species to process from CALPUFF runs	9	N.A.	SO2, SO4, NOx, HNO3, NO3, EC, OC (SOA), PM25, PM10	2
	NSPECOUT	Number of species to write to output file	9	N.A.	SO2, SO4, NOx, HNO3, NO3, EC, OC (SOA), PM25, PM10	2
	NSPECCMP	Number of species to compute from those modeled	0	N.A.		1
	MDUPLCT	Stop run if duplicate species names found?	0	0		1
	NSCALED	Number of CALPUFF data files that will be scaled	0	0		1
	MNITRATE	Re-compute the HNO3/NO3 for concentrations?	1	N	Yes, for all sources combined	1
	BCKNH3	Default ammonia concentrations used for HNO3/NO3 partition	-	N	12*3	1
2	ASPECI	NSPECINP species will be processed	-	N.A.	SO2, SO4, NOx, HNO3, NO3, EC, OC (SOA), PM25, PM10	2
	ASPECO	NSPECOUT species will be written	-	N.A.	SO2, SO4, NOx, HNO3, NO3, EC, OC (SOA), PM25, PM10	2

Notes:

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A T T A C H M E N T G

CALPOST Control File Inputs

Group	Paramater	Description	CALPOST Input	Default	Comments	Source
1	METRUN	Option to run all periods found in met files	0	0	Run period explicitly defined	1
	ISYR	Starting year	2002	N.A.	2001 and 2003 also modeled	1
	ISMO	Starting month	1	N.A.		1
	IDY	Starting day	1	N.A.		1
	ISHR	Starting hour	0	N.A.	CALMET, CALPUFF, and POSTUTIL in GMT; therefore, CALPOST run must correspond to 0 GMT	2
	NHRS	Number of hours to process	8760	N.A.	2001=8760 hrs, 2003=8748 hrs (only 12 hrs on 12/31)	1
	NREP	Process every hour of data?	1	1	Every hour processed	1
	ASPEC	Species to process	VISIB	N.A.	Visibility processing	1
	ILAYER	Layer/deposition code	1	1	CALPUFF concentration	1
	A,B	Scaling factors X(new)=X(old)*A+B	0,0	0,0		1
	LBACK	Add hourly background concentrations/fluxes?	F	F		1
	MSOURCE	Option to process source contributions	0	0		1
	LG LD	Gridded receptors processed? Discrete receptors processed?	F T	N/Y	Receptors located only in the Class I areas assessed	1
	LCT	CTSG Complex terrain receptors processed?	F	F		1
	LDRING	Report results by DISCRETE receptor RING?	F	F		1
	NDRECP	Flag for all receptors after the last one assigned is set to "0"	1	1		2
	IBGRID JBGRID IEGRID JEGRID	Range of gridded receptors	-1 -1 -1 -1	-1 -1 -1 -1	When LG=T entire grid processed if all = -1	1
	NGONOFF	Number of gridded receptor rows provided to identify specific gridded receptors to process	0	0		1
	BTZONE	Base time zone for the CALPUFF simulation	0	N.A.	Greenwich Mean Time	2
	MFRH	Particle growth curve f(RH) for hygroscopic species	2	2	FLAG (2000) f(RH) tabulation. Note: not used	1
	RHMAX	Maximum relative humidity (%) used in particle growth curve	95	98	Doesn't matter, not used	1
	LVSO4 LVNO3 LVOC LVPMC LVPMF LVEC	Modeled species to be included in computing light extinction	T T T T T T	T T T T T T		1,2
	LVBK	Include BACKGROUND when ranking for TOP-N, TOP-50, and exceedance tables?	T	T		1
	SPECPMC SPECPMF	Species name used for particulates in MODEL.DAT file	PM10 PM25	N N		1
	EEPMC EEPMF	Modeled particulate species	0.6 1.0	Y Y		1
	EEPMCBK	Background particulate species	0.6	Y		1
	EESO4 EENO3 EEOC EESOIL EEEC	Other species	3.0 3.0 4.0 1.0 10	Y Y Y Y Y		1
	LAVER	Background extinction computation	F	Y		1
	MVISBK	Method used for background light extinction	6	N	Compute extinction from speciated PM measurements. FLAG RH adjustment factor applied to observed and modeled sulfate and nitrate.	1
	RHFAC	Extinction coefficients for hygroscopic species (modeled and background). Monthly RH adjustment factors.	-	N.A.	See Table 4 in main protocol document	1
	BKSO4 BKNO3 BKPMC BKOC BKSOIL BKEC	Monthly concentrations of ammonium sulfate, ammonium nitrate, coarse particulates, organic carbon, soil and elemental carbon to compute background extinction coefficients	-	N.A.	See Table 5 in main protocol document	1
	BEXTRAY	Extinction due to Rayleigh scattering (1/Mm)	10	Y		1
	IPRTU	Units for all output	3	N	micrograms/cubic meter	1
	L24HR	Averaging time reported	T	N.A.		1
	LTOPN	Visibility: Top "N" table for each averaging time selected.	F	Y		1
	NTOP	Number of "Top-N" values at each receptor selected (NTOP must be <=4)	4	Y		1
	MDVIS	Output file with visibility change at each receptor?	0	Y	Create file of DAILY (24 hour) delta-deciview. Grid model run.	1

Notes:

[1] TCEQ, Best Available Retrofit Technology (BART) Modeling Protocol to Determine Sources Subject to BART in the State of Texas, January 2007

[2] User-specified input based on CENRAP guidance (CENRAP BART Modeling Guidelines, December 2005)

A T T A C H M E N T H

Modeling Archive

Model	File Type	File Name	Notes
CALPUFF	Input	2001a_pre.cpi	Pre-BART: 2880 hrs – 1/1 – 4/30
		2001b_pre.cpi	Pre-BART:3024 hrs – 4/28 – 8/31
		2001c_pre.cpi	Pre-BART: 2952 hrs – 8/29 – 12/31
		2002_pre.cpi	Pre-BART: 8760 hrs
		2003_pre.cpi	Pre-BART: 8748 hrs (only 12 hrs on 12/31)
		2001a_post.cpi	Post-BART: 2880 hrs – 1/1 – 4/30
		2001b_post.cpi	Post -BART:3024 hrs – 4/28 – 8/31
		2001c_post.cpi	Post -BART: 2952 hrs – 8/29 – 12/31
		2002_post.cpi	Post -BART: 8760 hrs
		2003_post.cpi	Post -BART: 8748 hrs (only 12 hrs on 12/31)
POSTUTIL	Input	2001a_xom_bea_pre_ postutil.inp	Pre-BART: 2880 hrs – 1/1 – 4/30
		2001b_xom_bea_pre_ postutil.inp	Pre-BART: 3024 hrs – 4/28 – 8/31
		2001c_xom_bea_pre_postutil.inp	Pre-BART: 2952 hrs – 8/29 – 12/31
		2002_xom_bea_pre_postutil.inp	Pre-BART: 8760 hrs
		2003_xom_bea_pre_postutil.inp	Pre-BART: 8748 hrs (only 12 hrs on 12/31)
		2001a_xom_bea_post.inp	Post-BART: 2880 hrs – 1/1 – 4/30
		2001b_xom_bea_post.inp	Post -BART: 3024 hrs – 4/28 – 8/31
		2001c_xom_bea_post.inp	Post -BART: 2952 hrs – 8/29 – 12/31
		2002_xom_bea_post.inp	Post -BART: 8760 hrs
		2003_xom_bea_post.inp	Post -BART: 8748 hrs (only 12 hrs on 12/31)
APPEND	Input	Append.inp	2001
CALPOST	Input	2001_xom_bea_band.inp	Bandelier Wilderness Area
		2001_xom_bea_bibe.inp	Big Bend National Park
		2001_xom_bea_bosq.inp	Bosque del Apache Wilderness Area
		2001_xom_bea_bret.inp	Breton Wilderness Area
		2001_xom_bea_cacr.inp	Caney Creek Wilderness Area
		2001_xom_bea_cave.inp	Carlsbad Caverns National Park
		2001_xom_bea_grsa.inp	Great Sand Dunes Wilderness Area
		2001_xom_bea_gumo.inp	Guadalupe Mountains National Park
		2001_xom_bea_herc.inp	Hercules-Glades Wilderness Area
		2001_xom_bea_laga.inp	La Garita Wilderness Area
		2001_xom_bea_meve.inp	Mesa Verde National Park
		2001_xom_bea_ming.inp	Mingo Wilderness Area
		2001_xom_bea_peco.inp	Pecos Wilderness Area
		2001_xom_bea_sacr.inp	Salt Creek Wildlife Refuges
		2001_xom_bea_sape.inp	San Pedro Parks Wilderness Area
		2001_xom_bea_upbu.inp	Upper Buffalo Wilderness Area
		2001_xom_bea_wemi.inp	Weminuche Wilderness Area
		2001_xom_bea_whpe.inp	Wheeler Peak Wilderness Area
		2001_xom_bea_whmo.inp	White Mountain Wilderness Area
		2001_xom_bea_wich.inp	Wichita Mountains Wildlife Refuges
		2002_xom_bea_band.inp	Bandelier Wilderness Area
		2002_xom_bea_bibe.inp	Big Bend National Park
		2002_xom_bea_bosq.inp	Bosque del Apache Wilderness Area

Model	File Type	File Name	Notes
CALPOST	Input	2002_xom_bea_bret.inp	Breton Wilderness Area
		2002_xom_bea_cacr.inp	Caney Creek Wilderness Area
		2002_xom_bea_cave.inp	Carlsbad Caverns National Park
		2002_xom_bea_grsa.inp	Great Sand Dunes Wilderness Area
		2002_xom_bea_gumo.inp	Guadalupe Mountains National Park
		2002_xom_bea_herc.inp	Hercules-Glades Wilderness Area
		2002_xom_bea_laga.inp	La Garita Wilderness Area
		2002_xom_bea_meve.inp	Mesa Verde National Park
		2002_xom_bea_ming.inp	Mingo Wilderness Area
		2002_xom_bea_peco.inp	Pecos Wilderness Area
		2002_xom_bea_sacr.inp	Salt Creek Wildlife Refuges
		2002_xom_bea_sape.inp	San Pedro Parks Wilderness Area
		2002_xom_bea_upbu.inp	Upper Buffalo Wilderness Area
		2002_xom_bea_wemi.inp	Weminuche Wilderness Area
		2002_xom_bea_whpe.inp	Wheeler Peak Wilderness Area
		2002_xom_bea_whmo.inp	White Mountain Wilderness Area
		2002_xom_bea_wich.inp	Wichita Mountains Wildlife Refuges
		2003_xom_bea_band.inp	Bandelier Wilderness Area
		2003_xom_bea_bibe.inp	Big Bend National Park
		2003_xom_bea_bosq.inp	Bosque del Apache Wilderness Area
		2003_xom_bea_bret.inp	Breton Wilderness Area
		2003_xom_bea_cacr.inp	Caney Creek Wilderness Area
		2003_xom_bea_cave.inp	Carlsbad Caverns National Park
		2003_xom_bea_grsa.inp	Great Sand Dunes Wilderness Area
		2003_xom_bea_gumo.inp	Guadalupe Mountains National Park
		2003_xom_bea_herc.inp	Hercules-Glades Wilderness Area
		2003_xom_bea_laga.inp	La Garita Wilderness Area
		2003_xom_bea_meve.inp	Mesa Verde National Park
		2003_xom_bea_ming.inp	Mingo Wilderness Area
		2003_xom_bea_peco.inp	Pecos Wilderness Area
		2003_xom_bea_sacr.inp	Salt Creek Wildlife Refuges
		2003_xom_bea_sape.inp	San Pedro Parks Wilderness Area
		2003_xom_bea_upbu.inp	Upper Buffalo Wilderness Area
		2003_xom_bea_wemi.inp	Weminuche Wilderness Area
		2003_xom_bea_whpe.inp	Wheeler Peak Wilderness Area
		2003_xom_bea_whmo.inp	White Mountain Wilderness Area
		2003_xom_bea_wich.inp	Wichita Mountains Wildlife Refuges
CALPUFF	Output	2001a.con	Concentration
		2001a.dry	Dry deposition
		2001a.wet	Wet deposition
		2001a.rst	Restart file
		2001b.con	Concentration
		2001b.dry	Dry deposition
		2001b.wet	Wet deposition
		2001b.rst	Restart file
		2001c.con	Concentration
		2001c.dry	Dry deposition
		2001c.wet	Wet deposition
		2001c.rst	Restart file
		2002.con	Concentration
		2002.dry	Dry deposition
		2002.wet	Wet deposition

Model	File Type	File Name	Notes
		2002.rst	Restart file
		2003.con	Concentration
		2003.dry	Dry deposition
		2003.wet	Wet deposition
		2003.rst	Restart file
POSTUTIL	Output	2001a_xom_bea_pre_cpuf.dat	Pre-BART: Concentration
		2001a_xom_bea_pre_postutil.lst	Pre-BART: List file
		2001b_xom_bea_pre_cpuf.dat	Pre-BART: Concentration
		2001b_xom_bea_pre_postutil.lst	Pre-BART: List file
		2001c_xom_bea_pre_cpuf.dat	Pre-BART: Concentration
		2001c_xom_bea_pre_cpuf.lst	Pre-BART: List file
		2002_xom_bea_pre_cpuf.dat	Pre-BART: Concentration
		2002_xom_bea_pre_postutil.lst	Pre-BART: List file
		2003_xom_bea_pre_cpuf.dat	Pre-BART: Concentration
		2003_xom_bea_pre_postutil.lst	Pre-BART: List file
		2001a_xom_bea_post_cpuf.dat	Post-BART: Concentration
		2001a_xom_bea_post_postutil.lst	Post-BART: List file
		2001b_xom_bea_post_cpuf.dat	Post-BART: Concentration
		2001b_xom_bea_post_postutil.lst	Post-BART: List file
		2001c_xom_bea_post_cpuf.dat	Post-BART: Concentration
		2001c_xom_bea_post_cpuf.lst	Post-BART: List file
		2002_xom_bea_post_cpuf.dat	Post-BART: Concentration
		2002_xom_bea_post_postutil.lst	Post-BART: List file
		2003_xom_bea_post_cpuf.dat	Post-BART: Concentration
		2003_xom_bea_post_postutil.lst	Post-BART: List file
APPEND	Output	2001_xom_bea_pre_cpuf.dat	Pre-BART: Concentration - appended
		2001_xom_bea_post_cpuf.dat	Post-BART: Concentration - appended
		Append.lst	List file
CALPOST	Output	2001_xom_bea_pre_band_cpst.lst	Bandelier Wilderness Area
		2001_xom_bea_pre_bibe_cpst.lst	Big Bend National Park
		2001_xom_bea_pre_bosq_cpst.lst	Bosque del Apache Wilderness Area
		2001_xom_bea_pre_bret_cpst.lst	Breton Wilderness Area
		2001_xom_bea_pre_cacr_cpst.lst	Caney Creek Wilderness Area
		2001_xom_bea_pre_cave_cpst.lst	Carlsbad Caverns National Park
		2001_xom_bea_pre_grsa_cpst.lst	Great Sand Dunes Wilderness Area
		2001_xom_bea_pre_gumo_cpst.lst	Guadalupe Mountains National Park
		2001_xom_bea_pre_herc_cpst.lst	Hercules-Glades Wilderness Area
		2001_xom_bea_pre_laga_cpst.lst	La Garita Wilderness Area
		2001_xom_bea_pre_meve_cpst.lst	Mesa Verde National Park
		2001_xom_bea_pre_ming_cpst.lst	Mingo Wilderness Area
		2001_xom_bea_pre_peco_cpst.lst	Pecos Wilderness Area
		2001_xom_bea_pre_sacr_cpst.lst	Salt Creek Wildlife Refuges
		2001_xom_bea_pre_sape_cpst.lst	San Pedro Parks Wilderness Area
		2001_xom_bea_pre_upbu_cpst.lst	Upper Buffalo Wilderness Area
		2001_xom_bea_pre_wemi_cpst.lst	Weminuche Wilderness Area
		2001_xom_bea_pre_whpe_cpst.lst	Wheeler Peak Wilderness Area
		2001_xom_bea_pre_whmo_cpst.lst	White Mountain Wilderness Area
		2001_xom_bea_pre_wich_cpst.lst	Wichita Mountains Wildlife Refuges
		2002_xom_bea_pre_band_cpst.lst	Bandelier Wilderness Area
		2002_xom_bea_pre_bibe_cpst.lst	Big Bend National Park
		2002_xom_bea_pre_bosq_cpst.lst	Bosque del Apache Wilderness Area

Model	File Type	File Name	Notes
CALPOST	Output	2002_xom_bea_pre_bret_cpst.lst	Breton Wilderness Area
		2002_xom_bea_pre_cacr_cpst.lst	Caney Creek Wilderness Area
		2002_xom_bea_pre_cave_cpst.lst	Carlsbad Caverns National Park
		2002_xom_bea_pre_grsa_cpst.lst	Great Sand Dunes Wilderness Area
		2002_xom_bea_pre_gumo_cpst.lst	Guadalupe Mountains National Park
		2002_xom_bea_pre_herc_cpst.lst	Hercules-Glades Wilderness Area
		2002_xom_bea_pre_laga_cpst.lst	La Garita Wilderness Area
		2002_xom_bea_pre_meve_cpst.lst	Mesa Verde National Park
		2002_xom_bea_pre_ming_cpst.lst	Mingo Wilderness Area
		2002_xom_bea_pre_peco_cpst.lst	Pecos Wilderness Area
		2002_xom_bea_pre_sacr_cpst.lst	Salt Creek Wildlife Refuges
		2002_xom_bea_pre_sape_cpst.lst	San Pedro Parks Wilderness Area
		2002_xom_bea_pre_upbu_cpst.lst	Upper Buffalo Wilderness Area
		2002_xom_bea_pre_wemi_cpst.lst	Weminuche Wilderness Area
		2002_xom_bea_pre_whpe_cpst.lst	Wheeler Peak Wilderness Area
		2002_xom_bea_pre_whmo_cpst.lst	White Mountain Wilderness Area
		2002_xom_bea_pre_wich_cpst.lst	Wichita Mountains Wildlife Refuges
		2003_xom_bea_pre_band_cpst.lst	Bandelier Wilderness Area
		2003_xom_bea_pre_bibe_cpst.lst	Big Bend National Park
		2003_xom_bea_pre_bosq_cpst.lst	Bosque del Apache Wilderness Area
		2003_xom_bea_pre_bret_cpst.lst	Breton Wilderness Area
		2003_xom_bea_pre_cacr_cpst.lst	Caney Creek Wilderness Area
		2003_xom_bea_pre_cave_cpst.lst	Carlsbad Caverns National Park
		2003_xom_bea_pre_grsa_cpst.lst	Great Sand Dunes Wilderness Area
		2003_xom_bea_pre_gumo_cpst.lst	Guadalupe Mountains National Park
		2003_xom_bea_pre_herc_cpst.lst	Hercules-Glades Wilderness Area
		2003_xom_bea_pre_laga_cpst.lst	La Garita Wilderness Area
		2003_xom_bea_pre_meve_cpst.lst	Mesa Verde National Park
		2003_xom_bea_pre_ming_cpst.lst	Mingo Wilderness Area
		2003_xom_bea_pre_peco_cpst.lst	Pecos Wilderness Area
		2003_xom_bea_pre_sacr_cpst.lst	Salt Creek Wildlife Refuges
		2003_xom_bea_pre_sape_cpst.lst	San Pedro Parks Wilderness Area
		2003_xom_bea_pre_upbu_cpst.lst	Upper Buffalo Wilderness Area
		2003_xom_bea_pre_wemi_cpst.lst	Weminuche Wilderness Area
		2003_xom_bea_pre_whpe_cpst.lst	Wheeler Peak Wilderness Area
		2003_xom_bea_pre_whmo_cpst.lst	White Mountain Wilderness Area
		2003_xom_bea_pre_wich_cpst.lst	Wichita Mountains Wildlife Refuges
		2001_xom_bea_post_band_cpst.lst	Bandelier Wilderness Area
		2001_xom_bea_post_bibe_cpst.lst	Big Bend National Park
		2001_xom_bea_post_bosq_cpst.lst	Bosque del Apache Wilderness Area
		2001_xom_bea_post_bret_cpst.lst	Breton Wilderness Area
		2001_xom_bea_post_cacr_cpst.lst	Caney Creek Wilderness Area
		2001_xom_bea_post_cave_cpst.lst	Carlsbad Caverns National Park
		2001_xom_bea_post_grsa_cpst.lst	Great Sand Dunes Wilderness Area
		2001_xom_bea_post_gumo_cpst.lst	Guadalupe Mountains National Park
		2001_xom_bea_post_herc_cpst.lst	Hercules-Glades Wilderness Area
		2001_xom_bea_post_laga_cpst.lst	La Garita Wilderness Area
		2001_xom_bea_post_meve_cpst.lst	Mesa Verde National Park
		2001_xom_bea_post_ming_cpst.lst	Mingo Wilderness Area
		2001_xom_bea_post_peco_cpst.lst	Pecos Wilderness Area
		2001_xom_bea_post_sacr_cpst.lst	Salt Creek Wildlife Refuges
		2001_xom_bea_post_sape_cpst.lst	San Pedro Parks Wilderness Area

Model	File Type	File Name	Notes
CALPOST	Output	2001_xom_bea_post_upbu_cpst.lst	Upper Buffalo Wilderness Area
		2001_xom_bea_post_wemi_cpst.lst	Weminuche Wilderness Area
		2001_xom_bea_post_whpe_cpst.lst	Wheeler Peak Wilderness Area
		2001_xom_bea_post_whmo_cpst.lst	White Mountain Wilderness Area
		2001_xom_bea_post_wich_cpst.lst	Wichita Mountains Wildlife Refuges
		2002_xom_bea_post_band_cpst.lst	Bandelier Wilderness Area
		2002_xom_bea_post_bibe_cpst.lst	Big Bend National Park
		2002_xom_bea_post_bosq_cpst.lst	Bosque del Apache Wilderness Area
		2002_xom_bea_post_bret_cpst.lst	Breton Wilderness Area
		2002_xom_bea_post_cacr_cpst.lst	Caney Creek Wilderness Area
		2002_xom_bea_post_cave_cpst.lst	Carlsbad Caverns National Park
		2002_xom_bea_post_grsa_cpst.lst	Great Sand Dunes Wilderness Area
		2002_xom_bea_post_gumo_cpst.lst	Guadalupe Mountains National Park
		2002_xom_bea_post_herc_cpst.lst	Hercules-Glades Wilderness Area
		2002_xom_bea_post_laga_cpst.lst	La Garita Wilderness Area
		2002_xom_bea_post_meve_cpst.lst	Mesa Verde National Park
		2002_xom_bea_post_ming_cpst.lst	Mingo Wilderness Area
		2002_xom_bea_post_peco_cpst.lst	Pecos Wilderness Area
		2002_xom_bea_post_sacr_cpst.lst	Salt Creek Wildlife Refuges
		2002_xom_bea_post_sape_cpst.lst	San Pedro Parks Wilderness Area
		2002_xom_bea_post_upbu_cpst.lst	Upper Buffalo Wilderness Area
		2002_xom_bea_post_wemi_cpst.lst	Weminuche Wilderness Area
		2002_xom_bea_post_whpe_cpst.lst	Wheeler Peak Wilderness Area
		2002_xom_bea_post_whmo_cpst.lst	White Mountain Wilderness Area
		2002_xom_bea_post_wich_cpst.lst	Wichita Mountains Wildlife Refuges
		2003_xom_bea_post_band_cpst.lst	Bandelier Wilderness Area
		2003_xom_bea_post_bibe_cpst.lst	Big Bend National Park
		2003_xom_bea_post_bosq_cpst.lst	Bosque del Apache Wilderness Area
		2003_xom_bea_post_bret_cpst.lst	Breton Wilderness Area
		2003_xom_bea_post_cacr_cpst.lst	Caney Creek Wilderness Area
		2003_xom_bea_post_cave_cpst.lst	Carlsbad Caverns National Park
		2003_xom_bea_post_grsa_cpst.lst	Great Sand Dunes Wilderness Area
		2003_xom_bea_post_gumo_cpst.lst	Guadalupe Mountains National Park
		2003_xom_bea_post_herc_cpst.lst	Hercules-Glades Wilderness Area
		2003_xom_bea_post_laga_cpst.lst	La Garita Wilderness Area
		2003_xom_bea_post_meve_cpst.lst	Mesa Verde National Park
		2003_xom_bea_post_ming_cpst.lst	Mingo Wilderness Area
		2003_xom_bea_post_peco_cpst.lst	Pecos Wilderness Area
		2003_xom_bea_post_sacr_cpst.lst	Salt Creek Wildlife Refuges
		2003_xom_bea_post_sape_cpst.lst	San Pedro Parks Wilderness Area
		2003_xom_bea_post_upbu_cpst.lst	Upper Buffalo Wilderness Area
		2003_xom_bea_post_wemi_cpst.lst	Weminuche Wilderness Area
		2003_xom_bea_post_whpe_cpst.lst	Wheeler Peak Wilderness Area
		2003_xom_bea_post_whmo_cpst.lst	White Mountain Wilderness Area
		2003_xom_bea_post_wich_cpst.lst	Wichita Mountains Wildlife Refuges

APPEND Discussion

Because of file size limitations, the CALPUFF simulation for 2001 was split into three separate CALPUFF runs (2001a, 2001b, and 2001c). When applying CALPUFF separately with meteorology that is split into multiple consecutive time periods, it is

necessary to account for puffs that are remaining at the end of one time period in the next time period.[1] This is achieved by modeling overlapping time periods. Therefore, the 2001b and 2001c CALPUFF runs begin with 3 days of meteorology from the end of the previous month. For example, the 2001b CALPUFF run begins on April 28, 2001, instead of May 1, 2001. Similarly, the 2001c CALPUFF run begins on August 29, 2001, instead of September 1, 2001.

The APPEND program can be used to append the sequential output data files into a single file for CALPOST processing. Output data files for 2001a, 2001b, and 2001c are appended to produce the 2001 output data file. Overlapping time periods are not a problem because the user can specify the number of hours to skip at the beginning and the total number of hours to read from each file. For this project, 72 hours (3 days) were skipped at the beginning of the 2001b and 2001c data files. The resulting output data file is 8760 hours in length.

[1] http://www.src.com/calpuff/FAQ-answers.htm#4.2.1

October 10, 2007

Mr. Richard Hyde
Director - Air Permits Division
Texas Commission on Environmental Quality
P.O. Box 13087
Mail Code 163
Austin, Texas 78711-3087
CERTIFIED MAIL NO.: 7004 1160 0005 3786 4932
RETURN RECEIPT REQUESTED

Re: Permit Alteration
Permit No. 49138
ExxonMobil Oil Corporation
Account ID No.: JE-0067-I
CN-600920748
RN-102450756

On behalf of ExxonMobil Oil Corporation, we would like to alter Permit No. 49138 to require the lowering of hourly emission rates on the High Pressure (EPN 60FLR_003), Low Pressure (EPN 60 FLR_005), FCC (EPN 60FLR_008), and No. 10 (EPN 60 FLR_010) Flares no later than July 1, 2009. This alteration does not represent any change in the method of operation or a physical modification of the affected facility. This alteration is allowed under §116.116(c)(1)(B), which allows a change from a representation in an application provided the change does not cause a change in method of emission control, a change in character of emissions, or an increase in the emission rate of any air contaminant.

A revised Table 1(a) is attached.

We look forward to working with you and your staff. If you have questions or require additional information, please contact L.A. Dresser at (409) 757-1234 or laura.a.dresser@exxonmobil.com.

Sincerely,

W. S. Stewart
Environmental Coordinator
Chemicals and Refinery Complex

C: Mrs. Heather Ross, TCEQ Region 10

Table of Contents

1.0 DESCRIPTION OF CHANGE 1

2.0 TABLE 1(a) 2

1.0 DESCRIPTION OF CHANGE

ExxonMobil's Beaumont Refinery is submitting this permit alteration for Permit No. 49138 to require the lowering of hourly emission rates on the High Pressure (EPN 60FLR_003), Low Pressure (EPN 60 FLR_005), FCC (EPN 60FLR_008), and No. 10 (EPN 60 FLR_010) Flares no later than July 1, 2009.

This request does not represent any change in method of emission control, a change in character of emissions, or an increase in the emission rate of any air contaminant.

MAERT Footnote (11):
Hourly emission rate shall be reduced no later than July 1, 2009.

2.0 TABLE 1(a)

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emissions Point Summary

Permit Number:	49138	RN Number:	102450756	Date:	October-2007
Company Name:	ExxonMobil Oil Corporation				

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA

1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate	
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)
60FLR_003	60FLR#003	High Pressure Flare (pre July 1, 2009)	NO_x	115.30	-----
		High Pressure Flare (post July 1, 2009)	NO_x	22.13	-----
60FLR_005	60FLR#005	Low Pressure Flare (pre July 1, 2009)	NO_x	155.80	-----
		Low Pressure Flare (post July 1, 2009)	NO_x	55.38	-----
60FLR_008	60FLR#008	FCC Flare (pre July 1, 2009)	NO_x	96.92	-----
		FCC Flare (post July 1, 2009)	NO_x	7.38	-----
60FLR_001	60FLR#001	CHD1 Flare	NO_x	83.96	-----
60FLR_006	60FLR#006	No. 6 Flare	NO_x	35.09	-----
60FLR_007	60FLR#007	No. 7 Flare	NO_x	72.26	-----
60FLR_010	60FLR#010	No. 10 Flare	NO_x	38.39	-----
60FLR_002	60FLR#002	CHD2 Flare	NO_x	1.82	-----
60FLR_003	60FLR#003	High Pressure Flare Pilot Gas	NO_x	0.02	0.08
60FLR_005	60FLR#005	Low Pressure Flare Pilot Gas	NO_x	0.02	0.08
60FLR_008	60FLR#008	FCC Flare Pilot Gas	NO_x	0.01	0.06
60FLR_001	60FLR#001	CHD1 Flare Pilot Gas	NO_x	0.01	0.03
60FLR_006	60FLR#006	No. 6 Flare Pilot Gas	NO_x	0.03	0.13
60FLR_007	60FLR#007	No. 7 Flare Pilot Gas	NO_x	0.03	0.13
60FLR_010	60FLR#010	No. 10 Flare Pilot Gas	NO_x	0.07	0.31
			NOx Emission Cap	-----	98.48
			NOx Emission Cap (12/31/07)	-----	56.76
60FLR_003	60FLR#003	High Pressure Flare (pre July 1, 2009)	CO	587.70	-----

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emissions Point Summary

Permit Number:	49138	RN Number:	102450756	Date:	October-2007
Company Name:	ExxonMobil Oil Corporation				

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA

1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate	
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)
		High Pressure Flare (post July 1, 2009)	CO	112.77	-----
60FLR_005	60FLR#005	Low Pressure Flare (pre July 1, 2009)	CO	794.10	-----
		Low Pressure Flare (post July 1, 2009)	CO	282.19	-----
60FLR_008	60FLR#008	FCC Flare (pre July 1, 2009)	CO	700.00	-----
		FCC Flare (post July 1, 2009)	CO	53.30	-----
60FLR_001	60FLR#001	CHD1 Flare	CO	427.80	-----
60FLR_006	60FLR#006	No. 6 Flare	CO	253.40	-----
60FLR_007	60FLR#007	No. 7 Flare	CO	521.90	-----
60FLR_010	60FLR#010	No. 10 Flare	CO	277.30	-----
60FLR_002	60FLR#002	CHD2 Flare	CO	9.27	-----
60FLR_003	60FLR#003	High Pressure Flare Pilot Gas	CO	0.12	0.54
60FLR_005	60FLR#005	Low Pressure Flare Pilot Gas	CO	0.12	0.54
60FLR_008	60FLR#008	FCC Flare Pilot Gas	CO	0.09	0.41
60FLR_001	60FLR#001	CHD1 Flare Pilot Gas	CO	0.05	0.24
60FLR_006	60FLR#006	No. 6 Flare Pilot Gas	CO	0.22	0.96
60FLR_007	60FLR#007	No. 7 Flare Pilot Gas	CO	0.22	0.38
60FLR_010	60FLR#010	No. 10 Flare Pilot Gas	CO	0.51	2.23
			CO Emission Cap	-----	644.96
			CO Emission Cap (12/31/07)	-----	375.51
60FLR_003	60FLR#003	High Pressure Flare (pre July 1, 2009)	$S0_2$	9747.00	-----
		High Pressure Flare (post July 1, 2009)	$S0_2$	234.58	-----

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emissions Point Summary

Permit Number:	49138	RN Number:	102450756	Date:	October-2007
Company Name:	ExxonMobil Oil Corporation				

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA

1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate	
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)
60FLR_005	60FLR#005	Low Pressure Flare (pre July 1, 2009)	$S0_2$	19698.00	-----
		Low Pressure Flare (post July 1, 2009)	$S0_2$	708.04	-----
60FLR_008	60FLR#008	FCC Flare (pre July 1, 2009)	$S0_2$	6808.00	-----
		FCC Flare (post July 1, 2009)	$S0_2$	64.96	-----
60FLR_001	60FLR#001	CHD1 Flare	$S0_2$	10741.00	-----
60FLR_006	60FLR#006	No. 6 Flare	$S0_2$	712.40	-----
60FLR_007	60FLR#007	No. 7 Flare	$S0_2$	1326.00	-----
60FLR_010	60FLR#010	No. 10 Flare (pre July 1, 2009)	$S0_2$	696.00	-----
		No. 10 Flare (post) July 1, 2009)	$S0_2$	117.58	-----
60FLR_002	60FLR#002	CHD2 Flare	$S0_2$	211.68	-----
60FLR_003	60FLR#003	High Pressure Flare Pilot Gas	$S0_2$	0.01	0.01
60FLR_005	60FLR#005	Low Pressure Flare Pilot Gas	$S0_2$	0.01	0.01
60FLR_008	60FLR#008	FCC Flare Pilot Gas	$S0_2$	0.01	0.01
60FLR_001	60FLR#001	CHD1 Flare Pilot Gas	$S0_2$	0.01	0.01
60FLR_006	60FLR#006	No. 6 Flare Pilot Gas	$S0_2$	0.01	0.01
60FLR_007	60FLR#007	No. 7 Flare Pilot Gas	$S0_2$	0.01	0.01
60FLR_010	60FLR#010	No. 10 Flare Pilot Gas	$S0_2$	0.01	0.01
			$S0_2$ Emission Cap	-----	3685.44
			SO_2 Emission Cap (12/31/06)	-----	2056.56
60FLR_003	60FLR#003	High Pressure Flare (pre July 1, 2009)	VOC	685.90	-----
		High Pressure Flare (post July 1, 2009)	VOC	131.62	-----

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emissions Point Summary

Permit Number:	49138	RN Number:	102450756	Date:	October-2007
Company Name:	ExxonMobil Oil Corporation				

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA

1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate	
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)
60FLR_005	60FLR#005	Low Pressure Flare (pre July 1, 2009)	VOC	1286.0000	-----
		Low Pressure Flare (post July 1, 2009)	VOC	457.1800	-----
60FLR_008	60FLR#008	FCC Flare (pre July 1, 2009)	VOC	1097.00	-----
		FCC Flare (post July 1, 2009)	VOC	83.53	-----
60FLR_001	60FLR#001	CHD1 Flare	VOC	470.10	-----
60FLR_006	60FLR#006	No. 6 Flare	VOC	391.00	-----
60FLR_007	60FLR#007	No. 7 Flare	VOC	1048.00	-----
60FLR_010	60FLR#010	No. 10 Flare	VOC	537.70	-----
60FLR_002	60FLR#002	CHD2 Flare	VOC	4.47	-----
60FLR_003	60FLR#003	High Pressure Flare Pilot Gas	VOC	0.05	0.02
60FLR_005	60FLR#005	Low Pressure Flare Pilot Gas	VOC	0.05	0.02
60FLR_008	60FLR#008	FCC Flare Pilot Gas	VOC	0.05	0.22
60FLR_001	60FLR#001	CHD1 Flare Pilot Gas	VOC	0.02	0.10
60FLR_006	60FLR#006	No. 6 Flare Pilot Gas	VOC	0.09	0.38
60FLR_007	60FLR#007	No. 7 Flare Pilot Gas	VOC	0.09	0.38
60FLR_010	60FLR#010	No. 10 Flare Pilot Gas	VOC	0.20	0.89
			VOC Emission Cap	-----	844.08
			VOC Emission Cap (12/31/07)	-----	515.65
60FLR_003	60FLR#003	High Pressure Flare (pre July 1, 2009)	H_2S	105.70	-----
		High Pressure Flare (post July 1, 2009)	H_2S	2.54	-----
60FLR_005	60FLR#005	Low Pressure Flare (pre July 1, 2009)	H_2S	213.60	-----

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emissions Point Summary

Permit Number:	49138	RN Number:	102450756	Date:	October-2007
Company Name:	ExxonMobil Oil Corporation				

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA

1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate	
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)
		Low Pressure Flare (post July 1, 2009)	H_2S	7.68	-----
60FLR_008	60FLR#008	FCC Flare (pre July 1, 2009)	H_2S	73.81	-----
		FCC Flare (post July 1, 2009)	H_2S	0.70	-----
60FLR_001	60FLR#001	CHD1 Flare	H_2S	116.50	-----
60FLR_006	60FLR#006	No. 6 Flare	H_2S	7.72	-----
60FLR_007	60FLR#007	No. 7 Flare	H_2S	14.38	-----
60FLR_010	60FLR#010	No. 10 Flare (pre July 1, 2009)	H_2S	7.55	-----
		No. 10 Flare (post) July 1, 2009)	H_2S	1.27	-----
60FLR_002	60FLR#002	CHD2 Flare	H_2S	2.29	-----
60FLR_003	60FLR#003	High Pressure Flare Pilot Gas	H_2S	0.01	0.01
60FLR_005	60FLR#005	Low Pressure Flare Pilot Gas	H_2S	0.01	0.01
60FLR_008	60FLR#008	FCC Flare Pilot Gas	H_2S	0.01	0.01
60FLR_001	60FLR#001	CHD1 Flare Pilot Gas	H_2S	0.01	0.01
60FLR_006	60FLR#006	No. 6 Flare Pilot Gas	H_2S	0.01	0.01
60FLR_007	60FLR#007	No. 7 Flare Pilot Gas	H_2S	0.01	0.01
60FLR_010	60FLR#010	No. 10 Flare Pilot Gas	H_2S	0.01	0.01
			H_2S Emission Cap	-----	39.95
			H_2S Emission Cap (12/31/07)	-----	22.20

The Goodyear Tire & Rubber Company

JE0039N

The Goodyear Tire & Rubber Company

Beaumont Chemical Plant
P.O. BOX 26003
BEAUMONT, TX 77720-6003

RECEIVED
DEC 14 2006
AIR QUALITY
PLANNING

December 8, 2006
91 7108 2133 3933 1574 8211

Ms. Kathy Pendleton
Texas Commission on Environmental Quality
MC-164
P.O. Box 13087
Austin, Texas 78711-3087

RE: Request for Removal from Potential Best Available Retrofit Technology (BART) Eligible Sources List
Air Account Number JE0039N
Regulated Entity Number: RN102561925
Customer Number: CN600616049

Dear Ms. Pendleton:

The Goodyear Tire & Rubber Company (Goodyear) requests to remove its Beaumont Chemical Plant from the potential BART-eligible source list. Per the TCEQ letter dated September 1, 2006, Goodyear is considered BART eligible for NOx and SOx. Goodyear's current Potential-to-emit (PTE) for NOx from BART eligible emission units is greater than 250 tons per year and PTE for SOx is less than 250 tons per year.

However, Goodyear plans to retrofit Boiler B104 with low NOx control technology by March 1, 2007 in compliance with Special Condition 5 of Permit 56473. A standard permit application was submitted to the TCEQ in this regard on October 16, 2006. Because of the pollution control installation, the PTE for NOx from Goodyear's BART-eligible emission units will be less than 250 tons per year. Boiler B105 was retrofitted with low NOx technology in the year 1998. Table 1 in Attachment A shows PTEs of NOx and SOx from Goodyear's BART-eligible emission units. Copy of Special Condition 5 of Permit 56473 relating to retrofitting boilers and MAERT showing B104 and B105 NOx emissions are attached in Attachment B. Since the total PTE for NOx and SOx will be less than 250 tons per year by March 1, 2007, Goodyear requests to remove the facility from BART-eligible list and exemption from need to conduct BART modeling.

If you have any questions or require additional information, please contact me at 409-794-5282.

Sincerely,

Charlie Mingo

Charlie Mingo
Environmental Section Head

Enclosure

cc: Ms. Heather Ross, TCEQ Region 10

Attachment A

PTEs for NOx and SOx from BART-Eligible Emission Units

Table 1
PTEs for NOx and SOx from BART-Eligible Emission Units
BART Applicability Determination

FIN	EPN	Source Description	NOx PTE, tpy	SO2 PTE, tpy	Permit No.
040FLARE	280FL-Q504	Budene Flare	1.94	0.01	70810
070FLARE	370FL-Q503	Wing Chemical Flare	0 [(a)]	0 [(a)]	22110
116P-GCMP	116P-GCMP	Abrasive Blasting Compressor	2.24	0.15	PBR
116P-GTRK	116P-GTRK	Fire Truck Gas Engine	0.55	0.03	PBR
116S-B104	116S-B104	Boiler 104	40.01	5.28	56473
116S-B105	116S-B105	Boiler 105	34.16	5.28	56473
116S-B501	116S-B501	Consumat Incinerator	0.1286 [(b)]	0.0119 [(b)]	SE 2
116S-G305	116S-G305	Canal Diesel Fire Pump	10.86	0.72	106.511
116S-G307	116S-G307	No. 1 Reserve Pump House Diesel Fire Pump	10.86	0.72	106.511
Total			**100.62**	**12.19**	

Notes:

a) Per Permit 9841, emissions from Wing Chemical flare are zero after Qualified Facilities change between Wing Chemical Flare (370FL-Q503) and Utilities Flare (130FL-Q502) approved in December 2005 can be completed or after July 1, 2006, whichever comes first.

b) Emissions from consumat incinerator were authorized under Standard Exemption 2, and there is no emission limit associated with this authorization. Therefore, actual emissions from the year 2005 are provided.

Attachment B

Selected copies of Permit No. 56473

Kathleen Hartnett White, *Chairman*
R. B. "Ralph" Marquez, *Commissioner*
Larry R. Soward, *Commissioner*
Margaret Hoffman, *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

June 16, 2004

Mr. Bradly E. Ioerger
Plant Manager
The Goodyear Tire & Rubber Company
P.O. Box 26003
Beaumont, Texas 77720-6003

Plant Manager's Office
RECEIVED
JUN 21 2004
The Goodyear Tire & Rubber Company
BEAUMONT CHEMICAL PLANT

Re: Existing Facility Air Permit
Permit Number: 56473
Six Steam Boilers and Utility Facilities
Beaumont, Jefferson County
Regulated Entity Number: RN102561925
Customer Reference Number: CN600616049

Dear Mr. Ioerger:

This is in response to your Form PI-1G, entitled "Grandfathered Facility Permit Application," concerning the above-referenced previously grandfathered facility. We appreciate your cooperation in sending us the information necessary to evaluate your proposal. Standard Permit Registration Numbers 39730 and 49294 are included in this permit and are hereby void.

This project meets the requirements for the Existing Facility Permit, Title 30 Texas Administrative Code § 116.777, if operated as described in your application. A permit for your facility is enclosed. The permit contains several general and special conditions that define the level of operation and allowable emissions. This permit will be in effect for ten years from the date of approval.

Please reference the regulated entity number (RN), customer reference number (CN), and permit number noted in this document in all your future correspondence for the referenced facility or site. The RN replaces the former Texas Commission on Environmental Quality account number for the facility (if portable) or site (if permanent). The CN is a unique number assigned to the company or corporation and applies to all facilities and sites owned or operated by this company or corporation.

Re: Permit Number: 56473

Thank you for your cooperation and interest in air pollution control. If you need further information or have any questions, please contact Mr. Stephen E. Anderson, P.E., at (512) 239-1287 or write to the Texas Commission on Environmental Quality, Office of Permitting, Remediation, and Registration, Air Permits Division (MC-163), P.O. Box 13087, Austin, Texas 78711-3087.

Sincerely,

Glenn Shankle
Acting Executive Director
Texas Commission on Environmental Quality

GS/SEA/pll

Enclosures

cc: Mr. Stuart Mueller, Air Section Manager, Region 10 - Beaumont

SPECIAL CONDITIONS

Permit Number 56473

EMISSION STANDARDS

1. This permit authorizes emissions only from those points listed in the attached table entitled "Emission Sources - Maximum Allowable Emission Rates," and the facilities covered by this permit are authorized to emit subject to the emission rate limits on that table and other operating conditions specified in this permit.

2. These facilities shall comply with the applicable requirements of Title 30 Texas Administrative Code § 113.260 (30 TAC § 113.260), Group I Polymers and Resins, including the referenced requirements contained in Title 40 Code of Federal Regulations Part 63 (40 CFR Part 63), Subparts A and U.

3. The volatile organic compound (VOC) associated with Cooling Tower Water (Emission Point No. [EPN] 116CT-MAIN) shall be monitored daily. By January 1, 2005, the daily sampling shall meet the air stripping system meeting the requirements of the Texas Commission on Environmental Quality (TCEQ) Sampling Procedures Manual, Appendix P (dated January 2003 or a later edition) or an approved equivalent sampling method. The heat exchange and cooling tower system shall be maintained so as to minimize VOC emissions. Faulty equipment shall be repaired at the earliest opportunity, but no later than the next scheduled shutdown of the process unit in which the leak occurs. The results of the monitoring and maintenance efforts shall be recorded, and such records shall be maintained for a period of two years. The records shall be made available to the TCEQ Executive Director upon request.

4. Steam boilers designated as EPN 116S-B (101 through 105) are each limited to a maximum hourly fired duty of 130 MMBtu. The steam boiler designated as EPN 116S-B106 is limited to a maximum hourly fired duty of 264 MMBtu. Records shall be kept at the plant site to demonstrate compliance with this condition on a rolling two year basis. ?

5 The represented steam boiler retrofit requirements will be complete for Steam Boilers B-101, B-102, and B-104 by March 1, 2007. Failure to complete each retrofit shall be a violation of this special condition. The steam boiler subject to the retrofit where the retrofit is not complete shall cease operation on and after March 1, 2007, until the retrofit is complete. Any required reduction in emissions from each steam boiler will also be achieved in accordance with the reduction milestones set forth in 30 TAC § 117.520 utilizing installation of control devices.

6. Fuel for each Steam Boiler identified as B-101 through B-105 is limited to pipeline quality sweet natural gas, sweet natural gas and regeneration gas, sweet natural gas and liquid fuel, sweet natural gas, liquid fuel and regeneration gas. Fuel for Steam Boiler B-106 is

EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

AIR CONTAMINANTS DATA

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates * lb/hr	TPY**
	Natural Gas and Regeneration Gas	CO	12.38	54.21
		NO_x	7.80	34.16
		PM_{10}	0.97	4.24
		SO_2	0.08	0.33
		VOC	2.83	4.07
	Natural Gas/Liquid Fuel Mix	CO	12.38	54.21
		NO_x	7.80	34.16
		PM_{10}	2.87	5.90
		SO_2	5.76	5.28
		VOC	0.59	2.97
	Natural Gas/Liquid Fuel Mix and Regeneration Gas	CO	12.38	54.21
		NO_x	7.80	34.16
		PM_{10}	2.87	5.90
		SO_2	5.76	5.28
		VOC	2.72	3.97
116S-B104	Steam Boiler 104 (6) Natural Gas	CO	12.38	54.21
		NO_x	78.00	341.64
		PM_{10}	0.97	4.24
		SO_2	0.08	0.33
		VOC	0.70	3.07
	Natural Gas and (6) Regeneration Gas	CO	12.38	54.21
		NO_x	78.00	341.64
		PM_{10}	0.97	4.24
		SO_2	0.08	0.33
		VOC	2.83	4.07
	Natural Gas/Liquid Fuel Mix (6)	CO	12.38	54.21
		NO_x	52.00	227.76
		PM_{10}	2.87	5.90
		SO_2	5.76	5.28
		VOC	0.59	2.97

EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

AIR CONTAMINANTS DATA

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates * lb/hr	TPY**
	Natural Gas/Liquid Fuel Mix (6) and Regeneration Gas	CO	12.38	54.21
		NO_x	52.00	227.76
		PM_{10}	2.87	5.90
		SO_2	5.76	5.28
		VOC	2.72	3.97
	Natural Gas (7)	CO	12.38	54.21
		NO_x	7.80	34.16
		PM_{10}	0.97	4.24
		SO_2	0.08	0.33
		VOC	0.70	3.07
	Natural Gas and (7) Regeneration Gas	CO	12.38	54.21
		NO_x	7.80	34.16
		PM_{10}	0.97	4.24
		SO_2	0.08	0.33
		VOC	2.83	4.07
	Natural Gas/Liquid Fuel Mix (7)	CO	12.38	54.21
		NO_x	20.80	40.01
		PM_{10}	2.87	5.90
		SO_2	5.76	5.28
		VOC	0.59	2.97
	Natural Gas/Liquid Fuel Mix (7) and Regeneration Gas	CO	12.38	54.21
		NO_x	20.80	40.01
		PM_{10}	2.87	5.90
		SO_2	5.76	5.28
		VOC	2.72	3.97
116S-B105	Steam Boiler 105 Natural Gas	CO	12.38	54.21
		NO_x	7.80	34.16
		PM_{10}	0.97	4.24
		SO_2	0.08	0.33
		VOC	0.70	3.07

EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

AIR CONTAMINANTS DATA

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates * lb/hr	TPY**
	Natural Gas and Regeneration Gas	CO	12.38	54.21
		NO_x	7.80	34.16
		PM_{10}	0.97	4.24
		SO_2	0.08	0.33
		VOC	2.83	4.07
	Natural Gas/Liquid Fuel Mix	CO	12.38	54.21
		NO_x	7.80	34.16
		PM_{10}	2.87	5.90
		SO_2	5.76	5.28
		VOC	0.59	2.97
	Natural Gas/Liquid Fuel Mix and Regeneration Gas	CO	12.38	54.21
		NO_x	7.80	34.16
		PM_{10}	2.87	5.90
		SO_2	5.76	5.28
		VOC	2.72	3.97
116S-B106	Steam Boiler 106 Natural Gas	CO	19.53	85.52
		NO_x	15.84	69.38
		PM_{10}	2.01	8.79
		SO_2	0.16	0.69
		VOC	1.45	6.36
	Natural Gas and Regeneration Gas	CO	19.53	85.52
		NO_x	15.84	69.38
		PM_{10}	2.01	8.79
		SO_2	0.16	0.69
		VOC	3.58	7.36
116CT-MAIN	Cooling Tower (5)	VOC	1.78	7.80
130WF	Isoprene Wastewater (5)	Acetone	0.64	2.58
		VOC (6)	9.40	19.24
		VOC (7)	3.30	7.36
	Maintenance Emissions (336 hours per rolling 12 months)	VOC (8)	8.13	0.63

EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

AIR CONTAMINANTS DATA

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates * lb/hr	TPY**
116F	830 Refrigeration (4) Process Fugitives	VOC	1.45	6.33
116F-BH	830 Boiler House Process Fugitives (4)	VOC	0.67	2.93

(1) Emission point identification - either specific equipment designation or emission point number (EPN) from a plot plan.
(2) Specific point source names. For fugitive sources, use an area name or fugitive source name.
(3) CO - carbon monoxide
NO_x - total oxides of nitrogen
PM_{10} - particulate matter (PM) equal to or less than 10 microns in diameter
SO_2 - sulfur dioxide
VOC - volatile organic compounds as defined in the Title 30 Texas Administrative Code § 101.1.
(4) Fugitive emissions are an estimate only and should not be considered as a maximum allowable emission rate.
(5) Emissions from this permitted facility are emitted from this EPN.
(6) Pre emission control
(7) Post emission control
(8) Emissions are only from process wastewater stream 1D-303.

* Emission rates are based on and the facilities are limited by the following maximum operating schedule:

24 Hrs/day 7 Days/week 52 Weeks/year

** Compliance with annual emission limits is based on a rolling 12-month period.

Dated June 16, 2004

NORIT Americas, Inc.

HH0019H

Kathleen Hartnett White, *Chairman*
R. B. "Ralph" Marquez, *Commissioner*
Larry R. Soward, *Commissioner*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

November 19, 2004

Mr. John E. Rectenwald
Manufacturing Director
NORIT Americas, Inc.
P.O. Box 790
Marshall, Texas 75671

Re: Permit Application
Permit Number: 56552
Activated Carbon Facility
Marshall, Harrison County
Regulated Entity Number: RN102609724
Customer Reference Number: CN600356372

Dear Mr. Rectenwald:

This is in response to your Form PI-1G entitled "Grandfathered Facility Permit Application" concerning the above-referenced previously grandfathered facility. This will acknowledge that your application for the above-referenced facility is technically complete as of March 26, 2004. We appreciate your cooperation in sending us the information necessary to evaluate your proposal.

This project meets the requirements for the Existing Facility Permit, Title 30 Texas Administrative Code § 116.777, if operated as described in your application. A permit for your facility is enclosed. The permit contains several general and special conditions that define the level of operation and allowable emissions. In addition, no new construction is authorized with the issuance of this permit. This permit will be in effect for ten years from the date of approval.

Please reference the regulated entity number (RN), customer reference number (CN), and permit number noted in this document in all your future correspondence for the referenced facility or site. The RN replaces the former Texas Commission on Environmental Quality account number for the facility (if portable) or site (if permanent). The CN is a unique number assigned to the company or corporation and applies to all facilities and sites owned or operated by this company or corporation.

Re: Permit Number: 56552

Thank you for your cooperation and interest in air pollution control. If you need further information or have any questions, please contact Mr. Richard Hughes at (512) 239-1554 or write to the Texas Commission on Environmental Quality, Office of Permitting, Remediation, and Registration, Air Permits Division (MC-163), P.O. Box 13087, Austin, Texas 78711-3087.

Sincerely,

Glenn Shankle
For Executive Director
Texas Commission on Environmental Quality

GS/RLH/ssl

Enclosures

cc: Mr. Charles Murray, Air Section Manager, Region 5 - Tyler

Project Number: 100793

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
AIR QUALITY PERMIT

A PERMIT IS HEREBY ISSUED TO
Norit Americas, Inc.
AUTHORIZING THE OPERATION OF
Activated Carbon Facility
LOCATED AT
Marshall, Harrison County, Texas
LATITUDE 32° 32′ 08″ LONGITUDE 094° 23′ 43″

1. **Facilities** covered by this permit shall be constructed and operated as specified in the application for the permit. All representations regarding construction plans and operation procedures contained in the permit application shall be conditions upon which the permit is issued. Variations from these representations shall be unlawful unless the permit holder first makes application to the Texas Commission on Environmental Quality (commission) Executive Director to amend this permit in that regard and such amendment is approved. [Title 30 Texas Administrative Code § 116.116 (30 TAC § 116.116)]

2. **Voiding of Permit.** A permit or permit amendment is automatically void if the holder fails to begin construction within 18 months of date of issuance, discontinues construction for more than 18 consecutive months prior to completion, or fails to complete construction within a reasonable time. Upon request, the executive director may grant a onetime 18-month extension of the date to begin construction. [30 TAC § 116.120(a)]

3. **Construction Progress.** Start of construction, construction interruptions exceeding 45 days, and completion of construction shall be reported to the appropriate regional office of the commission not later than 15 working days after occurrence of the event. [30 TAC § 116.115(b)(2)(B)]

4. **Start-up Notification.** The appropriate air program regional office shall be notified prior to the commencement of operations of the facilities authorized by the permit in such a manner that a representative of the commission may be present. The permit holder shall provide a separate notification for the commencement of operations for each unit of phased construction, which may involve a series of units commencing operations at different times. Prior to operation of the facilities authorized by the permit, the permit holder shall identify to the Office of Permitting, Remediation, and Registration the source or sources of allowances to be utilized for compliance with Chapter 101, Subchapter H, Division 3 of this title (relating to Mass Emissions Cap and Trade Program). [30 TAC § 116.115(b)(2)(c)]

5. **Sampling Requirements.** If sampling is required, the permit holder shall contact the commission's Office of Compliance and Enforcement prior to sampling to obtain the proper data forms and procedures. All sampling and testing procedures must be approved by the executive director and coordinated with the regional representatives of the commission. permit holder is also responsible for providing sampling facilities and conducting the sampling operations or contracting with an independent sampling consultant. TAC § 116.115(b)(2)(D)]

6. **Equivalency of Methods.** The permit holder must demonstrate or otherwise justify the equivalency of emission control methods, sampling or other emission testing methods, and monitoring methods proposed as alternatives to methods indicated in the conditions of the permit. Alternative methods shall be applied for in writing and must be reviewed and approved by the executive director prior to their use in fulfilling any requirements of the permit. [30 TAC § 116.115(b)(2)(E)]

7. **Recordkeeping.** The permit holder shall maintain a copy of the permit along with records containing the information and data sufficient to demonstrate compliance with the permit, including production records and operating hours; keep all required records in a file at the plant site. If, however, the facility normally operates unattended, records shall be maintained at the nearest staffed location within Texas specified in the application; make the records available at the request of personnel from the commission or any air pollution control program having jurisdiction; comply with any additional recordkeeping requirements specified in special conditions attached to the permit; and retain information in the file for at least two years following the date that the information or data is obtained. [30 TAC § 116.115(b)(2)(F)]

8. **Maximum Allowable Emission Rates.** The total emissions of air contaminants from any of the sources of emissions must not exceed the values stated on the table attached to the permit entitled "Emission Sources--Maximum Allowable Emission Rates." [30 TAC § 116.115(b)(2)(G)]

9. **Maintenance of Emission Control.** The permitted facilities shall not be operated unless all air pollution emission capture and abatement equipment is maintained in good working order and operating properly during normal facility operations. The permit holder shall provide notification for upsets and maintenance in accordance with § § 101.201, 101.211, and 101.221 of this title (relating to Emissions Event Reporting and Recordkeeping Requirements; Scheduled Maintenance, Startup and Shutdown Reporting and Recordkeeping Requirements; and Operational Requirements). [30 TAC § 116.115(b)(2)(H)]

10. **Compliance with Rules.** Acceptance of a permit by an applicant constitutes an acknowledgment and agreement that the permit holder will comply with all rules, regulations, and orders of the commission issued in conformity with the TCAA and the conditions precedent to the granting of the permit. If more than one state or federal rule or regulation or permit condition are applicable, the most stringent limit or condition shall govern and be the standard by which compliance shall be demonstrated. Acceptance includes consent to the entrance of commission employees and agents into the permitted premises at reasonable times to investigate conditions relating to the emission or concentration of air contaminants, including compliance with the permit. [30 TAC § 116.115(b)(2)(I)]

11. This permit may be appealed pursuant to 30 TAC § 50.139.

12. This permit may not be transferred, assigned, or conveyed by the holder except as provided by rule. [30 TAC § 116.110(e)]

13. There may be additional special conditions attached to a permit upon issuance or modification of the permit. Such conditions in a permit may be more restrictive than the requirements of Title 30 of the Texas Administrative Code. [30 TAC § 116.115(c)]

14. ...ssions from this facility must not cause or contribute to a condition of "air pollution" as defined in TCAA § 382.003(3) or violate TCAA § 382.085, as codified in the Texas ...lth and Safety Code. If the executive director determines that such a condition or violation occurs, the holder shall implement additional abatement measures as necessary ...o control or prevent the condition or violation.

SPECIAL CONDITIONS

Permit Number 56552

OPERATING RESTRICTIONS

1. This permit covers only those sources of emissions listed in the attached table entitled "Emission Sources - Maximum Allowable Emission Rates," and those sources are limited to the emission limits and other conditions specified in that attached table. The annual rates are based on a rolling 12-month period.

   If any condition or limitation of this permit or of any Texas Commission on Environmental Quality (TCEQ) regulation is more stringent than another, then the more stringent condition or limitation shall govern and be the standard by which compliance will be demonstrated.

2. The combined feed rate of lignite to the kilns covered by this permit shall not exceed the pounds per hour or tons per year feed rates represented in the confidential portion of the August 26, 2003 permit application. This permit does not limit the feed rate to an individual kiln.

3. Opacity of emissions from any point shall not exceed 30 percent averaged over a six-minute period, except for those periods described in Title 30 Texas Administrative Code § 111.111(a)(1)(E) [30 TAC § 111.111(a)(1)(E)]. The opacity shall be determined by the U.S. Environmental Protection Agency Reference Method 9.

4. This facility shall not produce a nuisance that may cause or contribute to a condition of "air pollution" as defined in 30 TAC § 101.4 of the General Rules as adopted by the TCEQ. If such a condition does occur, additional controls may be required.

5. The permit holder shall notify the TCEQ Regional Office of any upset conditions which cause emissions to exceed the emissions listed in the maximum allowable emission rates table as soon as possible.

6. Particulate matter (PM) collected from dust collectors shall be handled in such a manner as to prevent them from becoming airborne as far as is practicable. Particulate matter grain (gr) loading exhaust from any dust collector shall not exceed 0.01 gr per dry standard cubic foot (dscf) of air.

7. All air pollution abatement and collection equipment for the facility covered by this permit shall be properly maintained and operated during the operation of these facilities. Cleaning and maintenance of the abatement equipment shall be performed as recommended by the manufacturer and as necessary so that the equipment efficiency can be adequately maintained. The hourly and annual throughput of hydrochloric acid, sodium hydroxide, and hydrated lime shall be determined by process conditions and shall not be limited to the rates represented in the permit application.

8. The permit holder is limited to firing sweet natural gas not exceed 5 gr of sulfur per 100 dscf, hourly average, as well as combustible gases and PM generated by the activation process in Kiln Nos. 2, 3, and 4 and in Waste Heat Boiler Nos. 5, 6, and 7. The hourly and annual throughput shall be determined by process conditions and shall not be limited to the rate represented in the permit application.

9. The saturator and venturi shall operate when the rotary kiln is operational. Sufficient water shall be provided to the saturator and venturi so that they may perform as represented in the permit application dated August 26, 2003. Sufficient scrubber liquid flow within the established pH range and a sufficient pressure drop shall be provided to the venturi so that it may perform as represented in the permit application dated August 23, 2003. The acceptable range of scrubber liquid flow, scrubber liquid pH, and pressure drop shall be established by the holder of this permit.

10. The Emergency Stacks (Emission Point Nos. K2EMERSTK, K3EMERSTK, AND K4EMERSTK) may only be used during emergencies, upset conditions, or periods of maintenance or during start-up or shutdown when no lignite is being fed to the kilns. The permit holder shall notify the TCEQ Regional Office that the emergency stack is in use according to 30 TAC §§ 101.201 and 101.211.

CONTINUOUS DETERMINATION OF COMPLIANCE

11. The records required in Special Condition No. 12 shall constitute the method of demonstrating continuous compliance with the limits specified in the special conditions.

RECORDKEEPING REQUIREMENTS

12. The following records shall be maintained on-site for a rolling two-year period and made available upon request by representatives of the TCEQ or local air pollution control agency with jurisdiction:

    A. Records of lignite feed rates to Kiln Nos. 2, 3, and 4. In addition, the confidential application, containing the permitted lignite feed rate, shall be kept on-site and made available at the request of personnel from the TCEQ or any local air pollution control agency with jurisdiction.

    B. Pursuant to Special Condition No. 4, records to identify cleaning and any repairs or maintenance work performed on the abatement equipment, with emphasis given to the amount of time elapsing, until the repairs or corrections are made.

C. An annual gas analysis conducted by the gas supplier to demonstrate compliance with Special Condition No. 8.

D. Records of process and control equipment parameter monitoring including venturi scrubber liquid flow rate, scrubber liquid pH, and pressure drop across the scrubber.

13. A copy of this permit shall be kept at the plant site and made available at the request of personnel from the TCEQ or any local air pollution control agency with jurisdiction.

Dated November 19, 2004

EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

Permit Number 56552

This table lists the maximum allowable emission rates and all sources of air contaminants on the applicant's property covered by this permit. The emission rates shown are those derived from information submitted as part of the application for permit and are the maximum rates allowed for these facilities. Any proposed increase in emission rates may require an application for a modification of the facilities covered by this permit.

AIR CONTAMINANTS DATA

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates * lb/hr	TPY**
FGTVTRNSFR	Lignite Transfer Fugitives to Kilns 2, 3, and 4	PM_{10}	0.05	0.20
WILLMILL	Williams Mill (4)	PM_{10}	0.60	2.63
MAINSTACK	Kilns 2, 3, and 4	NO_x	113.77	498.31
		CO (5)	83.50	365.73
		SO_2	78.00	342.00
		PM_{10}	27.10	118.69
		VOC	22.14	96.98
K2FUGITIVE	Kiln 2 Fugitives (4)	PM_{10}	0.0001	0.0004
K3FUGITIVE	Kiln 3 Fugitives (4)	PM_{10}	0.0001	0.0004
K4FUGITIVE	Kiln 4 Fugitives (4)	PM_{10}	0.0001	0.0004
K2EMERSTK	Maintenance/Start-Up/ Shutdown Kiln 2	NO_x	---	0.1
		CO	---	15.3
		SO_2	---	0.02
		PM_{10}	---	2.9
		VOC	---	3.6
		H_2S	---	0.6
K3EMERSTK	Maintenance/Start-Up/ Shutdown Kiln 3	NO_x	---	0.1
		CO	---	15.3
		SO_2	---	0.02
		PM_{10}	---	2.9
		VOC	---	3.6
		H_2S	---	0.6

EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

AIR CONTAMINANTS DATA

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates * lb/hr	TPY**
K4EMERSTK	Maintenance/Start-Up/ Shutdown Kiln 4	NO_x	---	0.1
		CO	---	15.3
		SO_2	---	0.02
		PM_{10}	---	2.9
		VOC	---	3.6
		H_2S	---	0.6
ASHPIT	Ashpit Fugitives (4)	PM_{10}	0.0005	0.002
REFRACPIT	Refractory Pit Fugitives (4)	PM_{10}	0.0005	0.002
AREAADCVENT	LFP Conveyors from Kilns 2, 3, and 4	PM_{10}	0.51	2.25
1BKBNDCSK	No. 1 Bulk Bin Dust Collector Stack	PM_{10}	0.1	0.45
2BKBNDCSK	No. 2 Bulk Bin Dust Collector Stack	PM_{10}	0.1	0.45
HDRBNSDCSK	HDR Blend Bins Dust Collector Stack	PM_{10}	0.03	0.11
FGTVSTORAG	General Plant Fugitive Emissions (4)	PM_{10}	0.0009	0.004
HCLSRBRVNT	Main HCl Storage Tanks Scrubber Vent	PM_{10}	0.19	0.83
NAOHTNKVNT	Main 50 Percent NaOH Storage Tank	PM_{10}	0.11	0.50
METANK2	Lime Tank No. 2	PM_{10}	0.02	0.09

EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

AIR CONTAMINANTS DATA

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates * lb/hr	TPY**
GASFUELING	Gasoline Fueling Pump	VOC	4.62	0.50
DIESFUELING	Diesel Fueling Pump	VOC	0.46	0.05
WWCOOLTOWR	Wastewater Treatment Plant Cooling Tower	PM_{10}	0.12	0.51

(1) Emission point identification - either specific equipment designation or emission point number from a plot plan.
(2) Specific point source names. For fugitive sources, use an area name or fugitive source name.
(3) NO_x - total oxides of nitrogen
CO - carbon monoxide
SO_2 - sulfur dioxide
PM_{10} - particulate matter equal to or less than 10 microns in diameter. Where PM is not listed, it shall be assumed that no particulate matter greater than 10 microns is emitted.
VOC - volatile organic compounds as defined in Title 30 Texas Administrative Code § 101.1
H_2S - hydrogen sulfide
(4) Fugitive emissions are an estimate only and should not be considered as a maximum allowable emission rate.
(5) The CO concentration from EPN MAINSTACK shall be calculated on a 30-day rolling average.

* Emission rates are based on and the facilities are limited by the following maximum operating schedule:

___Hrs/day ___Days/week ___Weeks/year or 8,760 Hrs/year

** Compliance with annual emission limits is based on a rolling 12-month period.

Dated November 19, 2004

Regency Energy Partners, Tilden Gas Plant

MC0002H

Texas Commission on Environmental Quality

INTEROFFICE MEMORANDUM

To: Susana M. Hildebrand, P.E., Director
Air Quality Division

Date: June 22, 2007

Thru: Greg Nudd, P. E.
Air Quality Division

From: Kathy Pendleton, P.E.
Industrial Emissions Assessment Section

Subject: Removal of Air Account Number MC0002H From Consideration for Best Achievable Retrofit Technology (BART)

Regency Energy Partners requested the referenced site, Tilden Gas Plant, be removed from further BART consideration based on converting to acid gas injection for their tail gas incinerator. This process change is intended to eliminate the air emissions from the tail gas incinerator. The process is authorized under a permit by rule (PBR), dated May 31, 2007. The tail gas incinerator is the only BART eligible source of sulfur dioxide (SO_2) and nitrogen oxide (NO_x) emissions, based on the site's response to the BART survey in 2006 (Table 1). With the incorporation of this process change, the emissions at the site are less than 1,000 tons per year (tpy) combined of SO_2 and NO_x with the distance to the nearest Class I area, Big Bend, 458 kilometers. These parameters meet the exemption listed in Title 30 Texas Administrative Code (30 TAC) §116.1510(c). This site was modeled out for particulate emissions by the Texas Commission on Environmental Quality (TCEQ). The company certified our modeling was adequate.

Based on the PBR, this site meets the requirements of 30 TAC §116.1510(c). It is recommended the site be removed from the BART-eligible list.

Table 1. Potential BART-Eligible Units and 2002 Emissions (tpy)

FIN	EPN	SCC	VOC	NO_X	SO_2	PM_{10}
IS-1*	IS-1	31000299	35.96	1.92	2,275.95	0.24
SUL PLT #1	IS-1	31000208	0	0	0	0
SUL PLT #2	IS-1	31000208	0	0	0	0
DHS-1	DHS-1	31000404	0	0	0	0
IR-1	13	20100202	0	0	0	0
SLR-1	SLR-1	30103299	0	0	0	0
SLR-2	SLR-2	30103299	0	0	0	0
IR-1	IR-1	20100202	0	0	0	0

*IS-1 is the tail gas incinerator

Regency FS (Field Services) L.P.
16401 CR 2854
Eustace, Texas 75124
Tel: 903-451-3004
Fax: 903-451-2553

1500

REGENCY

March 28, 2007

FedEx Overnight Delivery
Air Bill Number: 8582 1030 6397

APIRT
MAR 30 2007

Texas Commission on Environmental Quality
Air Permits Division (ADP) – MC 163
12100 Park Circle, Building F, First Floor, Room 1206
Austin TX 78711-3087

RE: BART Inapplicability
Tilden Gas Plant
Account No. MC-0002-H
Permit's Nos. O-00679, 49157, 71017, and 71999

Dear Sir or Madam:

Regency FS (Field Services) L.P. (Regency), is submitting the following information in regards to the BART (Best Available Retrofit Technology) status of our Tilden Gas Plant, located in Mcmullen County, Texas.

All emissions sources at this site are are currently authorized under PBR (Permit by Rule) with the exception of the VERP (Voluntary Emissions Reduction Permit) No. 49167. The emission sources covered by Permit No. 49167 concerning the Boilers; EPN's BS-1 and BS-2, have either been shutdown or have been upgraded per the terms of that permit to meet 10 year old BACT (Best Available Control Technology).

Additionally, the site is currently scheduled to be converted to acid gas injection beginning in April of 2007, in order to meet our obligations to shutdown the grandfathered emission sources located at the site by the March 1, 2008 deadline. This conversion to acid gas injection will eliminate emissions to the atmosphere from EPN's IS-1, SULPT1, SULPT2, SLR1, and SLR2 thus insuring that the total emissions for the site will be less than 500 TPY (tons per year) of combined NO_x and SO_2 emissions.

Since the site is located over 400 kilometers from Big Bend National Park, and over 700 Kilometers from the Guadalupe Mountains.and is scheduled to have the acid gas conversion completed by mid May of 2007, Regency believes that this site in no longer BART eligible.

If you have any questions or require additional information, please don't hesitate to call me at (903) 451-3004 ext 15.

Sincerely,

Will Yenke
Regency EH&S

cc: Ms. Luna-Pirtle, Air Section Manager, TCEQ, Region 16

Regency FS (Field Services) L.P.
16401 CR 2854
Eustace, Texas 75142

May 10, 2007

Texas Commission on Environmental Quality
Air Permits Division (MC-163)
12100 Park 35 Circle, Building C, Third Floor
Austin, Texas 78753

Subject: **Permit by Rule Registration**
Tilden Gas Processing Plant
Tilden, McMullen County, Texas
CN602924318, RN100216621, Account No. MC-0002-H

Dear Sir or Madam:

Regency FS (Field Services) L.P. (Regency) in association with the shutdown of EPN's IS-1 (Tail Gas Incinerator), SULPT1 (Sulfur Pit 1), SULPT2 (Sulfur Pit 2), SLR1 (Sulfur Recovery Unit 1), and SLR2 (Sulfur Recovery Unit 2) is submitting this Permit by Rule (PBR) registration requesting authorization under §106.261 and §106.262 Facilities for our on-site Acid Gas injection system.

The Acid Gas Injection system is essentually a zero-emission process, where the acid gas is compressed and then conveyed via piping to a suitable underground formation. Regency has already identified a suitable underground formation and has registered and drilled the injection well. We are therefore requesting authorization under §106.261 and §106.262 to begin construction on the piping and installation of the Tatung 800Hp eletric motor that will provide the needed compression and pathway for the acid gas to be injected into the on-site well.

Regency believes that the Project and its associated air emissions qualify for PBR under 30 Texas Administrative Code (TAC) §106.261 and §106.262. This letter and the following attachments present information for the Project:

- Attachment 1 presents a process/Project description;
- Attachment 2 contains the TCEQ Form PI-7;
- Attachment 3 presents emission rate calculations;
- Attachment 4 describes how the Project qualifies for PBR; and
- Attachment 5 includes supporting documentation.

Please note that a copy of this letter, the TCEQ Form PI-7, and the PBR registration fee of $450 are being submitted to the TCEQ Revenue Section concurrently with this submittal. We would like to thank you in advance for your review and concurrence with this PBR registration. If you have any questions regarding the information presented in this letter and attachments, please do not hesitate to call me at (903) 451-3004, ext. 15.

Sincerly,

Will Yenke
Regency EH&S

Attachments

cc: Ms. Rose Luna-Pirtle, TCEQ Region 16 - Laredo
Regency Plants
TCEQ Revenue Section, MC-214, Bldg. A, Third Floor, Austin, Texas 78753
(Copy of Core Data Form, Form PI-7, and fee only)

Kathleen Hartnett White, *Chairman*
Larry R. Soward, *Commissioner*
H. S. Buddy Garcia, *Commissioner*
Glenn Shankle, *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

May 31, 2007

MR WILL YENKE
EHS DIRECTOR
REGENCY FS LP
16401 COUNTY ROAD 2854
EUSTACE TX 75124

Permit by Rule Registration Number:	81918
Location/City/County:	From the intersection of State Highway 72 and Highway 16 in Tilden travel south for about 4.0 miles on Highway 16. Turn east on Private Road with Regency sign. Tilden, McMullen County
Project Description/Unit:	Tilden Gas Plant - Acid Gas Injection System
Regulated Entity Number:	RN100216621
Customer Reference Number:	CN603117219
New or Existing Site:	Existing
Affected Permit (if applicable):	GOP #O-00679; NSR Permit #73580
Renewal Date (if applicable):	None

Regency FS, L.P. has certified the emissions associated with the acid gas injection system at the Tilden Gas Plant under Title 30 Texas Administrative Code §§ 106.261 and 106.262.

For rule information see www.tceq.state.tx.us/permitting/air/nav/numerical_index.html.

The company is also reminded that these facilities may be subject to and must comply with other state and federal air quality requirements. This certification is taken under the authority delegated by the Executive Director of the TCEQ. If you have questions, please contact Ms. Sidney Wheeler at (210) 403-4078.

Sincerely,

Certified Emissions:

VOCs	0.82	tpy

Anne M. Inman, P.E., Manager
General/Standard/Rule (GSR) Permit Section
Air Permits Division

cc: Air Section Manager, Region 16 - Laredo

Project Number: 129358

Account Overview Report

Tuesday, June 12, 2007

Account Information

RN: RN100216621 Account: MC0002H Last EI Date: 12/31/2005
Organization: REGENCY FS (FIELD SERVICES) LP CN:
Site: TILDEN GAS PLANT

Contact Information

Name: YENKE, WILL Address: 16410 CR 2854
Phone: (903) 451-3400
EUSTACE TX 75124

Latest Reported Span

Purpose: ANNUAL
Date Recorded: 2006

Latest Reported Milestone

Milestone: TO QA
Date Recorded: 6/8/2007 12:00:00AM

Equipment Totals

Path: 42 FIN: 42 EPN: 35 CIN: 1

2005 - Criteria Totals

Class	Annual TPY	Ozone PPD	SMSS(TPY)	Emiss Event(TPY)	EE/SMSS(TPY)
CO	28.5779	207.0006	0.0000	0.0277	0.0277
NOX	40.2968	395.2228	0.0000	0.0054	0.0054
PB	0.0000	0.0000	0.0000	0.0000	0.0000
PM10	5.2534	49.2269	0.0000	0.0000	0.0000
PM2.5	5.2534	49.2269	0.0000	0.0000	0.0000
SO2	1,856.6623	13230.5223	0.0000	30.2629	30.2629
VOC	15.0243	86.1913	0.0000	0.2891	0.2891

2004 - Criteria Totals

Class	Annual TPY	Ozone PPD	SMSS(TPY)	Emiss Event(TPY)	EE/SMSS(TPY)
CO	66.2900	911.1640	0.0000	0.0000	0.0000
NOX	70.7620	650.7090	0.0000	0.0000	0.0000
PB	0.0000	0.0000	0.0000	0.0000	0.0000
PM10	3.6990	23.3837	0.0000	0.0000	0.0000
PM2.5	3.6990	23.3837	0.0000	0.0000	0.0000
SO2	2383.7405	17563.6030	0.0000	24.8180	24.8180
VOC	15.6970	143.3090	0.0000	0.0000	0.0000

2003 - Criteria Totals

Class	Annual TPY	Ozone PPD	SMSS(TPY)	Emiss Event(TPY)	EE/SMSS(TPY)
CO	189.9520	1030.6301	0.0000	0.0000	6.3430
NOX	76.8090	439.8415	0.0000	0.0000	0.6829
PB	0.0000	0.0000	0.0000	0.0000	0.0000
PM10	5.6770	31.3643	0.0000	0.0000	0.0863
PM2.5	5.6770	31.3643	0.0000	0.0000	0.0863
SO2	4195.9201	22658.4422	0.0000	0.0000	222.6922
VOC	9.8100	63.6008	0.0000	0.0000	0.2646

----------End of Report----------

Saint-Gobain Vetrotex America, Inc

WH0014S

RECEIVED
MAY 23 2007
AIR QUALITY PLANNING

TITAN Engineering, Inc.
Environmental Consulting and Management

May 21, 2007

CERTIFIED MAIL
7003 3110 0000 4028 5637

Ms. Kathy Pendleton
Mail Code 164
Texas Commission on Environmental Quality
12100 Park 35 Circle, Building C
Austin, Texas 78753

RE: Best Available Retrofit Technology (BART)
30 TAC 116.1500-1540; Exemption Request
Saint-Gobain Vetrotex America, Inc.
Wichita Falls, Wichita County, Texas

Dear Ms. Pendleton:

TITAN Engineering, Inc. (TITAN) is submitting this letter on behalf of Saint-Gobain Vetrotex America, Inc. (Vetrotex). You requested that Saint-Gobain provide a verification of Texas Commission on Environmental Quality's, (TCEQ) modeling concerning the PM_{10} sources used in the BART evaluation. The sources subject to BART are listed in the attached tables. Please note there are several sources originally listed as BART sources that were later determined not to be subject to the BART review. There are two sources not included in the original BART sources which were not modeled. These sources are listed in Table 1.

The most significant of these sources is the Mat Machine (F-41). This source was originally built during the 1970's but never operated until the 1990's. Therefore, it is subject to BART. PM_{10} emissions from this source for 2002 were 2.23 tons per year.

However, Furnace F-22 was included in the BART modeling but this furnace was removed from service and is no longer in the permit. Its actual PM_{10} emissions are 59.49 tons per year.

We are presenting three tables to adequately address corrections. Table 1 shows the stack parameters corrections to the BART modeling database. Table 2 is a corrected stack parameter table showing the total PM_{10} emissions that should have been modeled. Table 3 is the TCEQ's BART modeling database used in the original modeling.

Table 3 shows the 82.85 tons per year of PM_{10} emissions that were modeled. Table 2 shows the corrected PM_{10} emission rate of 22.47 tons per year. For PM_{10} emissions, the TCEQ's BART modeling used a much higher PM_{10} emission rate then the correct number. Therefore, Saint-Gobain can easily certify that the TCEQ's modeling was sufficient in

11940 Jollyville Road • Suite 220-S • Austin, Texas 78759
phone: (512) 250-2600 • fax: (512) 250-2940

determining that Saint-Gobain's sources do not contribute to the visibility impairment at the Class I areas analyzed.

If you have any questions or need further information, please do not hesitate to contact Ms. Kara K. Dudash with Vetrotex at 940-689-3461 or me at 512-250-2600. Our email addresses are: Kara.K.Dudash@saint-gobain.com and Wdavison@titanengineering.com.

Sincerely,
TITAN Engineering, Inc.

Wayne Davison

Wayne Davison, P.E.
Senior Project Manager

Copy: Ms. Kara K. Dudash, Saint-Gobain, Wichita Falls
Ms. Stephanie Meadows, TITAN

Attachment A
BART Tables 1, 2, & 3

Saint - Gobain Vetrotex America, Inc.
Best Available Retrofit Technology (BART)
Corrections

FIN	EPN	Data are correct	STKHGT	STKDIA	STKTEMP	STKVEL	VOC	NOX	SO2	PM10	Notes
F-52	E-52	No				49					
F-61	E-61	Yes									
F-1	E-1	Yes									
F-2	E-2	Yes									
F-3	E-3	Yes									
F-6	E-6	Yes									
F-4	E-4	Yes									
F-5	E-5	Yes									
F-26	E-26	Yes									
F-22	E-22A	No			550						Shut down & removed from permit
F-31	E-31	Yes									
F-32	E-32A-F	Yes									
F-34	E-34	No									Source Not Subject to BART
F-35	E-35	No									Source Not Subject to BART
F-21	E-21A	No			425						
F-8	E-8	Yes									
F-9	E-9	Yes									
F-7A	E-7A	Yes									
F-72	E-72	No		fugitive emissions							Source Not Subject to BART
F-25	E-25	Yes									
F-33	E-33	Yes									
F-91	E-91	Yes									
F-92	E-92	Yes									
F-109	E-109	Yes									
F-10	E-10	No									Source Not Subject to BART
F-11	E-11	No									Source Not Subject to BART
F-81	E-81	No		6.35							
F-101	E-101	Yes									
F-97	E-97	Yes									
F-95	E-95	Yes									
F-81	E-85A	No		5.87							
F-7B	E-7B	Yes									
F-82	E-82	Yes									
F-42	E-42	No									Source Not Subject to BART
F-71	E-71	Yes									
F-75A	E-75A	Yes									
F-75B	E-75B	Yes									
F-75C	E-75C	No									Source Not Subject to BART
F-75D	E-75D	No									Source Not Subject to BART
F-16	E-16	Yes									
F-15	E-15	Yes									
F-17	E-17	No	16	3.3	70	0.01					Source Not Subject to BART
F-82	E-85B	Yes									
SB1	WWPTP	No		fugitive emissions							Source Not Subject to BART
SB2	WWPTP	No		fugitive emissions							Source Not Subject to BART
EB	WWPTP	No		fugitive emissions							Source Not Subject to BART
F-2	E-2A	Yes									
F-3	E-3A	No		0.66	70	40					
F-33 A-D	E-33 A-D	Yes									
E-41		No	37	1.12	250	65	1.3	0.06	0.01	2.23	Source Subject to BART
F-62		No	25	0.83	700	70	1.53	0.04	0.03	0.04	Source Subject to BART

Notes 1. "No" means either the stack parameters are corrected or the BART status is incorrect.

Kara Dudash 21 May 07

Saint - Gobain Vetrotex America, Inc.
Best Available Retrofit Technology (BART)
Correction of Modeled Sources

FIN	EPN	Data are correct	STKHGT	STKDIA	STKTEMP	STKVEL	VOC	NOx	SO2	PM10	Notes
F-52	E-52	No	48	2	305	49	0.06	2.82	0.03	0.1	
F-61	E-61	Yes	25	0.8299	700	70	0.03	1.28	0.02	0.04	
F-1	E-1	Yes	107	0.66	70	40	0	0	0	0.07	
F-2	E-2	Yes	107	0.66	70	40	0	0	0	0.13	
F-3	E-3	Yes	107	0.66	70	40	0	0	0	0.13	
F-6	E-6	Yes	107	0.66	70	35	0	0	0	0.07	
F-4	E-4	Yes	107	0.66	70	40	0	0	0	0.02	
F-5	E-5	Yes	107	0.66	70	35	0	0	0	0.02	
F-26	E-26	Yes	80	1	77	40	0	0	0	0.03	
F-22	E-22A	No	63	2.7999	550	74.6	1.1	62.59	16.41		Shut down & removed from permit
F-31	E-31	Yes	34	1.87	290	35.8	0.11	3.55	0.01	0.23	
F-32	E-32A-F	Yes	32	1.8999	260	25.6	0.13	4.00	0.01	0.38	
F-34	E-34	No	32	1.8999	260	25.6	0.12	3.64	0.01		Source Not Subject to BART
F-35	E-35	No	32	1.8999	260	25.6	0.11	3.28	0.01		Source Not Subject to BART
F-21	E-21A	No	88	2.7899	425	74.8	0.71	19.06	11.17	9.1	
F-8	E-8	Yes	107	0.66	70	40	0	0	0	0.03	
F-9	E-9	Yes	107	0.66	70	40	0	0	0	0	
F-7A	E-7A	Yes	107	0.66	70	40	0	0	0	0	
F-72	E-72	No		fugitive emissions			13.42	0	0		Source Not Subject to BART
F-25	E-25	Yes	80	1	77	40	0	0	0	0.03	
F-33	E-33	Yes	32	1.8999	260	25.6	0.13	4.03	0.01	0.79	
F-91	E-91	Yes	67	5	260	10	0.06	0.96	0.01	0.08	
F-92	E-92	Yes	67	5	260	10	0.09	1.49	0.01	0.13	
F-109	E-109	Yes	18	1.2	77	24	0	0	0	0.46	
F-10	E-10	No	107	0.66	70	40	0	0	0		Source Not Subject to BART
F-11	E-11	No	107	0.66	70	40	0	0	0		Source Not Subject to BART
F-81	E-81	No	50	6.35	80	37	0	0	0	3.78	
F-101	E-101	Yes	28	1.8999	150	51	0	0	0	0.14	
F-97	E-97	Yes	63	1	70	11	0	0	0	0	
F-95	E-95	Yes	25	1	70	11	0	0	0	0.06	
F-81	E-85A	No	55	5.87	80	40	0	0	0	0	
F-7B	E-7B	Yes	107	0.66	70	40	0	0	0	0	
F-82	E-82	Yes	50	6.7699	80	37	0	0	0	3.46	
F-42	E-42	No	28	1.8999	150	51	0	0	0		Source Not Subject to BART
F-71	E-71	Yes	20	3.8295	1000	0.65	0.16	0.04	0.01	0	
F-75A	E-75A	Yes	5	1	500	12.31	0	0.05	0	0	
F-75B	E-75B	Yes	5	1	500	14.86	0	0	0	0	
F-75C	E-75C	No	5	1	500	15.86	0	0.06	0		Source Not Subject to BART
F-75D	E-75D	No	5	1	500	15.86	0	0.06	0		Source Not Subject to BART
F-16	E-16	Yes	25	1	80	27.6	0	0	0	0.32	
F-15	E-15	Yes	25	1	80	27.6	0	0	0	0.16	
F-17	E-17	No	16	3.3	70	0.01	0	0	0		Source Not Subject to BART
F-82	E-85B	Yes	78	5.15	68	45.92	0	0	0	0	
SB1	WWPTP	No		fugitive emissions			0	0	0		Source Not Subject to BART
SB2	WWPTP	No		fugitive emissions			0	0	0		Source Not Subject to BART
EB	WWPTP	No		fugitive emissions			174.33	0	0		Source Not Subject to BART
F-2	E-2A	Yes	107	0.5	68	69.3	0	0	0	0.22	
F-3	E-3A	No	107	0.66	70	40	0	0	0	0.22	
F-33 A-D	E-33 A-D	Yes	34	1.87	290	35.8	0	0	0	0	
E-41		No	37	1.12	250	65	1.3	0.06	0.01	2.23	Source Subject to BART
F-62		No	25	0.83	700	70	1.53	0.04	0.03	0.04	Source Subject to BART

Total Emissions of Modeled Sources = 22.47 Tons per year

Notes 1. "No" means either the stack parameters are corrected or the BART status is incorrect.

Kara Rudash 21 May 07

Saint - Gobain Vetrotex America, Inc.
Best Available Retrofit Technology (BART)
Table of Modeled PM Emisison Sources

FIN	EPN	Data are correct	STKHGT	STKDIA	STKTEMP	STKVEL	VOC	NOx	SO2	PM10	Notes
F-52	E-52	No	48	2	305	49	0.06	2.82	0.03	0.1	
F-61	E-61	Yes	25	0.8299	700	70	0.03	1.28	0.02	0.04	
F-1	E-1	Yes	107	0.66	70	40	0	0	0	0.07	
F-2	E-2	Yes	107	0.66	70	40	0	0	0	0.13	
F-3	E-3	Yes	107	0.66	70	40	0	0	0	0.13	
F-6	E-6	Yes	107	0.66	70	35	0	0	0	0.07	
F-4	E-4	Yes	107	0.66	70	40	0	0	0	0.02	
F-5	E-5	Yes	107	0.66	70	35	0	0	0	0.02	
F-26	E-26	Yes	80	1	77	40	0	0	0	0.03	
F-22	E-22A	No	63	2.7999	550	74.6	1.1	62.59	16.41	59.49	Shut down & removed from permit
F-31	E-31	Yes	34	1.87	290	35.8	0.11	3.55	0.01	0.23	
F-32	E-32A-F	Yes	32	1.8999	260	25.6	0.13	4.00	0.01	0.38	
F-34	E-34	No	32	1.8999	260	25.6	0.12	3.64	0.01	0.31	Source Not Subject to BART
F-35	E-35	No	32	1.8999	260	25.6	0.11	3.28	0.01	0.27	Source Not Subject to BART
F-21	E-21A	No	88	2.7899	425	74.8	0.71	19.06	11.17	9.1	
F-8	E-8	Yes	107	0.66	70	40	0	0	0	0.03	
F-9	E-9	Yes	107	0.66	70	40	0	0	0	0	
F-7A	E-7A	Yes	107	0.66	70	40	0	0	0	0	
F-72	E-72	No		fugitive emissions			13.42	0	0	0	Source Not Subject to BART
F-25	E-25	Yes	80	1	77	40	0	0	0	0.03	
F-33	E-33	Yes	32	1.8999	260	25.6	0.13	4.03	0.01	0.79	
F-91	E-91	Yes	67	5	260	10	0.06	0.96	0.01	0.08	
F-92	E-92	Yes	67	5	260	10	0.09	1.49	0.01	0.13	
F-109	E-109	Yes	18	1.2	77	24	0	0	0	0.46	
F-10	E-10	No	107	0.66	70	40	0	0	0	0.04	Source Not Subject to BART
F-11	E-11	No	107	0.66	70	40	0	0	0	0.04	Source Not Subject to BART
F-81	E-81	No	50	6.35	80	37	0	0	0	3.78	
F-101	E-101	Yes	28	1.8999	150	51	0	0	0	0.14	
F-97	E-97	Yes	63	1	70	11	0	0	0	0	
F-95	E-95	Yes	25	1	70	11	0	0	0	0.06	
F-81	E-85A	No	55	5.87	80	40	0	0	0	0	
F-7B	E-7B	Yes	107	0.66	70	40	0	0	0	0	
F-82	E-82	Yes	50	6.7699	80	37	0	0	0	3.46	
F-42	E-42	No	28	1.8999	150	51	0	0	0	0.22	Source Not Subject to BART
F-71	E-71	Yes	20	3.8295	1000	0.65	0.16	0.04	0.01	0	
F-75A	E-75A	Yes	5	1	500	12.31	0	0.05	0	0	
F-75B	E-75B	Yes	5	1	500	14.86	0	0	0	0	
F-75C	E-75C	No	5	1	500	15.86	0	0.06	0	0	Source Not Subject to BART
F-75D	E-75D	No	5	1	500	15.86	0	0.06	0	0	Source Not Subject to BART
F-16	E-16	Yes	25	1	80	27.6	0	0	0	0.32	
F-15	E-15	Yes	25	1	80	27.6	0	0	0	0.16	
F-17	E-17	No	16	3.3	70	0.01	0	0	0	0.01	Source Not Subject to BART
F-82	E-85B	Yes	78	5.15	68	45.92	0	0	0	0	
SB1	WWPTP	No		fugitive emissions			0	0	0	0	Source Not Subject to BART
SB2	WWPTP	No		fugitive emissions			0	0	0	0	Source Not Subject to BART
EB	WWPTP	No		fugitive emissions			174.33	0	0	0	Source Not Subject to BART
F-2	E-2A	Yes	107	0.5	68	69.3	0	0	0	0.22	
F-3	E-3A	No	107	0.66	70	40	0	0	0	0.22	
F-33 A-D	E-33 A-D	Yes	34	1.87	290	35.8	0	0	0	0	
E-41		No	37	1.12	250	65	1.3	0.06	0.01	2.23	Source Subject to BART
F-62		No	25	0.83	700	70	1.53	0.04	0.03	0.04	Source Subject to BART

Total Emissions of Modeled Sources = 82.85 tons per year

Notes 1. "No" means either the stack parameters are corrected or the BART status is incorrect.

Kara Vandam 21 May 07

Attachment B
Certification

Certification Notice

I have reviewed the report, **"Screening Analysis of Potential BART-Eligible Sources in Texas,"** dated September 27, 2006, and the **Texas Modeling Data** that the TCEQ and their contractor used in the BART Exemption Screening Modeling for our source, found on the TCEQ website at:

http://www.tceq.state.tx.us/implementation/air/sip/bart/haze.html

I agree that the data used accurately represents the BART-eligible units at my site. I have include a list of the applicable BART-eligible units for this site to this certification.

Company Name: Saint-Gobain Vetrotex America, Inc.
Account Number: WH0014S
Registry Number: RN100218601

Based on the results presented in the above report, I agree that our BART-eligible units do not contribute to visibility impairment at the Class I areas analyzed. Therefore, this site does not need to perform any further analyses fore the BART rule for these sources.

The responsible official at the site must certify the information on this page and any accompanying documentation for truth, accuracy, and completeness. This original certification must be submitted to the Air quality Division of TCEQ within 60 days of the cover letter. Copies of the certification should be sent to the appropriate TCEQ regional offices and local air pollution control programs with jurisdiction of this site.

Authorized Signature: Kara Dudash
Printed Name: Ms. Kara K. Dudash
Title: Environmental Engineer
Date: 21 May 2007
Phone: 940-689-3461
Email: Kara.K.Dudash@saint-gobain.com

Mail original, signed certification and list of BART-eligible units to:

TCEQ
Kathy Pendleton, MC-164
P.O. Box 13087
Austin, TX 78711-3087

Attachment

TARGA, Waddell Compressor Station

CY0019H

TARGA

RECEIVED
OCT 20 2006
AIR QUALITY PLANNING

October 17, 2006

Ms. Kathy Pendleton
Industrial Emissions Assessment Section, MC-164
Texas Commission on Environmental Quality
P. O. Box 13087
Austin, TX 78711-3087

Re: ***BART-eligible Survey Revision***
Waddell Compressor Station (CY0019H)
(Previously owned by Dynegy Midstream Services, LP)

Dear Ms. Pendleton,

Per our discussion, enclosed please find a revised portion of the BART-eligible Survey for Targa Midstream Services's, L. P. (Targa's) Waddell Compressor Station (Waddell). Per Ms. Hildebrand's letter of September 1, 2006, Waddell had remained subject to BART even after the Texas Commission on Environmental Quality (TCEQ) completed the modeling on the preliminary list.

Prior to July of 2006, there were four (4) HRAT engines that made the site subject to the BART survey and review. These 4 engines (C-20, C-21, C-22, and C-23) were shutdown in July of 2006 as part of a permitting activity. A copy of the Permit Alteration response from the TCEQ is included with this letter. Post this change, the site remains in one of the 26 subject SIC, does have a potential to emit greater than 250 tpy of NO_x, SO_2, or PM, but does not have equipment that was constructed or reconstructed between August 7, 1962 and August 7, 1977.

Thank you for working with us to remove us from the BART requirements. If you have questions or need further information, please call me at (713) 584-1084 or you can e-mail me at jkeiser@targaresouces.com.

Sincerely,

Jessica L. Keiser

Jessica L. Keiser
Manager, ES&H

Enclosures

cc:	Susana M. Hildebrand, TCEQ	w/attachments
	Jim Hopper, Targa ES&H Specialist	w/attachments
	Paul Ivey, Targa Area Manager	w/o attachments
	Clark White, Targa Vice President	w/o attachments

Kathleen Hartnett White, *Chairman*
R. B. "Ralph" Marquez, *Commissioner*
Larry R. Soward, *Commissioner*
Glenn Shankle, *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

January 31, 2006

Mr. A. S. Shankar
Senior Environmental Specialist
Targa Midstream Services, Limited Partnership
1000 Louisiana Street, Suite 4700
Houston, Texas 77002

Re: Permit Alteration
Permit Number: 49137
Waddell Compressor Station
Crane, Crane County
Regulated Entity Number: RN102551785
Customer Reference Number: CN602957318
Account Number: CY-0019-H

Dear Mr. Shankar:

This is in response to your letter dated December 13, 2005, requesting alteration of the conditions and maximum allowable emission rates table (MAERT) of the above-referenced permit. We understand that you wish to shut down Engines C-20, C-21, C-22, and C-23 instead of retrofitting Engines C-5, C-6, and C-7.

As indicated in Title 30 Texas Administrative Code § 116.116(c), and based on our review, Permit Number 49137 is altered. Enclosed are the altered permit conditions and MAERT to replace those currently attached to your permit. Please attach these to your permit.

Please reference the Texas Commission on Environmental Quality (TCEQ) air account number, regulated entity reference number (RN), and customer reference number (CN) included in this document in all future correspondence. Before the Central Registry program began, the TCEQ assigned air account numbers. In the Central Registry computer application, the RN is a unique number assigned to the facility (if portable) or site (if permanent), and the CN is a unique number assigned to the company or corporation and applies to all facilities and sites owned or operated by the company or corporation.

Re: Permit Number: 49137

Your cooperation in this matter is appreciated. If you need further information or have any questions, please contact Mr. Sean O'Brien at (512) 239-1137 or write to the Texas Commission on Environmental Quality, Office of Permitting, Remediation, and Registration, Air Permits Division (MC-163), P.O. Box 13087, Austin, Texas 78711-3087.

This action is authorized on behalf of the TCEQ Executive Director.

Sincerely,

Richard A. Hyde, P.E., Director
Air Permits Division
Office of Permitting, Remediation, and Registration
Texas Commission on Environmental Quality

RAH/SAO/bis

Enclosures

cc: Air Section Manager, Region 7 - Midland

Project Number: 120108

SPECIAL CONDITIONS

Permit Number 49137

EMISSION STANDARDS

1. Natural gas will be used to fire each compressor engine. Natural gas usage shall be monitored and recorded for the compressor engines and tabulated on a monthly basis. These records shall be kept at the plant site for the last two years and be made immediately available to Texas Commission on Environmental Quality (TCEQ) personnel upon request.

   Compressor Engines identified as Emission Point Nos. (EPNs) C-5, C-6, and C-7 are limited to 4.25 grams of carbon monoxide (CO) per brake horsepower hour (bhp-hr) and 22.31 grams of nitrogen oxides (NO_x) per bhp-hr.

   The Compressor Engine identified as EPN C-8 is limited to 4.25 grams of CO per bhp-hr and 22.31 grams NO_x per bhp-hr.

   Compressor Engines identified as EPNs C-9, C-10 and C-11 are limited to 6.14 grams of CO per bhp-hr and 18.61 grams of NO_x per bhp-hr.

   Compressor Engines identified as EPNs C-20, C-21, C-22, and C-23 shall be shut down no later than July 1, 2006. **(1/06)**

2. The EPNs F-2 and F-4 will have thermocouples installed on each one within 240 days of permit issuance. The EPNs F-2 and F-4 shall be designed and operated in accordance with Title 40 Code of Federal Regulations § 60.18 (40 CFR § 60.18) including specifications of minimum heating value of the waste gas, maximum tip velocity, and pilot flame monitoring. If necessary to insure adequate combustion, sufficient fuel gas shall be added to make the gases combustible. An infrared monitor is considered equivalent to a thermocouple for flame monitoring purposes.

3. The Fire Water Pump, EPN FWP-1, is limited to operating 876 hours per calendar year. Records shall be kept at the plant site for the last two years demonstrating compliance with this requirement.

4. Permit issuance is conditioned on the permanent shutdown within 180 days of permit issuance of Compressor Engines (EPNs C-1 and C-4) and Combustion Sources (EPNs H-2, H-3, H-5, and H-7) located at the Dynegy site with TCEQ Account ID No. WC-0017-V and Compressor Engines (EPNs C-26, C-27, G-3, and G-6) and one Combustion Source (EPN H-7) located at TCEQ Account ID No. CY-0019-H. The required CO reductions are 148.8 tpy and NO_x reductions are 845.1 tpy. The permanent shutdown is needed to achieve the project emission reduction credits (PERC) for EPNs C-5, C-6, C-7, C-8, C-9, C-10, and C-11 to show compliance with the Title 30 Texas Administrative Code § 116.812 (30 TAC § 116.812). Failure to achieve this permanent shutdown by the listed date will make the PERC no longer creditable and the permit is automatically void. **(1/06)**

5. Piping, Valves, Pumps, and Compressors in Hydrogen Sulfide (H_2S) Service

   A. Audio, olfactory, and visual checks for leaks of H_2S within the compressor engine operating area shall be made once every 24 hours. The date and time of each check shall be recorded.

   B. Immediately, but no later than one-hour upon detection of a leak, plant personnel shall take the following actions in the order listed:

      (1) Isolate the leak.

      (2) Commence repair or replacement of the leaking component.

      (3) Use a leak collection/containment system to prevent the leak until repair or replacement can be made if immediate repair is not possible.

   Records shall be maintained at the plant site of all inspections, repairs, and replacements made including the date the inspection, repair, or replacement was completed. The records shall be maintained for two years, and shall be made available to the TCEQ Executive Director or designated representative upon request.

INITIAL DETERMINATION OF COMPLIANCE **(1/06)**

6. The holder of this permit shall perform initial stack sampling and other testing to establish the actual pattern and quantities of air contaminants being emitted into the atmosphere from two of the three Compressor Engines EPNs C-5, C-6, and C-7, from Compressor Engine EPN C-8, from any one of the three Compressor Engines identified as EPNs C-9, C-10, and C-11. Gaseous sampling port(s) and sampling platforms(s) shall be incorporated into the design of the engine stack(s) per specifications in the attachment entitled "Chapter 2, Stack Sampling Facilities" of the TCEQ Sampling Procedures Manual. Alternate sampling facility designs may be submitted for approval by the TCEQ Regional Director or the TCEQ Manager of the Austin Enforcement Division, Engineering Services Team. Sampling ports and sampling platforms will be installed within 180 days after the permit is issued on each compressor engine.

   During the pretest meeting, the applicant may request the use of the U.S. Environmental Protection Agency (EPA) Method 19 (as referenced by 30 TAC § 106.261) to calculate the stack flow in place of the requirements listed above. Pertinent data, including fuel flow, shall be recorded and included in the sampling report. Any data and/or records required in addition to the EPA Method 19 requirements shall be addressed at the pretest meeting.

A. The appropriate TCEQ Regional Office shall be contacted as soon as testing is scheduled, but not less than 45 days prior to sampling to schedule a pretest meeting.

The notice shall include:

(1) Date for pretest meeting.
(2) Date sampling will occur.
(3) Name of firm conducting sampling.
(4) Type of sampling equipment to be used.
(5) Method or procedure to be used in sampling.
(6) Procedure to be used to determine engine horsepower load during sampling period.

The purpose of the pretest meeting is to review the necessary sampling and testing procedures, to provide the proper data forms for recording pertinent data, and to review the format procedures for submitting the test reports.

A written proposed description of any deviation from sampling procedures specified in permit conditions or the TCEQ or the EPA sampling procedures shall be made available to the TCEQ prior to the pretest meeting. The TCEQ Regional Director or the Manager of the TCEQ Austin Enforcement Division Engineering Services Team shall approve or disapprove of any deviation from specified sampling procedures.

B. Air contaminants emitted from the engines to be tested for include (but are not limited to) NO_x, nitric oxide (NO), CO, and oxygen (O_2). Sampling shall occur within 180 days after installation of the sampling ports and platforms is complete on EPN C-8. Sampling of EPNs C-5, C-6, and C-7 shall occur within 180 days after installation of the sampling ports and platforms is complete. Sampling shall occur from two of the three Compressor Engines identified as EPNs C-5, C-6, and C-7 and the engines to be sampled shall be determined at the pretest meeting. If the sampling results demonstrate compliance with the pound per hour emission limits of CO and NO_x and the grams of CO and NO_x per in Special Condition No. 1 then the three engines are in compliance.

If the sampling results do not demonstrate compliance with the pound per hour emission limits of CO and NO_x and the grams of CO and NO_x per bhp-hr from the three Compressor Engines identified as EPNs C-5, C-6, and C-7, then each engine is not in compliance; therefore, each of the three engines will be sampled to demonstrate compliance with the pound per hour emission limits of CO and NO_x and the grams of CO and NO_x per bhp-hr in Special Condition No. 1.

C. Air contaminants emitted from the engines to be tested for include (but are not limited to) NO_x, NO, CO, and O_2. Sampling shall occur within 180 days after installation of the sampling ports and platforms is complete. Sampling shall occur from one of the

three Compressor Engines identified as EPNs C-9, C-10, and C-11 and the engine to be sampled shall be determined at the pretest meeting. If the sampling results demonstrate compliance with the pound per hour emission limits of CO and NO_x and the grams of CO and NO_x per brake horsepower in Special Condition No. 1, then all three engines are in compliance.

If the sampling results do not demonstrate compliance with the pound per hour emission limits of CO and NO_x and the grams of CO and NO_x per bhp-hr from the three compressor engines then each engine is not in compliance; therefore, each of the three engines will be sampled to demonstrate compliance with the pound per hour emission limits of CO and NO_x and the grams of CO and NO_x per bhp-hr in Special Condition No. 1.

D. Engine emissions shall be determined by appropriate the EPA methods or other methods approved by the TCEQ Regional Director or the Manager of the TCEQ Austin Enforcement Division, Engineering Services Team prior to sampling. Methods described in Permit by Rule 106.512 (2)(C)(iii) are considered to be approved methods.

Emissions shall be sampled at minimum, average, and maximum engine RPMs. Sampling at different RPMs is not required if the operating minimum, average, and maximum RPMs are within 10 percent of the maximum RPM. Every effort should be made to conduct initial compliance testing during conditions which demand the maximum horsepower expected for the engine.

E. Sampling shall be performed at other such times as required by the TCEQ Regional Director or the TCEQ Executive Director. Requests for additional time to perform sampling shall be submitted to the TCEQ Regional Office.

F. Copies of the final sampling report shall be forwarded to the TCEQ within 45 days after sampling is completed. Sampling reports shall comply with the attached provisions of Chapter 14 of the TCEQ Sampling Procedures Manual. These reports shall be distributed as follows:

One copy to the TCEQ Midland Regional Office.
One copy to the TCEQ Austin Enforcement Division, Engineering Services Team.

7. CONTINUOUS DETERMINATION OF COMPLIANCE

In order to demonstrate that emission limits specified in Special Condition No. 1 are continuously met, the holder of this permit shall perform the following for each Compressor Engine identified as EPNs C-5, C-6, C-7, C-8, C-9, C-10, and C-11:

A. Conduct evaluations of engine performance every three months (quarterly) at full engine load and speed by measuring the NO_x, CO, and O_2 content of the exhaust.

The use of portable analyzers specifically designed for measuring the concentration of each contaminant in ppmv is acceptable for these evaluations. A hot air probe or equivalent shall be used with portable analyzers to prevent error in results due to high exhaust gas temperatures. Three sets of measurements shall be averaged to determine the concentrations. Prior to and following the measurements, the portable analyzer shall be checked for accuracy using an audit gas that conforms to the specifications in Title 40 Code of Federal Regulations Part 60, Appendix F, 5.1.2(3). Any other method approved by the TCEQ Regional Director or the TCEQ Manager of the Engineering Services Team is also acceptable.

B. If the portable analyzer is capable of measuring NO and nitrogen dioxide, then these measurements shall be summed to determine the NO_x emission rate.

Emissions shall be measured and recorded in the as-found operating condition, except no compliance determination shall be established during start-up, shutdown, or under breakdown conditions.

RECORDKEEPING

8. The following written records demonstrating compliance shall be made and maintained by the holder of this permit on a two-year rolling retention basis and shall be made immediately available upon request to designated representatives of the TCEQ or EPA.

A. The results of all stack tests required in Special Condition Nos. 6 and 7. A copy of all reports required by Special Condition No. 7 shall be permanently kept on file.

B. Date and description of any engine maintenance.

REPORTING

9. The holder of this permit shall submit to the TCEQ Regional Office, annual reports containing the following:

A. Results of quarterly tests required in Special Condition No. 7.
B. A summary of the periods of emissions limit exceedance and engine downtime by cause.

C. When no excess emissions or air pollution control equipment failures or adjustments have occurred, such information shall be stated in the report.

10. The results of quarterly tests shall be submitted to the TCEQ Regional Office no later than 45 days after each test date.

Dated January 31, 2006

EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

Permit Number 49137

This table lists the maximum allowable emission rates and all sources of air contaminants on the applicant's property covered by this permit. The emission rates shown are those derived from information submitted as part of the application for permit and are the maximum rates allowed for these facilities. Any proposed increase in emission rates may require an application for a modification of the facilities covered by this permit.

AIR CONTAMINANTS DATA

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates * lb/hr	TPY**
C-5	Clark Compressor BA6 (1,200-horsepower)	CO	11.23	49.20
		NO_x	59.02	258.52
		VOC	1.14	4.98
C-6	Clark Compressor BA6 (1,200-horsepower)	CO	11.23	49.20
		NO_x	59.02	258.52
		VOC	1.14	4.98
C-7	Clark Compressor BA6 (1,200-horsepower)	CO	11.23	49.20
		NO_x	59.02	258.52
		VOC	1.14	4.98
C-8	Clark Compressor BA6 (1,200-horsepower)	CO	11.23	49.20
		NO_x	59.02	258.52
		VOC	1.14	4.98
C-9	Clark Compressor HBA6 (1,320-horsepower)	CO	17.88	78.32
		NO_x	54.17	237.25
		VOC	1.25	5.48
C-10	Clark Compressor HBA6 (1,320-horsepower)	CO	17.88	78.32
		NO_x	54.17	237.25
		VOC	1.25	5.48
C-11	Clark Compressor HBA6 (1,320-horsepower)	CO	17.88	78.32
		NO_x	54.17	237.25
		VOC	1.25	5.48

EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

AIR CONTAMINANTS DATA

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates * lb/hr	TPY**
C-20	Clark Compressor HRAT6 (1,100-horsepower) (5)	CO	10.59	46.38
		NO_x	35.01	153.35
		VOC	1.04	4.57
C-21	Clark Compressor HRAT6 (1,100-horsepower) (5)	CO	10.59	46.38
		NO_x	35.01	153.35
		VOC	1.04	4.57
C-22	Clark Compressor HRAT6 (1,100-horsepower) (5)	CO	10.59	46.38
		NO_x	35.01	153.35
		VOC	1.04	4.57
C-23	Clark Compressor HRAT6 (1,100-horsepower) (5)	CO	10.59	46.38
		NO_x	35.01	153.35
		VOC	1.04	4.57
F-2	Flare	CO	0.19	0.83
		NO_x	0.03	0.15
		SO_2	0.01	0.01
		VOC	0.16	0.04
F-4	Flare	CO	0.19	0.83
		NO_x	0.03	0.15
		SO_2	0.01	0.01
		VOC	0.16	0.04
FWP-1	Fire Water Pump (876 hours per calendar year)	CO	0.19	0.84
		NO_x	0.89	3.91
		PM_{10}	0.06	0.28
		SO_2	0.06	0.26
		VOC	0.07	0.31
FUG-3	Process Fugitives (4)	H_2S	0.16	0.71
		VOC	1.30	5.85

EMISSION SOURCES - MAXIMUM ALLOWABLE EMISSION RATES

AIR CONTAMINANTS DATA

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates * lb/hr	TPY**
PITFUG-1	Wastewater Pond Fugitives	H_2S	0.08	0.36
		VOC	0.10	0.44
PITFUG-2	Wastewater Pond Fugitives	H_2S	0.20	0.89
		VOC	0.25	1.10
PITFUG-3	Wastewater Pond Fugitives	H_2S	0.62	3.32
		VOC	0.76	2.70

(1) Emission point identification - either specific equipment designation or emission point number from a plot plan.
(2) Specific point source names. For fugitive sources, use an area name or fugitive source name.
(3) CO - carbon monoxide
H_2S - hydrogen sulfide
NO_x - total oxides of nitrogen
PM_{10} - particulate matter (PM) equal to or less than 10 microns in diameter. Where PM is not listed, it shall be assumed that no PM greater than 10 microns is emitted.
SO_2 - sulfur dioxide
VOC - volatile organic compounds as defined in the Title 30 Texas Administrative Code § 101.1
(4) Fugitive emissions are an estimate only and should not be considered as a maximum allowable emission rate.
(5) Engines to be shut down no later than July 1, 2006

* Emission rates are based on and the facilities are limited by the following maximum operating schedule:

24 Hrs/day 7 Days/week 52 Weeks/year

** Compliance with annual emission limits is based on a rolling 12-month period.

Dated January 31, 2006

Valence Midstream Limited

HR0018T

Grandfather Shutdown Technical Review

Permit No: **Shutdown**
Project Type: **GNPR**
Record No: **100444**
Account ID No: **HR-0018-T**
Permit Reviewer: **Mr. Stephen E. Anderson**

Company: **Valence Midstream Limited**
Facility Name: **Como Gas Plant**
City: **Como**
County: **Hopkins**

Project Overview

Valence Midstream filed a PI-1GSD for the permanent shutdown of one amine still vent, one amine flash tank vent, one glycol regenerator vent and tail gas incinerator fuel gas combustion emissions at the Como Gas Plant. These grandfathered facilities vent through the tail gas incinerator, EPN H-8. The anticipated permanent shutdown date is March 1, 2007 for these facilities. A confirmation letter confirming the shutdown is recommended for approval.

Permit Engineer Date Team Leader Date
Stephen E. Anderson, P.E. John Barrientez, P.E.

Mr. Jon R. Averhoff
President
Valence Midstream LTD
600 Rockmead Drive, Suite 200
Kingwood, Texas 77339

Re: Notice of Shutdown
Facilities at the Como Gas Plant
Como, Hopkins County
Regulated Entity Number: RN100213685
Customer Reference Number: CN601535800

Dear Mr. Averhoff:

This is in response to your letter received August 28, 2003 concerning notice of shutdown of grandfathered facilities at your site. We understand that you will shutdown the following grandfathered facilities in accordance with Title 30 Texas Administrative Code § 116.772(a) (30 TAC § 116.772[a]) and will cease emitting air contaminants by the date specified below.

Facility Identification Number	Emission Point Number	Facility Name	Estimated Shutdown Date
AU-1	H-8	Amine Unit Flash Tank Vent	March 1, 2007
GR-1	H-8	Glycol Regenerator Vent	March 1, 2007
H-8	H-8	Sulfur Recovery Incinerator Fuel Gas Combustion	March 1, 2007
SRU-1	H-8	Amine Unit Still Column Vent	March 1, 2007

If you decide not to shutdown any of the above facilities, you must obtain the proper authorization under 30 TAC Chapter 116 or 106 prior to recommencing operation.

Mr. Jon R. Averhoff
Page 2

Re: Notice of Shutdown

Please reference the regulated entity number (RN), and customer reference number (CN) noted in this document in all your future correspondence for the referenced facility or site. The RN replaces the former Texas Commission on Environmental Quality account number for the facility (if portable) or site (if permanent). The CN is a unique number assigned to the company or corporation and applies to all facilities and sites owned or operated by this company or corporation.

Please maintain a copy of this letter and a copy of Form PI-GSD on-site. Your cooperation in this matter is appreciated. If you need further information or have any questions, please contact Mr. Stephen E. Anderson, P.E., at (512) 239-1287 or write to the Texas Commission on Environmental Quality, Office of Permitting, Remediation, and Registration, Air Permits Division (MC-163), P.O. Box 13087, Austin, Texas 78711-3087.

Sincerely,

Dale L. Beebe Farrow, P.E., Director
Air Permits Division
Office of Permitting, Remediation & Registration
Texas Commission on Environmental Quality

DBF/SEA/jls

cc: Mr. Charles Murray, Air Section Manager, Region 5 - Tyler

Project Number: 100444

Air Permits Division (MC-163)

MR JON A AVERHOFF
PRESIDENT
VALENCE MIDSTREAM LTD
600 ROCKMEAD DR STE 200
KINGWOOD TX 77339