BART EXEMPTION MODELING PROTOCOL

PCS NITROGEN FERTILIZER

AUGUSTA, GEORGIA

Submitted to:

GEORGIA ENVIRONMENTAL PROTECTION DIVISION

Prepared for:

PotashCorp

Prepared by:

MACTEC Engineering and Consulting, Inc.
Kennesaw, Georgia

Project No. 6306-06-0034

May 2006

LIST OF APPENDICES

1. INTRODUCTION

MACTEC Engineering and Consulting, Inc. (MACTEC) is submitting the following Best Available Retrofit Technology (BART) Exemption Modeling protocol on behalf of the PCS Nitrogen Fertilizer (PCS) plant located in Augusta, Georgia. This modeling will follow the procedures outlined in the "Protocol for the Application of the CALPUFF Model for Analyses of Best Available Retrofit Technology (BART)" December 22, 2005 revised March 9th, 2006 as posted on the VISTAS website.

1.1 OBJECTIVES

The objective of this modeling protocol is to outline the procedures that will be utilized for conducting the BART exemption modeling for the PCS site located in Augusta, Georgia.

1.2 LOCATION OF SOURCE VS. RELEVANT CLASS I AREAS

Table 1 below provides the location of the PCS Nitrogen site and the Class I areas near the site. The distance from PCS to the nearby class I areas was determined by calculating the distance from the site to each of the receptor locations, which represent the Class I area boundary. These boundary receptors (taken from the National Park Service website) were used to determine the shortest distance between the PCS site to the nearby Class I areas. As shown in Table 1 the PCS site is within 300 km of eight class I areas. All eight Class I areas will therefore be evaluated as part of the exemption modeling.

Table 1: PCS Nitrogen Location and Distance to Class I Areas

Site/ Class I Area	LCC (Easting) - km	LCC (Northing) - km	Shortest Distance to PCS (km)
PCS	1390.6	-610.4	--
Cape Romain	1610.2	-627.0	220
Cohutta	1131.5	-484.1	288
Wolf Island	1485.8	-828.1	238
Great Smokey Mountains	1241.2	-400.0	258
Joyce Kilmer	1177.1	-429.2	280
Shining Rock Wilderness	1276.4	-416.0	225
Okefenokee	1401.4	-877.3	267
Linville Gorge	1349.5	-350.9	263

1.3 SOURCE IMPACT EVALUATION CRITERIA

The maximum 24 hour results from the CALPOST model for each modeled year will be compared to the 0.5 deciview significant impact level. If the results of this CALPOST analysis show that the site is below this level, then the site qualifies as an exemption source and no additional evaluation will be completed. If the site doesn't meet this criteria, a 98th percentile result for each year will be compared to the 0.5 dv value. For this assessment, the 98th percentile level (8th highest deciview value) for each modeled year will be compared to the 0.5 dv to determine exemption eligibility. The 4-km spacing meteorology will be used for the fine grid scale modeling.

2. SOURCE DESCRIPTION

PCS Nitrogen Fertilizer, L.P. (PCS) owns and operates a nitrogenous fertilizer manufacturing facility in Augusta, Georgia. The plant produces ammonia, nitric acid, urea, carbon dioxide, ammonium nitrate, and urea-ammonium nitrate solutions. In the ammonia plant, natural gas is reformed and mixed with atmospheric air to form ammonia in a series of reaction steps. The plant operates two nitric acid plants, which combust the ammonia in the presence of air to form NOx, which is routed through absorption columns to form nitric acid. Ammonium nitrate is formed at the plant by mixing gaseous ammonia with nitric acid. The neutralized solution is then concentrated in prilling towers to form a solid. The plant also operates a Urea production facility which combines carbon dioxide (produced from the ammonia plant) with ammonia to form urea. The urea is then concentrated in a prill tower. The ammonia plant, nitric acid plants, ammonium nitrate operations, and urea plant were built between the eligibility dates of August 1962 to August 1977, the processes are on the list of 26 listed processes (chemical plants), and the units have the potential NOx emissions greater than 250 tpy. All these units are therefore BART eligible. The boilers on site were not built during the BART eligibility dates, however, they are in place to support the chemical plant operations, therefore, they are noted as BART eligible sources and will be included in the modeling evaluation.

2.1 UNIT SPECIFIC SOURCE DATA

The exemption modeling will be based on the stack parameters for the regulated units as summarized in Table 2. The emission rates for the operations are based on results from continuous emission monitors (CEMs), stack tests, vendor estimates, and permit allowable emission rates. Exhaust flow rates and temperatures are based on stack tests where available and engineering design where testing data is not available. As per the common VISTAS modeling protocol (page 42), the modeling evaluation will not included building downwash, because all Class I areas being evaluated are greater than 50 km away from the site.

2.2 BOUNDARY CONDITIONS

Model options and switches will be used as set in the example models as provided on the Earth Tech website.

Table 2: BART Modeling Data
PCS Nitrogen - Augusta, Georgia

STATIONARY SOURCE NAME/LOCATION	COUNTY NAME OR FIPS COUNTY CODE	STATIONARY SOURCE ID (1)	2-DIGIT SIC	STACK ID	STACK HEIGHT FT	UTM COORDINATES EASTING	UTM COORDINATES NORTHING	ELEVATION FT ABOVE MSL	STACK DIAMETER FT	EXIT VELOCITY FT/SEC	EXIT TEMP DEGREES F
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28	ST03	102	586465.3294	3779240.826		3.2	53	85
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28	ST04	97	586465.3294	3779240.826		2.5	59	85
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28	ST05	119	586465.3294	3779240.826		6.24	80	120
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28	ST01	117	586465.3294	3779240.826		2	64.2	210
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28	ST09	200	586465.3294	3779240.826		8.66	83.85	70-100
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28	ST06	216	586465.3294	3779240.826		4	81	70-100
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28	ST07	95	586465.3294	3779240.826		6	50	60-120
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28	ST10	95	586465.3294	3779240.826		6	40.4	65-105
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28	ST02	95	586465.3294	3779240.826		2.6	64.15	209
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28	ST11	272	586465.3294	3779240.826		4.62	49.4	120-140
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28	ST33	272	586465.3294	3779240.826		8.66	82	100-120
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28	ST18	137.5	586465.3294	3779240.826		3.17	104	97
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28	ST19	69	586465.3294	3779240.826		5	104	344
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28			586465.3294	3779240.826				
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28			586465.3294	3779240.826				
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28			586465.3294	3779240.826				
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28			586465.3294	3779240.826				
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28			586465.3294	3779240.826				
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28			586465.3294	3779240.826				
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28			586465.3294	3779240.826				
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28			586465.3294	3779240.826				
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28	ST21	125	586465.3294	3779240.826		5	12.4	300
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28	ST21	125	586465.3294	3779240.826		5	12.4	300
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28			586465.3294	3779240.826				
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28	ST24	104	586465.3294	3779240.826		5	4.2	330
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28	ST24	104	586465.3294	3779240.826		5	4.2	330
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28	ST12	108	586465.3294	3779240.826		13.9	42	360
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28	ST12	108	586465.3294	3779240.826		13.9	42	360
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28								
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28	ST36	100	586465.3294	3779240.826		0.25	17.6	300
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28	ST15	285	586465.3294	3779240.826		1.5	436.9	225
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28	ST27	285	586465.3294	3779240.826		1.7	2	105
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28	ST28	285	586465.3294	3779240.826		0.5	44.2	137
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28	ST29	272	586465.3294	3779240.826		11.5	4.7	226
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28	ST30	285	586465.3294	3779240.826		1.67	2	105
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28	ST35	95	586465.3294	3779240.826		4	16	80
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28								
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28	ST13	285	586465.3294	3779240.826		3.5	201	150
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28								
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28	ST31	90	586465.3294	3779240.826		1	181.4	106
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28	ST17	45	586465.3294	3779240.826		1.3	263.4	80
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28	ST32	18	586465.3294	3779240.826		0.3	5.7	82
PCS Nitrogen Fertilizer, LP - Augusta	245	0002	28	ST08	95	586465.3294	3779240.826		4	53.5	100

Table 2: BART Modeling Data
PCS Nitrogen - Augusta, Georgia

							NOX (TPY)			PM10 (TPY)*		
EMISSION UNIT ID (2)	EMISSION UNIT DESCRIPTION	PROCESS CODE (3)	SCC CODE	EMISSION PROCESS DESCRIPTION	MAX. HEAT INPUT RATE, FUEL-FIRED BOILERS (MMBtu/HR)	CATEGORY CODE (4)	POTENTIAL	ACTUAL	MAX 24-HR EMMISION RATE FOR 2002-2004	POTENTIAL	ACTUAL	MAX 24-HR EMMISION RATE FOR 2002-2004
A103	C001 AN Plant Prill Drying System	1	30102706			10	0.00	0.00	0.00	31.60	20.70	30.10
A104	C001 AN Plant Prill Cooling System	1	30102706			10	0.00	0.00	0.00	78.50	52.20	75.70
A105	C001 AN Plant Prill Tower	1	30102701			10	0.00	0.00	0.00	21.40	14.10	20.70
AN01	C001 AN Neutralizer	1	30102704			10	0.00	0.00	0.00	36.60	29.30	35.80
A201	C002 AN Plant Prill Tower-Outside	1	30102701			10	0.00	0.00	0.00	12.70	8.40	12.70
A201	C002 AN Plant Prill Tower-Brinks	1	30102701			10	0.00	0.00	0.00	3.60	2.40	3.60
A202	C002 AN Plant Prill Cooler	1	30102706			10	0.00	0.00	0.00	17.00	11.20	17.00
A204	C002 AN Plant Prill Dryer	1	30102706			10	0.00	0.00	0.00	6.80	4.00	5.60
AN02	C002 AN Neutralizer	1	30102704			10	0.00	0.00	0.00	31.40	20.70	31.40
U201	C002 Urea Plant Prill Tower-Inner	1	30104003			10	0.00	0.00	0.00	7.70	5.60	7.00
U201	C002 Urea Plant Prill Tower-Outer	1	30104003			10	0.00	0.00	0.00	35.70	26.10	32.70
N101	C001 Nitric Acid Plant	1	30101301			10	2242.00	1876.80	1976.50	0.00	0.00	0.00
N201	C002 Nitric Acid Plant	1	30101302			10	602.30	274.00	440.70	0.00	0.00	0.00
NST1	Nitric Acid Tank TK628B	1	30101399			10	0.70	0.70	0.70	0.00	0.00	0.00
NST2	Nitric Acid Tank TK628A	1	30101399			10						
NST3	Nitric Acid Tank TK627B	1	30101399			10						
NST4	Nitric Acid Tank TK627A	1	30101399			10						
NST5	Nitric Acid Tank TK6231	1	30101399			10						
NST6	Nitric Acid Tank TK627C	1	30101399			10						
NST7	Nitric Acid Tank TK601	1	30101399			10						
NST8	Nitric Acid Tank TK620	1	30101399			10						
AB01	Boiler H 6531**	1	10200601	Natural Gas	191.00	10	124.30	52.2	124.30	6.40	2.70	6.40
AB01	Boiler H 6531**	2	10200501	Oil	191.00	10	126.80	0.50	63.20	12.30	0.00	6.10
AB02	Rental Boiler**	1	10200601	Natural Gas	191.00	10						
AB03	ABB/CE Boiler H 6532**	1	10200601	Natural Gas	191.00	10	34.90	2.60	34.90	6.40	0.50	6.40
AB03	ABB/CE Boiler H 6532**\	2	30515002	Oil	191.00	10	0.00	0.00	0.00	0.00	0.00	0.00
AM01	Primary Reformer	1	30100306	Natural Gas	397.00		39.70	37.20	39.70	10.20	9.50	10.20
AM01	Primary Reformer	2	30100306	waste gas	397.00		52.40	49.10	52.40	9.50	8.90	9.50
GT01	Combustion Turbine	1	20200201	Natural Gas	297.00		352.80	330.40	352.80	8.60	8.00	8.60
FL01	NH3 Storage Flare	1	2102006001	Natural Gas	10.00		0.10	0.10	0.10	0.00	0.00	0.00
AM04	Solution Regenerator	1	30100308				0.00	0.00	0.00	0.00	0.00	0.00
U202	Urea Plant Low P Vent	1	30104020				0.00	0.00	0.00	0.00	0.00	0.00
U203	Ure Plant High P Vent	1	30104020				0.00	0.00	0.00	0.00	0.00	0.00
U204	Dust Washer	1	30104003				0.00	0.00	0.00	5.40	3.90	4.80
U205	Urea Process Tanks	1	30104020				0.00	0.00	0.00	0.00	0.00	0.00
A205	Pond Evaporator	1	30199998				0.00	0.00	0.00	0.00	0.00	0.00
U206	Urea Warehouse	1	30104001				0.00	0.00	0.00	0.00	0.00	0.00
AM02	Startup Vent for Ammonia Plant	1	30100399				0.00	0.00	0.00	0.00	0.00	0.00
ACI1	ACI Plant	1	30199998				0.00	0.00	0.00	0.00	0.00	0.00
U207	Urea Compressor	1	30104001				0.00	0.00	0.00	0.00	0.00	0.00
ACI2	ACI Skids	1	30199998				0.00	0.00	0.00	0.00	0.00	0.00
U108	Formaldehyde Tank	1	30104001				0.00	0.00	0.00	0.00	0.00	0.00
A203	C2 AN HD Cooler	1	30102706				0.00	0.00	0.00	40.70	2.80	30.20

* As a worst case assumption all PM emissions will be modeled as PM fine

** The installation dates for the boilers do not fall within the BART eligibility window, however, they are included in the modeling because they support the operations of other modeled sources.

Table 2: BART Modeling Data
PCS Nitrogen - Augusta, Georgia

		SO2 (TPY)			VOCs (TPY)			NH3 (TPY)			PM2.5 (TPY)*		
EMISSION UNIT ID (2)	EMISSION UNIT DESCRIPTION	POTENTIAL	ACTUAL	MAX 24-HR EMMISION RATE FOR 2002-2004	POTENTIAL	ACTUAL	MAX 24-HR EMMISION RATE FOR 2002-2004	POTENTIAL	ACTUAL	MAX 24-HR EMMISION RATE FOR 2002-2004	POTENTIAL	ACTUAL	MAX 24-HR EMMISION RATE FOR 2002-2004
A103	C001 AN Plant Prill Drying System	0.00	0.00	0.00	0.00	0.00	0.00	27.70	18.20	26.40			
A104	C001 AN Plant Prill Cooling System	0.00	0.00	0.00	0.00	0.00	0.00	36.40	25.20	36.50			
A105	C001 AN Plant Prill Tower	0.00	0.00	0.00	0.00	0.00	0.00	23.40	15.40	22.30			
AN01	C001 AN Neutralizer	0.00	0.00	0.00	0.00	0.00	0.00	242.20	193.80	237.00			
A201	C002 AN Plant Prill Tower-Outside	0.00	0.0000	0.00	0.00	0.00	0.00	15.00	9.80	15.00			
A201	C002 AN Plant Prill Tower-Brinks	0.00	0.0000	0.00	0.00	0.00	0.00	54.40	35.70	54.40			
A202	C002 AN Plant Prill Cooler	0.00	0.0000	0.00	0.00	0.00	0.00	109.60	72.00	109.60			
A204	C002 AN Plant Prill Dryer	0.00	0.00	0.00	0.00	0.00	0.00	70.70	41.70	58.70			
AN02	C002 AN Neutralizer	0.00	0.00	0.00	0.00	0.00	0.00	519.00	343.00	519.00			
U201	C002 Urea Plant Prill Tower-Inner	0.00	0.00	0.00	0.00	0.00	0.00	106.50	77.70	97.30			
U201	C002 Urea Plant Prill Tower-Outer	0.00	0.00	0.00	0.00	0.00	0.00	108.70	79.30	99.40			
N101	C001 Nitric Acid Plant	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
N201	C002 Nitric Acid Plant	0.00	0.00	0.00	0.00	0.00	0.00	513.00	490.20	522.40			
NST1	Nitric Acid Tank TK628B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
NST2	Nitric Acid Tank TK628A												
NST3	Nitric Acid Tank TK627B												
NST4	Nitric Acid Tank TK627A												
NST5	Nitric Acid Tank TK6231												
NST6	Nitric Acid Tank TK627C												
NST7	Nitric Acid Tank TK601												
NST8	Nitric Acid Tank TK620												
AB01	Boiler H 6531	0.10	0.10	0.10	4.60	1.90	4.60	0.00	0.00	0.00			
AB01	Boiler H 6531	48.40	0.20	24.10	2.10	0.00	1.00	0.00	0.00	0.00			
AB02	Rental Boiler												
AB03	ABB/CE Boiler H 6532	0.10	0.00	0.10	4.60	0.30	4.60	0.00	0.00	0.00			
AB03	ABB/CE Boiler H 6532	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
AM01	Primary Reformer	0.00	0.00	0.00	7.40	6.90	7.40						
AM01	Primary Reformer	0.00	0.00	0.00	6.80	6.40	6.80						
GT01	Combustion Turbine	0.00	0.00	0.00	2.70	2.50	2.70						
FL01	NH3 Storage Flare	0.00	0.00	0.00	0.00	0.00	0.00						
AM04	Solution Regenerator	0.00	0.00	0.00	11.40	10.70	11.40	13.30	12.40	13.30			
U202	Urea Plant Low P Vent	0.00	0.00	0.00	0.00	0.00	0.00	0.90	0.70	0.90			
U203	Ure Plant High P Vent	0.00	0.00	0.00	0.00	0.00	0.00	232.70	183.50	226.10			
U204	Dust Washer	0.00	0.00	0.00	0.00	0.00	0.00	22.30	16.30	20.40			
U205	Urea Process Tanks	0.00	0.00	0.00	0.00	0.00	0.00	2.60	2.20	2.70			
A205	Pond Evaporator	0.00	0.00	0.00	0.00	0.00	0.00	23.10	23.10	23.10			
U206	Urea Warehouse	0.00	0.00	0.00	0.00	0.00	0.00	8.30	6.00	7.60			
AM02	Startup Vent for Ammonia Plant	0.00	0.00	0.00	0.00	0.00	0.00	25.30	24.40	26.10			
ACI1	ACI Plant	0.00	0.00	0.00	10.00	9.40	10.00	0.00	0.00	0.00			
U207	Urea Compressor	0.00	0.00	0.00	24.90	19.70	24.20	1.10	0.90	1.00			
ACI2	ACI Skids	0.00	0.00	0.00	10.00	9.40	10.00	21.20	19.60	21.20			
U108	Formaldehyde Tank	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
A203	C2 AN HD Cooler	0.00	0.00	0.00	0.00	0.00	0.00	3.10	0.20	2.30			

Table 2: BART Modeling Data
PCS Nitrogen - Augusta, Georgia

		NOx			PM10*			SO2			VOC		
EMISSION UNIT ID (2)	EMISSION UNIT DESCRIPTION	NEI PRIMARY CONTROL DEVICE CODE	CONTROL SYSTEM DESCRIPTION	TOTAL CAPTURE & CONTROL EFFICIENCY (%)	NEI PRIMARY CONTROL DEVICE CODE	CONTROL SYSTEM DESCRIPTION	TOTAL CAPTURE & CONTROL EFFICIENCY (%)	NEI PRIMARY CONTROL DEVICE CODE	CONTROL SYSTEM DESCRIPTION	TOTAL CAPTURE & CONTROL EFFICIENCY (%)	NEI PRIMARY CONTROL DEVICE CODE	CONTROL SYSTEM DESCRIPTION	TOTAL CAPTURE & CONTROL EFFICIENCY (%)
A103	C001 AN Plant Prill Drying System				85	Wet Cyclone	86						
A104	C001 AN Plant Prill Cooling System				85	Wet Cyclone	86						
A105	C001 AN Plant Prill Tower												
AN01	C001 AN Neutralizer				53	Venturi Scrubber	95						
A201	C002 AN Plant Prill Tower-Outside												
A201	C002 AN Plant Prill Tower-Brinks				1	Scrubber	93						
A202	C002 AN Plant Prill Cooler				1	Scrubber	99						
A204	C002 AN Plant Prill Dryer				1	Scrubber	99						
AN02	C002 AN Neutralizer				1	Scrubber	98						
U201	C002 Urea Plant Prill Tower-Inner												
U201	C002 Urea Plant Prill Tower-Outer												
N101	C001 Nitric Acid Plant	13	Mazar System	40									
N201	C002 Nitric Acid Plant	140	NSCR	90									
NST1	Nitric Acid Tank TK628B												
NST2	Nitric Acid Tank TK628A												
NST3	Nitric Acid Tank TK627B												
NST4	Nitric Acid Tank TK627A												
NST5	Nitric Acid Tank TK6231												
NST6	Nitric Acid Tank TK627C												
NST7	Nitric Acid Tank TK601												
NST8	Nitric Acid Tank TK620												
AB01	Boiler H 6531												
AB01	Boiler H 6531												
AB02	Rental Boiler												
AB03	ABB/CE Boiler H 6532												
AB03	ABB/CE Boiler H 6532												
AM01	Primary Reformer												
AM01	Primary Reformer												
GTO1	Combustion Turbine	28	Steam Injection	50									
FL01	NH3 Storage Flare												
AM04	Solution Regenerator												
U202	Urea Plant Low P Vent												
U203	Ure Plant High P Vent												
U204	Dust Washer				1	Scrubber	86						
U205	Urea Process Tanks												
A205	Pond Evaporator												
U206	Urea Warehouse												
AM02	Startup Vent for Ammonia Plant												
ACI1	ACI Plant												
U207	Urea Compressor												
ACI2	ACI Skids												
U108	Formaldehyde Tank												
A203	C2 AN HD Cooler												

Table 2: BART Modeling Data
PCS Nitrogen - Augusta, Georgia

		NH3			PM2.5*			DATES			LOCATION				
EMISSION UNIT ID (2)	EMISSION UNIT DESCRIPTION	NEI PRIMARY CONTROL DEVICE CODE	CONTROL SYSTEM DESCRIPTION	TOTAL CAPTURE & CONTROL EFFICIENCY (%)	NEI PRIMARY CONTROL DEVICE CODE	CONTROL SYSTEM DESCRIPTION	TOTAL CAPTURE & CONTROL EFFICIENCY (%)	IN EXISTENCE ≤8/7/77?	BEGAN OPERATION >8/7/62?(5)	EXPECTED BART CLASSIFICATION (6)	LATITUDE (Decimal Degrees)	LONGITUDE (Decimal Degrees)	UTMX	UTMY	UTM Zone
A103	C001 AN Plant Prill Drying System							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
A104	C001 AN Plant Prill Cooling System							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
A105	C001 AN Plant Prill Tower							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
AN01	C001 AN Neutralizer							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
A201	C002 AN Plant Prill Tower-Outside							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
A201	C002 AN Plant Prill Tower-Brinks							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
A202	C002 AN Plant Prill Cooler							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
A204	C002 AN Plant Prill Dryer							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
AN02	C002 AN Neutralizer							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
U201	C002 Urea Plant Prill Tower-Inner							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
U201	C002 Urea Plant Prill Tower-Outer							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
N101	C001 Nitric Acid Plant							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
N201	C002 Nitric Acid Plant							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
NST1	Nitric Acid Tank TK628B							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
NST2	Nitric Acid Tank TK628A							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
NST3	Nitric Acid Tank TK627B							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
NST4	Nitric Acid Tank TK627A							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
NST5	Nitric Acid Tank TK6231							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
NST6	Nitric Acid Tank TK627C							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
NST7	Nitric Acid Tank TK601							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
NST8	Nitric Acid Tank TK620							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
AB01	Boiler H 6531							No	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
AB01	Boiler H 6531							No	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
AB02	Rental Boiler							NA	NA	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
AB03	ABB/CE Boiler H 6532							No	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
AB03	ABB/CE Boiler H 6532							No	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
AM01	Primary Reformer							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
AM01	Primary Reformer							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
GTO1	Combustion Turbine							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
FL01	NH3 Storage Flare							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
AM04	Solution Regenerator							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
U202	Urea Plant Low P Vent							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
U203	Ure Plant High P Vent							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
U204	Dust Washer							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
U205	Urea Process Tanks							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
A205	Pond Evaporator							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
U206	Urea Warehouse							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
AM02	Startup Vent for Ammonia Plant							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
ACI1	ACI Plant							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
U207	Urea Compressor							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
ACI2	ACI Skids							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
U108	Formaldehyde Tank							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17
A203	C2 AN HD Cooler							Yes	Yes	Bart eligible	33.445	81.930278	586465.3294	3779240.826	17

3. GEOGRAPHICAL AND METEOROLOGICAL DATA

3.1 MODELING DOMAIN AND TERRAIN

The modeling data to be utilized for the modeling evaluation is the CALMET data provided by VISTAS via Georgia EPD. The modeling domain consists of the area which includes the site, all eight class I areas being evaluated, with an additional 50 km buffer around this area. The area around the site is primarily flat terrain.

3.2 LAND USE

The area immediately around the site is industrial, but is primarily rural outside a few kilometers from the site.

3.3 METEOROLOGICAL DATA BASE

All met data will be run as provided by VISTAS.

3.3.1 MM5 Simulations

As provided by VISTAS.

3.3.2 Measurements and Observations

None.

3.4 AIR QUALITY DATA BASE

3.4.1 Ozone Concentrations – Measured or Modeled

The ozone concentrations will be modeled using the three years of ozone data as provided by Earth Tech on their website. The OZONE.DAT file to be used in each year of the model runs will be extracted from the corresponding year data taken from the Earth Tech website. The CALPRO GUI will be used to extract the data by providing the domain being used for the CALPUFF model.

3.4.2 Ammonia Concentrations – Measured or Modeled

Ammonia emissions will be modeled from the site.

3.4.3 Concentrations of Other Pollutants – Measured or Modeled

Per the "Federal Land Managers' Air Quality Related Values Workgroup (FLAG) Phase I report (December 2000)" the background SO_4 concentration (BKSO4) will be calculated based on the reported hygroscopic value for each of the Class I areas divided by 3. The hygroscopic value for all eight class I areas is 0.9, therefore a 0.3 value will be used for the BKSO4 variable for all months. The soil background (BKSOIL) concentration will be set to the non-hygroscopic value as per the FLAG document. This value is 8.5 for all eight of the Class I areas. Per the FLAG document all other background concentrations will be modeled at 0 except for ammonia as noted in 3.4.2.

3.5 NATURAL CONDITIONS AT CLASS I AREAS

The relative humidity to be used for each site is based on data taken from the FLAG document. Table 3 below provides the monthly relative humidity that will be used for each of the eight Class I areas.

Table 3: Relative Humidity Factor Data

Month	Cape Romain	Cohutta	Wolf Island	Great Smokey Mountains	Joyce Kilmer	Shining Rock Wilderness	Okefenokee	Linville Gorge
January	2.9	3	3.1	3	3	2.9	3.2	2.9
February	2.9	3	3.1	3	3	2.9	3.2	2.9
March	3.3	3.1	3.3	3.1	3.1	3.1	3.4	3.1
April	3.3	3.1	3.3	3.1	3.1	3.1	3.4	3.1
May	3.3	3.1	3.3	3.1	3.1	3.1	3.4	3.1
June	3.9	3.6	3.9	3.6	3.6	3.7	3.9	3.7
July	3.9	3.6	3.9	3.6	3.6	3.7	3.9	3.7
August	3.9	3.6	3.9	3.6	3.6	3.7	3.9	3.7
September	3.3	3.3	3.6	3.2	3.2	3.2	3.6	3.1
October	3.3	3.3	3.6	3.2	3.2	3.2	3.6	3.1
November	3.3	3.3	3.6	3.2	3.2	3.2	3.6	3.1
December	2.9	3	3.1	3	3	2.9	3.2	2.9

4. AIR QUALITY MODELING METHODOLOGY

4.1 PLUME MODEL SELECTION

The modeling will be completed using the VISTAS recommended CALPUFF version for BART modeling as posted on the Earth Tech website. The modeling will be completed using the 12-km meteorological data files provided by VISTAS (via Georgia EPD). The sample CALPUFF model and CALPOSTL input files posted on the Earth Tech website will be used for the modeling assessment.

4.1.1 Major Relevant Features of CALMET

The CALMET data as provided by VISTAS will be used in the analysis.

4.1.2 Major Relevant Features of CALPUFF

The modeling will utilize the MESOPUFF II module for chemical mechanism portion of the model. The integrated puff sampling methodology option will be chosen. For running the CALPOST processor, the visibility Method 6 option will be used using the monthly relative humidity values identified above. The species modeled in the visibility analysis will include SO2, NOx, NH3, and PM which will be modeled as fine particulate.

4.2 MODELING DOMAIN CONFIGURATION

The domain consists of the area which includes the site, all eight class I areas, with an additional 50 km buffer around this area. Table 4 provides the coordinates of the area bounded by the modeling domain.

Table 4: Modeling Domain Coordinates

Location	km	km
Southwest Corner	1037.973	-1001.974
Southeast Corner	1709.973	-1001.974
Northeast Corner	1709.973	-269.974
Northwest Corner	1037.973	-269.974

4.3 CLAMET METEOROLOGICAL MODELING

No CALMET modeling will be completed as VISTAS has provided the meteorological data to be used in the CALPUFF modeling. The CALMET modeling has already been completed by Earth Tech.

4.4 CALPUFF COMPUTATIONAL DOMAIN AND RECEPTORS

The computational domain is the same as the modeling domain as indicated above. The CALPUFF model will include the Class I receptors for each site as taken from the National Park Service Website. The website conversion program will be used to convert the receptor set into Lambert Conformal Coordinates (LCC) for use in the CALPUFF model.

4.5 CALPUFF MODELING OPTIONS SELECTIONS

All modeling option selections will be made as outlined in the Earth Tech provided sample CALPUFF modeling file as provided on the Earth Tech website which includes the VISTAS recommend version for BART modeling.

4.6 LIGHT EXTINCTION AND HAZE IMPACT CALCULATIONS

The light extinction and haze impact calculations will be completed by the CALPUFF model.

4.7 MODELING PRODUCTS

The output of the CALPOSTL modeling will be summarized in tables for presentation of the modeling results.

5. REVIEW PROCESS

5.1 CALMET FIELDS

As provided by VISTAS.

5.2 CALPUFF, CALPOST, AND POSTUTIL RESULTS

The initial run results will be based on the highest change in light extinction (deciviews) from natural conditions over the three-year period for each Class I area considered. Predicted concentrations exceeding the "contribution" threshold of 0.5 deciviews will trigger a finer grid CALPUFF modeling analysis. In the finer grid (4 km) modeling analysis the predicted visibility impairment that is compared to the threshold is based on the BART guidance of the 98th percentile change in deciviews value rather than the more conservative highest value used in the initial analysis.

6. REFERENCES

Protocol for the Application of the CALPUFF Model for Analyses of Best Available Retrofit Technology (BART)" December 22, 2005 revised March 9th, 2006.

Federal Land Managers' Air Quality Related Values Workgroup (FLAG) Phase I report (December 2000).

APPENDICES

A.1 VISTAS BART MODELING PROTOCOL