


# Environmental Impact Assessment for TASNEE Petrochemicals Ethylene and Polyethylene Projects

## ATTACHMENT 5: Air Quality Background Data and AERMOD input

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						Client 
<b>FLUOR</b> <sup>®</sup>						

## 1 STATISTICAL DATA FOR JUBAIL

Below figures show the statistical data (descriptive data) for the SO<sub>2</sub> and NO<sub>x</sub> emissions (in µg/m<sup>3</sup>) for sampling station 1.

1999	Average of Nox	Average of Sox
Mean	10.7357	1.8860
Standard Error	0.3259	0.1564
Median	9.6375	0.8792
Mode	0.0000	0.0000
Standard Deviation	6.2269	2.9871
Sample Variance	38.7739	8.9229
Kurtosis	6.8785	14.3236
Skewness	1.6222	3.3404
Range	54.7958	22.5708
Minimum	0.0000	0.0000
Maximum	54.7958	22.5708
Sum	3918.5417	688.4000
Count	365.0000	365.0000
Confidence Level(95.0%)	0.6409	0.3075

2000	Average of Nox	Average of Sox
Mean	12.7125	0.4420
Standard Error	0.3283	0.0698
Median	11.6167	0.0333
Mode	9.3167	0.0000
Standard Deviation	6.2631	1.3324
Sample Variance	39.2259	1.7752
Kurtosis	0.2235	74.1058
Skewness	0.7706	7.4063
Range	33.1583	16.9583
Minimum	1.2792	0.0000
Maximum	34.4375	16.9583
Sum	4627.3417	160.8833
Count	364.0000	364.0000
Confidence Level(95.0%)	0.6456	0.1373

2001	Average of Nox	Average of Sox
Mean	15.1564	2.0013
Standard Error	0.3907	0.1623
Median	13.4625	1.6625
Mode	#N/A	0.0000
Standard Deviation	7.4537	3.0963
Sample Variance	55.5584	9.5871
Kurtosis	3.4753	82.4783
Skewness	1.2664	8.4655
Range	53.3708	34.5833
Minimum	0.0000	0.0000
Maximum	53.3708	34.5833
Sum	5516.9208	728.4583
Count	364.0000	364.0000
Confidence Level(95.0%)	0.7683	0.3191

2002	Average of Nox	Average of Sox
Mean	17.0064	1.3540
Standard Error	0.3982	0.0950
Median	16.0104	0.5062
Mode	0.0000	0.0000
Standard Deviation	7.5979	1.8130
Sample Variance	57.7284	3.2869
Kurtosis	1.8086	8.5275
Skewness	0.9861	2.4574
Range	53.8708	12.9917
Minimum	0.0000	0.0000
Maximum	53.8708	12.9917
Sum	6190.3250	492.8708
Count	364.0000	364.0000
Confidence Level(95.0%)	0.7831	0.1869

The overall background concentration for sampling station 1 for SO<sub>2</sub> is estimated to be 1.4 µg/m<sup>3</sup> and for NO<sub>x</sub> 13.9 µg/m<sup>3</sup>.

Overall	Average of Nox	Average of Sox
Mean	13.9196	1.4215
Standard Error	0.1915	0.0654
Median	12.6938	0.6646
Mode	0.0000	0.0000
Standard Deviation	7.3186	2.5000
Sample Variance	53.5615	6.2500
Kurtosis	2.5848	62.0294
Skewness	1.1269	6.2713
Range	54.7958	34.5833
Minimum	0.0000	0.0000
Maximum	54.7958	34.5833
Sum	20322.5750	2075.3833
Count	1460.0000	1460.0000
Confidence Level(95.0%)	0.3757	0.1283

Below figures show the statistical data (descriptive data) for the SO<sub>2</sub> and NO<sub>x</sub> emissions (in µg/m<sup>3</sup>) for sampling station 9.

1999	Average of Nox	Average of Sox
Mean	28.3485	8.7234
Standard Error	0.7519	0.6099
Median	27.5167	5.0208
Mode	0.0000	0.0000
Standard Deviation	14.3656	11.6521
Sample Variance	206.3700	135.7722
Kurtosis	0.4790	9.9576
Skewness	0.4384	2.6861
Range	84.2125	76.3625
Minimum	0.0000	0.0000
Maximum	84.2125	76.3625
Sum	10347.2083	3184.0333
Count	365.0000	365.0000
Confidence Level(95.0%)	1.4787	1.1994

2000	Average of Nox	Average of Sox
Mean	33.0821	13.8948
Standard Error	1.1630	1.1953
Median	30.6771	4.6708
Mode	26.4833	0.0000
Standard Deviation	22.2501	22.8683
Sample Variance	495.0660	522.9612
Kurtosis	85.3226	7.8826
Skewness	7.0124	2.7224
Range	325.2583	138.6208
Minimum	1.2625	0.0000
Maximum	326.5208	138.6208
Sum	12108.0667	5085.4917
Count	366.0000	366.0000
Confidence Level(95.0%)	2.2871	2.3506

2001	Average of Nox	Average of Sox
Mean	25.8293	7.2434
Standard Error	0.5920	0.7837
Median	24.9292	2.3958
Mode	36.7375	0.0542
Standard Deviation	11.3099	14.9716
Sample Variance	127.9143	224.1495
Kurtosis	0.0908	14.5817
Skewness	0.4742	3.4378
Range	60.2792	120.0583
Minimum	0.5333	-19.1667
Maximum	60.8125	100.8917
Sum	9427.6958	2643.8458
Count	365.0000	365.0000
Confidence Level(95.0%)	1.1641	1.5410

2002	Average of Nox	Average of Sox
Mean	29.6213	5.7072
Standard Error	0.5697	0.5130
Median	30.0958	2.5000
Mode	39.7125	0.0000
Standard Deviation	10.8837	9.8004
Sample Variance	118.4551	96.0485
Kurtosis	-0.2003	17.4144
Skewness	0.0882	3.8228
Range	63.9583	73.0083
Minimum	0.0000	0.0000
Maximum	63.9583	73.0083
Sum	10811.7667	2083.1375
Count	365.0000	365.0000
Confidence Level(95.0%)	1.1203	1.0088

2003	Average of Nox	Average of Sox
Mean	32.8113	4.0372
Standard Error	0.6892	1.2470
Median	33.6375	1.7667
Mode	0.0000	0.0000
Standard Deviation	13.1674	23.8234
Sample Variance	173.3798	567.5529
Kurtosis	0.0421	266.7590
Skewness	0.1236	-14.9157
Range	75.6667	474.4958
Minimum	0.0000	-415.8125
Maximum	75.6667	58.6833
Sum	11976.1208	1473.5750
Count	365.0000	365.0000
Confidence Level(95.0%)	1.3553	2.4522

The overall background concentration for sampling station 1 for SO<sub>2</sub> is estimated to be 7.9 µg/m<sup>3</sup> and for NOx 29.9 µg/m<sup>3</sup>.

Overall	Average of Nox	Average of Sox
Mean	29.9402	7.9245
Standard Error	0.3560	0.4187
Median	29.1750	2.8417
Mode	0.0000	0.0000
Standard Deviation	15.2128	17.8916
Sample Variance	231.4293	320.1103
Kurtosis	81.7751	180.0315
Skewness	4.7003	-5.1136
Range	326.5208	554.4333
Minimum	0.0000	-415.8125
Maximum	326.5208	138.6208
Sum	54670.8583	14470.0833
Count	1826.0000	1826.0000
Confidence Level(95.0%)	0.6982	0.8212

## 2 MODEL INPUT SO<sub>2</sub>

\*\* BREEZE AERMOD SUITE v3.5.15 - D:\Aermod\Tasnee\161205\_TASNEE\_SO2.dat  
\*\* Trinity Consultants

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CO STARTING
CO TITLEONE Tasnee EIA Air Quality modeling
CO TITLETWO SO2
CO MODELOPT CONC FLAT
CO AVERTIME 24 PERIOD
CO POLLUTID SO2
CO RUNORNOT RUN
CO FINISHED

SO STARTING
SO ELEVUNIT METERS
SO LOCATION 3H0101 POINT 358132.8 2993348.1 0
** SRCDESCR 3H-0101
SO LOCATION 3H0201 POINT 358144.0 2993359.7 0
** SRCDESCR 3H-0201
SO LOCATION 3H0401 POINT 358167.4 2993381.9 0
** SRCDESCR 3H-0401
SO LOCATION 3H0601 POINT 358190.8 2993404.2 0
** SRCDESCR 3H-0601
SO LOCATION 3PK8001A POINT 358132.0 2993312.8 0
** SRCDESCR 3PK-8001A
SO LOCATION 3H0701 POINT 358202.5 2993414.8 0
** SRCDESCR 3H-0701_SPARE
SO LOCATION 3H0501 POINT 358178.6 2993392.6 0
** SRCDESCR 3H-0501
SO LOCATION 3H0301 POINT 358155.2 2993370.8 0
** SRCDESCR 3H-0301
SO LOCATION 3PK8001B POINT 358145.0 2993298.9 0
** SRCDESCR 3PK-8001B
SO LOCATION SCINC POINT 358157.1 2993275.6 0
** SRCDESCR S.C. incinerator
SO LOCATION WOINC POINT 358174.4 2993259.0 0
** SRCDESCR W.O. incinerator
SO LOCATION 3PK8501 POINT 358262.4 2993027.2 0
** SRCDESCR 3PK-8501
SO LOCATION 6ST4201 POINT 358688.8 2992372.6 0
** SRCDESCR 6-ST4201
SO SRCPARAM 3H0101 8.629992E-03 50 412.15 7 2
SO SRCPARAM 3H0201 8.629992E-03 50 412.15 7 2
SO SRCPARAM 3H0401 8.629992E-03 50 412.15 7 2
SO SRCPARAM 3H0601 8.629992E-03 50 412.15 7 2
SO SRCPARAM 3PK8001A 9.608057E-02 50 412.15 1.786693 3.5
SO SRCPARAM 3H0701 0.000000E+00 0 273.15 0 0
SO SRCPARAM 3H0501 8.629992E-03 50 412.15 7 2
SO SRCPARAM 3H0301 8.629992E-03 50 412.15 7 2
SO SRCPARAM 3PK8001B 9.608057E-02 50 412.15 1.786693 3.5
SO SRCPARAM SCINC 5.465661E-01 50 496.15 15 1.9
SO SRCPARAM WOINC 2.301331E-01 50 1373.15 20 1.4

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SO SRCPARAM 3PK8501 0.000000E+00 0 273.15 0 0
SO SRCPARAM 6ST4201 0.000000E+00 25 323.15 5 0.5
SO EMISUNIT 1.0E+06 GRAMS/SEC MICROGRAMS/M**3
SO SRCGROUP ALL
SO FINISHED

RE STARTING
RE GRIDCART GRD1 STA 0
RE GRIDCART GRD1 XYINC 353343 36 370 2986799 41 370
RE GRIDCART GRD1 END
RE DISCCART 363613.0 2991025.0
** RCPDESCR Samplin_station_9
RE DISCCART 354614.0 2989772.0
** RCPDESCR Sampling_station_1
RE FINISHED

ME STARTING
ME SURFFILE D:\AERMOD\TASNEE\METEO\2002_2004.SFC
ME PROFFILE D:\AERMOD\TASNEE\METEO\2002_2004.PFL
ME PROFBASE 17 METERS
ME SURFDATA 40416 2002
ME UAIRDATA 0 2002
ME STARTEND 2002 01 01 1 2004 12 31 24
ME FINISHED

OU STARTING
OU RECTABLE 24 FIRST
OU MAXTABLE 24 10
OU FINISHED

** PROJECTN 0 104 7 -177 0 0.9996 500000 0
** IMAGE2 D:\AERMOD\TASNEE\MODELI~1.TAB
** OUTFILE D:\Aermod\Tasnee\161205~3.LST
** RAWFILE D:\Aermod\Tasnee\161205~2.RAW
** RAWFMT 2
** HILLBOUN 0 0 0 0

** AERMET SUFILE 0 False
** AERMET UAFILE 0 1 0 1 0
** AERMET SITE 0 1 0 1 0 1 1
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### 3 MODEL INPUT NOX

\*\* BREEZE AERMOD SUITE v3.5.15 - D:\Aermod\Tasnee\161205\_TASNEE\_NOX.dat  
\*\* Trinity Consultants

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CO STARTING
CO TITLEONE Tasnee EIA Air Quality modeling
CO TITLETWO NOX
CO MODELOPT CONC FLAT
CO AVERTIME 24 PERIOD
CO POLLUTID NOX
CO RUNORNOT RUN
CO FINISHED

SO STARTING
SO ELEVUNIT METERS
SO LOCATION 3H0101 POINT 358132.8 2993348.1 0
** SRCDESCR 3H-0101
SO LOCATION 3H0201 POINT 358144.0 2993359.7 0
** SRCDESCR 3H-0201
SO LOCATION 3H0401 POINT 358167.4 2993381.9 0
** SRCDESCR 3H-0401
SO LOCATION 3H0601 POINT 358190.8 2993404.2 0
** SRCDESCR 3H-0601
SO LOCATION 3PK8001A POINT 358132.0 2993312.8 0
** SRCDESCR 3PK-8001A
SO LOCATION 3H0701 POINT 358202.5 2993414.8 0
** SRCDESCR 3H-0701_SPARE
SO LOCATION 3H0501 POINT 358178.6 2993392.6 0
** SRCDESCR 3H-0501
SO LOCATION 3H0301 POINT 358155.2 2993370.8 0
** SRCDESCR 3H-0301
SO LOCATION 3PK8001B POINT 358145.0 2993298.9 0
** SRCDESCR 3PK-8001B
SO LOCATION SCINC POINT 358157.1 2993275.6 0
** SRCDESCR S.C. incinerator
SO LOCATION WOINC POINT 358174.4 2993259.0 0
** SRCDESCR W.O. incinerator
SO LOCATION 3PK8501 POINT 358262.4 2993027.2 0
** SRCDESCR 3PK-8501
SO LOCATION 6ST4201 POINT 358688.8 2992372.6 0
** SRCDESCR 6-ST4201
SO SRCPARAM 3H0101 2.669544E+00 50 412.15 7 2
SO SRCPARAM 3H0201 2.669544E+00 50 412.15 7 2
SO SRCPARAM 3H0401 2.669544E+00 50 412.15 7 2
SO SRCPARAM 3H0601 2.669544E+00 50 412.15 7 2
SO SRCPARAM 3PK8001A 2.600504E+00 50 412.15 1.786693 3.5
SO SRCPARAM 3H0701 0.000000E+00 0 273.15 0 0
SO SRCPARAM 3H0501 2.669544E+00 50 412.15 7 2
SO SRCPARAM 3H0301 2.669544E+00 50 412.15 7 2
SO SRCPARAM 3PK8001B 2.600504E+00 50 412.15 1.786693 3.5
SO SRCPARAM SCINC 2.189141E+00 50 496.15 15 1.9
SO SRCPARAM WOINC 9.176558E-01 50 1373.15 20 1.4
SO SRCPARAM 3PK8501 0.000000E+00 0 273.15 0 0

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```
SO SRCPARAM 6ST4201 3.739663E-01 25 323.15 5 0.5
SO EMISUNIT 1.0E+06 GRAMS/SEC MICROGRAMS/M**3
SO SRCGROUP ALL
SO FINISHED

RE STARTING
RE GRIDCART GRD2 STA 0
RE GRIDCART GRD2 XYINC 352630 34 350 2987332 31 375
RE GRIDCART GRD2 END
RE DISCCART 363613.0 2991025.0
** RCPDESCR Sampling_station_9
RE DISCCART 354614.0 2989772.0
** RCPDESCR Samplin_station_1
RE FINISHED

ME STARTING
ME SURFFILE D:\AERMOD\TASNEE\METEO\2002_2004.SFC
ME PROFFILE D:\AERMOD\TASNEE\METEO\2002_2004.PFL
ME PROFBASE 17 METERS
ME SURFDATA 40416 2002
ME UAIRDATA 0 2002
ME STARTEND 2002 01 01 1 2004 12 31 24
ME FINISHED

OU STARTING
OU RECTABLE 24 FIRST
OU MAXTABLE 24 10
OU FINISHED

** PROJECTN 0 104 7 -177 0 0.9996 500000 0
** IMAGE2 D:\AERMOD\TASNEE\MODELI~1.TAB
** OUTFILE D:\Aermod\Tasnee\161205~1.LST
** RAWFILE D:\Aermod\Tasnee\161205~1.RAW
** RAWFMT 2
** HILLBOUN 0 0 0 0

** AERMET SUFILE 0 False
** AERMET UAFILE 0 1 0 1 0
** AERMET SITE 0 1 0 1 0 1 1
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