APPENDIX 9D

Air Dispersion Modeling

9D-1 Sherwood Compressor Station Modeling Results
9D-2 Majorsville Compressor Station Modeling Results
9D-3 Burgettstown Compressor Station Modeling Results

APPENDIX 9D

9D-1 Sherwood Modeling Results

TABLE 9D-1-1

SCREEN3 DISPERSION MODELING INPUT

ROVER PIPELINE LLC

SHERWOOD COMPRESSOR STATION

			Source Parameters				Emission Rates	
Source	ID	Source Type	Height (ft)	Diameter (ft)	Velocity (fps)	Temperature (°F)	NO_X (lb/hr)	$PM_{2.5}$ (lb/hr)
Caterpillar G3616	COMP1	Point	54.0	2.5	108.7	856	5.74	0.39
Caterpillar G3616	COMP2	Point	54.0	2.5	108.7	856	5.74	0.39
Caterpillar G3616	COMP3	Point	54.0	2.5	108.7	856	5.74	0.39

TABLE 9D-1-2

BUILDING PARAMETERS FOR SCREEN3 INPUT

ROVER PIPELINE LLC

SHERWOOD COMPRESSOR STATION

		Structure Parameters		
Building/Structure Name	**Number of Tiers**	**Tier Height (ft)**	**Length (ft)**	**Width (ft)**
Compressor Building	1	36.0	144.0	70.0

TABLE 9D-1-3

NO² AMBIENT AIR MONITORING DATA

ROVER PIPELINE LLC

SHERWOOD COMPRESSOR STATION

Criteria Air Pollutant	Year of Monitored Data	EPA Monitor Site Identification Number	Monitoring Site Address/Location				Annual		98th Percentile 1-Hour Concentration		3-Year Average Design Annual Concentration (µg/m³)	3-Year Average Design 1-Hour 98th Percentile Concentration (µg/m³)
			Street Address	City	County	State	(ppb)	(µg/m³)	(ppb)	(µg/m³)		
NO_2	2013	421250005	Charleroi Waste Treatment Plant	Charleroi	Washington	Pennsylvania	17.3	32.5	34	64		
NO_2	2012	421250005	Charleroi Waste Treatment Plant	Charleroi	Washington	Pennsylvania	18.4	34.6	36	68	**34.7**	**66**
NO_2	2011	421250005	Charleroi Waste Treatment Plant	Charleroi	Washington	Pennsylvania	19.6	36.8	36	68		
NO_2	2013	420070014	8th Street & River Alley	Beaver Falls	Beaver	Pennsylvania	20.3	38.2	37	70		
NO_2	2012	420070014	8th Street & River Alley	Beaver Falls	Beaver	Pennsylvania	21.6	40.6	39	73	**39.8**	**72**
NO_2	2011	420070014	8th Street & River Alley	Beaver Falls	Beaver	Pennsylvania	21.6	40.6	39	73		
NO_2	2013	421255200	220 Meddings Road	Washington	Washington	Pennsylvania	8.2	15.4	22	41.4		
NO_2	2012	421255200	220 Meddings Road	Washington	Washington	Pennsylvania	N/A	N/A	N/A	N/A	**N/A**	**N/A**
NO_2	2011	421255200	220 Meddings Road	Washington	Washington	Pennsylvania	N/A	N/A	N/A	N/A		

Source: EPA - Air Data Monitor Values Report: on Internet web site (*http://www.epa.gov/airquality/airdata/ad_data.html)*

EPA Primary and Secondary Annual NAAQS for NO_2: 53 ppb = 100 µg/m³ (average of the three annual means over a 3-year monitoring period)

EPA Primary 1-Hour NAAQS for NO_2: 100 ppb = 188 µg/m³ (average of the 98th percentile 1-hour NO_2 concentrations over a 3-year monitoring period)

The annual NO_2 concentration (39.8 µg/m³) will be used to characterize the background annual NO_2 concentration for the project area.

The three-year average 1-hour NO_2 concentration (72 µg/m³) will be used to characterize the background 1-hour NO_2 concentration for the project area.

TABLE 9D-1-4

$PM^{2.5}$ AMBIENT AIR MONITORING DATA

ROVER PIPELINE LLC

SHERWOOD COMPRESSOR STATION

Criteria Air Pollutant	Year of Monitored Data	EPA Monitor Site Identification Number	Monitoring Site Address/Location				Annual ($\mu g/m^3$)	Maximum 24-Hour Concentration ($\mu g/m^3$)	3-Year Average Design Annual Concentration ($\mu g/m^3$)	3-Year Average Design 24-Hour Concentration ($\mu g/m^3$)
			Street Address	City	County	State				
$PM_{2.5}$	2013	540330003	443 Lee Avenue	Clarksburg	Harrison	West Virginia	8.8	20.8		
$PM_{2.5}$	2012	540330003	443 Lee Avenue	Clarksburg	Harrison	West Virginia	9.7	28.1	**9.3**	**24.5**
$PM_{2.5}$	2011	540330003	443 Lee Avenue	Clarksburg	Harrison	West Virginia	9.5	24.7		
$PM_{2.5}$	2013	540490006	401 Guffey Street	Fairmont	Marion	West Virginia	9.3	23.6		
$PM_{2.5}$	2012	540490006	401 Guffey Street	Fairmont	Marion	West Virginia	10.3	28.0	**10.3**	**27.8**
$PM_{2.5}$	2011	540490006	401 Guffey Street	Fairmont	Marion	West Virginia	11.3	31.7		

Source: EPA - Air Data Monitor Values Report: on Intemet web site (*http://www.epa.gov/airquality/airdata/ad_data.html)*

[a] On January 15, 2013 EPA promulgated a new $PM_{2.5}$ annual standard of 12 $\mu g/m^3$.

[b] EPA Primary and Secondary 24-Hour NAAQS for $PM_{2.5}$: 35 $\mu g/m^3$ (average of the 98th percentile 24-hour $PM_{2.5}$ concentrations over a 3-year monitoring period).

[c] The maximum 24-Hour concentration for each year was used due to the 3-day sampling frequency.

TABLE 9D-1-5

NO_2 SCREEN3 OUTPUT

ROVER PIPELINE LLC

SHERWOOD COMPRESSOR STATION

1-hr NO_2 Modeling Results

Source	EPN	Maximum Value from SCREEN3 for 1-hr Concentration ($\mu g/m^3$ per lb/hr)	NO_2/NO_x Ratio	Adjusted Generic SCREEN3 Value ($\mu g/m^3$ per lb/hr)	Emission Rate (lb/hr)	Maximum 1-hr Impact ($\mu g/m^3$)
Caterpillar G3616	COMP1	3.82	0.8	3.05	5.74	17.52
Caterpillar G3616	COMP2	3.82	0.8	3.05	5.74	17.52
Caterpillar G3616	COMP3	3.82	0.8	3.05	5.74	17.52
					Total Project Impact	**52.57**

Annual NO_2 Modeling Results

Source	EPN	Maximum Value from SCREEN3 for 1-hr Concentration ($\mu g/m^3$ per lb/hr)	NO_2/NO_x Ratio	Adjustment for 1-hr to Annual Average	Adjusted Generic SCREEN3 Value ($\mu g/m^3$ per lb/hr)	Emission Rate (lb/hr)	Maximum Annual Impact ($\mu g/m^3$)
Caterpillar G3616	COMP1	3.82	0.75	0.08	0.23	5.74	1.31
Caterpillar G3616	COMP2	3.82	0.75	0.08	0.23	5.74	1.31
Caterpillar G3616	COMP3	3.82	0.75	0.08	0.23	5.74	1.31
						Total Project Impact	**3.94**

Conversion of 1-hour concentration to annual average based on standard EPA factor of 0.08.

TABLE 9D-1-6

$PM_{2.5}$ SCREEN3 OUTPUT

ROVER PIPELINE LLC

SHERWOOD COMPRESSOR STATION

24-hr $PM_{2.5}$ Modeling Results

Source	EPN	Maximum Value from SCREEN3 for 1-hr Concentration ($\mu g/m^3$ per lb/hr)	Adjustment for 1-hr to 24-hr Average[a]	Adjusted Generic SCREEN3 Value ($\mu g/m^3$ per lb/hr)	Emission Rate (lb/hr)	Maximum 24-hr Impact ($\mu g/m^3$)
Caterpillar G3616	COMP1	3.82	0.4	1.53	0.39	0.60
Caterpillar G3616	COMP2	3.82	0.4	1.53	0.39	0.60
Caterpillar G3616	COMP3	3.82	0.4	1.53	0.39	0.60
					Total Project Impact	**1.79**

Annual $PM_{2.5}$ Modeling Results

Source	EPN	Maximum Value from SCREEN3 for 1-hr Concentration ($\mu g/m^3$ per lb/hr)	Adjustment for 1-hr to Annual Average	Adjusted Generic SCREEN3 Value ($\mu g/m^3$ per lb/hr)	Emission Rate (lb/hr)	Maximum Annual Impact ($\mu g/m^3$)
Caterpillar G3616	COMP1	3.82	0.08	0.31	0.39	0.12
Caterpillar G3616	COMP2	3.82	0.08	0.31	0.39	0.12
Caterpillar G3616	COMP3	3.82	0.08	0.31	0.39	0.12
					Total Project Impact	**0.36**

Conversion of 1-hr concentration to 24-hr average based on standard EPA factor of 0.4.
Conversion of 1-hour concentration to annual average based on standard EPA factor of 0.08.

TABLE 9D-1-7

MAXIMUM PREDICTED NO^2 AND $PM^{2.5}$ IMPACTS

ROVER PIPELINE LLC

SHERWOOD COMPRESSOR STATION

Criteria Air Pollutant	Averaging Period	National Ambient Air Quality Standards (NAAQS) (µg/m³)	Maximum Predicted Project Impact (µg/m³)	Background Concentration (µg/m³)	Predicted Project Impact with Background Concentration (µg/m³)	Percent of NAAQS (%)	Is the Maximum Predicted Project Impact Above the NAAQS?
NO_2	Annual	100	3.94	39.80	43.74	43.7%	No
NO_2	1-hour	188	52.57	72	125	66.3%	No
$PM_{2.5}$	Annual	12	0.36	10.30	10.66	88.8%	No
$PM_{2.5}$	24-hour	35	1.79	27.80	29.59	84.5%	No

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 13043 ***

01272015 Sherwood CS Caterpillar G3616 - COMP1, COMP2 and COMP3 dwnsh incl.

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	0.126000
STACK HEIGHT (M)	=	16.4592
STK INSIDE DIAM (M)	=	0.7620
STK EXIT VELOCITY (M/S)	=	33.1440
STK GAS EXIT TEMP (K)	=	730.9278
AMBIENT AIR TEMP (K)	=	293.1500
RECEPTOR HEIGHT (M)	=	0.0000
URBAN/RURAL OPTION	=	RURAL
BUILDING HEIGHT (M)	=	10.9728
MIN HORIZ BLDG DIM (M)	=	21.3360
MAX HORIZ BLDG DIM (M)	=	43.8912

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 28.257 M**4/S**3; MOM. FLUX = 63.955 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
68.	2.034	4	20.0	21.6	6400.0	16.59	5.76	6.57	SS
100.	3.132	4	20.0	21.6	6400.0	16.73	8.20	7.96	SS
200.	3.564	4	15.0	16.2	4800.0	18.87	15.56	11.42	SS
300.	2.642	4	15.0	16.2	4800.0	21.02	22.61	14.48	SS
400.	2.004	4	15.0	16.2	4800.0	23.19	29.45	17.54	SS
500.	1.765	4	15.0	16.2	4800.0	23.19	36.15	20.48	SS
600.	1.519	4	15.0	16.2	4800.0	23.19	42.72	23.32	SS
700.	1.379	4	10.0	10.8	3200.0	31.53	49.19	25.41	SS
800.	1.270	4	10.0	10.8	3200.0	31.53	55.57	28.13	SS
900.	1.156	4	10.0	10.8	3200.0	31.53	61.88	30.78	SS
1000.	1.050	4	10.0	10.8	3200.0	31.53	68.13	32.09	SS
1100.	0.9784	4	8.0	8.6	2560.0	38.27	74.31	34.12	SS
1200.	0.9135	4	8.0	8.6	2560.0	38.27	80.44	36.09	SS
1300.	0.8523	4	8.0	8.6	2560.0	38.27	86.52	38.00	SS
1400.	0.7955	4	8.0	8.6	2560.0	38.27	92.55	39.86	SS
1500.	0.7432	4	8.0	8.6	2560.0	38.27	98.54	41.67	SS
1600.	0.6953	4	8.0	8.6	2560.0	38.27	104.49	43.44	SS
1700.	0.6516	4	8.0	8.6	2560.0	38.27	110.41	45.17	SS
1800.	0.6208	4	5.0	5.4	1600.0	58.85	116.28	46.86	SS
1900.	0.6020	4	5.0	5.4	1600.0	58.85	122.13	48.52	SS
2000.	0.5827	4	5.0	5.4	1600.0	58.85	127.94	50.15	SS
2100.	0.5634	4	5.0	5.4	1600.0	58.85	133.73	51.75	SS
2200.	0.5443	4	5.0	5.4	1600.0	58.85	139.48	53.33	SS
2300.	0.5256	4	5.0	5.4	1600.0	58.85	145.21	54.87	SS
2400.	0.5074	4	5.0	5.4	1600.0	58.85	150.91	56.40	SS

2500.	0.4909	5	1.0	1.2	10000.0	101.89	119.66	45.20	NO
2600.	0.5058	5	1.0	1.2	10000.0	101.89	123.80	45.93	NO
2700.	0.5196	5	1.0	1.2	10000.0	101.89	127.94	46.65	NO
2800.	0.5325	5	1.0	1.2	10000.0	101.89	132.06	47.36	NO
2900.	0.5444	5	1.0	1.2	10000.0	101.89	136.17	48.07	NO
3000.	0.5553	5	1.0	1.2	10000.0	101.89	140.27	48.77	NO
3500.	0.5970	5	1.0	1.2	10000.0	101.89	160.62	52.17	NO
4000.	0.6209	5	1.0	1.2	10000.0	101.89	180.71	55.43	NO
4500.	0.6231	5	1.0	1.2	10000.0	101.89	200.57	58.19	NO
5000.	0.6182	5	1.0	1.2	10000.0	101.89	220.22	60.82	NO
5500.	0.6086	5	1.0	1.2	10000.0	101.89	239.66	63.35	NO
6000.	0.5959	5	1.0	1.2	10000.0	101.89	258.92	65.78	NO
6500.	0.5813	5	1.0	1.2	10000.0	101.89	278.01	68.13	NO
7000.	0.5654	5	1.0	1.2	10000.0	101.89	296.94	70.40	NO
7500.	0.5580	6	1.0	1.3	10000.0	85.04	210.45	45.59	NO
8000.	0.5555	6	1.0	1.3	10000.0	85.04	222.85	46.60	NO
8500.	0.5518	6	1.0	1.3	10000.0	85.04	235.16	47.58	NO
9000.	0.5471	6	1.0	1.3	10000.0	85.04	247.38	48.53	NO
9500.	0.5417	6	1.0	1.3	10000.0	85.04	259.53	49.45	NO
10000.	0.5357	6	1.0	1.3	10000.0	85.04	271.61	50.35	NO
15000.	0.4640	6	1.0	1.3	10000.0	85.04	388.92	58.28	NO
20000.	0.3902	6	1.0	1.3	10000.0	85.04	501.33	63.40	NO
25000.	0.3356	6	1.0	1.3	10000.0	85.04	610.07	67.75	NO
30000.	0.2938	6	1.0	1.3	10000.0	85.04	715.86	71.57	NO
40000.	0.2338	6	1.0	1.3	10000.0	85.04	920.43	77.02	NO
50000.	0.1943	6	1.0	1.3	10000.0	85.04	1117.59	81.58	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 68. M:

147.	3.816	4	15.0	16.2	4800.0	17.89	11.79	9.55	SS

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** REGULATORY (Default) ***
PERFORMING CAVITY CALCULATIONS
WITH ORIGINAL SCREEN CAVITY MODEL
(BRODE, 1988)
****

*** CAVITY CALCULATION - 1 ***		*** CAVITY CALCULATION - 2 ***	
CONC (UG/M**3)	= 0.000	CONC (UG/M**3)	= 0.000
CRIT WS @10M (M/S)	= 99.99	CRIT WS @10M (M/S)	= 99.99
CRIT WS @ HS (M/S)	= 99.99	CRIT WS @ HS (M/S)	= 99.99
DILUTION WS (M/S)	= 99.99	DILUTION WS (M/S)	= 99.99
CAVITY HT (M)	= 12.37	CAVITY HT (M)	= 11.07
CAVITY LENGTH (M)	= 30.73	CAVITY LENGTH (M)	= 25.12
ALONGWIND DIM (M)	= 21.34	ALONGWIND DIM (M)	= 43.89

CAVITY CONC NOT CALCULATED FOR CRIT WS > 20.0 M/S. CONC SET = 0.0

****
END OF CAVITY CALCULATIONS
****

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	3.816	147.	0.

APPENDIX 9D

9D-2 Majorsville Modeling Results

TABLE 9D-2-1

SCREEN3 DISPERSION MODELING INPUT

ROVER PIPELINE LLC

MAJORSVILLE COMPRESSOR STATION

			Source Parameters				Emission Rates	
Source	Emission Unit ID	Source Type	Height (ft)	Diameter (ft)	Velocity (fps)	Temperature (°F)	NO_X (lb/hr)	$PM_{2.5}$ (lb/hr)
Caterpillar G3612	CE-1S	Point	54.0	2.5	81.6	838	4.30	0.29
Caterpillar G3612	CE-2S	Point	54.0	2.5	81.6	838	4.30	0.29

TABLE 9D-2-2

BUILDING PARAMETERS FOR SCREEN3 INPUT

ROVER PIPELINE LLC

MAJORSVILLE COMPRESSOR STATION

		Structure Parameters		
Building/Structure Name	**Number of Tiers**	**Tier Height (ft)**	**Length (ft)**	**Width (ft)**
Compressor Building	1	36.0	100.0	70.0

TABLE 9D-2-3

NO² AMBIENT AIR MONITORING DATA

ROVER PIPELINE LLC

MAJORSVILLE COMPRESSOR STATION

Criteria Air Pollutant	Year of Monitored Data	EPA Monitor Site Identification Number	Monitoring Site Address/Location				Annual		98th Percentile 1-Hour Concentration		3-Year Average Design Annual Concentration (µg/m³)	3-Year Average Design 1-Hour 98th Percentile Concentration (µg/m³)
			Street Address	City	County	State	(ppb)	(µg/m³)	(ppb)	(µg/m³)		
NO_2	2013	421250005	Charleroi Waste Treatment Plant	Charleroi	Washington	Pennsylvania	17.3	32.5	34	64		
NO_2	2012	421250005	Charleroi Waste Treatment Plant	Charleroi	Washington	Pennsylvania	18.4	34.6	36	68	**34.7**	**66**
NO_2	2011	421250005	Charleroi Waste Treatment Plant	Charleroi	Washington	Pennsylvania	19.6	36.8	36	68		
NO_2	2013	420070014	8th Street & River Alley	Beaver Falls	Beaver	Pennsylvania	20.3	38.2	37	70		
NO_2	2012	420070014	8th Street & River Alley	Beaver Falls	Beaver	Pennsylvania	21.6	40.6	39	73	**39.8**	**72**
NO_2	2011	420070014	8th Street & River Alley	Beaver Falls	Beaver	Pennsylvania	21.6	40.6	39	73		
NO_2	2013	421255200	220 Meddings Road	Washington	Washington	Pennsylvania	8.2	15.4	22	41.4		
NO_2	2012	421255200	220 Meddings Road	Washington	Washington	Pennsylvania	N/A	N/A	N/A	N/A	**N/A**	**N/A**
NO_2	2011	421255200	220 Meddings Road	Washington	Washington	Pennsylvania	N/A	N/A	N/A	N/A		

Source: EPA - Air Data Monitor Values Report: on Internet web site (*http://www.epa.gov/airquality/airdata/ad_data.html)*

EPA Primary and Secondary Annual NAAQS for NO_2: 53 ppb = 100 µg/m³ (average of the three annual means over a 3-year monitoring period)

EPA Primary 1-Hour NAAQS for NO_2: 100 ppb = 188 µg/m³ (average of the 98th percentile 1-hour NO_2 concentrations over a 3-year monitoring period)

The annual NO_2 concentration (39.8 µg/m³) will be used to characterize the background annual NO_2 concentration for the project area.

The three-year average 1-hour NO_2 concentration (72 µg/m³) will be used to characterize the background 1-hour NO_2 concentration for the project area.

TABLE 9D-2-4

$PM^{2.5}$ AMBIENT AIR MONITORING DATA

ROVER PIPELINE LLC

MAJORSVILLE COMPRESSOR STATION

Criteria Air Pollutant	Year of Monitored Data	EPA Monitor Site Identification Number	Monitoring Site Address/Location				Annual ($\mu g/m^3$)	98th Percentile 24-Hour Concentration ($\mu g/m^3$)	3-Year Average Design Annual Concentration ($\mu g/m^3$)	3-Year Average Design 24-Hour 98th Percentile Concentration ($\mu g/m^3$)
			Street Address	City	County	State				
$PM_{2.5}$	2013	540511002	1501 9th ST	Moundsville	Marshall	West Virginia	11.1	24.2		
$PM_{2.5}$	2012	540511002	1501 9th ST	Moundsville	Marshall	West Virginia	12.4	24.5	**11.9**	**26.1**
$PM_{2.5}$	2011	540511002	1501 9th ST	Moundsville	Marshall	West Virginia	12.2	29.5		
$PM_{2.5}$	2013	540690010	Warwood Water Plant	Wheeling	Ohio	West Virginia	10.1	29.1		
$PM_{2.5}$	2012	540690010	Warwood Water Plant	Wheeling	Ohio	West Virginia	10.4	21.4	**10.6**	**26.1**
$PM_{2.5}$	2011	540690010	Warwood Water Plant	Wheeling	Ohio	West Virginia	11.3	27.7		
$PM_{2.5}$	2013	421250200	McCarrell and Fayette STS	Washington	Washington	Pennsylvania	9.7	20.4		
$PM_{2.5}$	2012	421250200	McCarrell and Fayette STS	Washington	Washington	Pennsylvania	10.6	20.6	**10.4**	**22.8**
$PM_{2.5}$	2011	421250200	McCarrell and Fayette STS	Washington	Washington	Pennsylvania	10.8	27.4		

Source: EPA - Air Data Monitor Values Report: on Internet web site (*http://www.epa.gov/airquality/airdata/ad_data.html*)

[a] On January 15, 2013 EPA promulgated a new $PM_{2.5}$ annual standard of 12 $\mu g/m^3$.

[b] EPA Primary and Secondary 24-Hour NAAQS for $PM_{2.5}$: 35 $\mu g/m^3$ (average of the 98th percentile 24-hour $PM_{2.5}$ concentrations over a 3-year monitoring period).

[c] The maximum 24-Hour concentration for each year was used due to the 3-day sampling frequency.

[d] The three monitors located closest to the Site were considered in order to characterize the $PM_{2.5}$ background concentration. The monitors at Moundsville and Wheeling are located in the Ohio River valley within heavily industrialized areas compared to the site which is located in a relatively flat rural area. Based on the surrounding emission sources, topography, and terrain, the monitor in Washington County, PA appears to be most representative of the $PM_{2.5}$ background concentration of the Site. However, in order to provide a more conservative estimate, an average of the values from the three monitors was used to determine the $PM_{2.5}$ design background concentration.

TABLE 9D-2-5

NO_2 SCREEN3 OUTPUT

ROVER PIPELINE LLC

MAJORSVILLE COMPRESSOR STATION

1-hr NO_2 Modeling Results

Source	Emission Unit ID	Maximum Value from SCREEN3 for 1-hr Concentration (µg/m^3 per lb/hr)	NO_2/NO_x Ratio	Adjusted Generic SCREEN3 Value (µg/m^3 per lb/hr)	Emission Rate (lb/hr)	Maximum 1-hr Impact (µg/m^3)
Caterpillar G3612	CE-1S	4.63	0.8	3.71	4.30	15.94
Caterpillar G3612	CE-2S	4.63	0.8	3.71	4.30	15.94
					Total Project Impact	**31.88**

Annual NO_2 Modeling Results

Source	Emission Unit ID	Maximum Value from SCREEN3 for 1-hr Concentration (µg/m^3 per lb/hr)	NO_2/NO_x Ratio	Adjustment for 1-hr to Annual Average	Adjusted Generic SCREEN3 Value (µg/m^3 per lb/hr)	Emission Rate (lb/hr)	Maximum Annual Impact (µg/m^3)
Caterpillar G3612	CE-1S	4.63	0.75	0.08	0.28	4.30	1.20
Caterpillar G3612	CE-2S	4.63	0.75	0.08	0.28	4.30	1.20
						Total Project Impact	**2.39**

Conversion of 1-hour concentration to annual average based on standard EPA factor of 0.08.

TABLE 9D-2-6

$PM_{2.5}$ SCREEN3 OUTPUT

ROVER PIPELINE LLC

MAJORSVILLE COMPRESSOR STATION

24-hr $PM_{2.5}$ Modeling Results

Source	Emission Unit ID	Maximum Value from SCREEN3 for 1-hr Concentration ($\mu g/m^3$ per lb/hr)	Adjustment for 1-hr to 24-hr Average[a]	Adjusted Generic SCREEN3 Value ($\mu g/m^3$ per lb/hr)	Emission Rate (lb/hr)	Maximum 24-hr Impact ($\mu g/m^3$)
Caterpillar G3612	CE-1S	4.63	0.4	1.85	0.29	0.54
Caterpillar G3612	CE-2S	4.63	0.4	1.85	0.29	0.54
					Total Project Impact	**1.08**

Annual $PM_{2.5}$ Modeling Results

Source	Emission Unit ID	Maximum Value from SCREEN3 for 1-hr Concentration ($\mu g/m^3$ per lb/hr)	Adjustment for 1-hr to Annual Average	Adjusted Generic SCREEN3 Value ($\mu g/m^3$ per lb/hr)	Emission Rate (lb/hr)	Maximum Annual Impact ($\mu g/m^3$)
Caterpillar G3612	CE-1S	4.63	0.08	0.37	0.29	0.11
Caterpillar G3612	CE-2S	4.63	0.08	0.37	0.29	0.11
					Total Project Impact	**0.22**

Conversion of 1-hr concentration to 24-hr average based on standard EPA factor of 0.4.
Conversion of 1-hour concentration to annual average based on standard EPA factor of 0.08.

TABLE 9D-2-7

MAXIMUM PREDICTED NO_2 AND $PM_{2.5}$ IMPACTS

ROVER PIPELINE LLC

MAJORSVILLE COMPRESSOR STATION

Criteria Air Pollutant	Averaging Period	National Ambient Air Quality Standards (NAAQS) (µg/m³)	Maximum Predicted Project Impact (µg/m³)	Background Concentration (µg/m³)	Maximum Predicted Project Impact with Background Concentration (µg/m³)	Percent of NAAQS (%)	Is the Maximum Predicted Project Impact Above the NAAQS?
NO_2	Annual	100	2.39	39.80	42.19	42.2%	No
NO_2	1-hour	188	31.88	72	104	55.3%	No
$PM_{2.5}$	Annual	12	0.22	10.96	11.17	93.1%	No
$PM_{2.5}$	24-hour	35	1.08	24.98	26.05	74.4%	No

```
 ***  SCREEN3 MODEL RUN  ***
 *** VERSION DATED 13043 ***

02042015 Majorsville CS Caterpillar G3612 - COMP1 and COMP2 dwnsh. incl.

SIMPLE TERRAIN INPUTS:
   SOURCE TYPE            =        POINT
   EMISSION RATE (G/S)    =     0.126000
   STACK HEIGHT (M)       =      16.4592
   STK INSIDE DIAM (M)    =       0.7620
   STK EXIT VELOCITY (M/S)=      24.8717
   STK GAS EXIT TEMP (K)  =     720.9278
   AMBIENT AIR TEMP (K)   =     293.1500
   RECEPTOR HEIGHT (M)    =       0.0000
   URBAN/RURAL OPTION     =        RURAL
   BUILDING HEIGHT (M)    =      10.9728
   MIN HORIZ BLDG DIM (M) =      21.3360
   MAX HORIZ BLDG DIM (M) =      30.4800

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.


BUOY. FLUX =   21.008 M**4/S**3;  MOM. FLUX =   36.514 M**4/S**2.

*** FULL METEOROLOGY ***

**********************************
*** SCREEN AUTOMATED DISTANCES ***
**********************************

*** TERRAIN HEIGHT OF    0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***
```

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
22.	0.000	1	1.0	1.0	320.0	219.49	11.87	10.21	NO
100.	3.948	4	15.0	16.2	4800.0	16.93	8.20	7.96	SS
200.	4.151	4	15.0	16.2	4800.0	18.17	15.56	11.85	SS
300.	3.031	4	15.0	16.2	4800.0	19.84	22.61	14.88	SS
400.	2.465	4	15.0	16.2	4800.0	20.36	29.45	17.92	SS
500.	2.196	4	10.0	10.8	3200.0	26.26	36.15	20.29	SS
600.	1.977	4	10.0	10.8	3200.0	26.26	42.72	23.14	SS
700.	1.747	4	10.0	10.8	3200.0	26.26	49.19	25.91	SS
800.	1.599	4	8.0	8.6	2560.0	31.38	55.57	28.24	SS
900.	1.453	4	8.0	8.6	2560.0	31.38	61.88	30.89	SS
1000.	1.319	4	8.0	8.6	2560.0	31.38	68.13	32.09	SS
1100.	1.202	4	8.0	8.6	2560.0	31.38	74.31	34.12	SS
1200.	1.098	4	8.0	8.6	2560.0	31.38	80.44	36.09	SS
1300.	1.033	4	5.0	5.4	1600.0	47.60	86.52	38.00	SS
1400.	0.9890	4	5.0	5.4	1600.0	47.60	92.55	39.86	SS
1500.	0.9441	4	5.0	5.4	1600.0	47.60	98.54	41.67	SS
1600.	0.8997	4	5.0	5.4	1600.0	47.60	104.49	43.44	SS
1700.	0.8567	4	5.0	5.4	1600.0	47.60	110.41	45.17	SS
1800.	0.8155	4	5.0	5.4	1600.0	47.60	116.28	46.86	SS
1900.	0.7779	4	4.5	4.8	1440.0	52.46	122.13	48.52	SS
2000.	0.7458	4	4.5	4.8	1440.0	52.46	127.94	50.15	SS
2100.	0.7149	4	4.5	4.8	1440.0	52.46	133.73	51.75	SS
2200.	0.6853	4	4.5	4.8	1440.0	52.46	139.48	53.33	SS
2300.	0.6609	4	4.0	4.3	1280.0	58.55	145.21	54.87	SS
2400.	0.6466	6	4.0	5.3	10000.0	46.92	75.12	24.29	SS

2500.	0.6605	5	1.0	1.2	10000.0	93.85	119.21	44.00	NO
2600.	0.6767	5	1.0	1.2	10000.0	93.85	123.37	44.75	NO
2700.	0.6913	5	1.0	1.2	10000.0	93.85	127.52	45.49	NO
2800.	0.7046	5	1.0	1.2	10000.0	93.85	131.65	46.22	NO
2900.	0.7164	5	1.0	1.2	10000.0	93.85	135.78	46.95	NO
3000.	0.7270	5	1.0	1.2	10000.0	93.85	139.89	47.66	NO
3500.	0.7628	5	1.0	1.2	10000.0	93.85	160.29	51.14	NO
4000.	0.7766	5	1.0	1.2	10000.0	93.85	180.42	54.46	NO
4500.	0.7666	5	1.0	1.2	10000.0	93.85	200.31	57.26	NO
5000.	0.7499	5	1.0	1.2	10000.0	93.85	219.98	59.94	NO
5500.	0.7290	5	1.0	1.2	10000.0	93.85	239.44	62.50	NO
6000.	0.7059	5	1.0	1.2	10000.0	93.85	258.72	64.96	NO
6500.	0.7021	6	1.0	1.3	10000.0	78.58	185.19	42.53	NO
7000.	0.7026	6	1.0	1.3	10000.0	78.58	197.79	43.76	NO
7500.	0.6958	6	1.0	1.3	10000.0	78.58	210.29	44.83	NO
8000.	0.6876	6	1.0	1.3	10000.0	78.58	222.69	45.86	NO
8500.	0.6784	6	1.0	1.3	10000.0	78.58	235.01	46.85	NO
9000.	0.6683	6	1.0	1.3	10000.0	78.58	247.25	47.82	NO
9500.	0.6577	6	1.0	1.3	10000.0	78.58	259.40	48.75	NO
10000.	0.6468	6	1.0	1.3	10000.0	78.58	271.48	49.66	NO
15000.	0.5375	6	1.0	1.3	10000.0	78.58	388.83	57.68	NO
20000.	0.4430	6	1.0	1.3	10000.0	78.58	501.26	62.85	NO
25000.	0.3755	6	1.0	1.3	10000.0	78.58	610.01	67.24	NO
30000.	0.3253	6	1.0	1.3	10000.0	78.58	715.81	71.09	NO
40000.	0.2555	6	1.0	1.3	10000.0	78.58	920.39	76.57	NO
50000.	0.2104	6	1.0	1.3	10000.0	78.58	1117.56	81.16	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 22. M:

130.	4.634	4	15.0	16.2	4800.0	17.25	10.53	9.38	SS

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** REGULATORY (Default) ***
PERFORMING CAVITY CALCULATIONS
WITH ORIGINAL SCREEN CAVITY MODEL
(BRODE, 1988)
****

*** CAVITY CALCULATION - 1 ***		*** CAVITY CALCULATION - 2 ***	
CONC (UG/M**3)	= 0.000	CONC (UG/M**3)	= 0.000
CRIT WS @10M (M/S)	= 99.99	CRIT WS @10M (M/S)	= 99.99
CRIT WS @ HS (M/S)	= 99.99	CRIT WS @ HS (M/S)	= 99.99
DILUTION WS (M/S)	= 99.99	DILUTION WS (M/S)	= 99.99
CAVITY HT (M)	= 12.37	CAVITY HT (M)	= 11.45
CAVITY LENGTH (M)	= 23.29	CAVITY LENGTH (M)	= 25.12
ALONGWIND DIM (M)	= 21.34	ALONGWIND DIM (M)	= 30.48

CAVITY CONC NOT CALCULATED FOR CRIT WS > 20.0 M/S. CONC SET = 0.0

****
END OF CAVITY CALCULATIONS
****

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	4.634	130.	0.

APPENDIX 9D

9D-3 Burgettstown Modeling Results

TABLE 9D-3-1

SCREEN3 DISPERSION MODELING INPUT

ROVER PIPELINE LLC

BURGETTSTOWN COMPRESSOR STATION

			Source Parameters				Emission Rates	
Source	Emissions Unit ID	Source Type	Height (ft)	Diameter (ft)	Velocity (fps)	Temperature (°F)	NO_X (lb/hr)	$PM_{2.5}$ (lb/hr)
Caterpillar G3520B	COMP1	Point	44.0	1.7	88.3	986	2.09	0.14
Caterpillar G3520B	COMP2	Point	44.0	1.7	88.3	986	2.09	0.14
Caterpillar G3520B	COMP3	Point	44.0	1.7	88.3	986	2.09	0.14

TABLE 9D-3-2

BUILDING PARAMETERS FOR SCREEN3 INPUT

ROVER PIPELINE LLC

BURGETTSTOWN COMPRESSOR STATION

		Structure Parameters		
Building/Structure Name	**Number of Tiers**	**Tier Height (ft)**	**Length (ft)**	**Width (ft)**
Compressor Building	1	36.0	125.0	60.0

TABLE 9D-3-3

NO² AMBIENT AIR MONITORING DATA

ROVER PIPELINE LLC

BURGETTSTOWN COMPRESSOR STATION

Criteria Air Pollutant	Year of Monitored Data	EPA Monitor Site Identification Number	Monitoring Site Address/Location				Annual		98th Percentile 1-Hour Concentration		3-Year Average Design Annual Concentration (µg/m³)	3-Year Average Design 1-Hour 98th Percentile Concentration (µg/m³)
			Street Address	City	County	State	(ppb)	(µg/m³)	(ppb)	(µg/m³)		
NO_2	2013	421250005	Charleroi Waste Treatment Plant	Charleroi	Washington	Pennsylvania	17.3	32.5	34	64	**34.7**	**66**
NO_2	2012	421250005	Charleroi Waste Treatment Plant	Charleroi	Washington	Pennsylvania	18.4	34.6	36	68		
NO_2	2011	421250005	Charleroi Waste Treatment Plant	Charleroi	Washington	Pennsylvania	19.6	36.8	36	68		
NO_2	2013	420070014	8th Street & River Alley	Beaver Falls	Beaver	Pennsylvania	20.3	38.2	37	70	**39.8**	**72**
NO_2	2012	420070014	8th Street & River Alley	Beaver Falls	Beaver	Pennsylvania	21.6	40.6	39	73		
NO_2	2011	420070014	8th Street & River Alley	Beaver Falls	Beaver	Pennsylvania	21.6	40.6	39	73		
NO_2	2013	421255200	220 Meddings Road	Washington	Washington	Pennsylvania	8.2	15.4	22	41.4	**N/A**	**N/A**
NO_2	2012	421255200	220 Meddings Road	Washington	Washington	Pennsylvania	N/A	N/A	N/A	N/A		
NO_2	2011	421255200	220 Meddings Road	Washington	Washington	Pennsylvania	N/A	N/A	N/A	N/A		

Source: EPA - Air Data Monitor Values Report: on Internet web site (*http://www.epa.gov/airquality/airdata/ad_data.html)*

[a] EPA Primary and Secondary Annual NAAQS for NO_2: 53 ppb = 100 µg/m³ (average of the three annual means over a 3-year monitoring period)

[b] EPA Primary 1-Hour NAAQS for NO_2: 100 ppb = 188 µg/m³ (average of the 98th percentile 1-hour NO_2 concentrations over a 3-year monitoring period)

[c] The annual NO_2 concentration (39.8 µg/m³) will be used to characterize the background annual NO_2 concentration for the project area.

[d] The three-year average 1-hour NO_2 concentration (72 µg/m³) will be used to characterize the background 1-hour NO_2 concentration for the project area.

TABLE 9D-3-4

PM2.5 AMBIENT AIR MONITORING DATA

ROVER PIPELINE LLC

BURGETTSTOWN COMPRESSOR STATION

Criteria Air Pollutant	Year of Monitored Data	EPA Monitor Site Identification Number	Monitoring Site Address/Location				Annual (µg/m³)	98th Percentile 24-Hour Concentration (µg/m³)	3-Year Average Design Annual Concentration (µg/m³)	3-Year Average Design 24-Hour 98th Percentile Concentration (µg/m³)
			Street Address	City	County	State				
$PM_{2.5}$	2013	421255001	Hillman State Park-Kings Creek Road	N/A	Washington	Pennsylvania	8.6	19.5		
$PM_{2.5}$	2012	421255001	Hillman State Park-Kings Creek Road	N/A	Washington	Pennsylvania	6.1	14.0	**6.9**	**15.2**
$PM_{2.5}$	2011	421255001	Hillman State Park-Kings Creek Road	N/A	Washington	Pennsylvania	6.0	12.2		

Source: EPA - Air Data Monitor Values Report: on Internet web site (*http://www.epa.gov/airquality/airdata/ad_data.html)*

[a] On January 15, 2013 EPA promulgated a new $PM_{2.5}$ annual standard of 12 µg/m^3.

[b] EPA Primary and Secondary 24-Hour NAAQS for $PM_{2.5}$: 35 µg/m³ (average of the 98th percentile 24-hour $PM_{2.5}$ concentrations over a 3-year monitoring period).

[c] This three-year average annual $PM_{2.5}$ concentration (6.9 µg/m³) has been used to characterize the background annual $PM_{2.5}$ concentration for the Air Quality Analysis.

[d] This three-year average 98th percentile 24-hour $PM_{2.5}$ concentration (15.2 µg/m³) has been used to characterize the background 24-hour $PM_{2.5}$ concentration for the Air Quality Analysis.

TABLE 9D-3-5

NO_2 SCREEN3 OUTPUT

ROVER PIPELINE LLC

BURGETTSTOWN COMPRESSOR STATION

1-hr NO_2 Modeling Results

Source	Emissions Unit ID	Maximum Value from SCREEN3 for 1-hr Concentration (µg/m^3 per lb/hr)	NO_2/NO_x Ratio	Adjusted Generic SCREEN3 Value (µg/m^3 per lb/hr)	Emission Rate (lb/hr)	Maximum 1-hr Impact (µg/m^3)
Caterpillar G3520B	COMP1	18.46	0.8	14.77	2.09	30.87
Caterpillar G3520B	COMP2	18.46	0.8	14.77	2.09	30.87
Caterpillar G3520B	COMP3	18.46	0.8	14.77	2.09	30.87
					Total Project Impact	**92.60**

Annual NO_2 Modeling Results

Source	Emissions Unit ID	Maximum Value from SCREEN3 for 1-hr Concentration (µg/m^3 per lb/hr)	NO_2/NO_x Ratio	Adjustment for 1-hr to Annual Average	Adjusted Generic SCREEN3 Value (µg/m^3 per lb/hr)	Emission Rate (lb/hr)	Maximum Annual Impact (µg/m^3)
Caterpillar G3520B	COMP1	18.46	0.75	0.08	1.11	2.09	2.31
Caterpillar G3520B	COMP2	18.46	0.75	0.08	1.11	2.09	2.31
Caterpillar G3520B	COMP3	18.46	0.75	0.08	1.11	2.09	2.31
						Total Project Impact	**6.94**

Conversion of 1-hour concentration to annual average based on standard EPA factor of 0.08.

TABLE 9D-3-6

$PM_{2.5}$ SCREEN3 OUTPUT

ROVER PIPELINE LLC

BURGETTSTOWN COMPRESSOR STATION

24-hr $PM_{2.5}$ Modeling Results

Source	Emissions Unit ID	Maximum Value from SCREEN3 for 1-hr Concentration ($\mu g/m^3$ per lb/hr)	Adjustment for 1-hr to 24-hr Average[a]	Adjusted Generic SCREEN3 Value ($\mu g/m^3$ per lb/hr)	Emission Rate (lb/hr)	Maximum 24-hr Impact ($\mu g/m^3$)
Caterpillar G3520B	COMP1	18.46	0.4	7.38	0.14	1.03
Caterpillar G3520B	COMP2	18.46	0.4	7.38	0.14	1.03
Caterpillar G3520B	COMP3	18.46	0.4	7.38	0.14	1.03
					Total Project Impact	**3.10**

Annual $PM_{2.5}$ Modeling Results

Source	Emissions Unit ID	Maximum Value from SCREEN3 for 1-hr Concentration ($\mu g/m^3$ per lb/hr)	Adjustment for 1-hr to Annual Average	Adjusted Generic SCREEN3 Value ($\mu g/m^3$ per lb/hr)	Emission Rate (lb/hr)	Maximum Annual Impact ($\mu g/m^3$)
Caterpillar G3520B	COMP1	18.46	0.08	1.48	0.14	0.21
Caterpillar G3520B	COMP2	18.46	0.08	1.48	0.14	0.21
Caterpillar G3520B	COMP3	18.46	0.08	1.48	0.14	0.21
					Total Project Impact	**0.62**

Conversion of 1-hr concentration to 24-hr average based on standard EPA factor of 0.4.
Conversion of 1-hour concentration to annual average based on standard EPA factor of 0.08.

TABLE 9D-3-7

MAXIMUM PREDICTED NO^2 AND $PM^{2.5}$ IMPACTS

ROVER PIPELINE LLC

BURGETTSTOWN COMPRESSOR STATION

Criteria Air Pollutant	Averaging Period	National Ambient Air Quality Standards (NAAQS) ($\mu g/m^3$)	Maximum Predicted Project Impact ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Maximum Predicted Project Impact with Background Concentration ($\mu g/m^3$)	Percent of Applicable Standard (%)	Is the Maximum Predicted Project Impact Above the NAAQS?
NO_2	Annual	100	6.94	39.80	46.74	46.7%	No
NO_2	1-hour	188	92.60	72.00	164.60	87.6%	No
$PM_{2.5}$	Annual	12	0.62	6.90	7.52	62.7%	No
$PM_{2.5}$	24-hour	35	3.10	15.20	18.30	52.3%	No

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 13043 ***

02022015 Burgettstown CS, PA - Caterpillar G3520B - COMP1 - COMP3 dwnsh incl.

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	0.126000
STACK HEIGHT (M)	=	13.4112
STK INSIDE DIAM (M)	=	0.5081
STK EXIT VELOCITY (M/S)	=	26.8984
STK GAS EXIT TEMP (K)	=	803.1500
AMBIENT AIR TEMP (K)	=	293.1500
RECEPTOR HEIGHT (M)	=	0.0000
URBAN/RURAL OPTION	=	RURAL
BUILDING HEIGHT (M)	=	10.9728
MIN HORIZ BLDG DIM (M)	=	18.2880
MAX HORIZ BLDG DIM (M)	=	38.1000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 10.810 M**4/S**3; MOM. FLUX = 17.045 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
64.	18.46	4	8.0	8.4	2560.0	13.98	5.42	7.17	SS
100.	16.86	4	8.0	8.4	2560.0	14.73	8.20	8.95	SS
200.	9.184	4	8.0	8.4	2560.0	17.69	15.56	12.68	SS
300.	6.890	4	8.0	8.4	2560.0	18.26	22.61	15.83	SS
400.	5.405	4	8.0	8.4	2560.0	18.26	29.45	18.83	SS
500.	4.361	4	5.0	5.2	1600.0	27.12	36.15	20.79	SS
600.	3.935	4	5.0	5.2	1600.0	27.12	42.72	23.63	SS
700.	3.487	4	5.0	5.2	1600.0	27.12	49.19	26.39	SS
800.	3.091	4	4.5	4.7	1440.0	30.06	55.57	28.84	SS
900.	2.775	4	4.5	4.7	1440.0	30.06	61.88	31.48	SS
1000.	2.520	4	4.0	4.2	1280.0	33.81	68.13	32.14	SS
1100.	2.316	4	4.0	4.2	1280.0	33.81	74.31	34.17	SS
1200.	2.131	4	4.0	4.2	1280.0	33.81	80.44	36.13	SS
1300.	1.986	4	3.5	3.7	1120.0	38.70	86.52	38.00	SS
1400.	2.015	6	4.0	4.7	10000.0	34.56	46.05	19.68	SS
1500.	2.030	6	4.0	4.7	10000.0	34.56	49.03	20.40	SS
1600.	2.033	6	4.0	4.7	10000.0	34.56	51.99	21.10	SS
1700.	1.958	6	3.5	4.1	10000.0	36.52	54.94	21.54	SS
1800.	1.924	6	4.0	4.7	10000.0	34.56	57.87	21.80	SS
1900.	1.903	6	4.0	4.7	10000.0	34.56	60.78	22.38	SS
2000.	1.878	6	4.0	4.7	10000.0	34.56	63.68	22.95	SS
2100.	1.850	6	4.0	4.7	10000.0	34.56	66.56	23.50	SS
2200.	1.826	6	3.5	4.1	10000.0	36.52	69.42	23.87	SS
2300.	1.805	6	3.5	4.1	10000.0	36.52	72.28	24.41	SS
2400.	1.782	6	3.5	4.1	10000.0	36.52	75.12	24.94	SS

2500.	1.760	6	3.0	3.5	10000.0	38.95	77.95	25.25	SS
2600.	1.744	6	3.0	3.5	10000.0	38.95	80.76	25.77	SS
2700.	1.727	6	3.0	3.5	10000.0	38.95	83.57	26.27	SS
2800.	1.708	6	3.0	3.5	10000.0	38.95	86.37	26.77	SS
2900.	1.657	6	3.0	3.5	10000.0	38.95	89.15	26.81	SS
3000.	1.642	6	2.5	2.9	10000.0	42.07	91.92	27.10	SS
3500.	1.561	6	2.5	2.9	10000.0	42.07	105.65	29.10	SS
4000.	1.504	6	2.0	2.4	10000.0	46.30	119.17	30.84	SS
4500.	1.443	6	1.5	1.8	10000.0	52.44	132.50	32.57	SS
5000.	1.410	6	1.5	1.8	10000.0	52.44	145.67	34.21	SS
5500.	1.368	6	1.5	1.8	10000.0	52.44	158.69	35.76	SS
6000.	1.337	6	1.0	1.2	10000.0	61.98	171.58	37.23	SS
6500.	1.324	6	1.0	1.2	10000.0	61.98	184.34	38.64	SS
7000.	1.304	6	1.0	1.2	10000.0	61.98	196.99	40.00	SS
7500.	1.274	6	1.0	1.2	10000.0	61.98	209.54	41.16	SS
8000.	1.242	6	1.0	1.2	10000.0	61.98	221.98	42.28	SS
8500.	1.209	6	1.0	1.2	10000.0	61.98	234.34	43.36	SS
9000.	1.176	6	1.0	1.2	10000.0	61.98	246.61	44.40	SS
9500.	1.144	6	1.0	1.2	10000.0	61.98	258.79	45.41	SS
10000.	1.112	6	1.0	1.2	10000.0	61.98	270.90	46.38	SS
15000.	0.8461	6	1.0	1.2	10000.0	61.98	388.43	54.88	SS
20000.	0.6662	6	1.0	1.2	10000.0	61.98	500.95	60.29	SS
25000.	0.5466	6	1.0	1.2	10000.0	61.98	609.75	64.86	SS
30000.	0.4620	6	1.0	1.2	10000.0	61.98	715.59	68.84	SS
40000.	0.3522	6	1.0	1.2	10000.0	61.98	920.22	74.49	SS
50000.	0.2839	6	1.0	1.2	10000.0	61.98	1117.42	79.19	SS

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 64. M:

64.	18.46	4	8.0	8.4	2560.0	13.98	5.42	7.17	SS

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** REGULATORY (Default) ***
PERFORMING CAVITY CALCULATIONS
WITH ORIGINAL SCREEN CAVITY MODEL
(BRODE, 1988)
****

*** CAVITY CALCULATION - 1 ***		*** CAVITY CALCULATION - 2 ***	
CONC (UG/M**3)	= 0.000	CONC (UG/M**3)	= 0.000
CRIT WS @10M (M/S)	= 99.99	CRIT WS @10M (M/S)	= 99.99
CRIT WS @ HS (M/S)	= 99.99	CRIT WS @ HS (M/S)	= 99.99
DILUTION WS (M/S)	= 99.99	DILUTION WS (M/S)	= 99.99
CAVITY HT (M)	= 12.98	CAVITY HT (M)	= 11.17
CAVITY LENGTH (M)	= 31.11	CAVITY LENGTH (M)	= 22.59
ALONGWIND DIM (M)	= 18.29	ALONGWIND DIM (M)	= 38.10

CAVITY CONC NOT CALCULATED FOR CRIT WS > 20.0 M/S. CONC SET = 0.0

****
END OF CAVITY CALCULATIONS
****

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
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CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	18.46	64.	0.