

Air Dispersion Modeling Summary for Permit No. 7200M4

Report Date: 3/1/2023

NMED/AQB Modeler: Angela Raso

Facility Identification:

Project: Roadrunner Gas Processing Plant Company: Targa Northern Delaware, LLC
Permit number: 7200M4 TEMPO ID: 36536

Location Information:

The facility is located 1.6 miles south-southwest of Loving, in Eddy County. The facility is located 4.0 miles northwest of Malaga.

UTM Coordinates: 583,982 m East, 3,570,216 m North, zone 13, Datum: NAD83

Elevation = 3122 feet Air Quality Control Region (AQCR): 155 Airshed: Pr

Project Description:

Brief: Targa Northern Delaware, LLC has applied to the New Mexico Air Quality Bureau for a New Source Review air quality permit for the modification of the Roadrunner Gas Processing Plant facility (the facility). The facility is changing equipment, throughput, and eliminating Train 4 from its current permit. The facility is a gas processing plant.

The following types of emission sources are included in the project: Amine Reboiler, Flare (SSM), Glycol Reboiler, Haul Road, Pigging, Regen Reboiler, SSM Thermal Oxidizer, Stabilizer Heater, Tank Combustor, Thermal Oxidizer, Trim Reboiler, and Wastewater Tank. The emission units used in the modeling are described in the tables below.

For this permit, modeling was required for the following pollutants: Carbon Monoxide (CO), Nitrogen Dioxide (NO₂), Particulate Matter 10 micrometers or less in aerodynamic diameter (PM10), Particulate Matter (2.5 microns or less) (PM2.5), and Sulfur Dioxide (SO₂).

Table 1: Total Facility Emissions

	NO ₂ Rate (lbs/hr)	CO Rate (lbs/hr)	SO ₂ Rate (lbs/hr)	H ₂ S Rate (lbs/hr)	PM10 Rate (lbs/hr)	PM2.5 Rate (lbs/hr)
Short term	4,764.030	9,492.600	2,512.687	41.138	3.992	3.891
Annualized	35.588	-	33.761	-	3.585	3.511

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Table 2: Point Sources

Stack Number	Description	Stack Ht (ft)	Dia. (ft)	Vel. (ft/s)	Temp. (°F)	CO Rate (lbs/hr)	H ₂ S Rate (lbs/hr)	NO ₂ Rate (lbs/hr)	PM _{2.5} Rate (lbs/hr)	PM ₁₀ Rate (lbs/hr)	SO ₂ Rate (lbs/hr)
EP2	Trim Reboiler	22.5	3.8	51.1	624	2.180	-	2.600	0.200	0.200	0.020
2EP2	Trim Reboiler	17.8	4.0	7.5	575	2.180	-	0.840	0.200	0.200	0.020
3EP2	Trim Reboiler	25.8	2.3	51.1	624	2.180	-	0.840	0.200	0.200	0.020
EP3A	Amine Reboiler	24.8	3.5	176.1	624	4.530	-	2.230	0.520	0.520	0.060
EP3B	Amine Reboiler	39.0	4.0	117.0	450	3.480	-	0.340	1.100	1.100	0.070
EP4	Glycol Reboiler	25.0	2.0	59.7	624	0.320	-	0.380	0.030	0.030	0.003
2EP4	Glycol Reboiler	15.0	2.3	10.5	450	0.320	-	0.380	0.030	0.030	0.003
3EP4	Glycol Reboiler	31.8	2.0	59.7	624	0.320	-	0.380	0.030	0.030	0.003
EP5	Regen Reboiler	15.8	2.5	5.6	624	0.780	-	0.930	0.070	0.070	0.010
2EP5	Regen Reboiler	16.1	2.5	32.1	575	0.780	-	0.930	0.070	0.070	0.010
3EP5	Regen Reboiler	22.0	1.3	42.7	550	0.780	-	0.930	0.070	0.070	0.010
EP6	Stabilizer Heater	24.9	2.3	90.9	624	1.930	-	2.290	0.170	0.170	0.020
2EP6	Stabilizer Heater	24.9	2.3	90.9	624	1.930	-	2.290	0.170	0.170	0.020
EP9	Thermal Oxidizer	76.0	10.0	12.1	1,600	2.980	0.010	6.120	0.600	0.600	26.660
EP1	Flare (SSM)	100.0	75.9	65.6	1,832	3,150.917	8.980	1,578.323 (Short-term) / 4.543 (Annual)	-	-	828.536 (Short-term) / 2.279 (Annual)
2EP1	Flare (SSM)	123.0	83.9	65.6	1,832	3,150.817	8.980	1,578.263 (Short-term) / 4.489 (Annual)	-	-	828.536 (Short-term) / 2.279 (Annual)

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3EP1	Flare (SSM)	150.0	195.3	65.6	1,832	3,150.547	8.980	1,578.133 (Short-term) / 4.356 (Annual)	-	-	828.526 (Short-term) / 2.272 (Annual)
COMB1	Tank Combustor	50.0	7.0	18.4	1,500	15.630	0.004	7.830 (Short-term) / 7.03 (Annual)	0.420 (Short-term) / 0.039 (Annual)	0.420 (Short-term) / 0.039 (Annual)	0.160 (Short-term) / 0.001 (Annual)
SSMTO	SSM Thermal Oxidizer	76.0	10.0	12.1	1,600		14.170	-	-	-	-
T6	Waste Water Tank	12.1	0.0	0.0	-460		0.005	-	-	-	-

Table 3: Volume Sources

Source ID	Description	Release Height (ft)	Horizontal Dimension (ft)	Vertical Dimension (ft)	H ₂ S Rate (lbs/hr)	PM ₁₀ Rate (lbs/hr)	PM _{2.5} Rate (lbs/hr)
HAUL1	Haul Road	11.1	22.3	10.4	-	0.112	0.011
MSSM	Pigging	4.9	22.3	10.4	0.010	-	-

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Modeling Assumptions:

No additional assumptions were made for the modeling.

Permit Conditions:

No additional permit conditions are required by this modeling.

Conclusion:

This modeling analysis demonstrates that operation of the facility described in this report neither causes nor contributes to any exceedances of applicable air quality standards. The standards relevant at this facility are NAAQS for CO, NO₂, PM_{2.5}, PM₁₀, and SO₂; NMAAQs for CO, H₂S, NO₂, and SO₂; and Class I and Class II PSD increments for NO₂, PM_{2.5}, PM₁₀, and SO₂.

Action: The permit can be issued based on this modeling analysis.

Modeling report submitted by Martin R. Schluep.

The air quality analysis demonstrates compliance with applicable regulatory requirements.

Model(s) Used: AERMOD version 21112 was used to run the modeling analysis.

Note: Complete modeling input and output files can be made available and are located in the Modeling Archives in the folder, "7200M4_Targa Northern Delaware, LLC_Roadrunner Gas Processing Plant".

Modeling Parameters:

The AERMOD regulatory default parameters were included in assumptions made by the model.

Building downwash produced by buildings at the facility was considered. The following buildings were included in the modeling.

Table 4: Buildings

Building Name	Height (m)	Diagonal Length (m)	Location (approx. center)	
			UTM E (m)	UTM N (m)
BLD 1	6.1	49.2	583,680.88	3,570,515.34
BLD 2	6.1	30.4	584,016.31	3,570,236.67
BLD 16	4.9	6.6	583,845.95	3,570,272.54
BLD 17	4.9	6.6	583,838.20	3,570,272.54
BLD 18	4.9	6.6	583,845.37	3,570,264.04
BLD 19	4.9	6.6	583,853.44	3,570,263.88
BLD 20	4.9	6.6	583,853.44	3,570,757.27

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Tank	3.7	3.1	583,838.04	3,570,264.53
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Complex Terrain Data:

Elevations of receptors, facility sources, and surrounding sources were obtained from USGS GeoTIFF files using AERMAP.

Both simple and complex types of terrain were used to model the facility.

Receptor Grid: The following grids were used to determine the maximum concentration for each pollutant.

Table 5: Receptor Grids

Grid Type	Description	Shape	Spacing	Radius or Length
Cartesian	Very rough	Circular	5000 meters	50 kilometers
Cartesian	Rough	Circular	1000 meters	10 kilometers
Cartesian	Intermediate	Circular	500 meters	5 kilometers
Cartesian	Intermediate	Circular	250 meters	2.5 kilometers
Cartesian	Fine	Rectangular	100 meters	1 kilometers
Fence line	Very fine	Fence line	50 meters	Fence line

Receptors outside of the radii of impact were discarded for the surrounding source runs.

Meteorological Data: AERMOD – Carlsbad (NMED Onsite) 2014-2018. Processed by NMED and available on our website.

Surrounding Sources:

CO: No Cumulative Analysis was required.

H₂S: The Division 's Modeling Guidance was used to select 56 sources (emissions units) within 50 km of the facility.

NO₂: A background concentration was utilized in lieu of surrounding sources.

PM_{2.5}: The Division 's Modeling Guidance was used to select 1,810 sources (emissions units) within 50 km of the facility.

PM₁₀: The Division 's Modeling Guidance was used to select 1,811 sources (emissions units) within 50 km of the facility.

SO₂: The Division 's Modeling Guidance was used to select 967 sources (emissions units) within 50 km of the facility.

Nearby Facilities: The facility is 1.0 km from Pecos Compressor Station. The facility is 1.4 km from Sendero Carlsbad Plant. The facility is 24.0 km from Pecos River Compressor Station. The facility is 49.0 km from Indian Basin Gas Plant. The facility is 50.6 km from Zia II Gas Plant.

Modeling Procedures:

The applicant submitted a modeling protocol prior to submitting the application. The modeling protocol was approved by Angela Raso on 11/30/2022.

PSD Increment Information:

The facility is a minor source (for PSD purposes) located in AQCR 155. The minor source baseline dates here are 3/16/1988 for NO₂, 7/28/1978 for SO₂, 2/20/1979, 11/13/2013 for

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PM2.5, and for PM10.

The facility is 26.3 km from the Class I area Carlsbad Caverns National Park. Class I area modeling is required.

Results Discussion:

CO Analysis:

The 1-hour CO concentration ($1812.471 \mu\text{g}/\text{m}^3$) was below the significance level. No cumulative analysis is required.

The 8-hour CO concentration ($303.884 \mu\text{g}/\text{m}^3$) was below the significance level. No cumulative analysis is required.

H₂S Analysis:

The facility is in the Pecos-Permian Basin AQCR. Facilities within 5-miles of the corporate limits of municipalities with populations greater than 20,000 and within AQCR 155 have a different NMAAQs. The facility is 1.6 miles from Loving (population 1,337). The closest municipality with a population greater than 20,000 is Carlsbad (approximately 12 miles away). The appropriate NMAAQs for this facility is $139.3 \mu\text{g}/\text{m}^3$ (0.1000 ppm).

The maximum source alone 1-hour H₂S concentration was $23.986 \mu\text{g}/\text{m}^3$. The facility was modeled with surrounding sources. The maximum total 1-hour H₂S concentration was $40.889 \mu\text{g}/\text{m}^3$. This was 29.4% of the NMAAQs.

NO₂ Analysis:

ARM2 was used with default options (0.5 minimum ratio, 0.9 maximum ratio) to determine the conversion of NO_x to NO₂.

The maximum source alone 1-hour NO₂ concentration was $70.966 \mu\text{g}/\text{m}^3$. A background concentration of $65.800 \mu\text{g}/\text{m}^3$ was added from the monitor 5ZS, at Hobbs - 2320 N. Jefferson St. The maximum total 1-hour NO₂ concentration was $136.766 \mu\text{g}/\text{m}^3$. This was 72.7% of the NAAQS.

Compliance with 1-hour NO₂ NAAQS automatically demonstrates compliance with 24-hour NMAAQs.

Compliance with annual NO₂ NMAAQs automatically demonstrates compliance with annual NAAQS.

The maximum source alone annual NO₂ concentration was $4.600 \mu\text{g}/\text{m}^3$. A background concentration of $9.300 \mu\text{g}/\text{m}^3$ was added from the monitor 5ZS, at Hobbs - 2320 N. Jefferson St. The maximum total annual NO₂ concentration was $13.900 \mu\text{g}/\text{m}^3$. This was 14.8% of the NMAAQs.

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The maximum total annual NO₂ concentration was 13.900 µg/m³. This was 55.6% of the PSD Class II increment.

The annual NO₂ concentration at Carlsbad Caverns (0.003 µg/m³) was below the Class I significance level. No cumulative analysis is required.

PM2.5 Analysis:

The maximum (8th high) source alone 24-hour PM2.5 concentration was 1.791 µg/m³. The facility was modeled with surrounding sources. The maximum 24-hour PM2.5 concentration with surrounding sources was 4.426 µg/m³. A background concentration of 16.500 µg/m³ was added from the monitor 5ZS, at Hobbs - 2320 N. Jefferson St. Secondary formation of PM2.5 was accounted for using MERPS. Secondary formation causes 0.120 µg/m³ of PM2.5. The maximum total 24-hour PM2.5 concentration was 21.046 µg/m³. This was 60.1% of the NAAQS.

The maximum (2nd high) source alone 24-hour PM2.5 concentration was 2.404 µg/m³. The facility was modeled with surrounding sources. The 24-hour PM2.5 concentration with increment consuming surrounding sources was 3.321 µg/m³. Secondary formation causes 0.12 µg/m³ of PM2.5. The maximum total 24-hour PM2.5 concentration was 3.441 µg/m³. This was 38.2% of the PSD Class II increment.

The 24-hour PM2.5 concentration at Carlsbad Caverns (0.129 µg/m³) was below the Class I significance level. No cumulative analysis is required.

The maximum source alone annual PM2.5 concentration was 0.649 µg/m³. The facility was modeled with surrounding sources. The maximum annual PM2.5 concentration with surrounding sources was 2.028 µg/m³. A background concentration of 7.100 µg/m³ was added from monitor 5ZS, at Hobbs – 2320 N. Jefferson St. Secondary formation causes 0.003 µg/m³ of PM2.5. The maximum total annual PM2.5 concentration was 9.131 µg/m³. This was 76.1% of the NAAQS.

The maximum annual PM2.5 concentration with increment consuming surrounding sources and secondary formation was 1.506 µg/m³. This was 37.7% of the PSD Class II increment.

The annual PM2.5 concentration at Carlsbad Caverns (0.0036 µg/m³) was below the Class I significance level. No cumulative analysis is required.

PM10 Analysis:

The maximum source alone 24-hour PM10 concentration was 14.537 µg/m³. The facility was modeled with surrounding sources. The maximum 24-hour PM10 concentration with surrounding sources was 22.380 µg/m³. A background concentration of 37.300 µg/m³ was added from the monitor 5ZS, at Hobbs - 2320 N. Jefferson St. The maximum total 24-hour PM10 concentration was 59.680 µg/m³. This was 39.8% of the NAAQS.

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The maximum total 24-hour PM₁₀ concentration with increment consuming surrounding sources was 21.088 µg/m³. This was 70.3% of the PSD Class II increment.

The 24-hour PM₁₀ concentration at Carlsbad Caverns (0.013 µg/m³) was below the Class I significance level. No cumulative analysis is required.

The maximum source alone annual PM₁₀ concentration was 3.306 µg/m³. The facility was modeled with surrounding sources. The maximum total annual PM₁₀ concentration with increment consuming surrounding sources was 5.247 µg/m³. This was 30.9% of the PSD Class II increment.

The annual PM₁₀ concentration at Carlsbad Caverns (0.0006 µg/m³) was below the Class I significance level. No cumulative analysis is required.

SO₂ Analysis:

The maximum source alone 1-hour SO₂ concentration was 25.712 µg/m³. The facility was modeled with surrounding sources. The maximum total 1-hour SO₂ concentration with surrounding sources was 177.111 µg/m³. This was 90.2% of the NAAQS.

Compliance with 1-hour SO₂ NAAQS automatically demonstrates compliance with 3-hour NAAQS.

The maximum source alone 3-hour SO₂ concentration was 82.954 µg/m³. The facility was modeled with surrounding sources. The maximum total 3-hour SO₂ concentration with increment consuming surrounding sources was 83.038 µg/m³. This was 16.2% of the PSD Class II increment.

The maximum source alone 3-hour SO₂ concentration at Carlsbad Caverns was 8.920 µg/m³. The facility was modeled with other sources surrounding Carlsbad Caverns. The maximum 3-hour SO₂ concentration at Carlsbad Caverns with increment consuming surrounding sources was 8.921 µg/m³. This was 35.7% of the PSD Class I increment.

Compliance with 1-hour SO₂ NAAQS automatically demonstrates compliance with 24-hour NMAAQs.

The maximum source alone 24-hour SO₂ concentration was 16.235 µg/m³. The facility was modeled with surrounding sources. The maximum total 24-hour SO₂ concentration with increment consuming surrounding sources was 16.298 µg/m³. This was 17.9% of the PSD Class II increment.

The maximum source alone 24-hour SO₂ concentration at Carlsbad Caverns was 2.040 µg/m³. The facility was modeled with other sources surrounding Carlsbad Caverns. The maximum 24-hour SO₂ concentration at Carlsbad Caverns with increment consuming surrounding sources was 2.047 µg/m³. This was 40.9% of the PSD Class I increment.

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Compliance with 1-hour SO₂ NAAQS automatically demonstrates compliance with annual NMAAQs.

The maximum source alone annual SO₂ concentration was 1.430 µg/m³. The facility was modeled with surrounding sources. The maximum total annual SO₂ concentration was 2.500 µg/m³. This was 12.5% of the PSD Class II increment.

The annual SO₂ concentration at Carlsbad Caverns (0.005 µg/m³) was below the Class I significance level. No cumulative analysis is required.

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Table 6: Modeling results

Pollutant, Time Period, and Standard	Facility Alone Concentration (µg/m³)	Concentration with Surrounding Sources (µg/m³)	Secondary Formation (µg/m³)	Background Concentration (µg/m³)	Cumulative Concentration (µg/m³)	Percent of Standard	Location		
							UTM E (m)	UTM N (m)	Elev. (ft)
CO 1-hour Significance Level	1812.471 (1 st high)	-	-	-	1812.471	90.6%	583,868	3,570,226	3,129
CO 8-hour Significance Level	303.884 (1 st high)	-	-	-	303.884	60.8%	583,868	3,570,226	3,129
H2S 1/2-hour NMAAQs	23.986 (1 st high)	40.889 (1 st high)	-	-	40.889	29.4%	581,750	3,570,750	3,121
NO ₂ 1-hour NAAQS	70.996 (8 th high)	-	-	65.800 (5ZS)	136.766	72.7%	583,791	3,570,533	3,115
NO ₂ 24-hour NMAAQs	Demonstrated by compliance with NO ₂ 1-hour NAAQS								
NO ₂ Annual NAAQS	Demonstrated by compliance with NO ₂ Annual NMAAQs								
NO ₂ Annual NMAAQs	4.600	-	-	9.300 (5ZR)	13.900	14.8%	583,791	3,570,533	3,115
NO ₂ Annual PSD Class II Increment	4.600	-	-	9.300 (5ZR)	13.900	55.6%	583,791	3,570,533	3,115
NO ₂ Annual PSD Class I Significance Level	0.003	-	-	-	0.003	3.4%	557,747	3,559,536	3,668
PM2.5 24-hour NAAQS	1.791 (8 th high)	4.426 (8 th high)	0.120	16.500 (5ZS)	21.046	60.1%	583,826	3,570,235	3,129
PM2.5 24-hour PSD Class II Increment	2.404 (2 nd high)	3.321 (2 nd high)	0.120	-	3.441	38.2%	583,826	3,570,235	3,129

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Pollutant, Time Period, and Standard	Facility Alone Concentration (µg/m ³)	Concentration with Surrounding Sources (µg/m ³)	Secondary Formation (µg/m ³)	Background Concentration (µg/m ³)	Cumulative Concentration (µg/m ³)	Percent of Standard	Location		
							UTM E (m)	UTM N (m)	Elev. (ft)
PM2.5 24-hour PSD Class I Significance Level	0.009 (1 st high)	-	0.120	-	0.129	4.3%	558,522	3,561,388	3,999
PM2.5 Annual NAAQS	0.649	2.028	0.003	7.100 (5ZS)	9.131	76.1%	583,944	3,570,534	3,114
PM2.5 Annual PSD Class II Increment	0.649	1.503	0.003	-	1.506	37.7%	583,944	3,570,534	3,114
PM2.5 Annual PSD Class I Significance Level	0.0006	-	0.003	-	0.0036	7.2%	557,747	3,559,536	3,668
PM10 24-hour NAAQS	14.537 (2 nd high)	22.380	-	37.300	59.680	39.8%	583,826	3,570,235	3,129
PM10 24-hour Class II Increment	14.537 (2 nd high)	21.088	-	-	21.088	70.3%	583,826	3,570,235	3,129
PM10 24-hour PSD Class I Significance Level	0.013 (1 st high)	-	-	-	0.013	4.3%	558,522	3,561,388	3,999
PM10 Annual PSD Class II Increment	3.306	5.247	-	-	5.247	30.9%	583,868	3,570,226	3,129
PM10 Annual PSD Class I Significance Level	0.0006	-	-	-	0.0006	0.3%	557,747	3,559,536	3,668
SO ₂ 1-hour NAAQS	25.712 (4 th high)	177.111 (4 th high)	-	-	177.111	90.2%	589,000	3,562,000	2,927
SO ₂ 3-hour NAAQS	Demonstrated by compliance with SO ₂ 1-hour NAAQS								

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							UTM E (m)	UTM N (m)	Elev. (ft)
SO ₂ 3-hour PSD Class II Increment	82.954 (2 nd high)	83.038 (2 nd high)	-		83.038	16.2%	583,800	3,570,000	3,117
SO ₂ 3-hour PSD Class I Increment	8.920 (2 nd high)	8.921 (2 nd high)	-	-	8.921	35.7%	545,184	3,557,625	4,990
SO ₂ 24-hour NMAAQs	Demonstrated by compliance with SO ₂ 1-hour NAAQS								
SO ₂ 24-hour Class II PSD Increment	16.235 (2 nd high)	16.298 (2 nd high)	-	-	16.298	17.9%	583,800	3,570,000	3,117
SO ₂ 24-hour PSD Class I Increment	2.040 (2 nd high)	2.047 (2 nd high)	-	-	2.047	40.9%	542,838	3,554,843	5,010
SO ₂ Annual NMAAQs	Demonstrated by compliance with SO ₂ 1-hour NAAQS								
SO ₂ Annual PSD Class II Increment	1.430	2.500	-	-	2.500	12.5%	583,617	3,570,533	3,116
SO ₂ Annual PSD Class I Significance Level	0.005	-	-	-	0.005	4.6%	555,395	3,558,599	3,645