

5.0 Impacts Evaluation

In accordance with 30 Texas Administrative Code (TAC) §101.21, §112.32, and paragraph (b)(8) of the NRSP, authorized emission sources must be able to demonstrate compliance with applicable NAAQS and State Property Line Standards. Table 5-1 demonstrates the high-level impacts evaluation requirements.

An impacts analysis was conducted as described in paragraph (k)(5)(iii) of the NRSP to verify that the Site is in compliance with hourly effects screening level (ESL) and annual ESL for benzene. The impacts analysis was conducted using the methodology in Table 1 of the NRSP using the applicable “G” value from the Generic Modeling Results Tables for each benzene emission source. Table 5-2 provides a summary of the benzene impacts analysis.

An impacts analysis was conducted as described in paragraph (k)(5)(iii) of the NRSP to verify that the Site is in compliance with the applicable TCEQ property line standard for H₂S. The impacts analysis was conducted using the methodology in Table 1 of the NRSP using the applicable “G” value from the Generic Modeling Results Tables for each H₂S emission source. Table 5-3 provides a summary of the H₂S impacts analysis.

Dispersion modeling impacts evaluation for nitrogen dioxide (NO₂) was conducted using SCREEN3. All sources with NO₂ emissions were evaluated to ensure compliance with the hourly and annual NAAQS for NO₂. The maximum predicted impacts are shown to be beyond the actual property line distance. Table 5-4 includes evaluation results of NO₂ impacts. See Section 8.0 for the SCREEN3 model output.

No demonstration of SO₂ is required as the permitted emission limit estimate is less than the limits provided in (k)(3)(C) of the NRSP.

Table 5-1 Impacts Exemption Evaluation

Air Contaminant	(k)(3)(C) Demonstration ^[1]			(k)(3)(A)-(B) Demonstration ^[2]			Compliance Demonstration Required?
	(k)(3)(C) Limits (lb/hr)	Project Total Emissions (lb/hr)	Emission Rates < Limit?	Applicable Distance for Compliance Demonstration:	Actual Distance (ft)	Is Actual Distance > 1 mile?	
Benzene	0.039	0.226	No	Nearest receptor	2,500	No	Yes
H ₂ S	0.025	0.061	No	Nearest Property Line	50	No	Yes
SO ₂	2	1.09	Yes	Nearest Property Line	50	No	No
NO _x	4	4.14	No	Nearest Property Line	50	No	Yes

[1] Compliance demonstration not required if permitted emissions rates are less than (k)(3)(C).

[2] Compliance demonstration not required if actual distance is greater than the specified applicable distance.

Table 5-2 Modeling Results Summary – Benzene

Benzene Impacts Assessment - Non-Rule Standard Permit Tables 2-4

Table 2: Fugitives and Process Vents - EPNs: TNK0405, TNK0404, TNK0403, TNK0402, TNK0401, TNK04421, TNK04423, TNK04425, FUG, SAMP, TNK-MSS, LOAD-MSS

Table 3: Flares and Thermal Destruction Devices - EPN: CONTL.

Table 4: Blowdowns, Purging, and Pigging Generic Modeling Results - EPN: VSSL-MSS.

EPN	Distance ft	Height ft	G Value	Effects Screening Level		Actual Emissions		Weighted Ratio		Maximum Acceptable Emissions	
				ESL _{Hourly} µg/m ³	ESL _{Annual} µg/m ³	lb/hr	tpy	WR _{HOURLY}	WR _{ANNUAL}	E _{MAX HOURLY} lb/hr	E _{MAX ANNUAL} tpy
TNK0405	2,500	60	18	170	4.5	0.02	0.03	0.07	0.19	0.64	2.65
TNK0404	2,500	60	18	170	4.5	0.02	0.03	0.07	0.19	0.64	2.65
TNK0403	2,500	60	18	170	4.5	0.02	0.03	0.07	0.19	0.64	2.66
TNK0402	2,500	60	18	170	4.5	0.02	0.03	0.07	0.19	0.64	2.66
TNK0401	2,500	60	18	170	4.5	0.02	0.02	0.09	0.15	0.83	2.01
TNK04421	2,500	11	56	170	4.5	1.68E-03	6.41E-05	0.01	4.36E-04	0.02	1.92E-03
TNK04423	2,500	11	56	170	4.5	1.68E-03	6.41E-05	0.01	4.36E-04	0.02	1.92E-03
TNK04425	2,500	11	56	170	4.5	1.68E-03	6.41E-05	0.01	4.36E-04	0.02	1.92E-03
FUG	2,500	3	64	170	4.5	1.89E-03	0.01	0.01	0.06	0.02	0.22
SAMP	2,500	2.5	64	170	4.5	4.68E-04	2.26E-05	1.86E-03	1.54E-04	4.94E-03	5.93E-04
TNK-MSS	2,500	60	18	170	4.5	0.03	1.84E-04	0.10	1.25E-03	0.96	0.02
CONTL	2,500	13	22	170	4.5	0.11	2.11E-03	0.44	0.01	3.36	0.16
LOAD-MSS	2,500	10	82	170	4.5	1.98E-05	9.25E-08	7.88E-05	6.29E-07	1.63E-04	1.89E-06
VSSL-MSS	2,500	2.5	84	170	4.5	0.02	5.00E-04	0.07	3.40E-03	0.15	0.01
Total						0.25	0.15	1.00	1.00	7.95	13.05

Table 5-3 Modeling Results Summary – H₂S

H₂S Impacts Assessment - Non-Rule Standard Permit Tables 2-4

Table 2: Fugitives and Process Vents - EPNs: TNK0405, TNK0404, TNK0403, TNK0402, TNK0401, TNK04421, TNK04423, TNK04425, FUG, SAMP, TNK-MSS, LOAD-MSS

Table 3: Flares and Thermal Destruction Devices - EPN: CONTL.

Table 4: Blowdowns, Purging, and Pigging Generic Modeling Results - EPN: VSSL-MSS.

EPN	Distance ft	Height ft	G Value	Property Line Standard µg/m ³	Actual Emissions lb/hr	Weighted Ratio WR _{HOURLY}	Maximum Acceptable Emissions E _{MAX HOURLY} lb/hr
TNK0405	2,500	60	18	108	1.16E-03	0.02	0.10
TNK0404	2,500	60	18	108	1.16E-03	0.02	0.10
TNK0403	2,500	60	18	108	1.22E-03	0.02	0.10
TNK0402	2,500	60	18	108	1.22E-03	0.02	0.10
TNK0401	2,500	60	18	108	9.91E-04	0.01	0.08
TNK04421	2,500	11	56	108	1.87E-03	0.03	0.05
TNK04423	2,500	11	56	108	1.87E-03	0.03	0.05
TNK04425	2,500	11	56	108	1.87E-03	0.03	0.05
FUG	2,500	3	64	108	4.54E-06	6.23E-05	1.05E-04
SAMP	2,500	2.5	64	108	5.46E-04	0.01	0.01
TNK-MSS	2,500	60	18	108	0.03	0.39	2.34
CONTL	2,500	13	22	108	0.01	0.16	0.78
LOAD-MSS	2,500	10	82	108	2.20E-05	3.03E-04	3.98E-04
VSSL-MSS	2,500	2.5	84	108	0.02	0.29	0.37
Total					0.07	1.00	4.12

Table 5-4 Screen3 Modeling Results Summary – NO₂

SCREEN3 Modeling Inputs

EPN	NO ₂ Emission Rate ^[1] (lb/hr)	Unit Emission Rate (lb/hr)	Stack Height (ft)	Stack Diameter (ft)	Exit Velocity (fps)	Exit Temperature (deg F)
CONTL	4.14	1.00	13.00	3.57	13.80	1130

[1] NO_x assumed to be 100% NO₂.

SCREEN3 Modeling Outputs

EPN	Distance to Maximum (m)	Predicted Concentration at Unit Emission Rate (µg/m ³)	Predicted Maximum 1-hr Concentration ^[1] (µg/m ³)	Predicted Annual Average Concentration ^[2] (µg/m ³)
CONTL	91	21.33	88.31	7.06
Project Impact (ug/m³)			88.31	7.06
NO₂ SIL (ug/m³) ^[3]			7.5	1
Background (ug/m³) ^{[4][5]}			70	20
Total Impacts (ug/m³)			158.31	27.06
Applicable NAAQS Standard (ug/m³) ^[3]			188	100
Pass?			Yes	Yes

[1] Emission rate in lb/hr multiplied by SCREEN3 predicted concentration at unit emission rate (1 lb/hr) to determine predicted maximum concentration.

[2] Adjustment factors from Section 4.2 of the USEPA Screening Procedures for Estimating the Air Quality Impact of Stationary Sources Revised (dated October 1992) are used to convert the maximum predicted 1-hr concentrations from SCREEN3 to other averaging periods, as follows: 1-hr to 3-hr factor = 0.9; 1-hr to 8-hr factor = 0.7; 1-hr to 24-hr = 0.4; 1-hr to annual = 0.08.

[3] From Appendix B of TCEQ Air Quality Modeling Guidelines (APDG 6232), dated November 2019

[4] 1-hr background concentration from Interim Screening Background Concentrations (dated July, 22, 2010), Region 13.

[5] Annual background concentration from Screening Background Concentrations Memo from Air Dispersion Modeling Team to NSRPD Technical Staff (dated September 4, 1998)

8.0 Supplemental Attachments

The following information is included in this section:

1. SCREEN3 Model Results

01/24/22
17:19:16

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

CONTL

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	0.126000
STACK HEIGHT (M)	=	3.9624
STK INSIDE DIAM (M)	=	1.0881
STK EXIT VELOCITY (M/S)	=	4.2066
STK GAS EXIT TEMP (K)	=	883.1500
AMBIENT AIR TEMP (K)	=	293.1500
RECEPTOR HEIGHT (M)	=	0.0000
URBAN/RURAL OPTION	=	RURAL
BUILDING HEIGHT (M)	=	0.0000
MIN HORIZ BLDG DIM (M)	=	0.0000
MAX HORIZ BLDG DIM (M)	=	0.0000

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

BOUY. FLUX = 8.157 M**4/S**3; MOM. FLUX = 1.739 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
1.	0.000	1	1.0	1.0	320.0	107.37	1.01	0.94	NO
100.	21.07	4	20.0	20.0	6400.0	6.33	8.26	4.76	NO
200.	12.56	4	15.0	15.0	4800.0	8.20	15.69	8.72	NO
300.	8.909	4	10.0	10.0	3200.0	11.95	22.80	12.45	NO
400.	6.911	4	8.0	8.0	2560.0	14.77	29.68	15.71	NO
500.	5.497	4	5.0	5.0	1600.0	23.21	36.63	19.23	NO
600.	4.847	4	5.0	5.0	1600.0	23.21	43.12	22.02	NO
700.	4.232	4	4.5	4.5	1440.0	25.71	49.62	24.92	NO
800.	3.756	4	4.0	4.0	1280.0	28.84	56.06	27.78	NO
900.	3.375	4	4.0	4.0	1280.0	28.84	62.32	30.38	NO
1000.	3.081	4	3.5	3.5	1120.0	32.86	68.65	33.18	NO
1100.	2.816	4	3.5	3.5	1120.0	32.86	74.79	35.15	NO

1200.	2.617	4	3.0	3.0	960.0	38.22	81.04	37.41	NO
1300.	2.435	4	3.0	3.0	960.0	38.22	87.08	39.26	NO
1400.	2.350	5	1.0	1.0	10000.0	63.80	71.29	31.74	NO
1500.	2.426	5	1.0	1.0	10000.0	63.80	75.65	32.75	NO
1600.	2.487	5	1.0	1.0	10000.0	63.80	80.00	33.74	NO
1700.	2.533	5	1.0	1.0	10000.0	63.80	84.33	34.73	NO
1800.	2.602	6	1.5	1.5	10000.0	47.34	59.18	23.73	NO
1900.	2.685	6	1.0	1.0	10000.0	53.62	62.41	25.29	NO
2000.	2.772	6	1.0	1.0	10000.0	53.62	65.24	25.87	NO
2100.	2.823	6	1.0	1.0	10000.0	53.62	68.05	26.36	NO
2200.	2.866	6	1.0	1.0	10000.0	53.62	70.86	26.84	NO
2300.	2.902	6	1.0	1.0	10000.0	53.62	73.66	27.31	NO
2400.	2.933	6	1.0	1.0	10000.0	53.62	76.45	27.78	NO
2500.	2.957	6	1.0	1.0	10000.0	53.62	79.23	28.25	NO
2600.	2.976	6	1.0	1.0	10000.0	53.62	82.00	28.70	NO
2700.	2.991	6	1.0	1.0	10000.0	53.62	84.77	29.16	NO
2800.	3.001	6	1.0	1.0	10000.0	53.62	87.52	29.60	NO
2900.	3.008	6	1.0	1.0	10000.0	53.62	90.27	30.04	NO
3000.	3.011	6	1.0	1.0	10000.0	53.62	93.01	30.48	NO
3500.	2.931	6	1.0	1.0	10000.0	53.62	106.60	32.27	NO
4000.	2.827	6	1.0	1.0	10000.0	53.62	120.01	33.94	NO
4500.	2.712	6	1.0	1.0	10000.0	53.62	133.26	35.53	NO
5000.	2.594	6	1.0	1.0	10000.0	53.62	146.36	37.03	NO
5500.	2.477	6	1.0	1.0	10000.0	53.62	159.32	38.47	NO
6000.	2.364	6	1.0	1.0	10000.0	53.62	172.16	39.84	NO
6500.	2.256	6	1.0	1.0	10000.0	53.62	184.89	41.17	NO
7000.	2.154	6	1.0	1.0	10000.0	53.62	197.50	42.44	NO
7500.	2.055	6	1.0	1.0	10000.0	53.62	210.02	43.54	NO
8000.	1.962	6	1.0	1.0	10000.0	53.62	222.44	44.60	NO
8500.	1.877	6	1.0	1.0	10000.0	53.62	234.77	45.62	NO
9000.	1.797	6	1.0	1.0	10000.0	53.62	247.02	46.61	NO
9500.	1.723	6	1.0	1.0	10000.0	53.62	259.18	47.57	NO
10000.	1.654	6	1.0	1.0	10000.0	53.62	271.27	48.51	NO
15000.	1.164	6	1.0	1.0	10000.0	53.62	388.69	56.69	NO
20000.	0.8883	6	1.0	1.0	10000.0	53.62	501.15	61.94	NO
25000.	0.7148	6	1.0	1.0	10000.0	53.62	609.92	66.39	NO
30000.	0.5960	6	1.0	1.0	10000.0	53.62	715.73	70.28	NO
40000.	0.4476	6	1.0	1.0	10000.0	53.62	920.33	75.83	NO
50000.	0.3572	6	1.0	1.0	10000.0	53.62	1117.51	80.45	NO

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

91.	21.33	4	20.0	20.0	6400.0	6.33	7.65	4.43	NO
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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

*** SUMMARY OF SCREEN MODEL RESULTS ***

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
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SIMPLE TERRAIN	21.33	91.	0.