

**Big Tree 2 TB
Impacts Evaluation**

Initial Screening

Air Contaminants	Screening Emission Rate (lb/hr)	Total Emission Rate (lb/hr)	Further Demonstration Required?	Nearest receptor (miles)	Nearest receptor (ft)	Screening Distance (miles)	Further Demonstration Required?
Benzene	0.039	0.34	Yes	1.00	>5280	1.00	No
Hydrogen Sulfide	0.03	0.02	No	N/A	N/A	N/A	N/A
Sulfur Dioxide	2.0	0.70	No	N/A	N/A	N/A	N/A
Nitrogen Oxide	4.0	17.98	Yes	N/A	N/A	N/A	N/A

Screen3 Demonstration: Nitrogen Oxide

EPN	Unit Description	Source Type	Emission Rate (g/s)	Height of Release Point (m)	Stack Diameter (m)	Exit Velocity (m/s)	Stack Temp (K)	Ambient Temp (K)	Max Predicted Hourly NO _x Conc (µg/m3)	NO2/NO _x Ratio	Max Predicted Hourly NO ₂ Conc (µg/m3)	Max Predicted Annual NO ₂ Conc (µg/m3)
FLARE-1	Flare	Point	2.228	18.29	2.641	20.00	1273.0	308	2.541	0.80	2.03	0.16
HTR-1	Separator Heater	Point	0.019	6.10	0.457	3.93	533.2	308	6.290	0.80	5.03	0.40
HTR-2	Separator Heater	Point	0.019	6.10	0.457	3.93	533.2	308	6.290	0.80	5.03	0.40

Flare Diameter Calculation

Average MW weight	21.53 lb/lb-mol
Gross Heat Release	128.1 MMBtu/hr
Gross Heat Release	8,972,814 Cal/s
Net Heat Release	6,974,528 Cal/s
Effective Diameter	2.64 meters

Background Concentration (µg/m3)	70.0	20.0
Maximum Predicted NO ₂ Concentration (µg/m3)	82.1	21.0
NAAQS Standard (µg/m3)	188.0	100.0
Is Max Predicted Concentration Less than NAAQS Standard?	Yes	Yes

09:28:36

*** VERSION DATED 13043 ***

SIMPLE TERRAIN INPUTS:

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

*** FULL METEOROLOGY ***

*** 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	-----	-----	----	-----	-----	-----	-----	-----	-----
NO	1.	0.000	1	1.0	1.0	1060.9	1059.87	4.20	4.18
NO	100.	0.1282	6	1.0	1.4	10000.0	161.44	41.10	40.97
NO	200.	0.1387	5	1.0	1.2	10000.0	197.88	52.61	51.69
NO	300.	0.1482	5	1.0	1.2	10000.0	197.88	54.02	52.04
NO	400.	0.1586	5	1.0	1.2	10000.0	197.88	55.83	52.44

NO	500.	0.2429	4	20.0	21.9	6400.0	64.81	37.11	20.13
NO	600.	0.8446	1	3.0	3.1	960.0	365.48	148.48	167.59
NO	700.	1.599	1	3.0	3.1	960.0	365.48	169.08	225.61
NO	800.	1.881	1	3.0	3.1	960.0	365.48	189.26	294.17
NO	900.	2.056	4	20.0	21.9	6400.0	64.81	63.12	31.97
NO	1000.	2.357	4	20.0	21.9	6400.0	64.81	69.42	34.74
NO	1100.	2.488	4	20.0	21.9	6400.0	64.81	75.65	36.95
NO	1200.	2.530	4	20.0	21.9	6400.0	64.81	81.68	38.78
NO	1300.	2.541	4	20.0	21.9	6400.0	64.81	87.67	40.56
NO	1400.	2.529	4	20.0	21.9	6400.0	64.81	93.63	42.31
NO	1500.	2.500	4	20.0	21.9	6400.0	64.81	99.56	44.02
NO	1600.	2.458	4	20.0	21.9	6400.0	64.81	105.45	45.69
NO	1700.	2.408	4	20.0	21.9	6400.0	64.81	111.31	47.34
NO	1800.	2.351	4	20.0	21.9	6400.0	64.81	117.15	48.96
NO	1900.	2.291	4	20.0	21.9	6400.0	64.81	122.95	50.55
NO	2000.	2.228	4	20.0	21.9	6400.0	64.81	128.73	52.12
NO	2100.	2.164	4	20.0	21.9	6400.0	64.81	134.48	53.66
NO	2200.	2.100	4	20.0	21.9	6400.0	64.81	140.20	55.18
NO	2300.	2.037	4	20.0	21.9	6400.0	64.81	145.90	56.68
NO	2400.	1.974	4	20.0	21.9	6400.0	64.81	151.58	58.15
NO	2500.	1.913	4	20.0	21.9	6400.0	64.81	157.23	59.61
NO	2600.	1.854	4	20.0	21.9	6400.0	64.81	162.86	61.05
NO	2700.	1.797	4	20.0	21.9	6400.0	64.81	168.47	62.47
NO	2800.	1.741	4	20.0	21.9	6400.0	64.81	174.06	63.88
NO	2900.	1.687	4	20.0	21.9	6400.0	64.81	179.63	65.27
NO	3000.	1.636	4	20.0	21.9	6400.0	64.81	185.18	66.64
NO	3500.	1.461	4	15.0	16.4	4800.0	82.96	213.03	73.94

	4000.	1.313	4	15.0	16.4	4800.0	82.96	240.05	79.76
NO									
	4500.	1.213	2	1.5	1.6	713.7	712.67	617.56	602.78
NO									
	5000.	1.265	5	3.0	3.7	10000.0	142.81	221.73	66.10
NO									

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:
 1293. 2.541 4 20.0 21.9 6400.0 64.81 87.19 40.42
 NO

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, $X < 3 \cdot LB$

 *** 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	2.541	1293.	0.

 ** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **

15:16:40

HTR-1

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	0.190000E-01
STACK HEIGHT (M)	=	6.1000
STK INSIDE DIAM (M)	=	0.4570
STK EXIT VELOCITY (M/S)	=	3.9300
STK GAS EXIT TEMP (K)	=	533.2000
AMBIENT AIR TEMP (K)	=	308.0000
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

BUOY. FLUX = 0.850 M**4/S**3; MOM. FLUX = 0.466 M**4/S**2.

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*** SCREEN AUTOMATED DISTANCES ***
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	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	-----	-----	----	-----	-----	-----	-----	-----	-----
NO	1.	0.000	1	1.0	1.0	320.0	25.06	0.62	0.49
NO	100.	6.232	3	4.0	4.0	1280.0	10.37	12.54	7.56
NO	200.	5.541	4	3.5	3.5	1120.0	11.17	15.64	8.64
NO	300.	4.861	4	2.0	2.0	640.0	15.58	22.77	12.39
NO	400.	4.243	4	1.5	1.5	480.0	18.74	29.67	15.69

NO	500.	3.660	4	1.0	1.0	320.0	25.06	36.55	19.08
NO	600.	3.331	4	1.0	1.0	320.0	25.06	43.06	21.89
NO	700.	2.957	4	1.0	1.0	320.0	25.06	49.49	24.64
NO	800.	2.603	4	1.0	1.0	320.0	25.06	55.84	27.32
NO	900.	2.290	4	1.0	1.0	320.0	25.06	62.12	29.96
NO	1000.	2.021	4	1.0	1.0	320.0	25.06	68.34	32.55
NO	1100.	1.845	6	1.0	1.0	10000.0	29.85	37.58	16.30
NO	1200.	1.890	6	1.0	1.0	10000.0	29.85	40.59	17.07
NO	1300.	1.913	6	1.0	1.0	10000.0	29.85	43.57	17.81
NO	1400.	1.918	6	1.0	1.0	10000.0	29.85	46.54	18.55
NO	1500.	1.909	6	1.0	1.0	10000.0	29.85	49.50	19.27
NO	1600.	1.889	6	1.0	1.0	10000.0	29.85	52.44	19.97
NO	1700.	1.862	6	1.0	1.0	10000.0	29.85	55.36	20.66
NO	1800.	1.828	6	1.0	1.0	10000.0	29.85	58.26	21.34
NO	1900.	1.791	6	1.0	1.0	10000.0	29.85	61.16	22.01
NO	2000.	1.750	6	1.0	1.0	10000.0	29.85	64.04	22.67
NO	2100.	1.704	6	1.0	1.0	10000.0	29.85	66.90	23.22
NO	2200.	1.658	6	1.0	1.0	10000.0	29.85	69.75	23.77
NO	2300.	1.612	6	1.0	1.0	10000.0	29.85	72.60	24.31
NO	2400.	1.568	6	1.0	1.0	10000.0	29.85	75.42	24.83
NO	2500.	1.524	6	1.0	1.0	10000.0	29.85	78.24	25.35
NO	2600.	1.482	6	1.0	1.0	10000.0	29.85	81.05	25.86
NO	2700.	1.441	6	1.0	1.0	10000.0	29.85	83.85	26.36
NO	2800.	1.401	6	1.0	1.0	10000.0	29.85	86.63	26.85
NO	2900.	1.363	6	1.0	1.0	10000.0	29.85	89.41	27.34
NO	3000.	1.326	6	1.0	1.0	10000.0	29.85	92.17	27.82
NO	3500.	1.161	6	1.0	1.0	10000.0	29.85	105.87	29.76

	4000.	1.026	6	1.0	1.0	10000.0	29.85	119.36	31.57
NO									
	4500.	0.9160	6	1.0	1.0	10000.0	29.85	132.68	33.27
NO									
	5000.	0.8244	6	1.0	1.0	10000.0	29.85	145.83	34.87
NO									

	MAXIMUM 1-HR CONCENTRATION AT OR BEYOND						1. M:		
	85.	6.290	3	5.0	5.0	1600.0	9.24	10.89	6.57
NO									

DWASH= MEANS NO CALC MADE (CONC = 0.0)
 DWASH=NO MEANS NO BUILDING DOWNWASH USED
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 DWASH=NA MEANS DOWNWASH NOT APPLICABLE, $X < 3 \cdot LB$

 *** 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	6.290	85.	0.

 ** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
