June 5, 2006
[MERGEFIELD Modeler]

Air Quality Dispersion Modeling Summary for Permit No.0733M11 [MERGEFIELD PermitNo]

Project: Sterigenics US, Santa Tresa Plant
Section:----, T29, R3, [MERGEFIELD County] County: Dona Ana
UTM Coordinates: 340260 m East, 3526226 m North, zone [MERGEFIELD Zone]
Elevation = 4096 feet

Brief: Sterigenics US desires that the New Mexico Air Quality Bureau issue air quality permit [MERGEFIELD PermitNo] for its Santa Teresa facility located in Dona Ana County, New Mexico. Sterigenics is requesting to modify emission limits for to natural gas boilers. The facility currently operates four combustion devices, including the natural gas fueled three boilers and a catalytic oxidizer. The facility performs ethylene oxide and propylene oxide sterilization services for medical devices and food products.

[MERGEFIELD ProjectInfo]

Modeling Assumptions: Only NOx and CO emissions were modeled. Emissions were modeled for 24 hours a day, 8760 hours a year.

Permit conditions: Facility may operate all year long at daily and weekly schedule.

Conclusion: This modeling analysis demonstrates that normal operation of the facility described in this report neither causes nor significantly contributes to any exceedances of applicable air quality standards. The standards relevant at this facility are NAAQS and NMAAQS for CO and NO2 and Class II PSD increments for NO_2.

Action: The permit can be issued based on this modeling analysis.
Modeling report submitted by AQMS, LLC [MERGEFIELD ModelContractor] (dated 5/15/06)
[IF MERGEFIELD Revised > 0 "Revised modeling received " ""][MERGEFIELD Revised]
The air quality analysis demonstrates compliance with applicable regulatory requirements.

Model(s) Used: Prime ISCST3 was used to run the modeling analysis.
Note: complete modeling input and output files can be made available and are located on the computer Fates in the directory Modeling Archives\0733M11_Sterigenics_Santa Teresa in subdirectory Sufis Files*[MERGEFIELD SitePath]* and Cons Files.

Number of Model Runs: Prime ISCST3- Four modeling runs were performed by NMED.

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Table 1: Table of Emissions and Stack Parameters[1]:

Stack Number	Description	UTMH (m)	UTMV (m)	Elevation (m)	Stack Height (m)	Diameter (m)	Velocity (m/s)	Temperature (K)	NO_2 Rate (g/s)	NO_2 Rate (lbs/hr)	CO Rate (g/s)	CO Rate (lbs/hr)
B1	Boiler	340232	3526251	1248.35	8.53	0.31	2.11	355	0.0171	0.1357	0.1698	0.1698
B2	Boiler	340230	3526252	1248.35	8.53	0.31	4.22	355	0.0342	0.2714	0.3389	0.3389
B3	Boiler	340228	3526253	1248.35	8.53	0.31	8.41	355	0.0680	0.5397	0.6746	0.6746
CD3	Catalytic Oxidizer	340260	3526226	1248.35	20.42	0.71	33.25	355	0.0465	0.3690	0.3103	0.3103

[1] All values copied or converted from Sterigenics –*Santa Teresa Facility Modeling files*.

Modeling Parameters: The following ISCST3 regulatory default parameters were included in assumptions made by the model: Default wind profile exponents were used. Default vertical potential temperature gradients were used. Final plume rise was assumed. Because of the close proximity of the stacks to the building, prime downwash algorithm was used to incorporate building downwash affect at the facility into the modeling analysis.

Complex Terrain Data: Simple and complex terrain was considered to model the facility.

Receptor Grid: A Cartesian grid with variable receptor spacing was used to evaluate impacts around the station. The grid contained receptors with 50-meter spacing out to 500 meters, 100 meter spacing from 500 meters out to 2000 meters, 250 meter spacing from 2000 meters out to 4000 meters, 500 meter spacing from 4000 meters out to 6000. Fenceline receptors were not used because there is no physical barrier around the facility. Receptors outside of the radii of impact were discarded for the surrounding source runs.

Meteorological Data: ISCST3 -- One (1) year Santa Teresa 1997

Adjacent Sources: The Division's Modeling Guidance was used to select 149 NO2 sources within 65 km of the facility. For increment consumption modeling, 73 adjacent NO2 PSD increment-consuming sources within 65 kilometers were modeled. The entire lists of sources can be made available and can be found on the computer Fates at the location *[MERGEFIELD SitePath]*under the directory Modeling Archives\\0733M11_Sterigenics_Santa Teresa in subdirectory Sufis Files.

Modeling Procedures: NO2 and CO emissions were modeled using EPA's Prime ISCST3 model and meteorological data collected from the Santa Teresa station during 1997. Facility was modeled as operting all year . The analysis demonstrates cumulative impacts from the operation of the facility will not exceed applicable federal and state standards.

Results Discussion: Facility was modeled for 24 hours per day, 8760 hours per year operating hours. The analysis demonstrates cumulative impacts from the operation of the facility will not exceed applicable federal and state standards.
Results are detailed in Table 2.

CO and NO_2 Standards...

1-hr and 8-hr CO standards…
CO concentrations produced by the facility were demonstrated to be below 1-hour and 8-hour CO significance levels as detailed in table 2.

Annual and 24-hr NO_2 NAAQS and NMAAQS…

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Compliance with the annual NO_2 NAAQS and annual and 24-hour NMAAQS has been demonstrated as detailed in table 2.

Annual NO_2 PSD Class II increment…
The facility is located in Air Quality Control Region (AQCR) 153 where minor source baseline date has been triggered for NO2. The facility does not cause any exceedance for PSD Class II area increment consumption.

NO_2 PSD Class I increment…
The nearest PSD Class I area is Guadalupe Mountains National Park which is located 157 km from the facility. The facility has insignificant impact at this distance.

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Table 2: Ambient Impact from Emissions

Pollutant	Contributing Sources	Averaging Period	Concentration (μg/m³)	Concentration (ppm)	Receptor Elevation (ft)	UTMH (m)	UTMV (m)	Distance from nearby source (m)	Radius of Impact (m)	Applicable Standard	Value of Standard	Units of Standard	Percent of Standard	Limit
NO2	All	24-hour	62.92[δ]	0.0384	4108	339950	3526250	311	311	NMAAQS	0.1	ppm	38	40%
NO2	Alone	24-hour	17.15[δ]	0.0105	4104	340188	3526252	77	311	NMAAQS	0.1	ppm	10	40%
NO2	Surrounding Sources	24-hour	59.85[δ]	0.0365	4108	339950	3526250	311	311	NMAAQS	0.1	ppm	37	40%
NO2	All	annual	23.94[ϕ]	0.0146	4108	339950	3526250	311	311	NMAAQS	0.05	ppm	29	75%
NO2	PSD	annual	22.96[ϕ]	0.0140	4108	339950	3526250	311	311	PSD Class II	25	ug/m3	92	75%
NO2	Surrounding Sources	annual	22.86[ϕ]	0.0139	4108	339950	3526250	311	311	NMAAQS	0.05	ppm	28	75%
CO	Alone	1-hour	326.03	0.3267	4098	340340	3526162	102	0	Significance	2000	ug/m3	16	None
CO	Alone	8-hour	117.01	0.1173	4101	340300	3526150	86	0	Significance	500	ug/m3	23	None

[ϕ] 75% annual conversion of NO_X to NO_2 was assumed.

[δ] NMED's 40% 24-hour conversion of NO_X to NO_2 applied to calculate concentration.

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