**Report Date:** 11/14/2018
**NMED/AQB Modeler:** Eric Peters

**Facility Identification:**
Project: Hobbs Generating Station    Company: Lea Power Partners, LLC
Permit number: 3449M5    TEMPO ID: 25726

**Location Information:**
The facility is located 7.4 miles north-northwest of Monument, in Lea County. The facility is located 8.7 miles west of Hobbs.
UTM Coordinates: 658,413 m East, 3,622,425 m North, zone 13, Datum: NAD83
Elevation = 3716 feet
Air Quality Control Region (AQCR): 155
Airshed: Tg

**Project Description:**
**Brief:** Lea Power Partners, LLC has applied to the New Mexico Air Quality Bureau for a New Source Review air quality permit for the modification of the Hobbs Generating Station (the facility). The facility is a power plant. The purpose of the modification is to increase the efficiency of the turbines by replacing inlet guide vanes and the first six stages of the compressor. The following types of emission sources are included in the project: Combustion Turbine and Duct Burner. The emission units are described in Table 1: Table of Emissions and Stack Parameters, below.

Pre-construction monitoring is waived because the facility is close to Hobbs monitors. For this permit, modeling was required for the following pollutants: Nitrogen Dioxide (NO2), ozone (O3), Particulate Matter (2.5 microns or less) (PM2.5), and Sulfur Dioxide (SO2).

**Table 1: Table of Total Facility Emissions**1

|  |  |  |
| --- | --- | --- |
| NO2 Rate (lbs/hr) | SO2 Rate (lbs/hr) | PM2.5 Rate (lbs/hr) |
| 10.936 | 10.045 | 4.178 |

**Table 2: Table of Point Sources**1

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Stack Number | Description | Stack Height (ft) | Diameter (ft) | Velocity (ft/s) | Temperature (°F) | NO2 Rate (lbs/hr) | SO2 Rate (lbs/hr) | PM2.5 Rate (lbs/hr) |
| HOBB1DB1 | Combustion Turbine and Duct Burner 1 | 165.0 | 18.0 | 80.3 | 179 | 5.468 | 5.023 | 2.089 |
| HOBB2DB2 | Combustion Turbine and Duct Burner 2 | 165.0 | 18.0 | 80.3 | 179 | 5.468 | 5.023 | 2.089 |

1 Emission rates are based on increases in emissions from the project.
**Modeling Assumptions:** The facility operates continuously.

**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 NO2, PM2.5, and SO2; NMAAQS for NO2, and SO2; and Class I and Class II PSD increments for NO2, and SO2.

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

Modeling report submitted by Alliant Environmental, LLC (dated 7/20/2018). Revised modeling was submitted 11/9/2018.
The air quality analysis demonstrates compliance with applicable regulatory requirements.

Model(s) Used: AERMOD 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, "3449M5\_Lea Power Partners, LLC\_Hobbs Generating Station".

**Number of Model Runs:** AERMOD - 35 modeling runs were reviewed by NMED.

**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 3: Table of Buildings**

| Building Name | Height (m) | Diagonal Length (m) |
| --- | --- | --- |
| ADMIN | 6.1 | 41.3 |
| AI\_01 | 4.6 | 19.0 |
| AI\_02 | 4.6 | 18.6 |
| AUX | 15.2 | 23.0 |
| CHILLER1 | 15.2 | 22.0 |
| CHILLER2 | 15.2 | 22.0 |
| CHILLER3 | 15.2 | 22.0 |
| CONTROL | 6.1 | 30.9 |
| FHBLDG | 3.7 | 14.5 |
| HRSGA1 | 25.8 | 32.5 |
| HRSGA2 | 25.8 | 15.6 |
| HRSGB1 | 25.8 | 32.4 |
| HRSGB2 | 25.8 | 15.4 |
| MakeUpW | 6.1 | 28.9 |
| SHOPBLDG | 15.2 | 42.5 |
| STEAM | 17.7 | 75.4 |
| TK\_01 | 10.7 | 12.2 |
| TK\_02 | 10.7 | 12.2 |
| TK\_03 | 10.7 | 26.8 |
| TK\_04 | 10.7 | 19.2 |
| TK\_05 | 10.7 | 34.0 |

**Complex Terrain Data:**
Both simple and complex types of terrain were used to model the facility. Elevations of receptors, facility sources, and surrounding sources were obtained from digitized USGS 7.5-minute maps and one-degree maps.

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

**Table 4: Table of Receptors**

| Grid Type | Description | Shape | Spacing | Length |
| --- | --- | --- | --- | --- |
| Cartesian | Rough | Square | 1000 meters | 22 kilometers |
| Cartesian | Intermediate | Square | 500 meters | 11.5 kilometers |
| Cartesian | Intermediate | Square | 250 meters | 6 kilometers |
| Cartesian | Fine | Square | 100 meters | 2.7 kilometers |
| Fence line | Very fine | Fence line | 50 meters | Fence line |

**Meteorological Data:** AERMOD – Hobbs with Artesia NWS to substitute for missing data and Midland, TX upper air. Three years, 2013 to 2015.

**Adjacent Sources:** Adjacent sources were not included in modeling because impacts from the project were below significance levels for all applicable air quality standards.

**Modeling Procedures:** Secondary PM2.5 analysis was conducted using the methods in the draft Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and PM2.5 under the PSD Permitting Program. Results predict PM2.5 concentrations well below significance levels. Results are described in the PM2.5 section, below. See "NOx and SO2 Precursor Assessment for Additive Secondary PM2.5 Impacts Along with Direct PM2.5" in the application for more details.

**PSD Increment Information:**
The facility is a PSD major source located in AQCR 155. The major source baseline dates here are 2/8/1988 for NO2, 1/6/1975 for SO2, 1/6/1975 for PM10, and 10/20/2010 for PM2.5.
The minor source baseline dates here are 3/16/1988 for NO2, 7/28/1978 for SO2, 2/20/1979 for PM10, and 11/13/2013 for PM2.5.

The facility is 116.3 km from the Class I area Carlsbad Caverns National Park. The facility is 135.8 km from the Class I area Salt Creek. The facility is 157.1 km from the Class I area Guadalupe Mountains National Park. The facility is 234.4 km from the Class I area White Mountain Wilderness Area. Class I area impacts are expected to be small for PSD major sources over 100 km from a Class I area. Modeling may not be required unless requested by Federal Land Managers.

**Results Discussion:**

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

The annual NO2 concentration was below the significance level. No cumulative analysis is required. The maximum source alone annual NO2 concentration was 0.072 µg/m3, which occurred 582 m north from the center of the facility. This was 0.1% of the NMAAQS.

The annual NO2 concentration was below the significance level. No cumulative analysis is required.

**O3 Analysis**:
O3 analysis was based on MERP guidance, EPA-454/R-16-006, December 2016. The 8-hour O3 concentration was below the significance level. No cumulative analysis is required. The maximum source alone 8-hour O3 concentration was 0.466 µg/m3. This was 0.3% of the NAAQS.

**PM2.5 Analysis**:
The 24-hour PM2.5 concentration was below the significance level. No cumulative analysis is required. The total primary plus secondary PM2.5 impact from the project was 0.366 µg/m3, which occurred 605 m north-northeast from the center of the facility. This was 1.0% of the NAAQS.

The annual PM2.5 concentration was below the significance level. No cumulative analysis is required. The maximum total primary plus secondary PM2.5 impact from the project was 0.209 µg/m3, which occurred 582 m north from the center of the facility. This was 1.7% of the NAAQS.

**SO2 Analysis**:
Compliance with 1-hour SO2 NAAQS automatically demonstrates compliance with air quality standards of other periods. The 1-hour SO2 concentration was below the significance level. No cumulative analysis is required. The maximum source alone 1-hour SO2 concentration was 0.558 µg/m3, which occurred 740 m east-northeast from the center of the facility. This was 0.3% of the NAAQS.

The 3-hour SO2 concentration was below the significance level. No cumulative analysis is required. The maximum source alone 3-hour SO2 concentration was 0.292 µg/m3, which occurred 740 m east-northeast from the center of the facility. This was 0.0% of the NAAQS.

The 24-hour SO2 concentration was below the significance level. No cumulative analysis is required. The maximum source alone 24-hour SO2 concentration was 0.405 µg/m3, which occurred 605 m north-northeast from the center of the facility. This was 0.2% of the NMAAQS.

The annual SO2 concentration was below the significance level. No cumulative analysis is required. The maximum source alone annual SO2 concentration was 0.073 µg/m3, which occurred 582 m north from the center of the facility. This was 0.1% of the NMAAQS.

**Table 5: Table of Ambient Impact from Emissions**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pollutant | Period | Facility Concentration (µg/m3) | Modeled Concentration (µg/m3) | Modeled Concentration (PPM) | Cumulative Concentration | Standard | Value of Standard | Units of Standard and Total | Percent of Standard |
| NO2 | annual | 0.072 | 0.072 | 0.0000 | 0.072 | NMAAQS | 94.02 | µg/m3 | 0.1 |
| O3 | 8-hour | 0.466 | 0.466 | 0.0002 | 0.466 | NAAQS | 137.3 | µg/m3 | 0.3 |
| PM2.5 | 24-hour | 0.366 | 0.366 | N/A | 0.366 | NAAQS | 35 | µg/m3 | 1.0 |
| PM2.5 | annual | 0.209 | 0.209 | N/A | 0.209 | NAAQS | 12 | µg/m3 | 1.7 |
| SO2 | 1-hour | 0.558 | 0.558 | 0.0002 | 0.558 | NAAQS | 196.4 | µg/m3 | 0.3 |
| SO2 | 3-hour | 0.292 | 0.292 | 0.0001 | 0.292 | NAAQS | 1309.3 | µg/m3 | 0.0 |
| SO2 | 24-hour |  | 0.405 | 0.0002 | 0.405 | NMAAQS | 261.9 | µg/m3 | 0.2 |
| SO2 | annual | 0.073 | 0.073 | 0.0000 | 0.073 | NMAAQS | 52.4 | µg/m3 | 0.1 |

**Table 6: Table of Location of Maximum Concentrations**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Pollutant | Period | UTM East (m) | UTM North (m) | Elevation (ft) | Distance (m) | ROI (m) |
| NO2 | annual | 658,500.0 | 3,623,000.0 | 3761 | 582 | 0 |
| PM2.5 | 24-hour | 658,600.0 | 3,623,000.0 | 3760 | 605 | 0 |
| PM2.5 | annual | 658,500.0 | 3,623,000.0 | 3761 | 582 | 0 |
| SO2 | 1-hour | 659,100.0 | 3,622,700.0 | 3757 | 740 | 0 |
| SO2 | 3-hour | 659,100.0 | 3,622,700.0 | 3757 | 740 | 0 |
| SO2 | 24-hour | 658,600.0 | 3,623,000.0 | 3760 | 605 | 0 |
| SO2 | annual | 658,500.0 | 3,623,000.0 | 3761 | 582 | 0 |