

**Air Quality Impacts Analysis (AQIA)  
for  
Basin Electric Power Cooperative  
Bison Generation Station**

**6261 121<sup>st</sup> Ave NW  
Ray, ND 58849**

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## 1 Executive Summary

Basin Electric Power Cooperative (Basin) conducted air dispersion modeling for the proposed Bison Generation Station (Bison) facility located in Williams County, near Ray, ND. The modeling efforts were conducted to demonstrate compliance with both state and federal Ambient Air Quality Standards (AAQS) and Prevention of Significant Deterioration (PSD) increment consumption regulations.

The Permit to Construct (PTC) application was submitted on February 10, 2025 and the Class I area modeling analysis was submitted on June 6, 2025. Based on the data provided in these documents, and the Department's independent review and modeling analysis, it is expected that the proposed facility will comply with the applicable AAQS and PSD Increments. The Department's results of the modeled impacts for the AAQS and PSD increment consumption are outlined in Table 1 and Table 2, respectively. Pollutants not included in the following tables were below the corresponding significant impact level (SIL). Those results can be found in Table 17.

*Table 1- Ambient Air Quality Standards (AAQS) Results Summary<sup>1</sup>*

| Pollutant         | Averaging Time | Modeled Impact ( $\mu\text{g}/\text{m}^3$ ) | Background ( $\mu\text{g}/\text{m}^3$ ) | Total Impact ( $\mu\text{g}/\text{m}^3$ ) | NDAAQS ( $\mu\text{g}/\text{m}^3$ ) | NAAQS ( $\mu\text{g}/\text{m}^3$ ) | Passed (Y/N) |
|-------------------|----------------|---------------------------------------------|-----------------------------------------|-------------------------------------------|-------------------------------------|------------------------------------|--------------|
| PM <sub>10</sub>  | 24-HR          | 9.03                                        | 30                                      | 39.03                                     | 150                                 | 150                                | Y            |
| PM <sub>2.5</sub> | Annual         | 0.64                                        | 4.76                                    | 5.40                                      | -                                   | 9                                  | Y            |
|                   | 24-HR          | 2.80                                        | 13.836                                  | 16.64                                     | -                                   | 35                                 | Y            |
| NO <sub>2</sub>   | 1-HR           | 138.3                                       | 35                                      | 173.30                                    | -                                   | 188                                | Y            |

*Table 2 - PSD Class II Increment Results Summary<sup>2</sup>*

| Pollutant         | Averaging Time | Modeled Impact ( $\mu\text{g}/\text{m}^3$ ) | Class II Increment ( $\mu\text{g}/\text{m}^3$ ) | Increment Consumed | Passed (Y/N) |
|-------------------|----------------|---------------------------------------------|-------------------------------------------------|--------------------|--------------|
| PM <sub>10</sub>  | Annual         | 2.17                                        | 17                                              | 13%                | Y            |
|                   | 24-HR          | 9.53                                        | 30                                              | 32%                | Y            |
| PM <sub>2.5</sub> | Annual         | 0.69                                        | 4                                               | 17%                | Y            |
|                   | 24-HR          | 6.40                                        | 9                                               | 71%                | Y            |

<sup>1</sup> See Table 22 for AAQS averaging times.

<sup>2</sup> See Table 23 for PSD Increment averaging times.

## 2 Introduction

On February 10, 2025, the North Dakota Department of Environmental Quality, Division of Air Quality (Department) received an application for a PTC from Basin for the proposed construction of a combined-cycle power plant near Ray, ND, located in Williams County. The application included a modeling analysis to confirm compliance with the North Dakota Ambient Air Quality Standards (NDAAQS), the National Ambient Air Quality Standards (NAAQS), and Class II PSD increment standards. Basin submitted the Class I area modeling analysis on June 17, 2025. Modeling efforts were carried out for CO, NO<sub>x</sub>, SO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>. This AQIA summarizes the Department's findings based on a thorough review and independent modeling analysis of the project.

## 3 Project Background

The proposed Bison facility will be located approximately 6 miles southwest of Ray, ND. The facility will utilize combined-cycle turbine technology and will consist of two natural gas combustion turbines along with various support equipment. Each turbine will produce approximately 745 megawatts (MW), for a total of 1,490 MW.

Initial construction of the Project will ensue after the PSD baseline dates for Region No. 172 (Table 3). Therefore, all the emission units proposed as a part of the Project will consume PSD increment.

*Table 3 - PSD Minor Source Baseline Dates<sup>3</sup>*

| Pollutant         | PSD Baseline Date<br>Region No. 172<br>(all counties except Cass County) | PSD Baseline Date<br>Region No. 130<br>(Cass County) | Source Included in<br>Baseline (Y/N) |
|-------------------|--------------------------------------------------------------------------|------------------------------------------------------|--------------------------------------|
| CO                | No PSD Class II Increment                                                | No PSD Class II Increment                            | N/A                                  |
| NO <sub>2</sub>   | October 31, 1989                                                         | September 13, 2007                                   | N                                    |
| SO <sub>2</sub>   | December 19, 1977                                                        | November 30, 1979                                    | N                                    |
| PM <sub>10</sub>  | January 13, 1978                                                         | November 30, 1979                                    | N                                    |
| PM <sub>2.5</sub> | August 23, 2012                                                          | April 28, 2022                                       | N                                    |
| Lead (Pb)         | No PSD Class II Increment                                                | No PSD Class II Increment                            | N/A                                  |

<sup>3</sup> May 13, 2022, *Department Memo, North Dakota Prevention of Significant Deterioration (PSD) Minor Source Baseline Dates*. Available at: [https://deg.nd.gov/publications/AQ/policy/Modeling/2022MEMO\\_PSD\\_BASELINE\\_DATES.pdf](https://deg.nd.gov/publications/AQ/policy/Modeling/2022MEMO_PSD_BASELINE_DATES.pdf) (Last visited October 24, 2025)

## 4 Model Requirements

Bison qualifies as a major source according to the PSD rules<sup>4,5</sup> and consequently falls under the purview of PSD review requirements. Per the Department Memo<sup>6</sup> dated October 6, 2014, sources that are subject to the PSD rules require dispersion modeling for criteria pollutants prior to the issuance of a PTC if the projected emissions exceed PSD significant emission rates (SERs) (Table 4).

Furthermore, any new source subject to PSD review that is situated within 250 kilometers (km) of a Class I area is required to include a Class I increment analysis. Table 5 provides a list of the Class I areas in closest proximity to the facility. Basin is located approximately 73 km from the nearest Class I area; therefore, a Class I increment analysis was required. The nearest Class I areas were located outside the recommended 50 km range for AERMOD dispersion modeling software, so CALPUFF software was utilized to evaluate the Class I impacts. These modeling details are outlined in Section 7. All other areas within North Dakota are designated Class II areas and Class II increment analysis applies.

*Table 4 - Significant Emission Rates (SERs) in Tons per Year (TPY)*

| Pollutant         | SER (TPY) | Final Project Emission Increase (TPY) | Modeling Required (Y/N) |
|-------------------|-----------|---------------------------------------|-------------------------|
| PM <sub>10</sub>  | 15        | 485                                   | Y                       |
| PM <sub>2.5</sub> | 10        | 485                                   | Y                       |
| SO <sub>2</sub>   | 40        | 65                                    | Y                       |
| NO <sub>x</sub>   | 40        | 615                                   | Y                       |
| CO                | 100       | 1,023                                 | Y                       |

<sup>4</sup> NDAC 33.1-15-15. Available at: <https://www.ndlegis.gov/information/acdata/pdf/33.1-15-15.pdf> (Last visited October 24, 2025)

<sup>5</sup> 40 CFR §52.21. Available at: <https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-52/subpart-A/section-52.21> (Last visited October 24, 2025)

<sup>6</sup> Criteria Pollutant Modeling Requirements for a Permit to Construct. Available at: [https://deg.nd.gov/publications/AQ/policy/Modeling/Criteria\\_Modeling\\_Memo.pdf](https://deg.nd.gov/publications/AQ/policy/Modeling/Criteria_Modeling_Memo.pdf) (Last visited October 24, 2025)

Table 5 - Class I Areas Near Source

| Class I Area                                             | Distance From Project (km) | Modeling Required (Y/N) |
|----------------------------------------------------------|----------------------------|-------------------------|
| Medicine Lake Wilderness Area (MT)                       | 76                         | Y                       |
| Fort Peck (MT)                                           | 95                         | Y                       |
| Theodore Roosevelt National Park-North Unit (ND)         | 78                         | Y                       |
| Theodore Roosevelt National Park-Elkhorn Ranch Unit (ND) | 122                        | Y                       |
| Theodore Roosevelt National Park-South Unit (ND)         | 151                        | Y                       |
| Lostwood Wilderness Area (ND)                            | 73                         | Y                       |

Basin is subject to the requirements of NDAC 33.1-15-02<sup>7</sup> and Ambient Air Quality Standards. Cumulative modeling was conducted to demonstrate compliance with applicable state and federal standards.

## 5 Model Input Values

### 5.1 Model Version

The U.S. Environmental Protection Agency (EPA) has developed the *Guideline on Air Quality Models*<sup>8</sup> (40 CFR 51 Appendix W) wherein they list preferred models for pre-construction permitting reviews. At the time of the application submittal, Appendix W (2017) was the most current revision in use.

EPA's preferred model is AERMOD, which Basin and the Department used for the analysis and review, in accordance with Appendix W. The model versions utilized in the Department review are shown in Table 6. CALPUFF was utilized for the Class I analysis and is detailed in Section 7.

Table 6 - Model Versions Used

| Model  | Version | Model      | Version |
|--------|---------|------------|---------|
| AERMOD | 24142   | BPIP-PRIME | 4274    |
| AERMET | 23132   | AERMINUTE  | 15272   |
| AERMAP | 18081   | AERSURFACE | 20060   |

### 5.2 Meteorological Data (MET)

In the modeling process, both surface and upper-air meteorological (met) data are pre-processed through

<sup>7</sup> Available at: <https://www.ndlegis.gov/information/acdata/pdf/33.1-15-02.pdf> (Last visited October 24, 2025)

<sup>8</sup> Available at: [https://www.epa.gov/sites/default/files/2020-09/documents/appw\\_17.pdf](https://www.epa.gov/sites/default/files/2020-09/documents/appw_17.pdf) (Last visited October 24, 2025)

AERMET. This pre-processing generates the boundary layer parameters required by AERMOD to estimate plume dispersion. AERMET processes hourly meteorological data to determine plume transport and dispersion downwind from a source.

Per Appendix W (2017) 8.4.2.e, the choice of meteorological data should be based on ensuring a sufficiently conservative and representative result, considering hourly and seasonal variations in meteorological conditions throughout the year, which directly influence plume movement due to atmospheric conditions. The options for selecting meteorological data include:

1. One year of site-specific data: This involves using data collected onsite from a monitoring station.
2. Five years of representative National Weather Service (NWS) data: This data source typically provides long-term, historical weather information.
3. At least 3 years of prognostic meteorological data: This type of data involves using predictive meteorological models to estimate future conditions.

The analysis used the second option, five years of representative NWS data. The specific MET stations used for input in AERMET for this analysis are listed in Table 7. AERMET processes hourly surface observations, including parameters such as wind speed and direction, ambient temperature, sky cover (opacity), and local air pressure (optionally). It combines these observations with the pre-processed AERSURFACE output values (Table 8) to compile the necessary surface met inputs for AERMOD.

Table 7 - MET Data Used

| MET Data    | Location                | Station No. | Years       | Distance From Source* | Source of Data |
|-------------|-------------------------|-------------|-------------|-----------------------|----------------|
| Surface Air | Tioga Municipal Airport | 720863      | 2019 -2023  | 31 km E               | NDDEQ          |
| Upper Air   | Bismarck, ND            | 24011       | 2019 - 2023 | 254 km SE             | NDDEQ          |

\* Approximate distances using Google Earth's measuring tool.

### 5.3 Surface Inputs

AERMET relies on certain key values, including surface roughness length, albedo, and Bowen ratio when pre-processing met data for use in AERMOD.

AERSURFACE allows users to generate these values based on inputs related to seasonal variation in the vegetative landscape (e.g., landcover). To facilitate this process, the Department has compiled a set of recommended inputs specifically designed for various regions within the state. These recommendations are outlined in the document titled *“Recommended AERSURFACE Inputs North Dakota (March 2017)”*.<sup>9</sup>

<sup>9</sup> Available at: [https://deq.nd.gov/publications/AQ/policy/Modeling/AERSURFACE\\_InputsND.pdf](https://deq.nd.gov/publications/AQ/policy/Modeling/AERSURFACE_InputsND.pdf) (Last visited October 24, 2025)

Table 8 - AERSURFACE Input Values

| Parameter                                                   | Value Used         |
|-------------------------------------------------------------|--------------------|
| Radius of study area used for surface roughness:            | 1.0 km             |
| Define the surface roughness length for multiple sectors?   | Yes                |
| Number of sectors:                                          | 12                 |
| Temporal resolution of surface characteristics              | Monthly            |
| Continuous snow cover for at least one month?               | Yes                |
| Reassign the months to different seasons?                   | Yes                |
| Specify months for each season:                             | Yes                |
| Late autumn after frost and harvest, or winter with no snow | Oct, Nov, Dec, Mar |
| Winter with continuous snow cover                           | Jan, Feb           |
| Transitional spring                                         | Apr, May           |
| Midsummer with lush vegetation                              | Jun, Jul, Aug      |
| Autumn with unharvested cropland                            | Sep                |
| Is this site at an airport?                                 | Yes                |
| Is the site in an arid region?                              | No                 |
| Surface moisture condition at the site:                     | Average            |

#### 5.4 Receptor Grid

Receptors serve as the designated locations where the air quality model calculates ground-level pollutant concentrations. These receptors are strategically placed within a receptor grid, and their distribution is determined by factors such as terrain characteristics and pollutant emission rates. While the exact configuration may vary, it typically forms a rectangular pattern radiating outward from the emission source. The goal is to ensure that the receptor grid effectively captures the dispersion and distribution of pollutants in the vicinity of the facility, as this is where the predicted maximum concentrations are likely to occur.

Further specifics on the receptor grid are shown in Table 9.

Table 9 - Receptor Grid Spacing

| Distance Out From Source              | Distance Between Receptors |
|---------------------------------------|----------------------------|
| Fence line                            | 25 meters                  |
| 0 to 1000 meters (0 to 1.0 km)        | 50 meters                  |
| 1,001 to 2,000 (1 to 2 km)            | 100 meters                 |
| 2,001 to 5,000 meters (2 to 5 km)     | 250 meters                 |
| 5,001 to 10,000 meters (5 to 10 km)   | 500 meters                 |
| 10,000 to 30,000 meters (10 to 30 km) | 1000 meters                |
| TOTAL NUMBER OF RECEPTORS             | 5,340                      |

The receptor points are placed at ground level, and their elevation is determined using the United States Geological Survey (USGS) National Elevation Dataset (NED) terrain and land-use data. The Universal Transverse Mercator (UTM) map projection with the North American Datum of 1983 (NAD83) is used for both the source input locations and the receptor grid location. To ensure accurate placement at ground level, the USGS NED 2017 data at a 1/3 arcsecond (10-meter) resolution is processed through the AERMAP pre-processor. This pre-processor adjusts the receptor points' elevations based on terrain data, aligning them with the actual topography of the area.

Receptor points located within the plant boundary are not modeled, as they do not represent ambient air.<sup>10</sup> Ambient air is defined as air situated outside of a boundary (e.g., a fence), which restricts general public access to a facility or source. Basin will utilize fencing, signage, or other approved techniques around the plant boundary to preclude access to the general public. This exclusion ensures that the modeling analysis focuses on assessing the impact of emissions on the air quality in areas accessible to the public.

## 5.5 Background

Basin used fixed background concentrations to predict the total ambient effect on AAQ. These fixed background concentrations are not included as inputs in the modeling process, and as a result, they are not included in the values output for concentrations (i.e., not included in Modeled Impact, but added in after under the Total Impact in Table 1 and Table 17). Fixed background concentrations shown in Table 10 are considered reasonably representative of the entire state, and while they are conservative, they play a significant role in ensuring a comprehensive and conservative assessment of the total ambient effect on AAQS due to emissions from the facility. To demonstrate the conservative nature of the fixed values the Department evaluated ambient concentrations from the Theodore Roosevelt National Park (TRNP) and the Lostwood National Wildlife Refuge (NWR) ambient monitors. While these areas will include some

<sup>10</sup> §40 CFR 50.1(e). Available at: <https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-50/section-50.1> (Last visited October 24, 2025)

anthropogenic contributions, they are low population areas that are closest to true representations of background in North Dakota. Ambient data was acquired from the EPA Outdoor Air Quality data<sup>11</sup> and averaged over the 5-year period from 2018-2022. An average of the ambient data is most representative of a background concentration. Table 11 shows that the Department's fixed ambient background concentrations are conservative in comparison to the ambient air concentrations.

Table 10 - Fixed Background Concentrations<sup>12</sup>

| Pollutant         | Averaging Time | Background (µg/m <sup>3</sup> ) |
|-------------------|----------------|---------------------------------|
| PM <sub>10</sub>  | 24-HR          | 30                              |
| PM <sub>2.5</sub> | Annual         | 4.75                            |
|                   | 24-HR          | 13.7                            |
| SO <sub>2</sub>   | Annual         | 3                               |
|                   | 24-HR          | 9                               |
|                   | 3-HR           | 11                              |
|                   | 1-HR           | 13                              |
| NO <sub>2</sub>   | Annual         | 5                               |
|                   | 1-HR           | 35                              |
| CO                | 8-HR           | 1,149                           |
|                   | 1-HR           | 1,149                           |

Table 11: Ambient Air Concentrations 2018-2022

| Parameter                                                                                          | PM <sub>10</sub> | PM <sub>2.5</sub> |             | SO <sub>2</sub> |             | CO             | NO <sub>2</sub> |             |
|----------------------------------------------------------------------------------------------------|------------------|-------------------|-------------|-----------------|-------------|----------------|-----------------|-------------|
| Averaging Period                                                                                   | 24-hr            | 24-hr             | Annual      | 1-hr            | Annual      | 8-hr           | 1-hr            | Annual      |
| <b>Monitoring Stations in North Dakota's Highest Population Areas – 5-Year Average (2018-2022)</b> |                  |                   |             |                 |             |                |                 |             |
| <b>Fargo</b>                                                                                       | 12.44            | 7.54              | 5.58        | 3.11            | 0.84        | -              | 33.61           | 4.17        |
| <b>Bismarck</b>                                                                                    | 19.45            | 6.99              | 6.46        | 11.11           | 0.41        | 221.28         | 34.56           | 4.71        |
| <b>Monitoring Stations in North Dakota's Lower Population Areas – 5-Year Average (2018-2022)</b>   |                  |                   |             |                 |             |                |                 |             |
| <b>TRNP</b>                                                                                        | -                | 4.35              | 4.35        | 4.33            | 1.35        | -              | 9.89            | 1.46        |
| <b>Lostwood NWR</b>                                                                                | 11.36            | -                 | -           | -               | -           | -              | -               | -           |
| <b>Background</b>                                                                                  | <b>30.00</b>     | <b>13.70</b>      | <b>4.75</b> | <b>13.00</b>    | <b>3.00</b> | <b>1149.00</b> | <b>35.00</b>    | <b>5.00</b> |

Sources: <https://www.epa.gov/outdoor-air-quality-data/download-daily-data>  
<https://www.epa.gov/outdoor-air-quality-data/monitor-values-report>

#### 5.5.1 Nearby Sources

The Department reviewed records pertaining to sources that could potentially share a significant concentration gradient with the proposed Basin facility in North Dakota. Air dispersion models were

<sup>11</sup> Available at: <https://www.epa.gov/outdoor-air-quality-data/download-daily-data> (Last visited October 24, 2025)

<sup>12</sup> Available at: [https://deq.nd.gov/publications/AQ/policy/Modeling/ND\\_Air\\_Dispersion\\_Modeling\\_Guide.pdf](https://deq.nd.gov/publications/AQ/policy/Modeling/ND_Air_Dispersion_Modeling_Guide.pdf) (Last visited October 24, 2025)

conducted to analyze potentially significant sources within 20 km of the proposed facility and evaluate major sources within 50 km. Of the sources evaluated, eight were identified as potentially sharing a significant NO<sub>2</sub> concentration gradient. One facility was identified for PM and SO<sub>2</sub>. The facilities included in the cumulative analysis are listed in Table 12, with the modeling parameters listed in Table 16.

*Table 12 – Nearby Sources Sharing Significant Concentration Gradient*

| Facility                                                      | Location                         | Source Type            |
|---------------------------------------------------------------|----------------------------------|------------------------|
| Nesson Gathering System, LLC - Rough Rider Compressor Station | Williston, Williams County, ND   | Compressor Station     |
| 1804 Ltd. LLC - Springbrook Gas Plant                         | Williston, Williams County, ND   | Natural Gas Processing |
| Hess Tioga Gas Plant LLC - Tioga Gas Plant                    | Tioga, Williams County, ND       | Natural Gas Processing |
| Nesson Gathering System, LLC - Nesson Gas Plant               | Tioga, Williams County, ND       | Natural Gas Processing |
| ONEOK Rockies Midstream, L.L.C. - Epping Compressor Station   | Epping, Williams County, ND      | Compressor Station     |
| 1804 Ltd. LLC - Stockyard Creek Compressor Station            | Springbrook, Williams County, ND | Compressor Station     |
| Hess North Dakota Pipelines LLC - Wheelock Compressor Station | Ray, Williams County, ND         | Compressor Station     |
| Hiland Partners Holdings LLC - Sacramento Compressor Station  | Tioga, Williams County, ND       | Compressor Station     |

## 5.6 Emission Source Modeling Parameters

AERMOD requires specific source data to model air pollutant dispersion accurately. This data includes:

1. Type and location of each emission point
2. Base elevation of each stack
3. Emission height and rate
4. Gas exit velocity and temperature
5. Other stack/emission parameters depending upon source type

To ensure the accuracy of model input values, a comparison was made between the emission rates and stack parameters provided in the application and the corresponding information in the modeling files. A conservative modeling approach was taken with this project, with multiple modeling scenarios being conducted for the natural gas combustion turbines at full and partial loads to ensure that the operation of the project will not result in impacts which violate the NAAQS and PSD Increments. Emission rates represent projected worst-case ambient conditions under various operating loads and include start-up

and shutdown emissions. Annual emissions are based on worst-case annual emissions. The modeling parameters for Basin's point sources are shown in Table 13 and Table 14. Table 13 details the different operating scenarios for the natural gas turbines. Volume source parameters are detailed in Table 15 with further detail located in Section 6.3.2 of the permit application.

Table 13 - Combustion Turbine Emissions and Modeling Parameters lists the model input parameters for emission rates of each scenario, stack temperature, exit velocity, location (UTM X-Y coordinates), height (i.e., release height), and stack exit diameter for the combustion turbines at the Basin facility.

Table 14 - Auxiliary Equipment and Modeling Parameters lists the model input parameters for emission rates, stack temperature, exit velocity, height (i.e., release height), and stack exit diameter for the auxiliary equipment at the Basin facility.

Table 15 – Volume Source Parameters and Emission Rates lists the volume source parameters for relative height, initial lateral dimension, initial vertical dimension, and emission rates at the Basin facility.

Table 16 - Nearby Source Parameters and Emission Rates lists the model input parameters for location (UTM X-Y coordinates), elevation, height (i.e., release height), exit temperature, exit velocity, stack exit diameter, stack exit orientation, and emission rates at the nearby facilities identified in Table 12.

Table 13 - Combustion Turbine Emissions and Modeling Parameters

| Pollutant                | Averaging Period    | Units | 100% Load With Duct Firing | 100% Load | 75% Load            | MECL Load | Start-up/ Shutdown |
|--------------------------|---------------------|-------|----------------------------|-----------|---------------------|-----------|--------------------|
| NO2                      | 1-HR                | lb/hr | 39.5                       | 31.2      | 28.25               | 17.76     | 1218               |
|                          | Annual              |       | 63.23                      | 63.23     | 63.23               | 63.23     | 63.23              |
| CO                       | 1-HR                |       | 19.24                      | 14.25     | 12.9                | 8.11      | 3778               |
|                          | 8-HR                |       |                            |           |                     |           |                    |
| PM10/PM2.5               | 24-HR               |       | 54.81                      | 37.84     | 34.5                | 33.55     | 37.84              |
|                          | Annual              |       |                            |           |                     |           |                    |
| SO2                      | 1, 3, 24-HR, Annual |       | 7.4                        | 5.85      | 5.29                | 5.71      | 5.85               |
| Stack Parameters         |                     |       |                            |           |                     |           |                    |
| Stack temperature (F)    |                     |       | 165.00                     | 171.90    | 164.98              | 165.00    | 171.61             |
| Exit velocity (ft/s)     |                     |       | 66.48                      | 67.20     | 49.93               | 48.40     | 66.42              |
| UTM X, Y Coordinates (m) |                     |       | 625157.49, 625153.75       |           | 5353691.58, 5353844 |           |                    |
| Stack height (ft)        |                     |       | 250.00                     |           |                     |           |                    |
| Exit diameter (ft)       |                     |       | 23.75                      |           |                     |           |                    |

Table 14 - Auxiliary Equipment and Modeling Parameters

| Pollutant             | Averaging Period    | Units | Auxiliary Boiler <sup>A</sup> | Natural Gas Heaters <sup>B</sup> |
|-----------------------|---------------------|-------|-------------------------------|----------------------------------|
| NO2                   | 1-HR                | lb/hr | 2.74                          | 0.15                             |
|                       | Annual              |       | 0.63                          | 0.15                             |
| CO                    | 1-HR                |       | 9.21                          | 0.56                             |
|                       | 8-HR                |       |                               |                                  |
| PM10/PM2.5            | 24-HR               |       | 1.86                          | 0.11                             |
|                       | Annual              |       |                               |                                  |
| SO2                   | 1, 3, 24-HR, Annual |       | 0.15                          | 0.0089                           |
| Stack Parameters      |                     |       |                               |                                  |
| Stack temperature (F) |                     |       | 300.00                        | 350.00                           |
| Exit velocity (ft/s)  |                     |       | 50.00                         | 14.65                            |
| Stack height (ft)     |                     |       | 165.00                        | 20.00                            |
| Exit diameter (ft)    |                     |       | 6.00                          | 2.67                             |

<sup>A</sup> Auxiliary boiler located at UTM X-Y (625159.07, 5353737.46)

<sup>B</sup> Natural gas heaters located at UTM X-Y (625081.34, 5353529.97), (625067.60, 5353529.63), (625053.90, 5353529.30)

Table 15 – Volume Source Parameters and Emission Rates

| Emission Points | Emission Point Description | Relative Height (ft) | Initial Lateral (ft) | Initial Vertical (ft) | PM <sub>10</sub> (lb/hr) | PM <sub>2.5</sub> (lb/hr) |
|-----------------|----------------------------|----------------------|----------------------|-----------------------|--------------------------|---------------------------|
| HR_0001-HR_0199 | Haul Roads                 | 10.203               | 18.47                | 9.48                  | 0.00215                  | 0.000527                  |

Table 16 - Nearby Source Parameters and Emission Rates

| Emission Point | Emission Point Description          | UTM X (m) | UTM Y (m) | Elev. (m) | Height (ft) | Temp (F) | Velocity (ft/s) | Exit Dia. (ft) | Orient. (vert/horiz) | NOx (lb/hr) | PM <sub>2.5</sub> (lb/hr) | SO <sub>2</sub> (lb/hr) |
|----------------|-------------------------------------|-----------|-----------|-----------|-------------|----------|-----------------|----------------|----------------------|-------------|---------------------------|-------------------------|
| RRW1           | Rough Rider - Williston - Reboiler  | 591923.3  | 5330851.0 | 615.59    | 24.00       | 1000     | 3.77            | 2.00           | Vertical             | 0.03        | -                         | -                       |
| RRW2           | Rough Rider - Williston - Heater    | 591923.3  | 5330851.0 | 615.59    | 24.00       | 800      | 172.40          | 2.00           | Vertical             | 0.21        | -                         | -                       |
| RRW3           | Rough Rider - Williston - Engine #1 | 591923.3  | 5330851.0 | 615.59    | 33.00       | 816      | 97.54           | 1.33           | Vertical             | 1.52        | -                         | -                       |
| RRW4           | Rough Rider - Williston - Engine #2 | 591923.3  | 5330851.0 | 615.59    | 33.00       | 816      | 97.54           | 1.33           | Vertical             | 1.52        | -                         | -                       |
| RRW5           | Rough Rider - Williston - Engine #3 | 591923.3  | 5330851.0 | 615.59    | 33.00       | 816      | 97.54           | 1.33           | Vertical             | 1.52        | -                         | -                       |
| RRW6           | Rough Rider - Williston - Engine #4 | 591923.3  | 5330851.0 | 615.59    | 33.00       | 816      | 97.54           | 1.33           | Vertical             | 1.52        | -                         | -                       |
| RRW7           | Rough Rider - Williston - Engine #5 | 591923.3  | 5330851.0 | 615.59    | 33.00       | 816      | 97.54           | 1.33           | Vertical             | 1.52        | -                         | -                       |
| RRW8           | Rough Rider - Williston - Engine #6 | 591923.3  | 5330851.0 | 615.59    | 33.00       | 816      | 97.54           | 1.33           | Vertical             | 1.52        | -                         | -                       |
| RRW9           | Rough Rider - Williston - Engine #7 | 591923.3  | 5330851.0 | 615.59    | 33.00       | 816      | 97.54           | 1.33           | Vertical             | 1.52        | -                         | -                       |
| RRW10          | Rough Rider - Williston - Engine #8 | 591923.3  | 5330851.0 | 615.59    | 33.00       | 816      | 97.54           | 1.33           | Vertical             | 1.52        | -                         | -                       |
| RRW11          | Rough Rider - Williston - Combustor | 591923.3  | 5330851.0 | 615.59    | 8.50        | 180      | 7.50            | 2.50           | Vertical             | 0.06        | -                         | -                       |
| SG1            | 1804 Springbrook Gas - Engine #1    | 610020.2  | 5342787.3 | 647.60    | 46.50       | 990      | 114.00          | 1.30           | Vertical             | 2.76        | -                         | -                       |
| SG2            | 1804 Springbrook Gas - Engine #2    | 610020.3  | 5342779.2 | 647.66    | 46.50       | 990      | 114.00          | 1.30           | Vertical             | 1.86        | -                         | -                       |
| SG3            | 1804 Springbrook Gas - Engine #3    | 610014.5  | 5342928.8 | 646.07    | 24.00       | 842      | 122.00          | 1.60           | Vertical             | 0.67        | -                         | -                       |
| SG4            | 1804 Springbrook Gas - Engine #4    | 610014.8  | 5342912.5 | 646.21    | 46.50       | 877      | 121.10          | 1.60           | Vertical             | 0.95        | -                         | -                       |
| SG5            | 1804 Springbrook Gas - Engine #5    | 610015.0  | 5342901.5 | 646.40    | 46.50       | 878      | 193.10          | 1.30           | Vertical             | 1.23        | -                         | -                       |
| SG6            | 1804 Springbrook Gas - Engine #6    | 609985.3  | 5342938.3 | 645.49    | 28.60       | 813      | 91.60           | 1.60           | Vertical             | 1.16        | -                         | -                       |
| SG7            | 1804 Springbrook Gas - Engine #7    | 609964.4  | 5342867.6 | 646.77    | 46.50       | 1012     | 138.30          | 1.00           | Vertical             | 0.87        | -                         | -                       |

| Emission Point | Emission Point Description           | UTM X (m) | UTM Y (m) | Elev. (m) | Height (ft) | Temp (F) | Velocity (ft/s) | Exit Dia. (ft) | Orient. (vert/horiz) | NOx (lb/hr) | PM <sub>2.5</sub> (lb/hr) | SO <sub>2</sub> (lb/hr) |
|----------------|--------------------------------------|-----------|-----------|-----------|-------------|----------|-----------------|----------------|----------------------|-------------|---------------------------|-------------------------|
| SG8            | 1804 Springbrook Gas - Engine #8     | 609957.7  | 5342867.5 | 646.76    | 46.50       | 1012     | 138.90          | 1.00           | Vertical             | 0.90        | -                         | -                       |
| SG9            | 1804 Springbrook Gas - Engine #9     | 610015.2  | 5342893.6 | 646.57    | 46.50       | 992      | 168.70          | 1.00           | Vertical             | 0.93        | -                         | -                       |
| SG10           | 1804 Springbrook Gas - Engine #10    | 610015.3  | 5342884.9 | 646.71    | 46.50       | 992      | 168.60          | 1.00           | Vertical             | 0.96        | -                         | -                       |
| SG11           | 1804 Springbrook Gas - Engine #11    | 610015.5  | 5342875.7 | 646.79    | 46.50       | 999      | 168.30          | 1.00           | Vertical             | 0.78        | -                         | -                       |
| SG12           | 1804 Springbrook Gas - Reboiler      | 609939.4  | 5342934.5 | 645.00    | 12.00       | 800      | 371.10          | 1.00           | Vertical             | 0.14        | -                         | -                       |
| SG14           | 1804 Springbrook Gas - Oil heater #1 | 609939.1  | 5342948.0 | 644.58    | 14.00       | 500      | 11.30           | 2.60           | Vertical             | 0.93        | -                         | -                       |
| SG15           | 1804 Springbrook Gas - Oil heater #2 | 609939.1  | 5342948.0 | 644.58    | 15.00       | 500      | 101.80          | 1.00           | Vertical             | 0.23        | -                         | -                       |
|                |                                      |           |           |           |             |          |                 |                |                      |             |                           |                         |
| TG1            | Hess - Tioga Gas Plant - Boiler #1   | 654389.3  | 5362817.6 | 683.85    | 50.00       | 395      | 31.48           | 2.25           | Vertical             | 1.20        | -                         | -                       |
| TG2            | Hess - Tioga Gas Plant - Boiler #2   | 654389.3  | 5362817.6 | 683.85    | 50.00       | 395      | 31.48           | 2.25           | Vertical             | 0.85        | -                         | -                       |
| TG3            | Hess - Tioga Gas Plant - Boiler #3   | 654389.3  | 5362817.6 | 683.85    | 50.00       | 395      | 31.48           | 2.25           | Vertical             | 0.71        | -                         | -                       |
| TG4            | Hess - Tioga Gas Plant - Boiler #4   | 654389.3  | 5362817.6 | 683.85    | 50.00       | 395      | 31.48           | 2.25           | Vertical             | 1.97        | -                         | -                       |
| TG5            | Hess - Tioga Gas Plant - Heater #1   | 654389.3  | 5362817.6 | 683.85    | 118.00      | 437      | 4.00            | 4.10           | Vertical             | 0.68        | -                         | -                       |
| TG6            | Hess - Tioga Gas Plant - Heater #2   | 654389.3  | 5362817.6 | 683.85    | 137.00      | 441      | 16.00           | 6.83           | Vertical             | 4.22        | -                         | -                       |
| TG7            | Hess - Tioga Gas Plant - Heater #3   | 654389.3  | 5362817.6 | 683.85    | 137.00      | 441      | 16.00           | 6.83           | Vertical             | 4.22        | -                         | -                       |
| TG14           | Hess - Tioga Gas Plant - Turbine #1  | 654389.3  | 5362817.6 | 683.85    | 40.00       | 800      | 21.93           | 3.00           | Vertical             | 2.05        | -                         | -                       |
| TG15           | Hess - Tioga Gas Plant - Turbine #2  | 654389.3  | 5362817.6 | 683.85    | 40.00       | 800      | 21.93           | 3.00           | Vertical             | 2.46        | -                         | -                       |
| TG16           | Hess - Tioga Gas Plant - Turbine #3  | 654389.3  | 5362817.6 | 683.85    | 40.00       | 800      | 21.93           | 3.00           | Vertical             | 1.46        | -                         | -                       |
|                |                                      |           |           |           |             |          |                 |                |                      |             |                           |                         |
| NGP1           | Nesson Gas Plant - Engine #2         | 645082.3  | 5358751.9 | 726.74    | 32.00       | 731      | 52.18           | 1.25           | Vertical             | 1.07        | 0.12                      | 0.13                    |
| NGP2           | Nesson Gas Plant - Engine #3         | 645096.3  | 5358752.0 | 728.34    | 32.00       | 759      | 81.47           | 1.31           | Vertical             | 1.57        | 0.11                      | 0.13                    |
| NGP3           | Nesson Gas Plant - Engine #4         | 645110.4  | 5358753.0 | 728.79    | 32.00       | 767      | 91.19           | 1.29           | Vertical             | 0.84        | 0.11                      | 0.13                    |
| NGP4           | Nesson Gas Plant - Engine #5         | 645123.8  | 5358753.9 | 727.62    | 32.00       | 615      | 72.29           | 1.38           | Vertical             | 0.70        | 0.12                      | 0.13                    |
| NGP5           | Nesson Gas Plant - Engine #6         | 645137.6  | 5358753.7 | 726.27    | 32.00       | 618      | 75.35           | 1.38           | Vertical             | 0.79        | 0.12                      | 0.13                    |
| NGP6           | Nesson Gas Plant - Heater #1         | 645024.0  | 5358688.8 | 725.95    | 24.67       | 427      | 11.41           | 1.29           | Vertical             | 0.28        | 0.03                      | 0.04                    |
| NGP7           | Nesson Gas Plant - Heater #2         | 645024.0  | 5358671.2 | 726.07    | 48.50       | 471      | 17.00           | 1.96           | Vertical             | 1.46        | 0.09                      | 0.13                    |
| NGP8           | Nesson Gas Plant - Oil Heater #1     | 645108.0  | 5358665.0 | 725.52    | 38.75       | 538      | 22.00           | 2.00           | Vertical             | 1.71        | 0.12                      | 0.16                    |
| NGP9           | Nesson Gas Plant - Oil Heater #2     | 645108.0  | 5358665.0 | 725.52    | 30.83       | 502      | 29.00           | 2.30           | Vertical             | 3.38        | 0.21                      | 0.19                    |

| Emission Point | Emission Point Description                    | UTM X (m) | UTM Y (m) | Elev. (m) | Height (ft) | Temp (F) | Velocity (ft/s) | Exit Dia. (ft) | Orient. (vert/horiz) | NOx (lb/hr) | PM <sub>2.5</sub> (lb/hr) | SO <sub>2</sub> (lb/hr) |
|----------------|-----------------------------------------------|-----------|-----------|-----------|-------------|----------|-----------------|----------------|----------------------|-------------|---------------------------|-------------------------|
| EC1            | ONEOK - Epping Compressor - Engine #1         | 624110.3  | 5346197.9 | 673.20    | 44.50       | 1005     | 135.97          | 1.20           | Vertical             | 0.74        | -                         | -                       |
| EC2            | ONEOK - Epping Compressor - Engine #2         | 624123.5  | 5346203.7 | 673.12    | 44.50       | 1005     | 135.97          | 1.20           | Vertical             | 0.88        | -                         | -                       |
| EC3            | ONEOK - Epping Compressor - Engine #3         | 624134.0  | 5346202.9 | 673.03    | 44.50       | 1005     | 135.97          | 1.20           | Vertical             | 1.15        | -                         | -                       |
| EC4            | ONEOK - Epping Compressor - Engine #4         | 624152.5  | 5346202.2 | 672.89    | 44.50       | 1005     | 135.97          | 1.20           | Vertical             | 1.19        | -                         | -                       |
| EC5            | ONEOK - Epping Compressor - Engine #5         | 624163.6  | 5346204.6 | 672.82    | 44.50       | 1005     | 135.97          | 1.20           | Vertical             | 1.02        | -                         | -                       |
| EC6            | ONEOK - Epping Compressor - Engine #6         | 624177.0  | 5346203.8 | 672.72    | 44.50       | 1005     | 135.97          | 1.20           | Vertical             | 0.82        | -                         | -                       |
|                |                                               |           |           |           |             |          |                 |                |                      |             |                           |                         |
| SCC1           | 1804 - Stockyard Creek Compressor - Engine #1 | 617056.3  | 5333132.6 | 724.25    | 28.00       | 690      | 6.66            | 2.00           | Vertical             | 0.52        | -                         | -                       |
| SCC2           | 1804 - Stockyard Creek Compressor - Engine #2 | 617056.5  | 5333140.4 | 725.13    | 28.00       | 765      | 6.16            | 2.00           | Vertical             | 1.64        | -                         | -                       |
| SCC3           | 1804 - Stockyard Creek Compressor - Engine #3 | 617055.6  | 5333148.4 | 725.96    | 28.00       | 961      | 0.79            | 2.00           | Vertical             | 0.08        | -                         | -                       |
| SCC4           | 1804 - Stockyard Creek Compressor - Engine #4 | 617063.0  | 5333140.1 | 724.92    | 28.00       | 1041     | 0.78            | 2.00           | Vertical             | 0.09        | -                         | -                       |
| SCC5           | 1804 - Stockyard Creek Compressor - Reboiler  | 617118.1  | 5333104.8 | 722.38    | 7.90        | 800      | 127.99          | 0.43           | Vertical             | 0.11        | -                         | -                       |
|                |                                               |           |           |           |             |          |                 |                |                      |             |                           |                         |
| WC1            | Wheelock Compressor Station - Engine #1       | 632483.1  | 5359183.7 | 726.89    | 9.50        | 750      | 127.95          | 3.00           | Vertical             | 1.17        | -                         | -                       |
| WC2            | Wheelock Compressor Station - Engine #2       | 632468.4  | 5359183.8 | 726.30    | 9.50        | 750      | 127.95          | 3.00           | Vertical             | 0.85        | -                         | -                       |
| WC3            | Wheelock Compressor Station - Engine #3       | 632453.6  | 5359183.0 | 726.12    | 9.50        | 750      | 127.95          | 3.00           | Vertical             | 0.97        | -                         | -                       |
| WC4            | Wheelock Compressor Station - Dehydrator      | 632473.7  | 5359148.2 | 725.49    | 18.00       | 800      | 8.20            | 0.90           | Vertical             | 0.06        | -                         | -                       |
|                |                                               |           |           |           |             |          |                 |                |                      |             |                           |                         |
| HS1            | Highland - Sacramento CS - TEG Reboiler       | 627794.1  | 5344634.7 | 697.94    | 32.00       | 400      | 9.34            | 1.00           | Vertical             | 0.06        | -                         | -                       |
| HS2            | Highland - Sacramento CS - Engine #1          | 627794.1  | 5344634.7 | 697.94    | 40.00       | 1149     | 184.26          | 1.00           | Vertical             | 0.27        | -                         | -                       |
| HS3            | Highland - Sacramento CS - Engine #2          | 627794.1  | 5344634.7 | 697.94    | 40.00       | 1149     | 184.26          | 1.00           | Vertical             | 0.25        | -                         | -                       |
| HS4            | Highland - Sacramento CS - Engine #3          | 627794.1  | 5344634.7 | 697.94    | 40.00       | 1149     | 184.26          | 1.00           | Vertical             | 0.20        | -                         | -                       |
| HS5            | Highland - Sacramento CS - Engine #4          | 627794.1  | 5344634.7 | 697.94    | 40.00       | 1149     | 184.26          | 1.00           | Vertical             | 0.27        | -                         | -                       |
| HS6            | Highland - Sacramento CS - Engine #5          | 627794.1  | 5344634.7 | 697.94    | 40.00       | 1149     | 184.26          | 1.00           | Vertical             | 0.12        | -                         | -                       |
| HS7            | Highland - Sacramento CS - Engine #6          | 627794.1  | 5344634.7 | 697.94    | 40.00       | 1149     | 184.26          | 1.00           | Vertical             | 0.17        | -                         | -                       |

## 6 Model Execution and Results

### 6.1 Single-Source Impact Analysis (AAQS & PSD Increments)

A single-source impact analysis (SSIA) may be conducted at a facility on a pollutant-by-pollutant basis to determine if a full cumulative analysis for individual pollutants is required. A SSIA compares the modeled impact of the standalone project against the applicable SIL; see Table 17 for a listing of Class II and NAAQS SILs. If the SSIA is below the NAAQS and Class II PSD Increment SILs, the analysis demonstrates the project is not expected to cause or contribute to a NAAQS or PSD increment violation.

Basin conducted an SSIA for CO, NO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, and SO<sub>2</sub>. The NAAQS and Class II PSD Increment SSIA results are shown in Table 17 below. SO<sub>2</sub>, Annual NO<sub>2</sub>, and CO were all below SIL levels and did not require a cumulative analysis.

Table 17 -Single Source Impacts Analysis Results

| Pollutant                      | Averaging Time | Maximum Modeled Impact (µg/m <sup>3</sup> ) | AAQS SIL <sup>13</sup> (µg/m <sup>3</sup> ) | PSD Class II SIL <sup>14</sup> (µg/m <sup>3</sup> ) | NAAQS/NDAAQS Modeling Required (Y/N) | PSD Modeling Required (Y/N) |
|--------------------------------|----------------|---------------------------------------------|---------------------------------------------|-----------------------------------------------------|--------------------------------------|-----------------------------|
| PM <sub>10</sub>               | Annual         | 2.17                                        | -                                           | 1.00                                                | N                                    | Y                           |
|                                | 24-HR          | 11.40                                       | 5.00                                        | 5.00                                                | Y                                    | Y                           |
| PM <sub>2.5</sub> <sup>A</sup> | Annual         | 0.65                                        | 0.13 <sup>15</sup>                          | 0.13 <sup>15</sup>                                  | Y                                    | Y                           |
|                                | 24-HR          | 5.56                                        | 1.20                                        | 1.20                                                | Y                                    | Y                           |
| SO <sub>2</sub>                | Annual         | 0.06                                        | 1.00                                        | 1.00                                                | N                                    | N                           |
|                                | 24-HR          | 1.06                                        | 5.00                                        | 5.00                                                | N                                    | N                           |
|                                | 3-HR           | 1.90                                        | 25.00                                       | 25.00                                               | N                                    | N                           |
|                                | 1-HR           | 1.97                                        | 7.80                                        | -                                                   | N                                    | N                           |
| NO <sub>2</sub>                | Annual         | 0.92                                        | 1.00                                        | 1.00                                                | N                                    | N                           |
|                                | 1-HR           | 148.90                                      | 7.50                                        | -                                                   | Y                                    | N                           |
| CO                             | 8-HR           | 228.70                                      | 500.00                                      | -                                                   | N                                    | N                           |
|                                | 1-HR           | 1012.00                                     | 2000.00                                     | -                                                   | N                                    | N                           |

<sup>A</sup> Secondary formation of PM<sub>2.5</sub> included in Maximum Modeled Impact

<sup>13</sup> NAAQS SILs can be found in NDAC 33.1-15-14-02.5a. Available at:

<https://www.ndlegis.gov/information/acdata/pdf/33.1-15-14.pdf> (Last visited October 29, 2025)

<sup>14</sup> §40 CFR 51.165(b)(2) Available at: [https://www.ecfr.gov/current/title-40/part-51/subpart-I#p-51.165\(b\)\(2\)](https://www.ecfr.gov/current/title-40/part-51/subpart-I#p-51.165(b)(2)) (Last visited October 29, 2025)

<sup>15</sup> SIL found in *Updates to the Guidance for Ozone and Fine Particulate Matter Permit Modeling* Available at: <https://www.epa.gov/system/files/documents/2024-05/clarification-memorandum-o3-pm25-permit-modeling-guidance-04302024.pdf> (Last visited October 29, 2025)

### 6.1.1 PM<sub>2.5</sub> Secondary Formation

The secondary formation of PM<sub>2.5</sub> resulting from emissions of precursor pollutants NO<sub>x</sub> and SO<sub>2</sub> was accounted for by utilizing the following equation:

$$\text{Project Impact } (\mu\text{g}/\text{m}^3) = \text{Project Emission Rate (tpy)} \times \frac{\text{Modeled Impact from Hypothetical Source } (\mu\text{g}/\text{m}^3)}{\text{Modeled Emission Rate from Hypothetical Source (tpy)}}$$

Basin's PTE of 614 tons per year and 66 tons per year of NO<sub>x</sub> and SO<sub>2</sub>, respectively, were utilized along with a hypothetical representative source in Williams County, ND from the EPA's database of modeled sources.<sup>16</sup> Class I secondary formation calculations utilized a hypothetical Williams County source data at a distance of 60 km. The nearest Class I area to the facility is 73 km. Both calculations used 1,000 ton per year and 10 m stack data. The resulting project impact values are shown in Table 18 and Table 19. For a more in-depth examination of the Modeled Emission Rates for Precursors (MERPs) calculations, refer to Section 6.4 of the permit application.

Table 18 - PM<sub>2.5</sub> MERPs Summary

| Averaging Period | Precursor       | Calculated Impact (μg/m <sup>3</sup> ) | Cumulative Impact (μg/m <sup>3</sup> ) |
|------------------|-----------------|----------------------------------------|----------------------------------------|
| 24-Hour          | NO <sub>x</sub> | 0.066                                  | 0.136                                  |
|                  | SO <sub>2</sub> | 0.07                                   |                                        |
| Annual           | NO <sub>x</sub> | 0.00406                                | 0.00531                                |
|                  | SO <sub>2</sub> | 0.00125                                |                                        |

Table 19 - Class I PM<sub>2.5</sub> MERPs Summary

| Averaging Period | Precursor       | Calculated Impact (μg/m <sup>3</sup> ) | Cumulative Impact (μg/m <sup>3</sup> ) |
|------------------|-----------------|----------------------------------------|----------------------------------------|
| 24-Hour          | NO <sub>x</sub> | 0.045                                  | 0.069                                  |
|                  | SO <sub>2</sub> | 0.024                                  |                                        |
| Annual           | NO <sub>x</sub> | 0.0018                                 | 0.0021                                 |
|                  | SO <sub>2</sub> | 0.0003                                 |                                        |

<sup>16</sup> Available at: <https://www.epa.gov/scram/merps-view-qlik> (Last visited October 24, 2025)

### 6.1.2 O<sub>3</sub> Secondary Formation

The secondary formation of O<sub>3</sub> resulting from emissions of precursor pollutants NO<sub>x</sub> and VOC was accounted for by utilizing the same equation used for the PM<sub>2.5</sub> secondary formation calculation. Basin's PTE of 614 tons per year and 416 tons per year of NO<sub>x</sub> and VOC, respectively, were utilized along with a hypothetical representative source in Williams County, ND from the EPA's database of modeled sources. The final project impacts were determined through a comparison of the calculated MERPs to design concentration monitoring data. For a more in-depth examination of MERPs calculations, refer to Section 6.4.3 of the permit application.

Table 20 - O<sub>3</sub> MERPs Summary

| Averaging Period | Precursor       | Calculated Impact (ppb) | Cumulative Impact (ppb) |
|------------------|-----------------|-------------------------|-------------------------|
| 24-Hour          | NO <sub>x</sub> | 1.025                   | 1.118                   |
|                  | VOC             | 0.093                   |                         |

Table 21 shows a summary of the 4<sup>th</sup>-high 8-hour O<sub>3</sub> monitoring data for the nearest representative site in North Dakota.<sup>17</sup> The 3-year average O<sub>3</sub> concentration recorded for Burke County in North Dakota is 0.060 ppm. Adding the calculated O<sub>3</sub> MERPs of 0.0011 ppm (1.1 ppb) to the monitoring data results in a total O<sub>3</sub> concentration of 0.0611 ppm. The total O<sub>3</sub> concentration remains below the design concentration of 0.07 ppm for O<sub>3</sub>, demonstrating compliance with the NAAQS.

Table 21 - O<sub>3</sub> Monitoring Data Summary

| County | 2022 (ppm) | 2023 (ppm) | 2024 (ppm) | 3-Year Average (ppm) |
|--------|------------|------------|------------|----------------------|
| Burke  | 0.053      | 0.072      | 0.056      | 0.060                |

## 6.2 Ambient Air Quality Standards (AAQS) and PSD Increment Analysis

State<sup>18</sup> and federal<sup>19</sup> AAQS and the Class II PSD Increment analyses were modeled per the parameters listed in Section 5.6. The model analysis results are shown in Table 22 and Table 23. SO<sub>2</sub>, Annual NO<sub>2</sub>, and CO were all below SIL levels and were not included in the cumulative analysis. NO<sub>2</sub> modeling utilized Tier II of the Ambient Ratio Method (ARM2). Default minimum and maximum ratios of 0.5 and 0.9 were applied to determine the predicted ground-level concentration of NO<sub>2</sub>.

<sup>17</sup> *Outdoor Air Quality Data - Monitor Value Report*. Available at: <https://www.epa.gov/outdoor-air-quality-data/monitor-values-report> (Last visited October 24, 2025)

<sup>18</sup> NDAC 33.1-15-02. Available at: <https://www.ndlegis.gov/information/acdata/pdf/33.1-15-02.pdf?20150602082326> (Last visited October 24, 2025)

<sup>19</sup> §40 CFR 50. Available at: <https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-50?toc=1> (Last visited October 24, 2025)

Table 22 – AAQS Results Summary

| Pollutant         | Averaging Time      | Modeled Impact ( $\mu\text{g}/\text{m}^3$ ) | Background ( $\mu\text{g}/\text{m}^3$ ) | Total Impact ( $\mu\text{g}/\text{m}^3$ ) | NDAAQS ( $\mu\text{g}/\text{m}^3$ ) | NAAQS ( $\mu\text{g}/\text{m}^3$ ) | Passed (Y/N) |
|-------------------|---------------------|---------------------------------------------|-----------------------------------------|-------------------------------------------|-------------------------------------|------------------------------------|--------------|
| PM <sub>10</sub>  | 24-HR <sup>A</sup>  | 9.03                                        | 30                                      | 39.03                                     | 150                                 | 150                                | Y            |
| PM <sub>2.5</sub> | Annual <sup>B</sup> | 0.64                                        | 4.76 <sup>E</sup>                       | 5.40                                      | -                                   | 9                                  | Y            |
|                   | 24-HR <sup>C</sup>  | 2.80                                        | 13.836 <sup>F</sup>                     | 16.64                                     | -                                   | 35                                 | Y            |
| NO <sub>2</sub>   | 1-HR <sup>D</sup>   | 138.3                                       | 35                                      | 173.30                                    | -                                   | 188                                | Y            |

<sup>A</sup> Modeled concentration is the highest-sixth-highest 24-hour average across five years of meteorological data.

<sup>B</sup> Modeled concentration is the highest annual average concentration of five modeled years of meteorological data.

<sup>C</sup> Modeled concentration is the 98th percentile (eighth-high) of the annual distribution of maximum 24-hour concentrations averaged across five years of meteorological data.

<sup>D</sup> Modeled concentration is the 98th percentile (eighth-high) of the annual distribution of daily maximum 1-hr concentrations averaged across five years of meteorological data.

<sup>E</sup> Includes MERP adjustment of 0.005  $\mu\text{g}/\text{m}^3$  to account for secondary formation.

<sup>F</sup> Includes MERP adjustment of 0.14  $\mu\text{g}/\text{m}^3$  to account for secondary formation.

Table 23 – PSD Class II Increment Results Summary

| Pollutant         | Averaging Time      | Modeled Impact ( $\mu\text{g}/\text{m}^3$ ) | Class II Increment ( $\mu\text{g}/\text{m}^3$ ) | Increment Consumed | Passed (Y/N) |
|-------------------|---------------------|---------------------------------------------|-------------------------------------------------|--------------------|--------------|
| PM <sub>10</sub>  | Annual <sup>A</sup> | 2.17                                        | 17                                              | 13%                | Y            |
|                   | 24-HR <sup>B</sup>  | 9.53                                        | 30                                              | 32%                | Y            |
| PM <sub>2.5</sub> | Annual <sup>A</sup> | 0.69 <sup>C</sup>                           | 4                                               | 17%                | Y            |
|                   | 24-HR <sup>B</sup>  | 6.40 <sup>D</sup>                           | 9                                               | 71%                | Y            |

<sup>A</sup> Modeled concentration is the highest annual average concentration of five modeled years of meteorological data.

<sup>B</sup> Modeled concentration is the highest-second-high concentration of five modeled years of meteorological data.

<sup>C</sup> Includes MERP adjustment of 0.005  $\mu\text{g}/\text{m}^3$  to account for secondary formation.

<sup>D</sup> Includes MERP adjustment of 0.14  $\mu\text{g}/\text{m}^3$  to account for secondary formation.

## 7 Class I Area Modeling

### 7.1 Background

The proposed Basin facility is in proximity to several Class I areas: Fort Peck Indian Reservation (Fort Peck), Medicine Lake National Wildlife Refuge (Medicine Lake), Theodore Roosevelt National Park (TRNP), and Lostwood National Wildlife Refuge (Lostwood). The distance of these Class I areas to the Basin facility is shown in Table 5. Due to the 50 km modeling limitation of AERMOD, CALPUFF software was used for the Class I analysis, following the FLAG 2010 guidance document.<sup>20,21</sup> The National Park

<sup>20</sup> Federal Land Managers' Air Quality Related Values Work Group (FLAG) Phase I Report Available at:

<https://www.nps.gov/subjects/air/permitresources.htm> (Last visited October 24, 2025)

<sup>21</sup> Federal Land Managers' Interagency Guidance for Nitrogen and Sulfur Deposition Analyses:

<https://www.nps.gov/subjects/air/permitresources.htm> (Last visited October 24, 2025)

Service and U.S. Fish and Wildlife Service reviewed the modeling methodologies and results and requested no further analysis.

The analysis evaluated four key impacts for each Class I area: ambient air quality, visibility, ozone, and deposition of nitrogen and sulfur. The results are summarized below, with more detailed information available in the PSD Class I Visibility and Deposition Modeling Report and the PSD Class I Increment Modeling Report included in the permit application.

## 7.2 CALPUFF Meteorological Data

A CALPUFF-ready Weather Research and Forecasting (WRF) dataset with a horizontal grid spacing of 12 km was utilized. That data consisted of 3 years of hourly output data from 2019-2021. The National Park Service and U.S. Fish and Wildlife Service provided input regarding the development of the meteorological data and did not request any further analysis after final review.

## 7.3 Class I Increment Significant Impact Levels

Modeling was conducted to determine if the project's impacts were below Class I Significant Impact Levels (SILs). The results of this evaluation are shown in Table 24. Further details of the modeling evaluation are provided in Section 6.8 of the permit application and the PSD Class I Increment Modeling Report. PM<sub>10</sub> and PM<sub>2.5</sub> 24-HR concentrations were modeled using CALPUFF. All other pollutants and averaging times were modeled using AERMOD with receptors placed in a ring 50 km from the facility site. 50 km is the maximum recommended range for AERMOD, and all Class I areas were located further than 50 km. The modeled impacts included secondary formation for PM<sub>2.5</sub> based on MERPs and did not exceed the respective Class I SILs at any of the evaluated Class I areas.

Table 24 - Significant Impact Level (SIL) Modeling Summary

| Pollutant         | Averaging Time | Class I SIL (µg/m <sup>3</sup> ) | Maximum Modeled Concentration (µg/m <sup>3</sup> ) <sup>A</sup> |           |       |          |
|-------------------|----------------|----------------------------------|-----------------------------------------------------------------|-----------|-------|----------|
|                   |                |                                  | Medicine Lake                                                   | Fort Peck | TRNP  | Lostwood |
| NO <sub>2</sub>   | Annual         | 0.1                              | 0.016                                                           | 0.015     | 0.019 | 0.018    |
| PM <sub>10</sub>  | Annual         | 0.2                              | 0.013                                                           | 0.012     | 0.015 | 0.014    |
|                   | 24-HR          | 0.3                              | 0.07                                                            | 0.05      | 0.04  | 0.05     |
| PM <sub>2.5</sub> | Annual         | 0.03                             | 0.015                                                           | 0.014     | 0.017 | 0.016    |
|                   | 24-HR          | 0.27                             | 0.2                                                             | 0.17      | 0.14  | 0.14     |
| SO <sub>2</sub>   | Annual         | 0.1                              | 0.002                                                           | 0.002     | 0.002 | 0.002    |
|                   | 24-HR          | 0.2                              | 0.04                                                            | 0.03      | 0.04  | 0.04     |
|                   | 3-HR           | 1                                | 0.11                                                            | 0.1       | 0.12  | 0.12     |

<sup>A</sup> Modeled level includes the secondary formation of PM<sub>2.5</sub> determined via MERPs (Table 19)

## 7.4 Acid Deposition Impacts Analysis

An evaluation of potential impacts on species (flora and fauna) and ecosystems (terrestrial and aquatic) resulting from Basin's SO<sub>2</sub> and NO<sub>x</sub> emissions was conducted per the "Federal Land Managers'

Interagency Guidance for Nitrogen and Sulfur Deposition Analyses.”<sup>22</sup> The results are shown in Table 25, with further analysis details provided in PSD Class I Visibility and Deposition Modeling Report in the permit application. The modeled results do not exceed the Deposition Analysis Thresholds (DATs) for any of the evaluated Class I areas.

Table 25 - Screening Analysis Results for Deposition Effects

| Class I Area                        | Year | Project Nitrogen<br>Deposition Rate       | Project Sulfur<br>Deposition Rate | Deposition<br>Analysis<br>Threshold <sup>A</sup> |
|-------------------------------------|------|-------------------------------------------|-----------------------------------|--------------------------------------------------|
|                                     |      | kilograms per hectare per year (kg/ha/yr) |                                   |                                                  |
| Medicine Lake<br>Wilderness         | 2019 | 0.0009                                    | 0.0005                            | 0.005                                            |
|                                     | 2020 | 0.0004                                    | 0.0001                            |                                                  |
|                                     | 2021 | 0.0008                                    | 0.0004                            |                                                  |
| Fort Peck                           | 2019 | 0.0009                                    | 0.0005                            |                                                  |
|                                     | 2020 | 0.0003                                    | 0.0001                            |                                                  |
|                                     | 2021 | 0.0008                                    | 0.0004                            |                                                  |
| Theodore Roosevelt<br>National Park | 2019 | 0.0008                                    | 0.0003                            |                                                  |
|                                     | 2020 | 0.0005                                    | 0.0002                            |                                                  |
|                                     | 2021 | 0.0006                                    | 0.0002                            |                                                  |
| Lostwood<br>Wilderness              | 2019 | 0.0008                                    | 0.0003                            |                                                  |
|                                     | 2020 | 0.0007                                    | 0.0003                            |                                                  |
|                                     | 2021 | 0.0009                                    | 0.0003                            |                                                  |

<sup>A</sup> Deposition Analysis Thresholds based on FLM guidance for the western U.S.

## 7.5 Visibility Impacts Analysis

The visibility impact analysis followed FLAG guidance<sup>23</sup>, with further details available in the PSD Class I Visibility and Deposition Modeling Report in the permit application. Visibility impairment processing was carried out using the CALPOST post-processor using Method 8. The 98th percentile in light extinction was calculated and compared to the level of acceptable change of 5.0%. Table 26 shows these results. The visibility impacts are well below the level of acceptable change and demonstrate that the facility will not have adverse visibility impacts on any of the Class I areas.

<sup>22</sup> Federal Land Managers’ Interagency Guidance for Nitrogen and Sulfur Deposition Analyses: <https://www.nps.gov/subjects/air/permitresources.htm> (Last visited October 24, 2025)

<sup>23</sup> Federal Land Managers’ Air Quality Related Values Work Group (FLAG) Phase I Report Available at: <https://www.nps.gov/subjects/air/permitresources.htm> (Last visited October 24, 2025)

Table 26 - Modeled Visibility Impacts

| Class I Area                     | Year | Maximum 98th Percentile Change in Light Extinction |
|----------------------------------|------|----------------------------------------------------|
| Medicine Lake Wilderness         | 2019 | 1.9                                                |
|                                  | 2020 | 1.4                                                |
|                                  | 2021 | 1.5                                                |
| Fort Peck                        | 2019 | 2.6                                                |
|                                  | 2020 | 1.9                                                |
|                                  | 2021 | 2                                                  |
| Theodore Roosevelt National Park | 2019 | 1.7                                                |
|                                  | 2020 | 1.3                                                |
|                                  | 2021 | 1.6                                                |
| Lostwood Wilderness              | 2019 | 1.1                                                |
|                                  | 2020 | 1.5                                                |
|                                  | 2021 | 1.2                                                |

## 8 Summary & Conclusions

Upon the Department's review and independent analysis of the modeling submitted by Basin, the following is concluded:

Basin followed all applicable State and Federal guidance in their modeling protocol.

Basin's dispersion modeling was conducted to demonstrate that emissions from the Project are expected to comply with state and federal Ambient Air Quality Standards (AAQS). Emissions associated with operating the facility with the proposed emission units and limits are not expected to cause or contribute to a violation of the NAAQS and NDAAQS as listed in NDAC 33.1-15-02-04. Results of the modeled impacts for the AAQS are displayed in Table 1 and Table 22.

Basin's modeling was conducted to demonstrate that emissions from the Project are expected to comply with federal PSD Class II and Class I Increments. Emissions associated with operating the facility with the proposed emission units and limits are not expected to cause or contribute to a violation of the PSD Increments as incorporated by reference in NDAC 33.1-15-15. Results of the modeled impacts for the Class II PSD Increments are displayed in Table 2 and Table 23.

Basin's CALPUFF modeling analysis demonstrated that the predicted impacts from the new facility will not prevent the attainment or maintenance of any ambient air quality standard and will not exceed any applicable AQRV screening thresholds at a Class I area. The Class I modeling results for SILs, deposition, and visibility impacts are displayed in Table 24, Table 25, and Table 26, respectively.

## 9 Plots

### Model Set-Up

|                  |      |   |
|------------------|------|---|
| Basin Site       | Plot | 1 |
| Terrain Contours | Plot | 2 |
| Windrose         | Plot | 3 |
| Receptor Grid    | Plot | 4 |

### SSIA

|                        |      |    |
|------------------------|------|----|
| SO <sub>2</sub> Annual | Plot | 5  |
| SO <sub>2</sub> 24-HR  | Plot | 6  |
| SO <sub>2</sub> 3-HR   | Plot | 7  |
| SO <sub>2</sub> 1-HR   | Plot | 8  |
| NO <sub>2</sub> Annual | Plot | 9  |
| CO 8-HR                | Plot | 10 |
| CO 1-HR                | Plot | 11 |

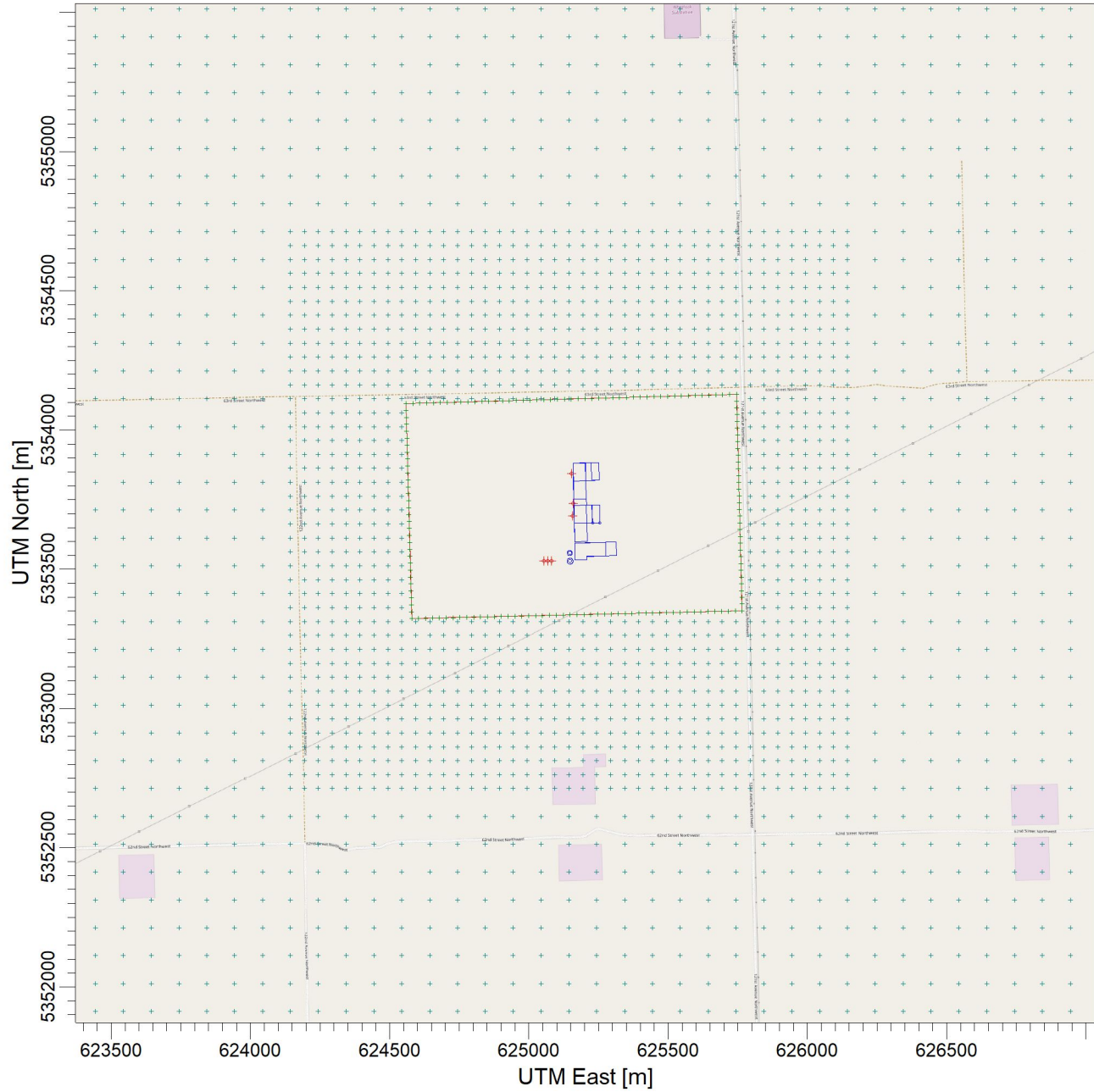
### AAQS Analysis

|                          |      |    |
|--------------------------|------|----|
| PM <sub>10</sub> 24-HR   | Plot | 12 |
| PM <sub>2.5</sub> Annual | Plot | 13 |
| PM <sub>2.5</sub> 24-HR  | Plot | 14 |
| NO <sub>2</sub> 1-HR     | Plot | 15 |

### PSD Increment Analysis

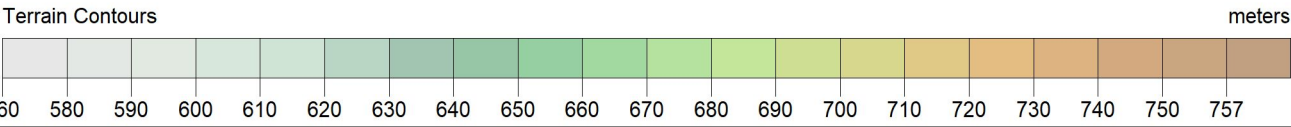
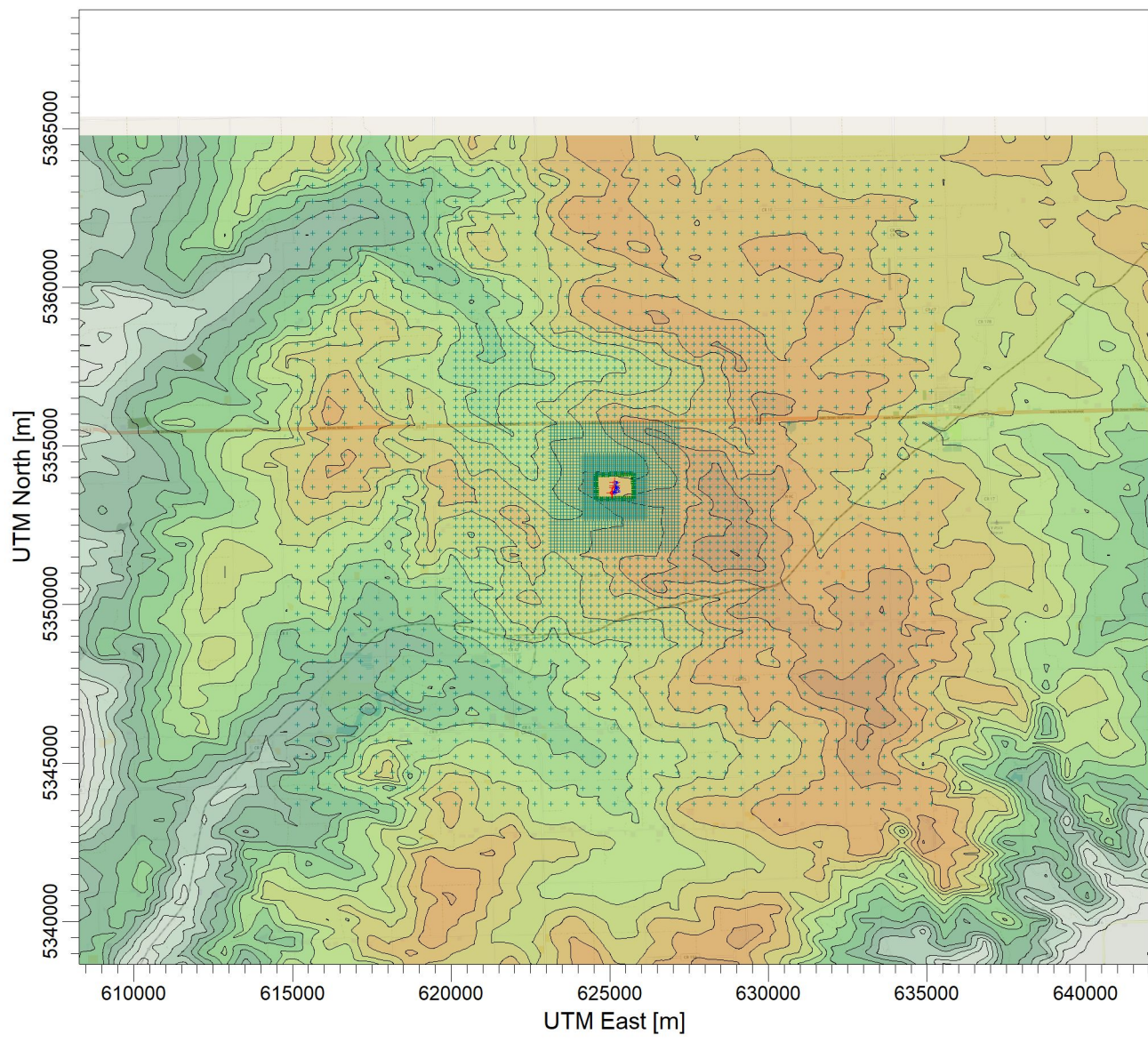
|                          |      |    |
|--------------------------|------|----|
| PM <sub>10</sub> Annual  | Plot | 16 |
| PM <sub>10</sub> 24-HR   | Plot | 17 |
| PM <sub>2.5</sub> Annual | Plot | 18 |
| PM <sub>2.5</sub> 24-HR  | Plot | 19 |

PROJECT TITLE:  
**Basin Bison Generation Station**  
**Plot 1 - Site**



|           |            |                                                  |                                                                                             |
|-----------|------------|--------------------------------------------------|---------------------------------------------------------------------------------------------|
| COMMENTS: | SOURCES:   | COMPANY NAME:                                    |                                                                                             |
|           | 6          | North Dakota Department of Environmental Quality |                                                                                             |
|           | RECEPTORS: | MODELER:                                         | <div><div>NORTH Dakota</div><div>Be Legendary.™</div><div>Environmental Quality</div></div> |
|           | 5340       | Rhannon Thorton                                  |                                                                                             |
|           |            | SCALE:                                           | 1:23,022                                                                                    |
|           |            | <div>0<div></div>0.5 km</div>                    |                                                                                             |
|           |            | DATE:                                            | PROJECT NO.:                                                                                |
|           |            | 11/10/2025                                       | ACP-18273                                                                                   |

PROJECT TITLE:  
**Basin Bison Generation Station**  
**Plot 2 - Terrain Contours**

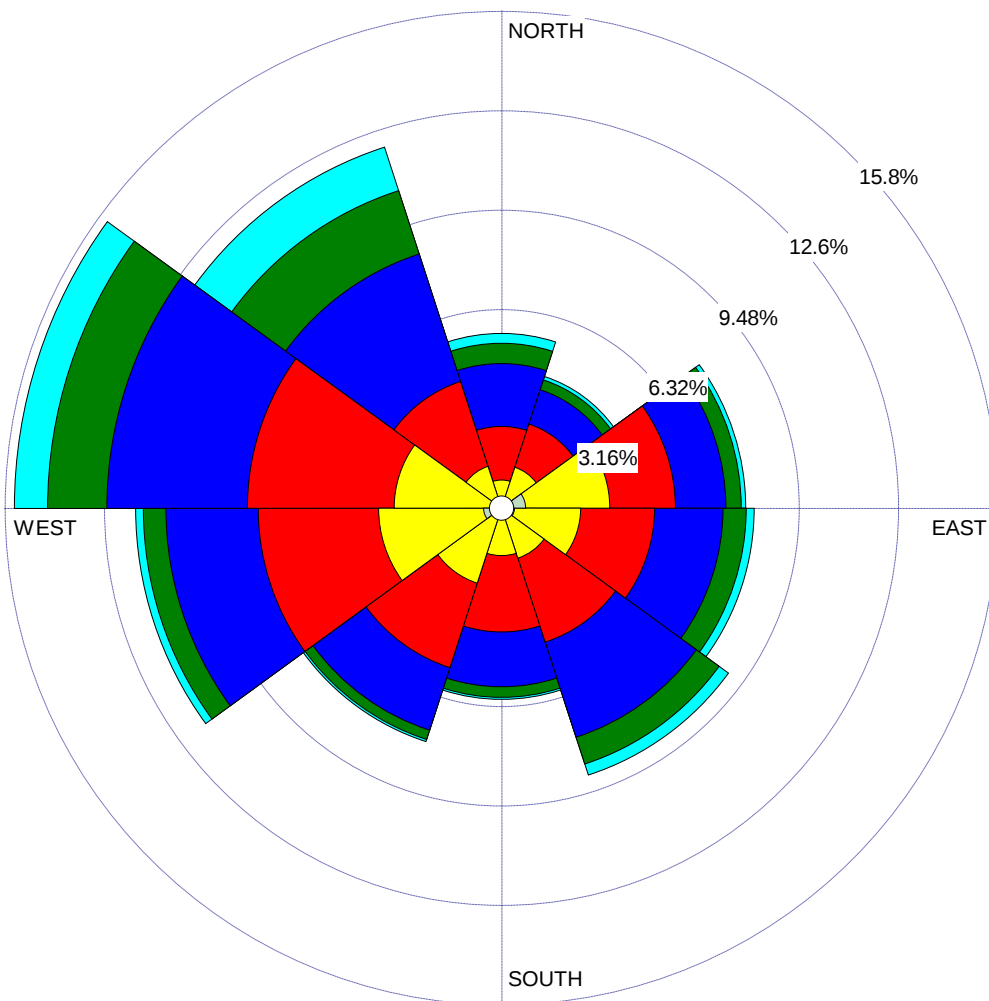


|           |             |                                                         |                  |
|-----------|-------------|---------------------------------------------------------|------------------|
| COMMENTS: | SOURCES:    | COMPANY NAME:                                           |                  |
|           | <b>6</b>    | <b>North Dakota Department of Environmental Quality</b> |                  |
|           | RECEPTORS:  | MODELER:                                                |                  |
|           | <b>5340</b> | <b>Rhannon Thorton</b>                                  |                  |
|           |             | SCALE:                                                  | 1:212,054        |
|           |             |                                                         |                  |
|           |             | DATE:                                                   | PROJECT NO.:     |
|           |             | <b>11/10/2025</b>                                       | <b>ACP-18273</b> |

WIND ROSE PLOT:

**Basin Bison Generation Station  
Plot 3 - Wind Rose**

DISPLAY:

**Wind Speed  
Direction (blowing from)**


## COMMENTS:

Tioga Municipal Airport, ND  
Station No. 720863  
Year: 2019-2023

## DATA PERIOD:

**Start Date: 1/1/2019 - 00:00  
End Date: 12/31/2023 - 23:59**

## COMPANY NAME:

**North Dakota Department of Environmental Quality**

## MODELER:

**Rhannon Thorton**

## CALM WINDS:

**10.69%**

## TOTAL COUNT:

**43096 hrs.**

## AVG. WIND SPEED:

**5.09 m/s**

## DATE:

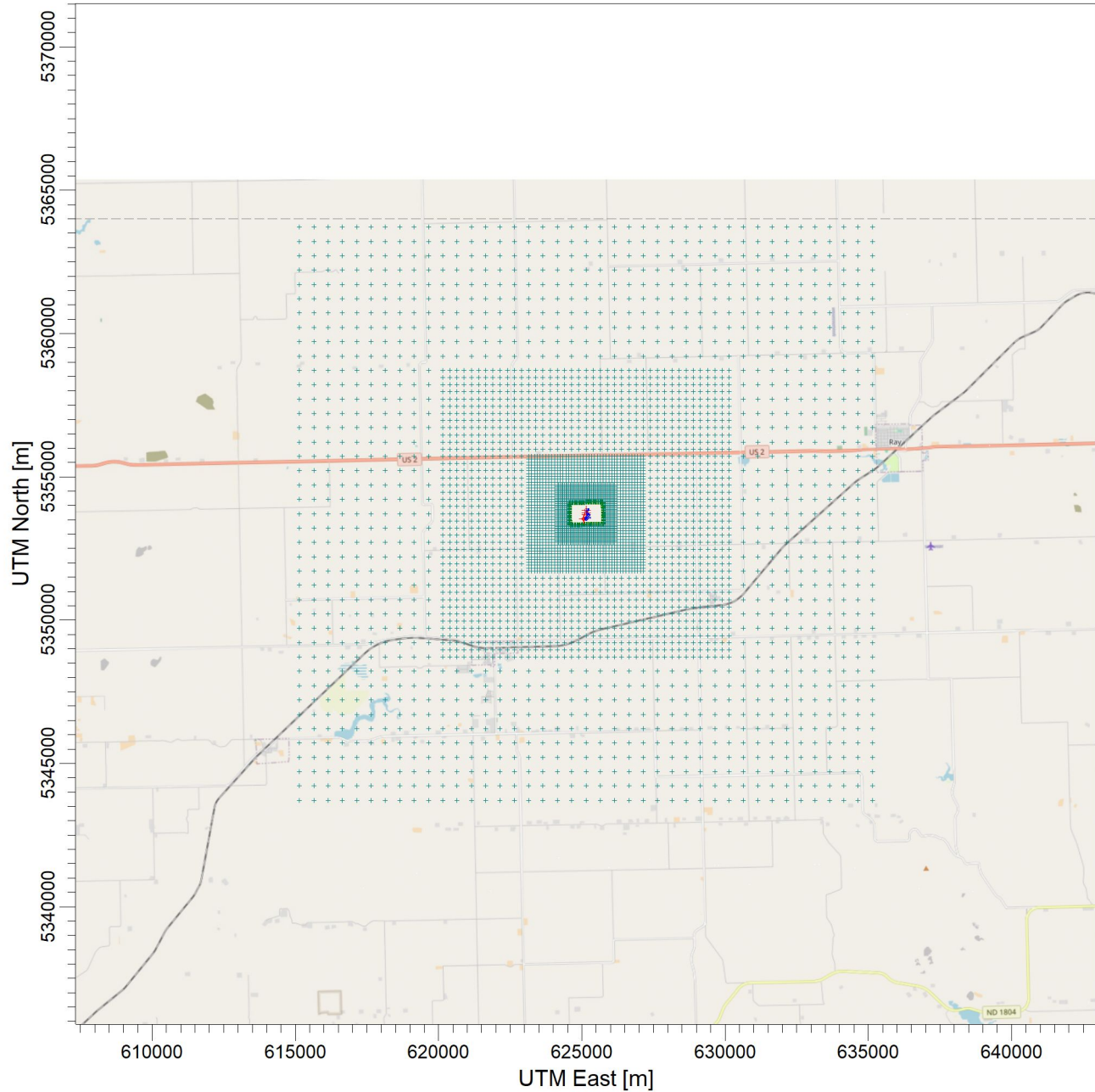
**11/10/2025**

## PROJECT NO.:

**ACP-18273**

**NORTH Dakota** | Environmental Quality  
Be Legendary.™

PROJECT TITLE:  
**Basin Bison Generation Station**  
**Plot 4 - Receptor Grid**



COMMENTS:

SOURCES:

**6**

COMPANY NAME:

**North Dakota Department of Environmental Quality**

RECEPTORS:

**5340**

MODELER:

**Rhannon Thorton**

SCALE:

**1:224,007**

0  5 km

DATE:

**11/10/2025**

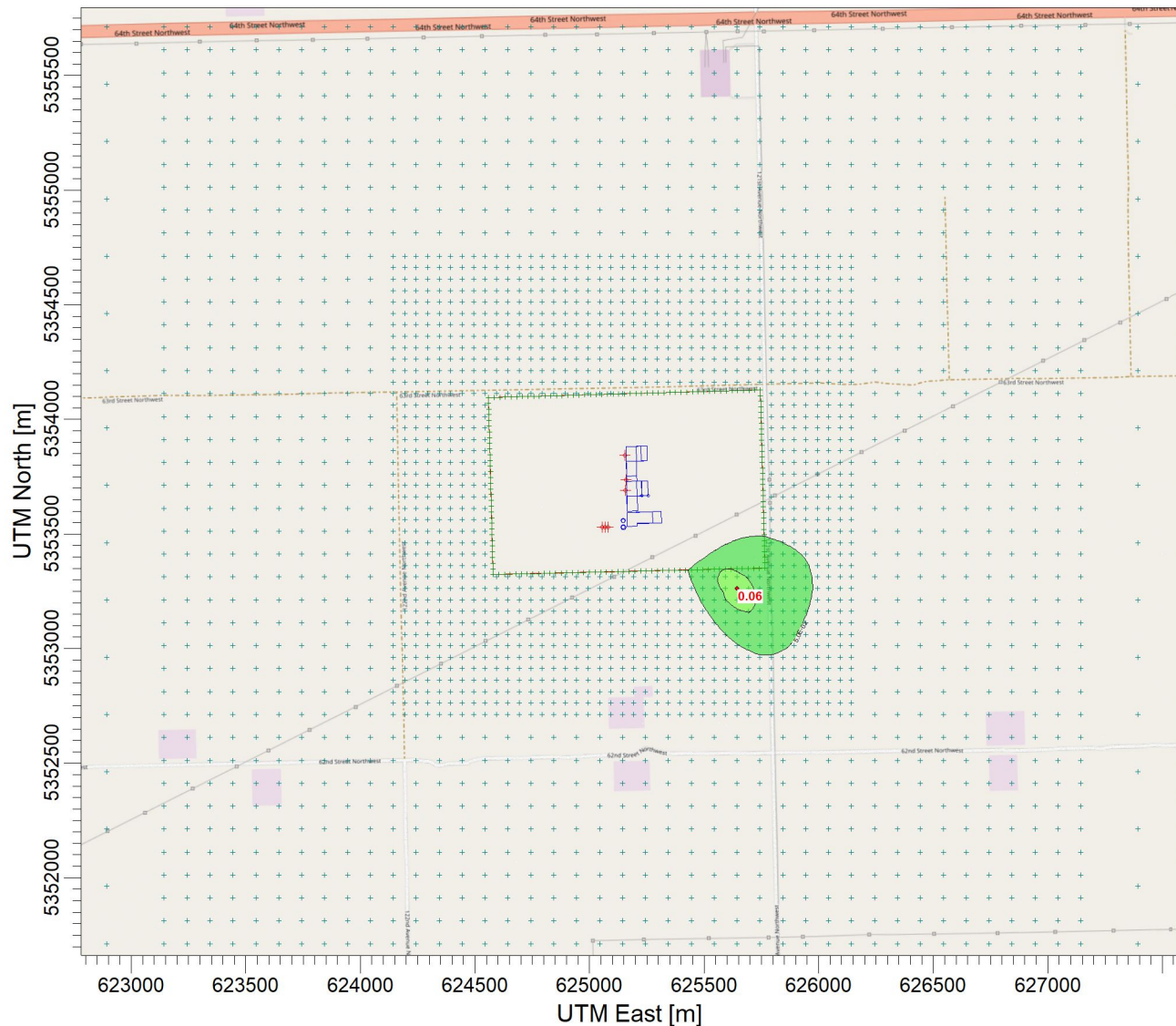
**NORTH Dakota** | Environmental Quality  
Be Legendary.™

PROJECT NO.:

**ACP-18273**

PROJECT TITLE:

**Basin Bison Generation Station  
Plot 5 - SO<sub>2</sub> Annual (SSIA)**



PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 5 YEARS FOR SOURCE GROUP: MECL

ug/m<sup>3</sup>

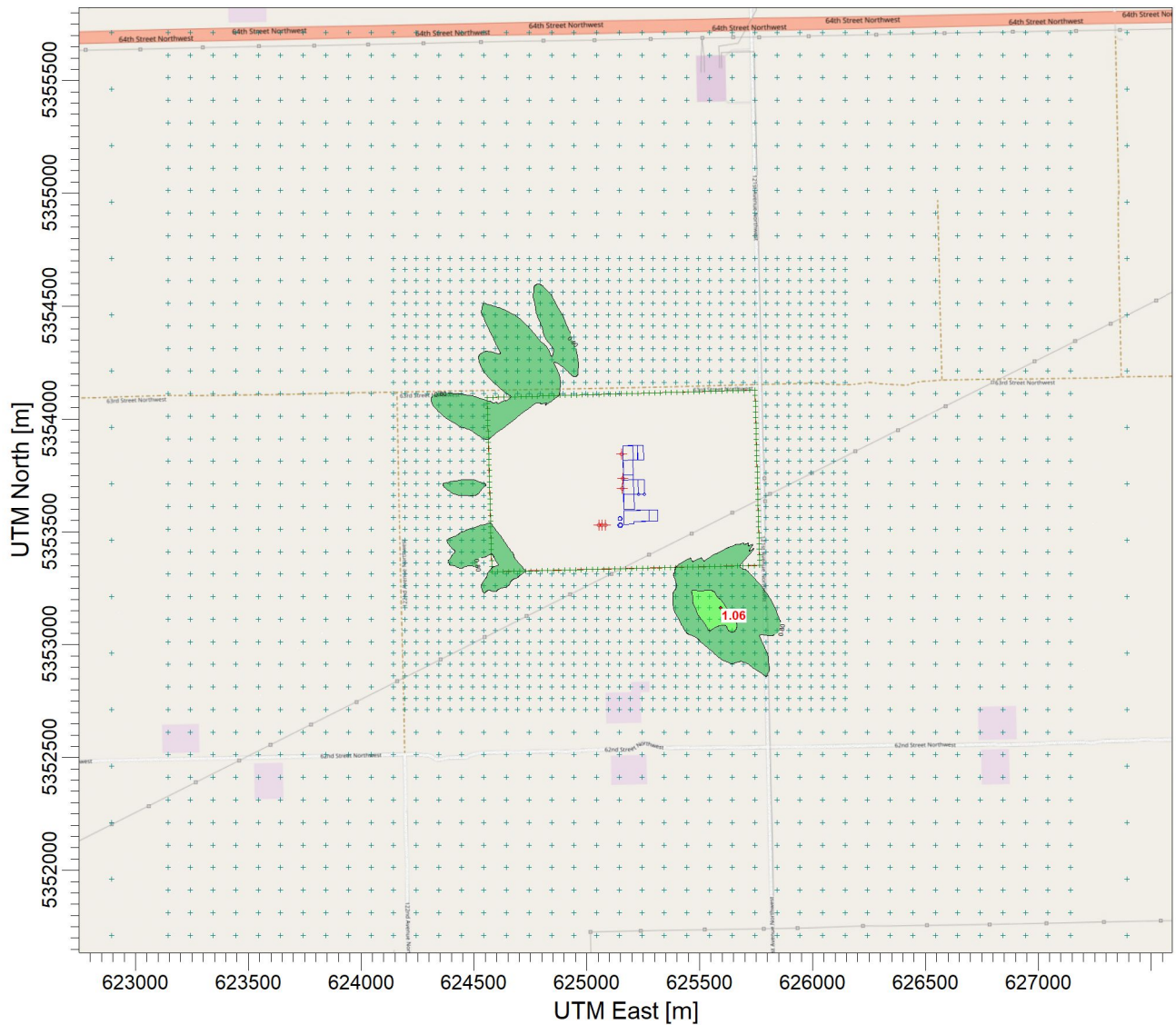
Max: 6.1E-02 [ug/m<sup>3</sup>] at (625643.63, 5353262.50)



|                                                                                          |                                                    |                                                                                                                       |                                                                                       |
|------------------------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>COMMENTS:</b><br><br>Highest modeled scenario: MECL<br><br>SIL is 1 µg/m <sup>3</sup> | <b>SOURCES:</b><br><br><b>14</b>                   | <b>COMPANY NAME:</b><br><br><b>North Dakota Department of Environmental Quality</b>                                   |                                                                                       |
|                                                                                          | <b>RECEPTORS:</b><br><br><b>5340</b>               | <b>MODELER:</b><br><br><b>Rhannon Thorton</b>                                                                         |  |
|                                                                                          | <b>OUTPUT TYPE:</b><br><br><b>Concentration</b>    | <b>SCALE:</b><br><br>1:30,080<br> |                                                                                       |
|                                                                                          | <b>MAX:</b><br><br><b>6.1E-02 ug/m<sup>3</sup></b> | <b>DATE:</b><br><br><b>11/6/2025</b>                                                                                  | <b>PROJECT NO.:</b><br><br><b>ACP-18273</b>                                           |

PROJECT TITLE:

**Basin Bison Generation Station  
Plot 6 - SO2 24-HR (SSIA)**



PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: MECL

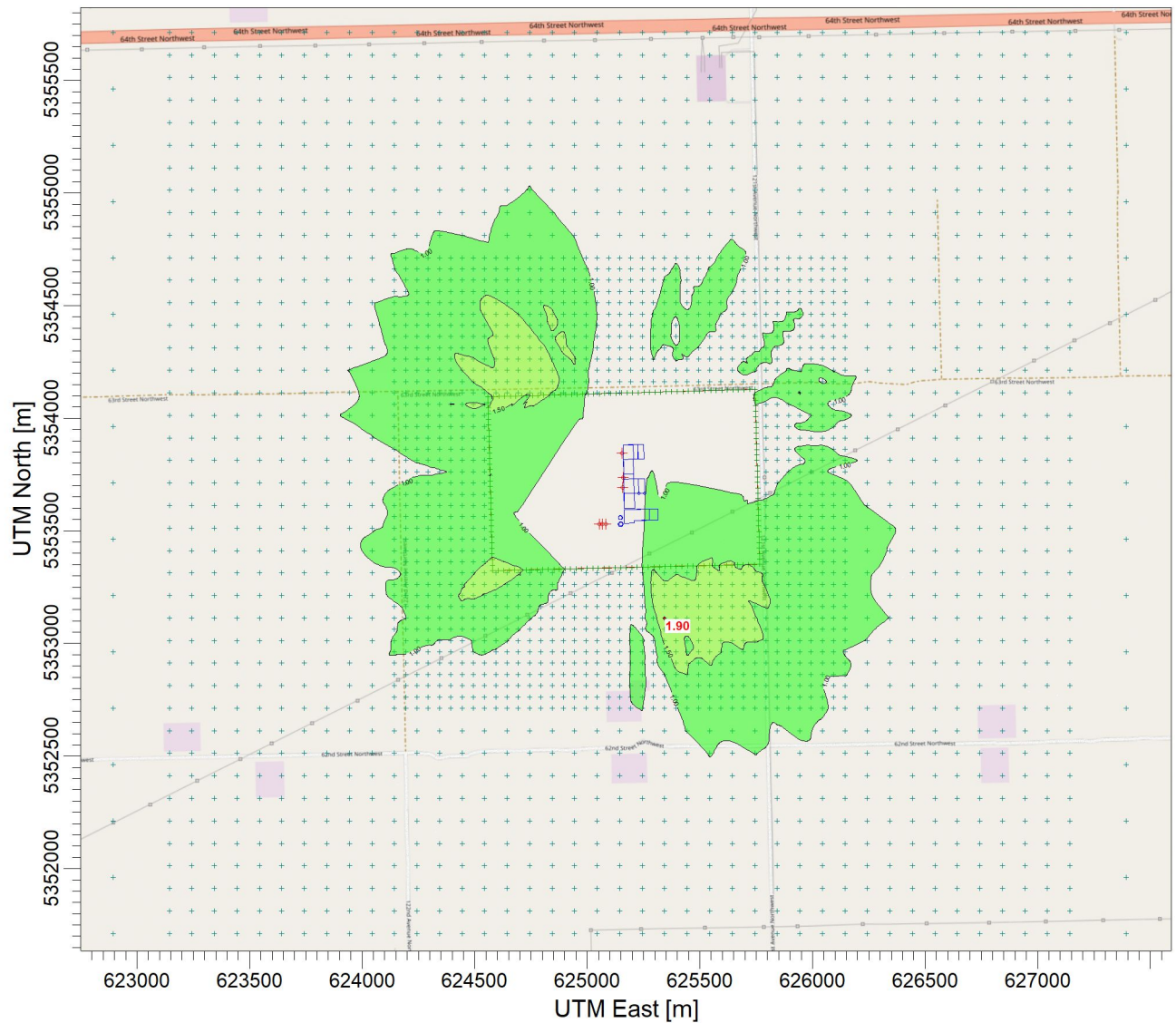
ug/m<sup>3</sup>

Max: 1.06 [ug/m<sup>3</sup>] at (625593.63, 5353162.50)



|                                                                       |                                          |                                                                                                                           |                                                                                                                   |
|-----------------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| COMMENTS:<br><br>Highest modeled scenario: MECL<br><br>SIL is 5 µg/m3 | SOURCES:<br><br><b>14</b>                | COMPANY NAME:<br><br><b>North Dakota Department of Environmental Quality</b>                                              |                                                                                                                   |
|                                                                       | RECEPTORS:<br><br><b>5340</b>            | MODELER:<br><br><b>Rhannon Thorton</b>                                                                                    | <div><div><div>NORTH<br/><b>Dakota</b><br/>Be Legendary.™</div><div>  Environmental<br/>Quality</div></div></div> |
|                                                                       | OUTPUT TYPE:<br><br><b>Concentration</b> | SCALE:<br><br>1:30,467<br><br>0  1 km |                                                                                                                   |
|                                                                       | MAX:<br><br><b>1.06 ug/m^3</b>           | DATE:<br><br><b>11/6/2025</b>                                                                                             | PROJECT NO.:<br><br><b>ACP-18273</b>                                                                              |

PROJECT TITLE:  
**Basin Bison Generation Station**  
**Plot 7 - SO2 3-HR (SSIA)**



PLOT FILE OF HIGH 1ST HIGH 3-HR VALUES FOR SOURCE GROUP: MECL

ug/m<sup>3</sup>

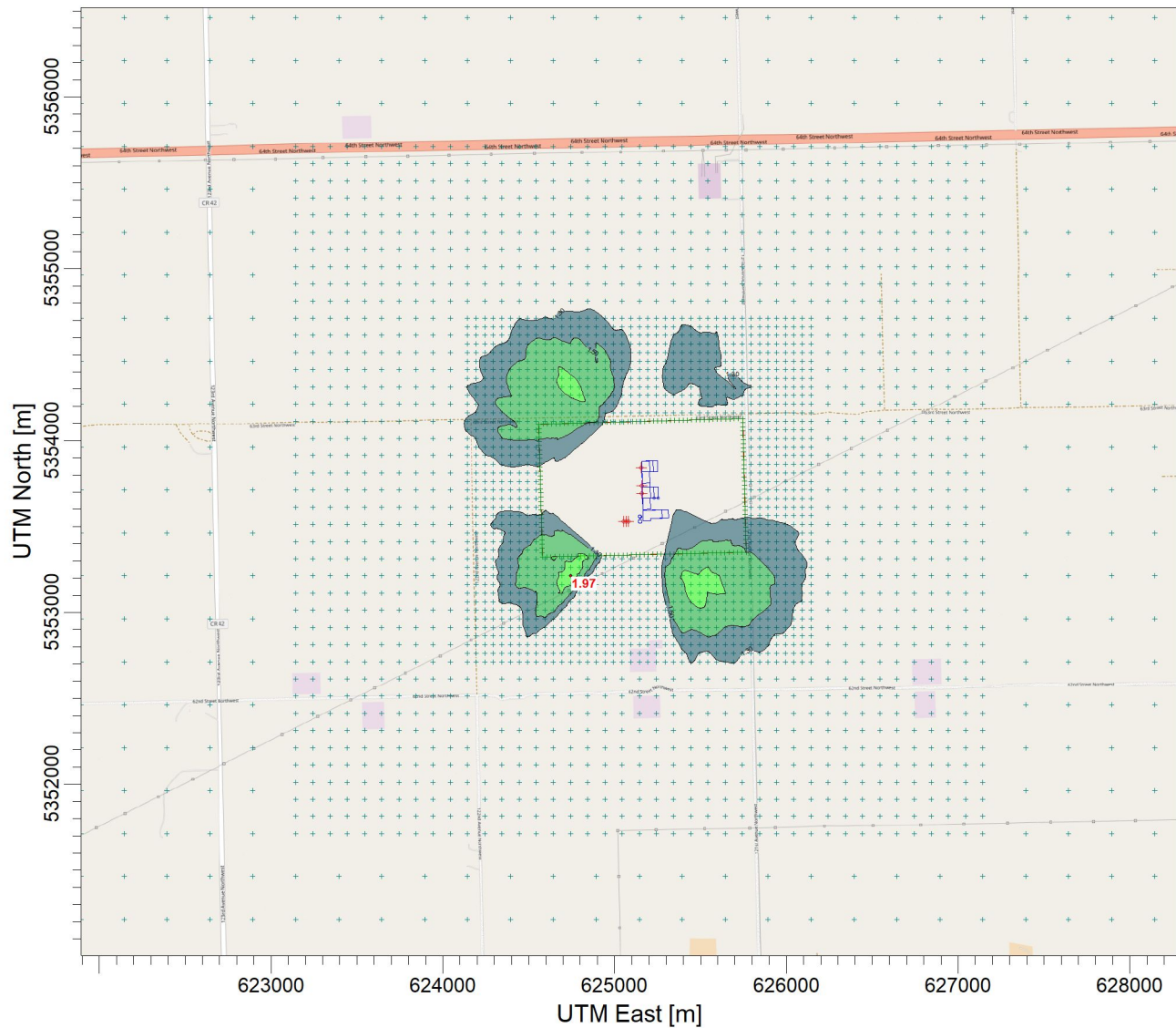
Max: 1.90 [ug/m<sup>3</sup>] at (625343.63, 5353112.50)



|                                                                                           |                                                  |                                                                                                                                              |                                                                                                        |
|-------------------------------------------------------------------------------------------|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| <div>COMMENTS:</div> <div>Highest modeled scenario: MECL</div> <div>SIL is 25 µg/m3</div> | <div>SOURCES:</div> <div>14</div>                | <div>COMPANY NAME:</div> <div>North Dakota Department of Environmental Quality</div>                                                         |                                                                                                        |
|                                                                                           | <div>RECEPTORS:</div> <div>5340</div>            | <div>MODELER:</div> <div>Rhannon Thorton</div>                                                                                               | <div><div><div>NORTH Dakota</div><div>Be Legendary.™</div></div><div>Environmental Quality</div></div> |
|                                                                                           | <div>OUTPUT TYPE:</div> <div>Concentration</div> | <div>SCALE:</div> <div>1:30,467</div> <div>0  1 km</div> |                                                                                                        |
|                                                                                           | <div>MAX:</div> <div>1.90 ug/m^3</div>           | <div>DATE:</div> <div>11/6/2025</div>                                                                                                        | <div>PROJECT NO.:</div> <div>ACP-18273</div>                                                           |

PROJECT TITLE:

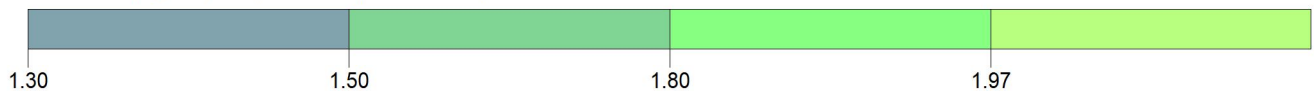
**Basin Bison Generation Station  
Plot 8 - SO2 1-HR (SSIA)**



PLOT FILE OF 1ST-HIGHEST MAX DAILY 1-HR VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: MECL

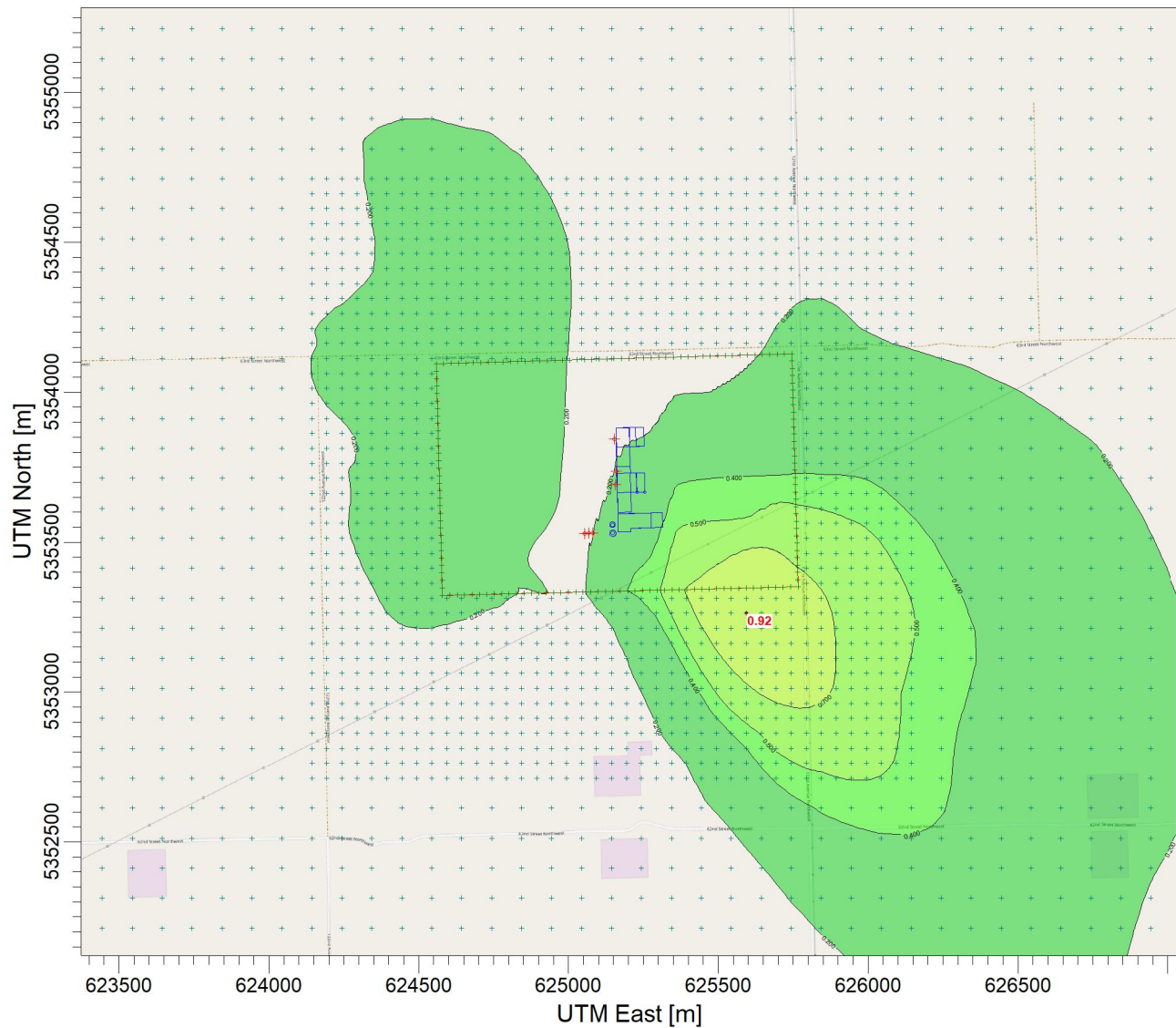
ug/m<sup>3</sup>

Max: 1.97 [ug/m<sup>3</sup>] at (624743.63, 5353212.50)



|                                                                                            |                                                  |                                                                                      |                                                                                                        |
|--------------------------------------------------------------------------------------------|--------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| <div>COMMENTS:</div> <div>Highest modeled scenario: MECL</div> <div>SIL is 7.8 µg/m3</div> | <div>SOURCES:</div> <div>14</div>                | <div>COMPANY NAME:</div> <div>North Dakota Department of Environmental Quality</div> |                                                                                                        |
|                                                                                            | <div>RECEPTORS:</div> <div>5340</div>            | <div>MODELER:</div> <div>Rhannon Thorton</div>                                       | <div><div><div>NORTH Dakota</div><div>Be Legendary.™</div></div><div>Environmental Quality</div></div> |
|                                                                                            | <div>OUTPUT TYPE:</div> <div>Concentration</div> | <div>SCALE:</div> <div>1:40,132</div> <div>0<div></div>1 km</div>                    |                                                                                                        |
|                                                                                            | <div>MAX:</div> <div>1.97 ug/m^3</div>           | <div>DATE:</div> <div>11/6/2025</div>                                                | <div>PROJECT NO.:</div> <div>ACP-18273</div>                                                           |

PROJECT TITLE:  
**Basin Bison Generation Station**  
**Plot 9 - NO2 Annual (SSIA)**

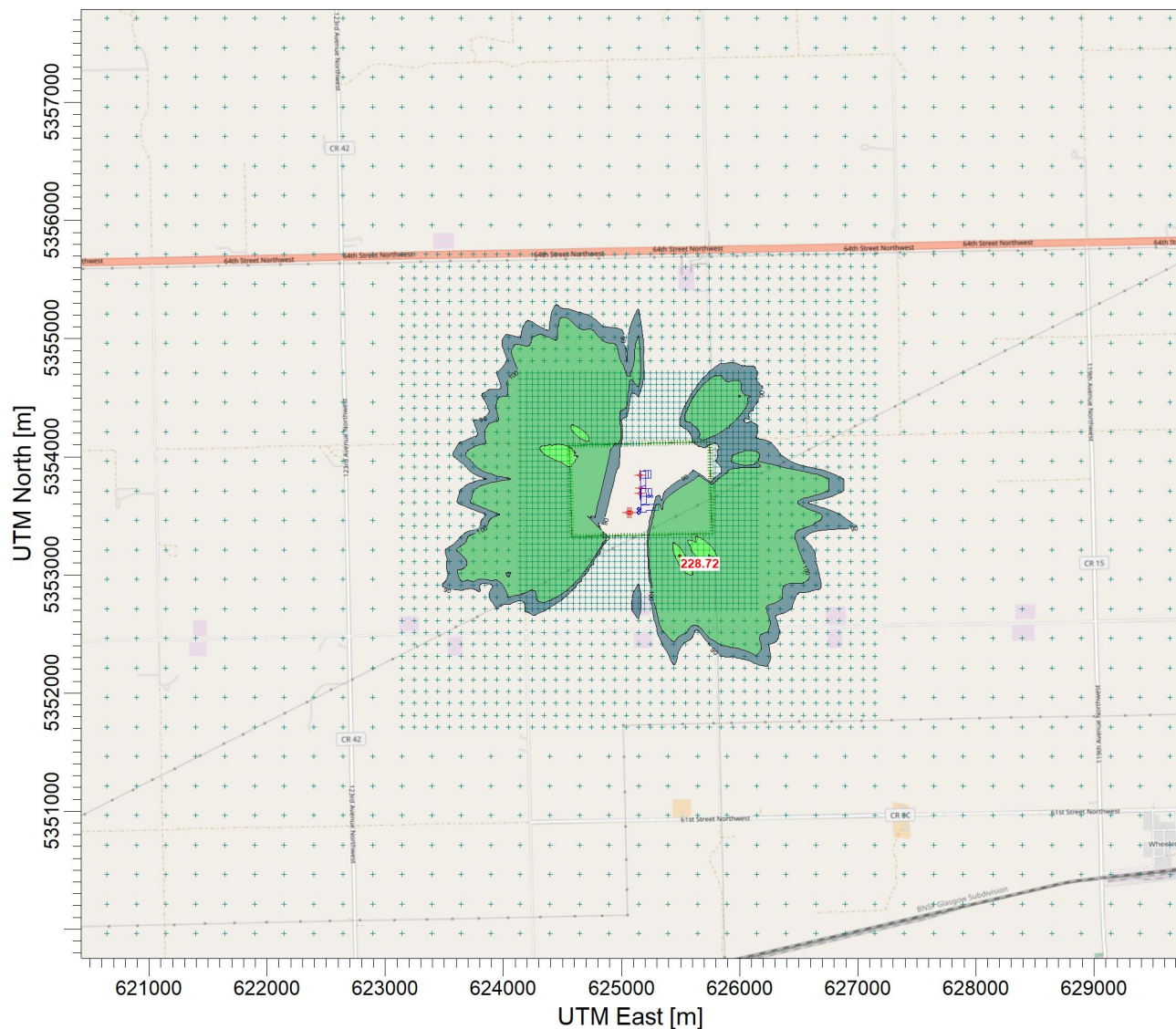


POST/PLOT FILE OF ANNUAL VALUES FOR YEAR 1 FOR SOURCE GROUP: ALL ug/m^3  
Max: 0.923 [ug/m^3] at (625593.63, 5353262.50)

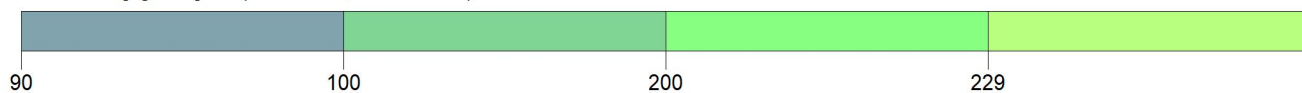


|                                                                       |                                          |                                                                                                                    |                                                                                       |
|-----------------------------------------------------------------------|------------------------------------------|--------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| COMMENTS:<br><br>Highest modeled scenario: MECL<br><br>SIL is 1 µg/m3 | SOURCES:<br><br><b>6</b>                 | COMPANY NAME:<br><br><b>North Dakota Department of Environmental Quality</b>                                       |                                                                                       |
|                                                                       | RECEPTORS:<br><br><b>5340</b>            | MODELER:<br><br><b>Rhannon Thorton</b>                                                                             |  |
|                                                                       | OUTPUT TYPE:<br><br><b>Concentration</b> | SCALE:<br><br>1:23,003<br><br> |                                                                                       |
|                                                                       | MAX:<br><br><b>0.923 ug/m^3</b>          | DATE:<br><br><b>11/10/2025</b>                                                                                     | PROJECT NO.:<br><br><b>ACP-18273</b>                                                  |

**Basin Bison Generation Station**  
**Plot 10 - CO 8-HR (SSIA)**

 $\mu\text{g}/\text{m}^3$ 

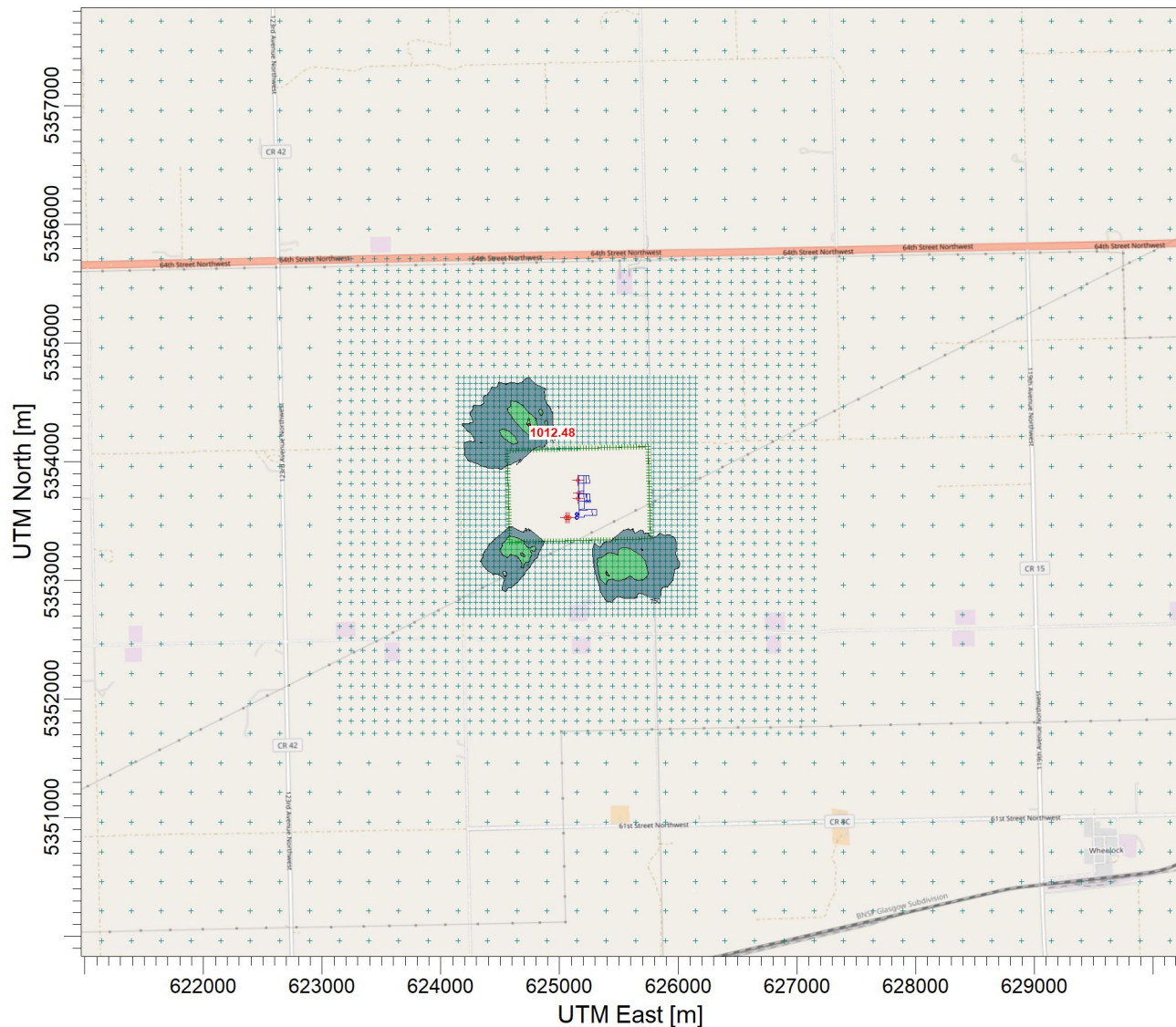
Max: 229 [ug/m<sup>3</sup>] at (625493.63, 5353162.50)



|                                                                       |                                          |                                                                                                                           |                                                                                       |
|-----------------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| COMMENTS:<br><br>Highest modeled scenario: SS<br><br>SIL is 500 µg/m3 | SOURCES:<br><br><b>14</b>                | COMPANY NAME:<br><br><b>North Dakota Department of Environmental Quality</b>                                              |                                                                                       |
|                                                                       | RECEPTORS:<br><br><b>5340</b>            | MODELER:<br><br><b>Rhannon Thorton</b>                                                                                    |  |
|                                                                       | OUTPUT TYPE:<br><br><b>Concentration</b> | SCALE:<br><br>1:58,446<br><br>0  2 km |                                                                                       |
|                                                                       | MAX:<br><br><b>229 ug/m^3</b>            | DATE:<br><br><b>11/6/2025</b>                                                                                             | PROJECT NO.:<br><br><b>ACP-18273</b>                                                  |

PROJECT TITLE:

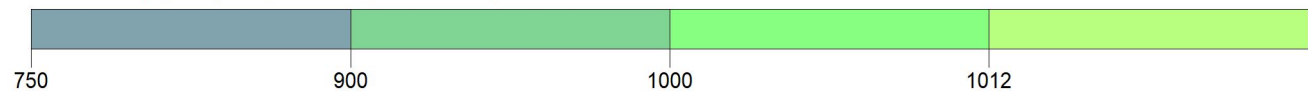
**Basin Bison Generation Station  
Plot 11 - CO 1-HR (SSIA)**



PLOT FILE OF HIGH 1ST HIGH 1-HR VALUES FOR SOURCE GROUP: SS

ug/m<sup>3</sup>

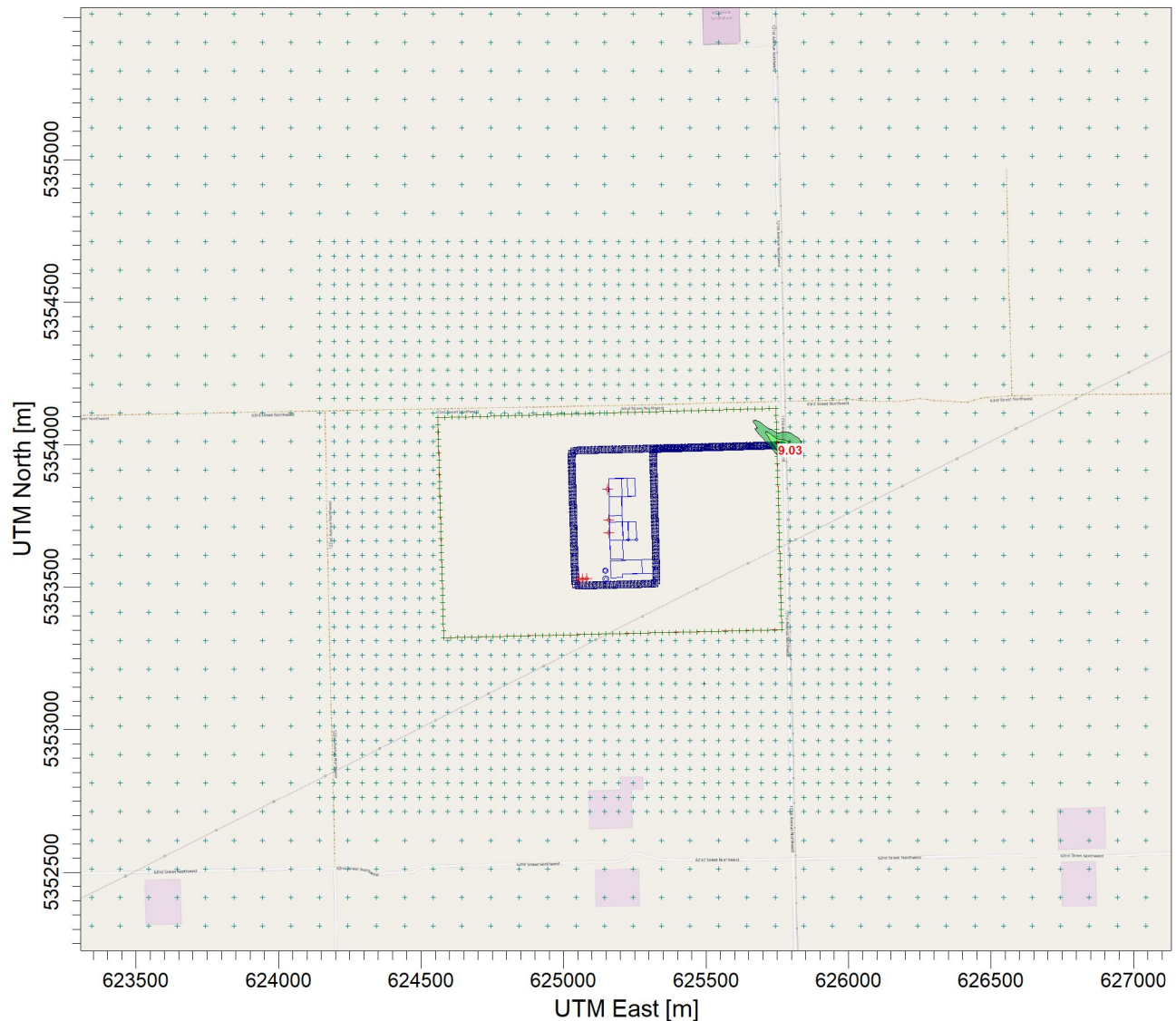
Max: 1012 [ug/m<sup>3</sup>] at (624743.63, 5354312.50)



|                                                                                            |                                                  |                                                                                      |                                                                                                        |
|--------------------------------------------------------------------------------------------|--------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| <div>COMMENTS:</div> <div>Highest modeled scenario: SS</div> <div>SIL is 2,000 µg/m3</div> | <div>SOURCES:</div> <div>14</div>                | <div>COMPANY NAME:</div> <div>North Dakota Department of Environmental Quality</div> |                                                                                                        |
|                                                                                            | <div>RECEPTORS:</div> <div>5340</div>            | <div>MODELER:</div> <div>Rhannon Thorton</div>                                       | <div><div><div>NORTH Dakota</div><div>Be Legendary.™</div></div><div>Environmental Quality</div></div> |
|                                                                                            | <div>OUTPUT TYPE:</div> <div>Concentration</div> | <div>SCALE:</div> <div>1:58,170</div> <div>0<div><div></div></div>2 km</div>         |                                                                                                        |
|                                                                                            | <div>MAX:</div> <div>1012 ug/m^3</div>           | <div>DATE:</div> <div>11/6/2025</div>                                                | <div>PROJECT NO.:</div> <div>ACP-18273</div>                                                           |

PROJECT TITLE:

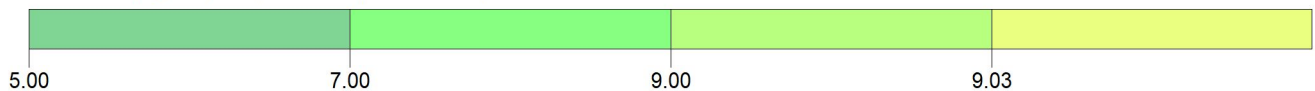
**Basin Bison Generation Station  
Plot 12 - PM10 24-HR (NAAQS)**



PLOT FILE OF HIGH 6TH HIGH 24-HR VALUES FOR SOURCE GROUP: MECL+INV

ug/m<sup>3</sup>

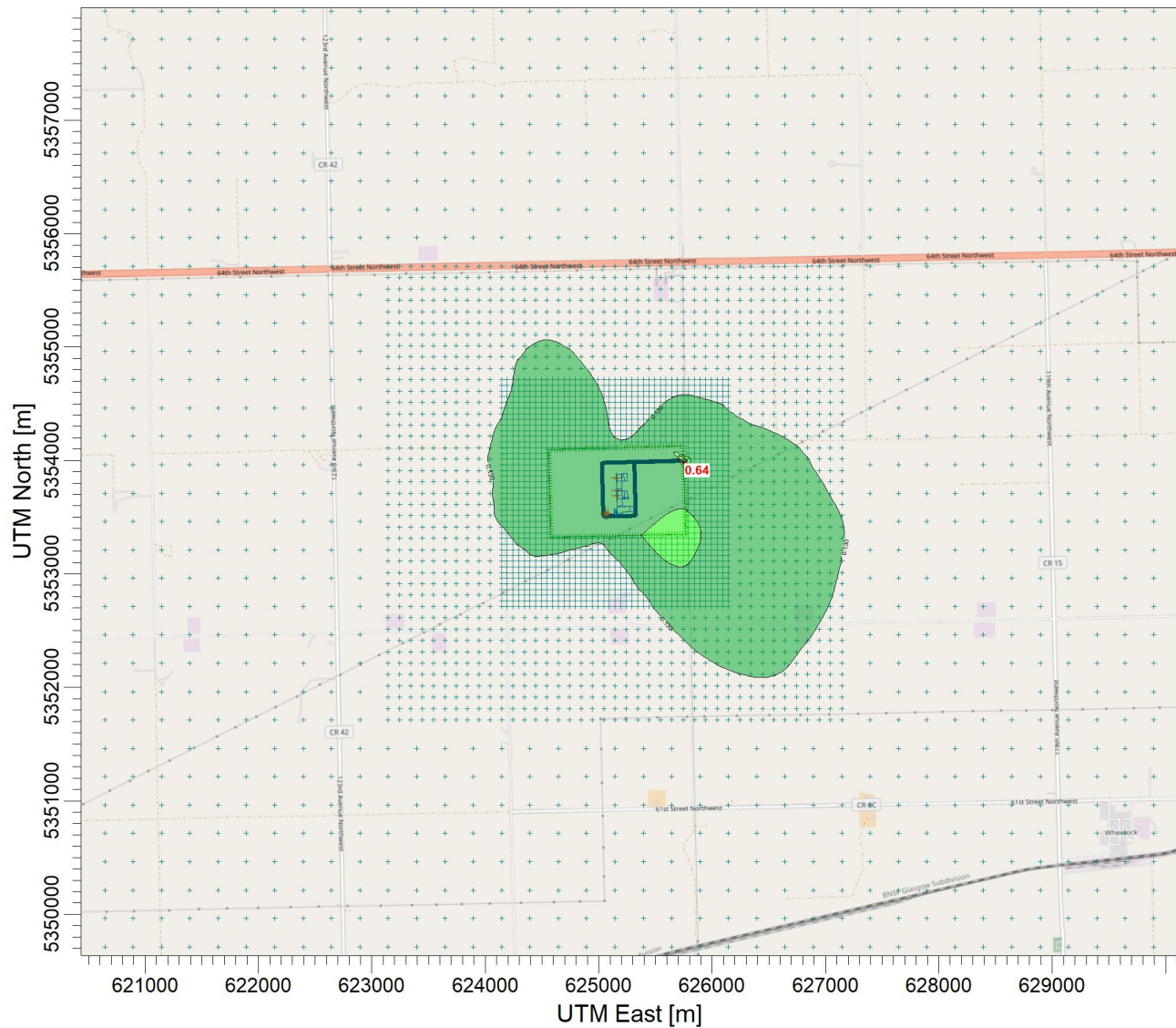
Max: 9.03 [ug/m<sup>3</sup>] at (625748.56, 5354006.89)



|                                                                                                                                                   |                                                 |                                                                                                                                    |                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>COMMENTS:</b><br><br>Highest modeled scenario: MECL<br><br>Background is 30 µg/m3<br><br>Total Impact is 39.03 µg/m3<br><br>NAAQS is 150 µg/m3 | <b>SOURCES:</b><br><br><b>222</b>               | <b>COMPANY NAME:</b><br><br><b>North Dakota Department of Environmental Quality</b>                                                |                                                                                       |
|                                                                                                                                                   | <b>RECEPTORS:</b><br><br><b>5340</b>            | <b>MODELER:</b><br><br><b>Rhannon Thorton</b>                                                                                      |  |
|                                                                                                                                                   | <b>OUTPUT TYPE:</b><br><br><b>Concentration</b> | <b>SCALE:</b><br><br>1:24,074<br><br>0  0.5 km |                                                                                       |
|                                                                                                                                                   | <b>MAX:</b><br><br><b>9.03 ug/m^3</b>           | <b>DATE:</b><br><br><b>11/10/2025</b>                                                                                              | <b>PROJECT NO.:</b><br><br><b>ACP-18273</b>                                           |

PROJECT TITLE:

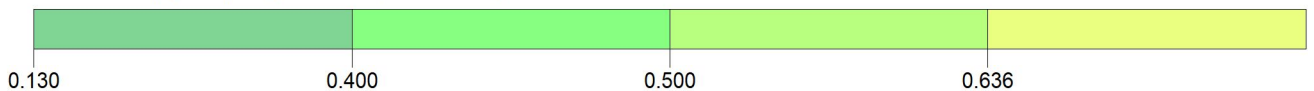
**Basin Bison Generation Station  
Plot 13 - PM2.5 Annual (NAAQS)**



PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 5 YEARS FOR SOURCE GROUP: INV+LW

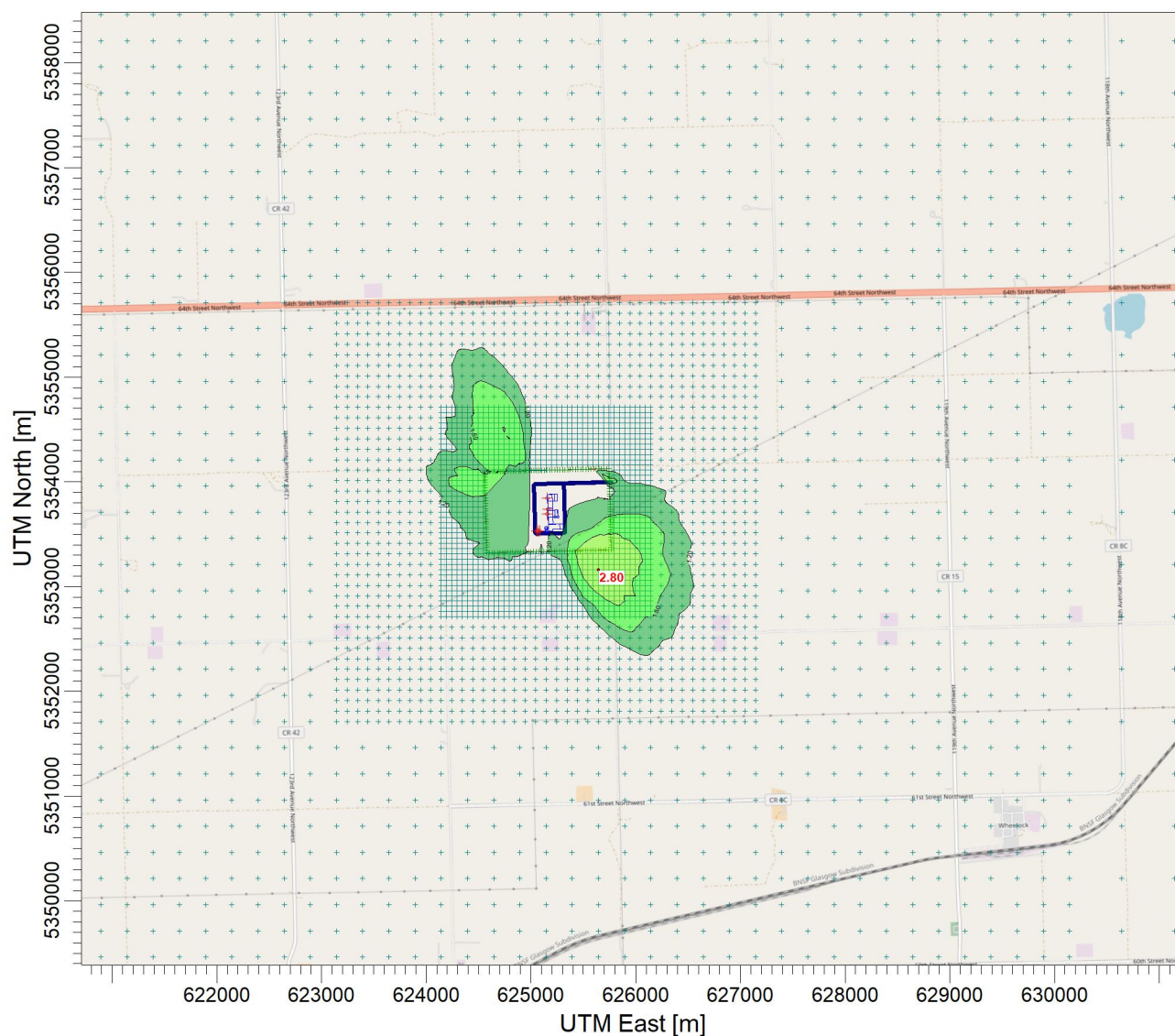
ug/m<sup>3</sup>

Max: 0.636 [ug/m<sup>3</sup>] at (625749.20, 5353982.59)

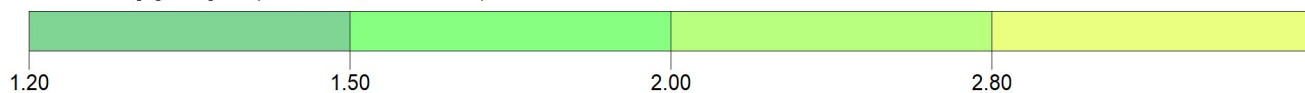


|                                                                                                                                                  |                                                 |                                                                                                                                 |                                                                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>COMMENTS:</b><br><br>Highest modeled scenario: MECL<br><br>Background is 4.76 ug/m3<br><br>Total Impact is 5.40 ug/m3<br><br>NAAQS is 9 ug/m3 | <b>SOURCES:</b><br><br><b>222</b>               | <b>COMPANY NAME:</b><br><br><b>North Dakota Department of Environmental Quality</b>                                             |                                                                                       |
|                                                                                                                                                  | <b>RECEPTORS:</b><br><br><b>5340</b>            | <b>MODELER:</b><br><br><b>Rhannon Thorton</b>                                                                                   |  |
|                                                                                                                                                  | <b>OUTPUT TYPE:</b><br><br><b>Concentration</b> | <b>SCALE:</b><br><br>1:60,786<br><br>0  2 km |                                                                                       |
|                                                                                                                                                  | <b>MAX:</b><br><br><b>0.636 ug/m^3</b>          | <b>DATE:</b><br><br><b>11/10/2025</b>                                                                                           |                                                                                       |
|                                                                                                                                                  | <b>PROJECT NO.:</b><br><br><b>ACP-18273</b>     |                                                                                                                                 |                                                                                       |

**Basin Bison Generation Station**  
**Plot 14 - PM2.5 24-HR (NAAQS)**



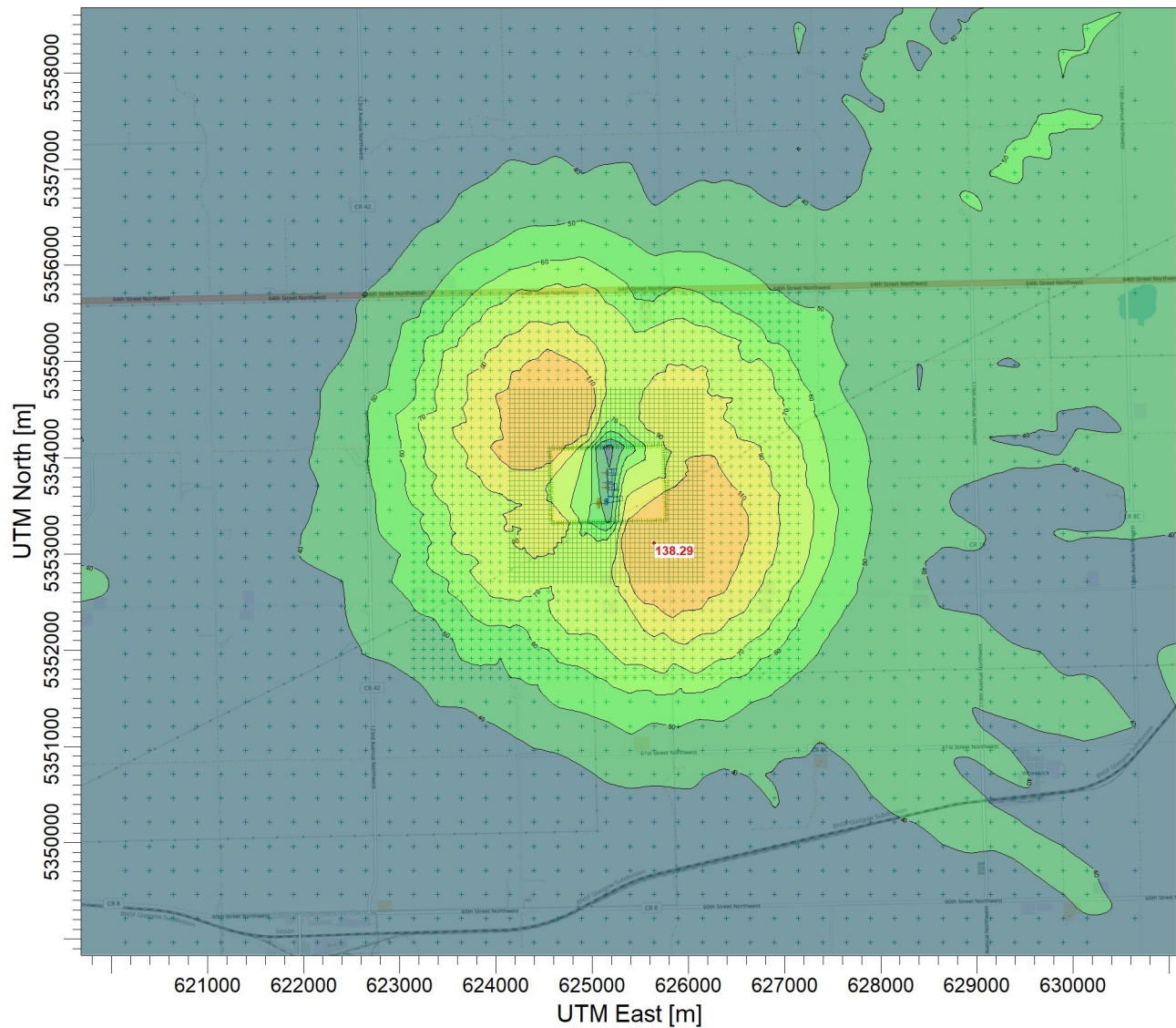
Max: 2.80 [ug/m^3] at (625643.63, 5353162.50)



|                                                                                                                                                                                                |                                                  |                                                                                                                                              |                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| <div>COMMENTS:</div> <div>Highest modeled scenario: 100% Load with duct firing</div> <div>Background is 13.836 µg/m3</div> <div>Total Impact is 16.64 µg/m3</div> <div>NAAQS is 35 µg/m3</div> | <div>SOURCES:</div> <div>222</div>               | <div>COMPANY NAME:</div> <div>North Dakota Department of Environmental Quality</div>                                                         |                                                                                                        |
|                                                                                                                                                                                                | <div>RECEPTORS:</div> <div>5340</div>            | <div>MODELER:</div> <div>Rhannon Thorton</div>                                                                                               | <div><div><div>NORTH Dakota</div><div>Be Legendary.™</div></div><div>Environmental Quality</div></div> |
|                                                                                                                                                                                                | <div>OUTPUT TYPE:</div> <div>Concentration</div> | <div>SCALE:</div> <div>1:66,174</div> <div>0  2 km</div> |                                                                                                        |
|                                                                                                                                                                                                | <div>MAX:</div> <div>2.80 ug/m^3</div>           | <div>DATE:</div> <div>11/10/2025</div>                                                                                                       |                                                                                                        |

PROJECT TITLE:

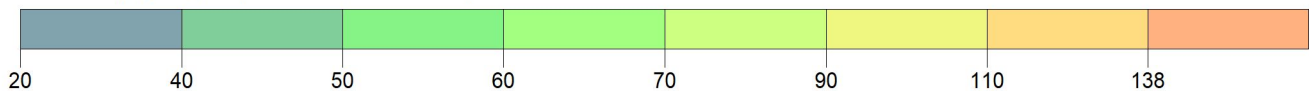
**Basin Bison Generation Station  
Plot 15 - NO2 1-HR (NAAQS)**



PLOT FILE OF 8TH-HIGHEST MAX DAILY 1-HR VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ALL

ug/m<sup>3</sup>

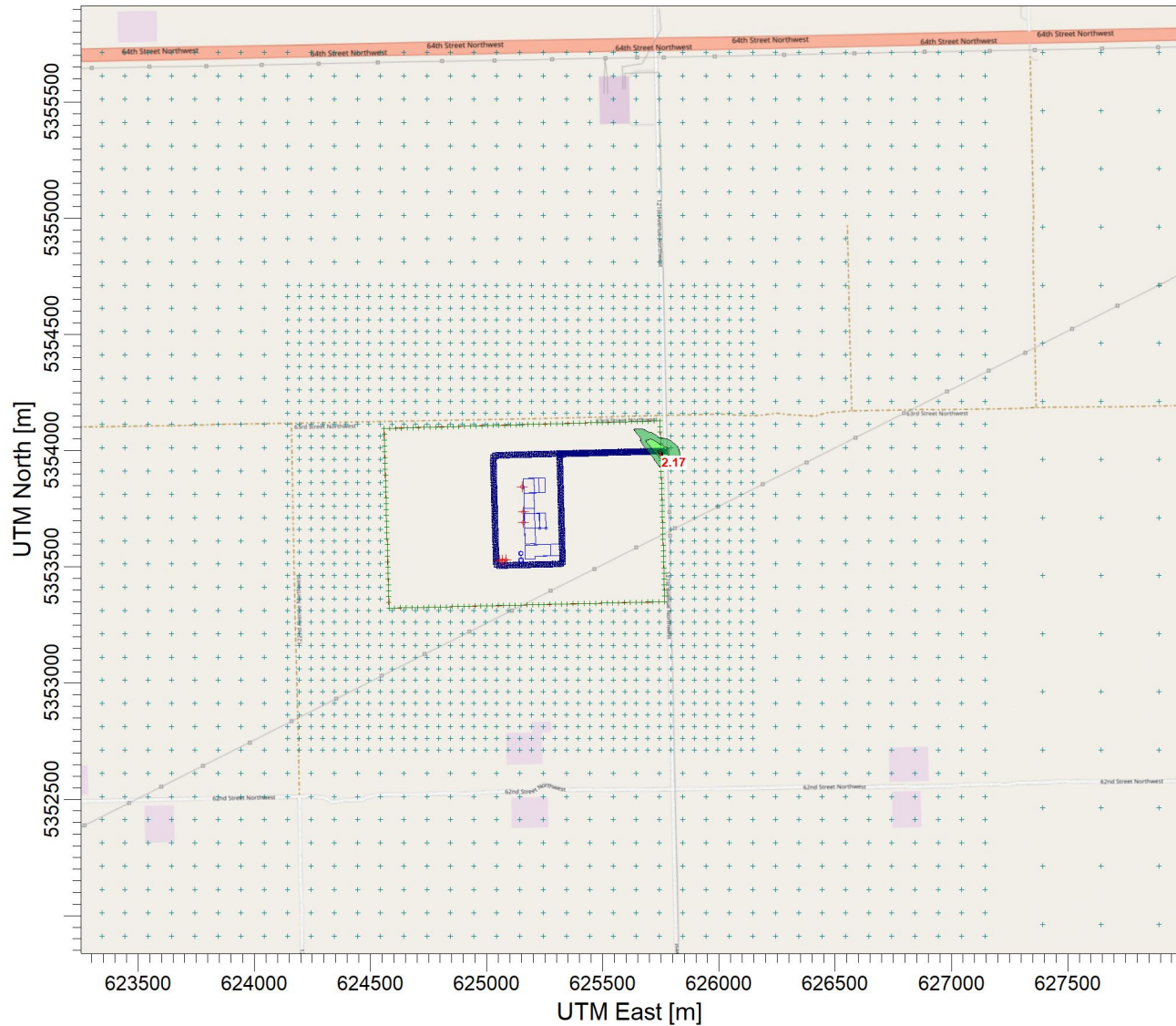
Max: 138 [ug/m<sup>3</sup>] at (625643.63, 5353112.50)



|                                                                                                                                                                                                       |                                                 |                                                                                                                                  |                                                                                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>COMMENTS:</b><br><br>Highest modeled scenario:<br>Start-up/Shutdown<br><br>Background is 35 µg/m <sup>3</sup><br><br>Total Impact is 173.3 µg/m <sup>3</sup><br><br>NAAQS is 188 µg/m <sup>3</sup> | <b>SOURCES:</b><br><br><b>72</b>                | <b>COMPANY NAME:</b><br><br><b>North Dakota Department of Environmental Quality</b>                                              |                                                                                       |
|                                                                                                                                                                                                       | <b>RECEPTORS:</b><br><br><b>5340</b>            | <b>MODELER:</b><br><br><b>Rhannon Thorton</b>                                                                                    |  |
|                                                                                                                                                                                                       | <b>OUTPUT TYPE:</b><br><br><b>Concentration</b> | <b>SCALE:</b><br><br>1:71,654<br><br>0  2 km |                                                                                       |
|                                                                                                                                                                                                       | <b>MAX:</b><br><br><b>138 ug/m<sup>3</sup></b>  | <b>DATE:</b><br><br><b>11/17/2025</b>                                                                                            | <b>PROJECT NO.:</b><br><br><b>ACP-18273</b>                                           |

PROJECT TITLE:

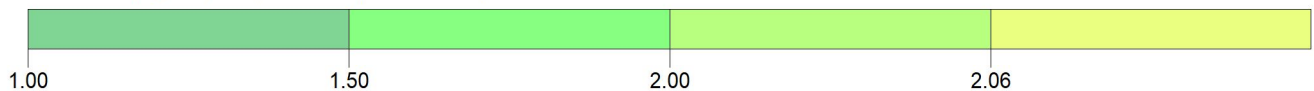
**Basin Bison Generation Station**  
**Plot 16 - PM10 Annual (PSD Increment)**



POST/PLOT FILE OF ANNUAL VALUES FOR YEAR 1 FOR SOURCE GROUP: INV+LW

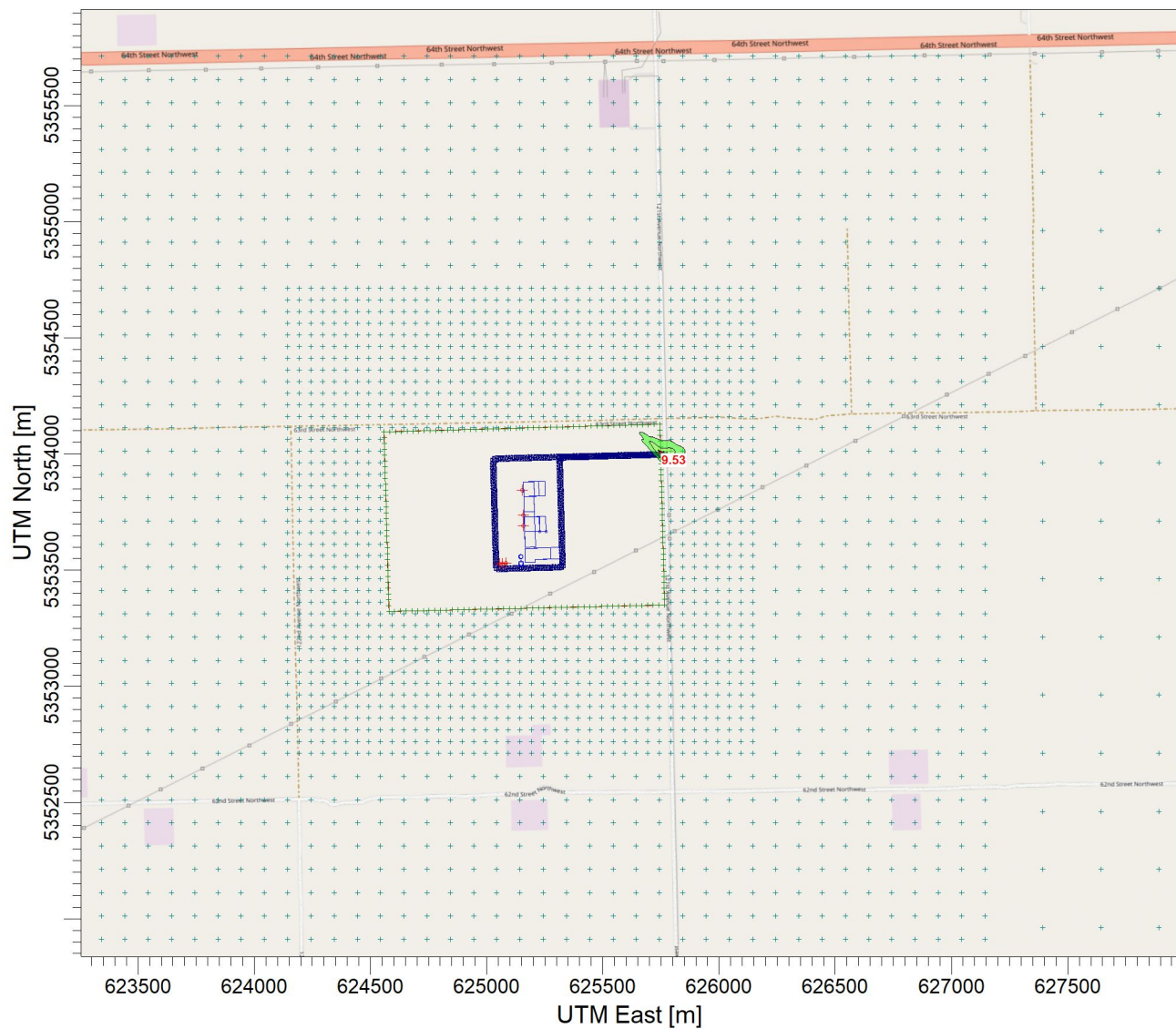
ug/m<sup>3</sup>

Max: 2.17 [ug/m<sup>3</sup>] at (625749.20, 5353982.59)

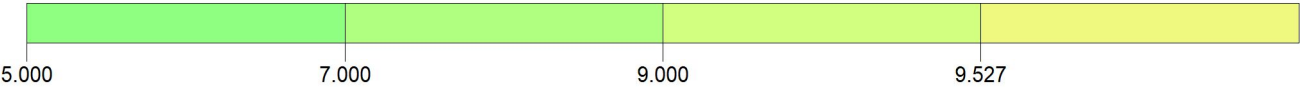


|                                                                                                                            |                                          |                                                                                                                           |                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| COMMENTS:<br><br>Highest modeled scenario: MECL<br><br>Highest year: 2020<br><br>Class II standard is 17 µg/m <sup>3</sup> | SOURCES:<br><br><b>222</b>               | COMPANY NAME:<br><br><b>North Dakota Department of Environmental Quality</b>                                              |                                                                                       |
|                                                                                                                            | RECEPTORS:<br><br><b>5340</b>            | MODELER:<br><br><b>Rhannon Thorton</b>                                                                                    |  |
|                                                                                                                            | OUTPUT TYPE:<br><br><b>Concentration</b> | SCALE:<br><br>1:29,660<br><br>0  1 km |                                                                                       |
|                                                                                                                            | MAX:<br><br><b>2.17 ug/m<sup>3</sup></b> | DATE:<br><br><b>11/10/2025</b>                                                                                            |                                                                                       |
|                                                                                                                            | PROJECT NO.:<br><br><b>ACP-18273</b>     |                                                                                                                           |                                                                                       |

PROJECT TITLE:  
**Basin Bison Generation Station**  
**Plot 17 - PM10 24-HR (PSD Increment)**



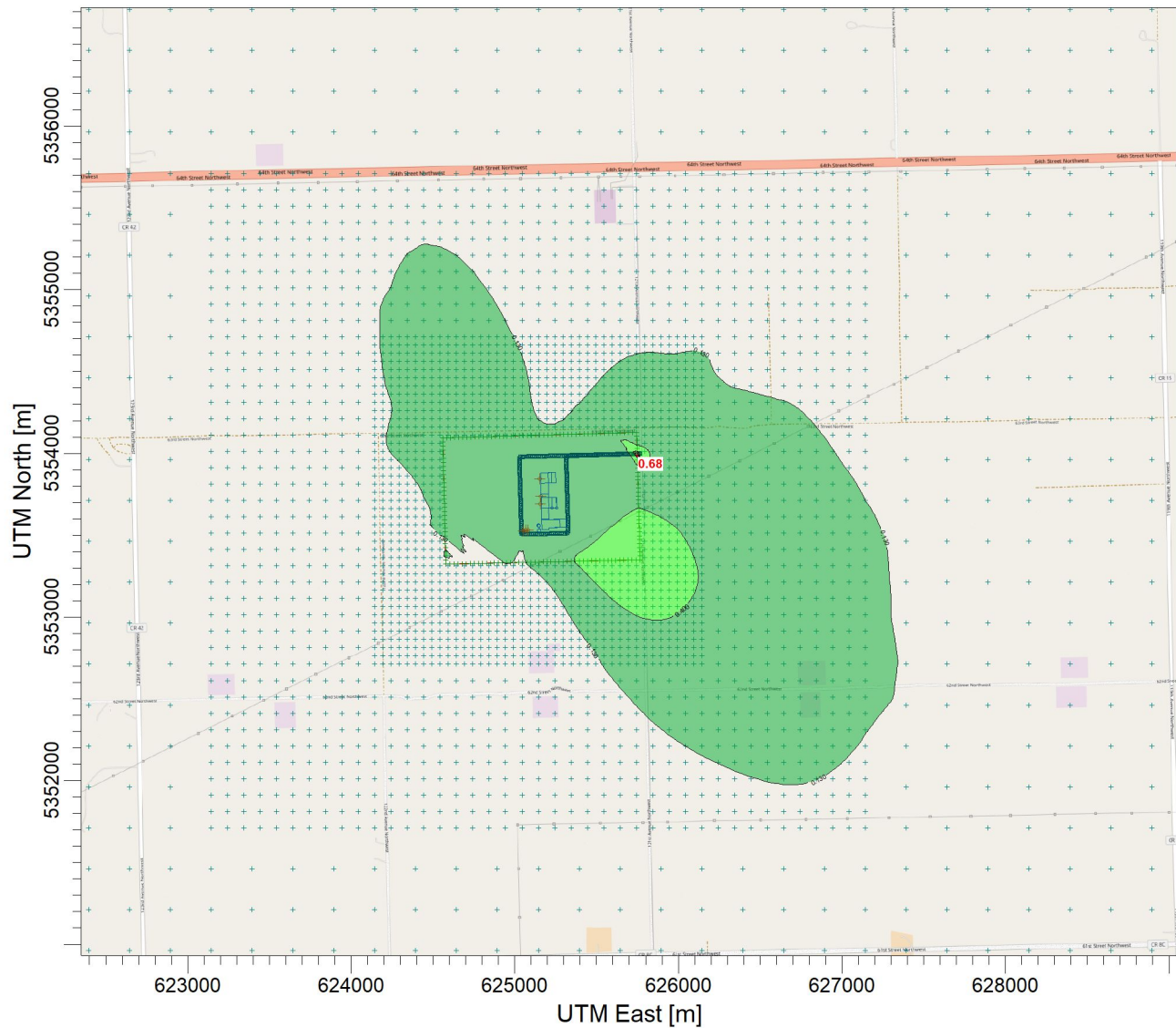
PLOT FILE OF HIGH 2ND HIGH 24-HR VALUES FOR SOURCE GROUP: INV+LW ug/m^3  
Max: 9.527 [ug/m^3] at (625748.56, 5354006.89)



|                                                                                                                                                   |                                                  |                                                                                      |                                                                                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| <div>COMMENTS:</div> <div>Highest modeled scenario: MECL</div> <div>Highest second-high year: 2023</div> <div>Class II standard is 30 ug/m3</div> | <div>SOURCES:</div> <div>222</div>               | <div>COMPANY NAME:</div> <div>North Dakota Department of Environmental Quality</div> |                                                                                             |
|                                                                                                                                                   | <div>RECEPTORS:</div> <div>5340</div>            | <div>MODELER:</div> <div>Rhannon Thorton</div>                                       | <div><div>NORTH Dakota</div><div>Be Legendary.™</div><div>Environmental Quality</div></div> |
|                                                                                                                                                   | <div>OUTPUT TYPE:</div> <div>Concentration</div> | <div>SCALE:</div> <div>1:29,659</div> <div>0 1 km</div>                              |                                                                                             |
|                                                                                                                                                   | <div>MAX:</div> <div>9.527 ug/m^3</div>          | <div>DATE:</div> <div>11/10/2025</div>                                               |                                                                                             |
|                                                                                                                                                   |                                                  |                                                                                      | <div>PROJECT NO.:</div> <div>ACP-18273</div>                                                |

PROJECT TITLE:

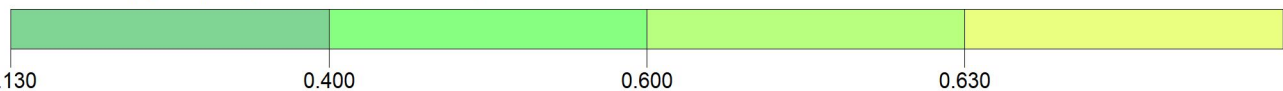
**Basin Bison Generation Station  
Plot 18 - PM2.5 Annual (PSD Increment)**



POST/PLOT FILE OF ANNUAL VALUES FOR YEAR 1 FOR SOURCE GROUP: INV+75

ug/m<sup>3</sup>

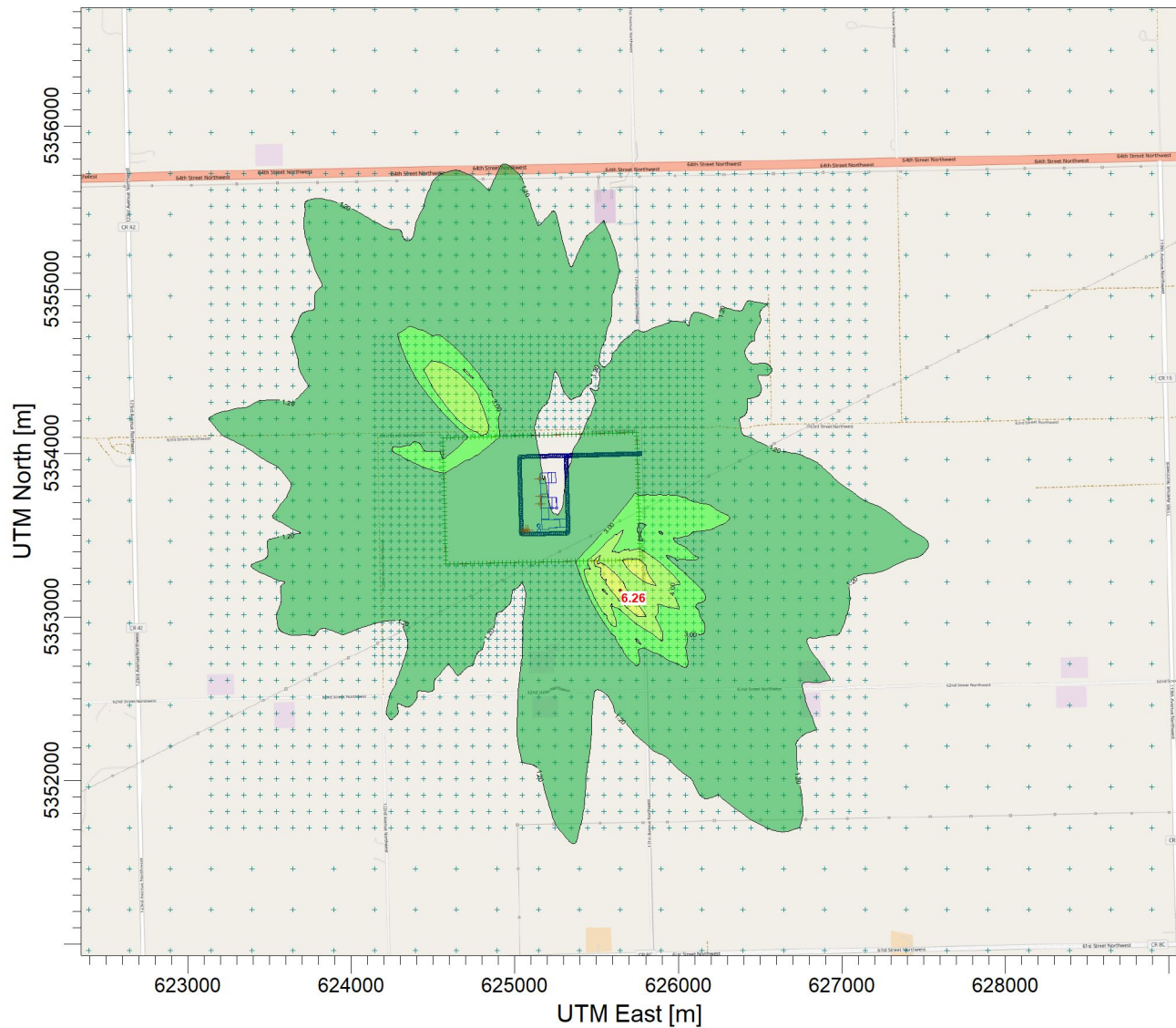
Max: 0.677 [ug/m<sup>3</sup>] at (625749.20, 5353982.59)



|                                                                                                                          |                                                 |                                                                                                                                  |                                                                                       |
|--------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>COMMENTS:</b><br><br>Highest modeled scenario: 75% Load<br><br>Highest year: 2020<br><br>Class II standard is 4 ug/m3 | <b>SOURCES:</b><br><br><b>222</b>               | <b>COMPANY NAME:</b><br><br><b>North Dakota Department of Environmental Quality</b>                                              |                                                                                       |
|                                                                                                                          | <b>RECEPTORS:</b><br><br><b>5340</b>            | <b>MODELER:</b><br><br><b>Rhannon Thorton</b>                                                                                    |  |
|                                                                                                                          | <b>OUTPUT TYPE:</b><br><br><b>Concentration</b> | <b>SCALE:</b><br><br>1:42,136<br><br>0  1 km |                                                                                       |
|                                                                                                                          | <b>MAX:</b><br><br><b>0.677 ug/m^3</b>          | <b>DATE:</b><br><br><b>11/10/2025</b>                                                                                            | <b>PROJECT NO.:</b><br><br><b>ACP-18273</b>                                           |

PROJECT TITLE:

**Basin Bison Generation Station**  
**Plot 19 - PM2.5 24-HR (PSD Increment)**



PLOT FILE OF HIGH 2ND HIGH 24-HR VALUES FOR SOURCE GROUP: INV+DB

ug/m<sup>3</sup>

Max: 6.26 [ug/m<sup>3</sup>] at (625643.63, 5353162.50)



|                                                                                                                                                                    |                                                 |                                                                                                                                  |                                                                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>COMMENTS:</b><br><br>Highest modeled scenario: 100% Load with duct firing<br><br>Highest second-high year: 2021<br><br>Class II standard is 9 µg/m <sup>3</sup> | <b>SOURCES:</b><br><br><b>222</b>               | <b>COMPANY NAME:</b><br><br><b>North Dakota Department of Environmental Quality</b>                                              |                                                                                       |
|                                                                                                                                                                    | <b>RECEPTORS:</b><br><br><b>5340</b>            | <b>MODELER:</b><br><br><b>Rhannon Thorton</b>                                                                                    |  |
|                                                                                                                                                                    | <b>OUTPUT TYPE:</b><br><br><b>Concentration</b> | <b>SCALE:</b><br><br>1:42,138<br><br>0  1 km |                                                                                       |
|                                                                                                                                                                    | <b>MAX:</b><br><br><b>6.26 ug/m<sup>3</sup></b> | <b>DATE:</b><br><br><b>11/10/2025</b>                                                                                            | <b>PROJECT NO.:</b><br><br><b>ACP-18273</b>                                           |