MEMORANDUM

DATE: April 1, 2026
TO: Joseph Fraganato, Construction Unit, Permits/BOA
FROM: Tamara Stewart, Modeling Unit, Permits/BOA
SUBJECT: Broadwing Energy LLC (ID 155015BWL) Permit Application #25040003

Broadwing Energy LLC (BEC) is requesting a permit to construct a natural gas-fired cogeneration facility with a gross electrical output of 425 MW in Decatur, IL. The new cogeneration facility would be located in Macon County, Illinois, with the approximate Universal Transverse Mercator (UTM) coordinates of 305,734 meters east and 4,571,796 meters north (UTM Zone 16 NAD 83). This facility would generate steam and electricity for sale primarily to Archer Daniels Midland (ADM), and the remaining electricity would be sold to the Midwest Independent System Operator (MISO) interconnection grid. The MISO is a Regional Transmission Organization (RTO) that manages the electricity transmission grid in much of the Midwest and parts of the southern United States.

The cogeneration unit would include a natural gas-fired combustion turbine generator (CTG) working in tandem with a heat recovery steam generator (HRSG). A supplemental natural gas-fired duct burner would be installed in the HRSG to enhance steam production. The flue gas from the cogeneration unit would be sent to an ammonia-based selective catalytic reduction (SCR) system to control nitrogen oxides (NOx) and to an oxidation catalyst to reduce carbon monoxide (CO) and volatile organic material (VOM). After passing through the noted pollution controls, the cleaned exhaust from the CTG/HRSG would enter an amine-based carbon capture system (CCP), which would remove CO_2 from the CTG/HRSG system exhaust before it is released through a stack. The diverted CO_2 would go to the existing sequestration equipment at ADM.

The CCP is a project-specific design to match the cogeneration units' emission rates. Sequestration of the captured CO_2 would be performed under contract with ADM at their nearby field of sequestration wells. BEC would own the CO_2 and transfer responsibility at the site boundary, and ADM would operate the pipeline, sequestration equipment, and sequestration wells.

Additional emission units at the cogeneration facility would include a dewpoint heater, a cooling tower, lube oil vent, emergency generators and fire pump engine.

Table 1-BEC – Sitewide Potential Emissions

Pollutant	Potential Emissions (tons/year)	Significant Emissions Rate (tons/year)	Threshold Exceeded?
PM	95.23	25	Yes
PM_{10}	165.31	15	Yes
$PM_{2.5}$	162.66	10	Yes
CO	244.45	100	Yes
NO_x	223.72	40	Yes
SO_2	33.73	40	No
VOM	655.80	40	Yes
SAM	30.89	7	Yes
CO_2	2,992,228	75,000	Yes

(1) PM consists only of filterable particulate matter whereas PM_{10}/$PM_{2.5}$ includes both filterable and condensable particulate matter (35 Ill. Adm. Code 204.610(a)(1)).

Under Prevention of Significant Deterioration (PSD), the applicant is required to perform an air quality impact analysis for pollutants that exceed their respective significant emission rates (SERs), to demonstrate that proposed emissions would not adversely affect air quality in the surrounding region. Based on these potential emissions, BEC must conduct an air quality analysis to address the impacts of this proposed project on the National Ambient Air Quality Standards (NAAQS) and applicable PSD Increments for the following pollutants: CO, NOx, particulates (PM_{10} and $PM_{2.5}$) and ozone (O_3). An ozone analysis is necessary due to significant emissions of NOx and VOM.[1] There are no NAAQS established for H_2SO_4, so no other analysis was done on that pollutant.

Specifically, the applicant must demonstrate through modeling that emissions from the facility would not cause violations of any applicable NAAQS, or cause exceedances of any applicable PSD increment. The proposed emissions at the BEC facility exceed the significant emission rate thresholds for all listed pollutants except sulfur dioxide (SO_2) (**See Table 1**).

The proposed BEC facility, as of the date of this modeling memorandum, is located in an Environmental Justice (EJ) community. In support of an EJ area assessment, the project's emissions of SO_2 were evaluated for comparison with the NAAQS.

[1] There are no NAAQS established for H_2SO_4, so no other analysis was done on that pollutant.

Modeling Unit Review

BEC has retained Power Engineers (Power) to conduct an air quality analysis. The air quality analysis was submitted April 8, 2025. Pollutants involved in the analysis were of SO_2, NO_x, CO, O_3 and particulates ($PM_{2.5}$ and PM_{10},).

The Modeling Unit received revised modeling information on January 26, 2026 based on refinement of emission information of the CTG. This revision updated the application package with new emission information for the cogeneration unit, dewpoint heater, cooling tower, new manufacturer's data for the carbon capture plant, and various updates to the BACT analysis to provide additional clarity in the BACT section process.

The following dot points describe the modeling methodology utilized in the additional impact analysis:

- Power used AERMOD (AMS/USEPA Regulatory Model), Version 23132. AERMOD is a state and federally approved regulatory model appropriate for use in an air quality analysis of this nature. The audit runs conducted by the Illinois EPA Modeling Unit used Version 24142 of AERMOD.

- Modeling inputs utilized Illinois EPA and United States Environmental Protection Agency (USEPA) recommended regulatory options, which simulate phenomena such as atmospheric stability, plume rise and downwash. Five years of locally representative meteorology were applied to the modeling. National Weather Service meteorological data files for years 2019 through 2023 were obtained from the National Centers for Environmental Information (NCEI) and consisted of surface data collected at the Decatur Airport in Decatur, Illinois and upper air data collected at the Lincoln Logan County Airport in Lincoln, Illinois. The Illinois EPA Modeling Unit audit runs used meteorological data from the same surface and upper air stations which were also processed with AERMET, version 23132. Power made use of a Cartesian grid in their distribution of receptors. The following receptor grid densities were used:

    - 50 meter spacing of receptors along the facility's property boundary
    - 100 meter spacing of receptors 1000 meters from the property boundary
    - 250 meter spacing of receptors 5.0 kilometers from the property boundary
    - 500 meter spacing of receptors 10 kilometers from the property boundary
    - 1000 meter spacing of receptors 50 kilometers from the property boundary

- National Elevation Data (NED) terrain elevations from United States Geological Survey (USGS) were processed using the most recent version of AERMAP to develop the receptor terrain elevations and hill height scales required by AERMOD. The site elevation at the BEC facility is approximately 207 meters above mean sea level and the surrounding terrain is relatively flat.

- Nitrogen dioxide (NO_2) modeling options consist of multiple tiers. Tier 1 assumes that all NO_x emitted from emission units at the source would convert to NO_2. Tier 2 is based on a representative atmospheric equilibrium default value that was developed using conversion ratios generated from monitored concentrations of NO_x and NO_2. Tier 3 allows the applicant to perform a detailed analysis using either the Ozone Limiting Method (OLM) or the Plume Volume Molar Ratio Method (PVMRM) regulatory screening options in AERMOD. These options consider the chemical mechanism of ozone titration and the resulting NO_2 concentrations. Power's NO_2 modeling analysis utilized AERMOD's Tier 2 algorithm for conversion of NOx to NO_2. Power followed modeling guidance from USEPA's June 29, 2010 memo, "Guidance Concerning the Implementation of the 1-hour NO_2 National Ambient Air Quality Standards for the PSD."

- Power performed a Good Engineering Practice (GEP) stack height analysis and determined that all sources are below their respective GEP heights. Power used USEPA's Building Profile Input Program (BPIPPRM) to determine GEP stack height and building downwash parameters to model building wake effects.

- Power considered the region to be rural, and accordingly, emission units at all sources were modeled without implementing the AERMOD urban option. POWER's Auer's analysis yielded an urban component of 39%. Modeling Unit also conducted an Auer's analysis and determined that the area surrounding the BEC facility was approximately 62% rural and 38% urban. Modeling Unit supports that running AERMOD without implementing the urban option is appropriate.

Scenarios

BEC expects to operate the combustion turbine continuously at full load to meet the needed steam demand and does not expect to operate the combustion turbine at reduced loads other than during transitional periods. Emissions rates at reduced loads were less than what was modeled for the air quality analysis. Reduced load scenarios were not included in the analysis.

All analyses for Significant Impact Analysis, NAAQS, and PSD increment were based on the worst case scenario for emission impacts, specifically emissions that would be emitted during startup of the combustion turbine and startup of the CCP system.

Significant Impact Analysis

As part of its air quality analysis, Power submitted a significant impact analysis to determine whether more detailed modeling would be required for any of the criteria pollutants identified SO_2, NO_2, CO, O_3 and particulates ($PM_{2.5}$ and PM_{10}).

As indicated in Table 2, proposed emission units at BEC required cumulative modeling for 1-hour NO_2, 8-hour CO, and 24-hour $PM_{2.5}$ given their predicted concentrations are greater than their respective Significant Impact Levels (SILS). Given the modeled levels of 1-hour CO, SO_2, annual NO_2, 24-hour PM_{10}, annual $PM_{2.5}$, and O_3 concentrations are less than their respective SILs, additional modeling was not required for these pollutants and averaging periods.

Table 2 - SIL Results

Pollutant	**Averaging Period**	**Modeled Impact** (μg/m³)	**Significant Impact Level** (μg/m³)	**Cumulative Modeling Required?**
CO	1-Hour	1785	2000	No
CO	8-Hour	512	500	Yes
NO_2	1-Hour	38.12	7.5	Yes
NO_2	Annual	0.68	1	No
$PM_{2.5}$	24-Hour	1.49*	1.2	Yes
$PM_{2.5}$	Annual	0.10*	0.13	No
PM_{10}	24-Hour	3.36	5	No
SO_2	1-Hour	3.90	7.8	No
SO_2	3-Hour	3.95	25	No
O_3	8-Hour	0.70 ppb	1 ppb	No

*Includes estimated secondary $PM_{2.5}$ from MERP analysis

$PM_{2.5}$ Impacts

Power and the Modeling Unit applied USEPA's MERPs guidance[2] to address precursor emission impacts on $PM_{2.5}$. When assessing $PM_{2.5}$, this methodology uses conservative assumptions about baseline conditions for NOx and SO_2 to produce photochemical modeling results.

[2] Wayland, R.A. (2019, April 30). *Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and $PM_{2.5}$ under the PSD Permitting Program.* USEPA.

During its analysis, Power and the Modeling Unit used potential project emissions for NO_X and SO_2 at a hypothetical source located in Christian County, IL. Results were based on a 500 tpy emission level and a 90-meter stack height – the option most representative of BEC's facility.

Table 3 shows the estimated secondary $PM_{2.5}$ impacts. The calculated concentrations were based on project emissions of 224 tons per year (tpy) of NO_X and 34 tpy of SO_2.

Table 3

Power MERPs Analysis for Secondary $PM_{2.5}$

Pollutant	Averaging Period	Concentration ($\mu g/m^3$)
$PM_{2.5}$	24-hour	0.02
	Annual	0.001

The total secondary $PM_{2.5}$ concentrations was added to the primary $PM_{2.5}$ impacts modeled with AERMOD, for each respective averaging period for a combined total comparison to the $PM_{2.5}$ SIL. The combined primary and secondary results are shown in **Table 2**.

Ozone Impacts

NO_2 and VOM emissions are O_3 precursors, meaning they each contribute to photochemical processes in the atmosphere that create ground level O_3. Power and the Modeling Unit considered the impacts of NO_2 and VOM emissions on O_3 formation in the significant impact analysis. VOM emissions were based on the maximum emissions possible during startup and shakedown of the CTG/HRSG and CCP operation.

CTG/HRSG exhaust vents through the CCP as the CCP performance level continues to ramp up. CO_2 capture is initiated. CO_2 is dried, cleaned, compressed, and injected into the CO_2 pipeline. VOM and HAPs emissions from the CCP are slightly higher than during normal operations. The elevated VOM and HAPs emissions were used in the Air Quality analysis calculations.

During the O3 analysis, Power and the Modeling Unit used potential project emissions for NO_2 and VOM at the same hypothetical source used for secondary $PM_{2.5}$. Results were based on a 500 tpy emission level and a 10-meter stack height to account for near surface release of ozone. The analysis estimated O_3 impacts to be below the 1.0 parts per billion (ppb) SIL, which verifies that the emissions of NO_2 and VOM would not significantly impact the O_3 NAAQS.

Table 4 shows estimated O_3 impacts in ppb (parts per billion) compared to the SIL. The calculated concentrations were based on project emissions of 224 tpy of NO_2 and 656 tpy of VOMs. The VOMs represent the maximum emissions from the project.

Table 4
Power MERPs Analysis for Ozone

Pollutant	Averaging Period	**Concentration** (ppb)	**SIL** (ppb)
O_3	8-hour	0.70	1.0

NAAQS Analysis

The significant impact analysis indicates further analysis is required to evaluate the impact of the proposed project against the 1-hour NO_2, 8-hour CO and 24-hour $PM_{2.5}$ NAAQS. Only the receptors that exceeded the SIL in the previous analysis were required to be included in the cumulative impact analysis. This analysis requires the addition of nearby sources to be directly modeled along with the proposed project. Monitored background values are then added to the modeled concentrations, and the total is compared to the respective NAAQS.

For a full impact NAAQS modeling analysis, background ambient air concentration data was required for NO_2, CO, and $PM_{2.5}$. Power used ambient air quality data from existing air quality monitoring stations to establish representative background concentrations for these pollutants.

NO_2 design values were obtained from the monitor located in Nilwood, Illinois (AQS ID: 17-117-0002). CO design values were obtained from the monitor in Bondville, Illinois (AQS: ID 17-019-1001). $PM_{2.5}$ design values for were obtained from the monitor located in Decatur, Illinois (AQS ID: 17-115-0013). The monitors were chosen based on the relative proximity to the proposed BEC facility.

Based on the significant impact results provided in Table 2, the pollutants CO (8-hour), NO_2 (1-hour), and $PM_{2.5}$ (24-hour) were modeled for comparison with the NAAQS for pollutants and averaging periods with preliminary impacts equal to or greater than the SIL. **Table 5** provides an overview of Power's modeling results.

Table 5
NAAQS Analysis Results – Broadwing Project and Off-Site Sources

Pollutant	Averaging Period	Modeled Concentration (µg/m^3)	Background Concentration (µg/m^3)	TOTAL (µg/m^3)	NAAQS (µg/m^3)
CO	8-Hour	416.31[(1)]	1,601[(a)]	2,018	10,000
NO_2	1-Hour	317.20[(2)]	26.3[(b)]	343.5	188
$PM_{2.5}$	24-Hour	13.60*[(3)]	23.7[(c)]	37.3	35

*Includes estimated secondary $PM_{2.5}$ from MERP analysis

(1) 2nd high of 5 years
(2) 5-year average of 98th percentile of the 1-hour daily maximums
(3) 5-Year average of 98th percentile of the 24-hour daily averages

(a) 2nd high, 2023
(b) 3-year average of 98th percentile of the daily 1-hour maximum 2021-2023
(c) 3-year average of 98th percentile of the daily maximum 2021-2023

In comparison, the Modeling Unit runs indicated the following modeled concentrations: CO - 417.57 µg/m^3, NO_2 - 317.21 µg/m^3, $PM_{2.5}$ - 13.82 µg/m^3.

From this analysis, the modeled 8-hour CO concentrations were less than the NAAQS. No additional modeling was required for this pollutant.

Because the 1-hour NO_2 and 24-hour $PM_{2.5}$ NAAQS were exceeded, Power conducted an analysis to determine if the proposed BEC project would cause or contribute to any of the model-predicted exceedances. This analysis utilized AERMOD's MAXDCONT tool and was performed for each receptor with a predicted NAAQS exceedance. For each modeled receptor, the MAXDCONT analyzed each level of impact (8th high, 9th high, 10th high, and so forth.) and terminated when the model found a concentration less than the NAAQS.

During its review, the Modeling Unit also conducted its own modeling to assess the impact that the proposed project would have on the 1-hour NO_2 NAAQS and the 24-hour $PM_{2.5}$ NAAQS.

For NO_2, the highest values were in the 8th and 9th ranking as shown in **Tables 6 and 7**.

Table 6
Power
NO_2 Cause and Contribute Analysis Modeling Results

	Rank	Total Concentration (μg/m³)	Project Contribution (μg/m³)	X-UTM Zone 16	Y-UTM Zone 16	NAAQS (μg/m³)	SIL (μg/m³)
Maximum Project Concentration	8th	141.72	0.013	338500	4414500	188	7.5
Maximum Project Contribution	9th	139.93	.0007	338500	4414500		

Table 7
Modeling Unit
NO_X Cause and Contribute Analysis Modeling Results

	Rank	Total Concentration (μg/m³)	Project Contribution (μg/m³)	X-UTM Zone 16	Y-UTM Zone 16	NAAQS (μg/m³)	SIL (μg/m³)
Maximum Project Concentration	8th	141.51	0.015	338500	4414500	188	7.5
Maximum Project Contribution	9th	146.00	.0007	338500	4414500		

For $PM_{2.5}$, the highest values were in the 8th and 9th ranking as shown in **Tables 8 and 9**.

Table 8
Power
$PM_{2.5}$ Cause and Contribute Analysis Modeling Results

	Rank	Total Concentration (μg/m³)	Project Contribution (μg/m³)	X-UTM Zone 16 (m, Easting)	Y-UTM Zone 16 (m, Northing)	NAAQS (μg/m³)	SIL (μg/m³)
Maximum Project Concentration	8th	13.60	0.13	337800	4416300	35	1.2
Maximum Project Contribution	9th	13.12	0.13	337800	4416300		

Table 9
Modeling Unit
$PM_{2.5}$ Cause and Contribute Analysis Modeling Results

	Rank	Total Concentration (μg/m³)	Project Contribution (μg/m³)	X-UTM Zone 16 (m, Easting)	Y-UTM Zone 16 (m, Northing)	NAAQS (μg/m³)	SIL (μg/m³)
Maximum Project Concentration	8th	13.83	0.17	337800	4416300	35	1.2
Maximum Project Contribution	9th	13.36	0.14	337800	4416300		

For all periods with predicted NAAQS exceedances, contribution from BEC would not exceed the SILs. Based on modeled results, the Modeling Unit concluded that BEC would not cause or contribute to any of the modeled exceedances of the 1-hour NO_2 and 24-hour $PM_{2.5}$ NAAQS. As such, no additional modeling was required for 1-hour NO_2 and 24-hour $PM_{2.5}$.

PSD Increment

Minor source baseline dates for NO_2 and PM_{10} were previously set for Macon County. The BEC facility will set the minor source baseline date for $PM_{2.5}$ (24-hour).[3] The significant impact analysis showed concentrations greater than the SIL for $PM_{2.5}$ (24-hour).[4] Consequently, a PSD increment analysis was performed for the $PM_{2.5}$ (24-hour). Because the BEC facility is setting the minor source baseline date for $PM_{2.5}$ (24-hour), only project-related emissions are to be considered in the $PM_{2.5}$ (24-hour) increment analysis. **Tables 10 and 11** below show Power's and the Modeling Unit's PSD Increment Consumption Analysis Results considering only the BEC Project for $PM_{2.5}$ (24-hour). Both results show that the BEC Project would not exceed the maximum allowable PSD increment.

[3] The minor source baseline for 24-hour $PM_{2.5}$ would be set on the date of the original submittal of the permit application, April, 3, 2025.
[4] Modeled impacts for NO_2 (annual), $PM_{2.5}$ (annual), and PM_{10} (annual) were below the respective SILs so a PSD increment analysis was not required for these pollutants. In addition to $PM_{2.5}$ (24-hour), the significant impact analysis showed concentrations greater than the SILs for NO_2 (1-hour) and CO (8-hour); however, USEPA has not adopted increments for NO_2 (1-hour) or CO (8-hour) so a PSD increment analysis was not required for these pollutants.

Table 10
Power
$PM_{2.5}$ (24-Hour) PSD Increment Modeling Results (BEC Project)

Pollutant	Averaging Period	Modeled Concentration (μg/m^3)	PSD Increment (μg/m^3)
$PM_{2.5}$	24-Hour	1.72*	9

*Includes the results of secondary $PM_{2.5}$ analysis.

Table 11
Modeling Unit
$PM_{2.5}$ (24-Hour) PSD Increment Modeling Results (BEC Project)

Pollutant	Averaging Period	Modeled Concentration (μg/m^3)	PSD Increment (μg/m^3)
$PM_{2.5}$	24-Hour	1.69*	9

*Includes the results of secondary $PM_{2.5}$ analysis.

Hazardous Air Pollutants (HAPs) Analysis

As part of the air quality analysis for BEC, the Modeling Unit requested an evaluation of the impacts of toxic air pollutant emissions from the proposed project. Power provided the Modeling Unit with emission calculations for potential HAP emissions from the proposed project. The Modeling Unit performed a screening analysis using the Air Emissions Risk Analysis (AERA) Guidance. Based on the MPCA Risk Assessment Screening Spreadsheet (RASS), further analysis was necessary for emissions of acetaldehyde, acrolein, benzene, diethanolamine, formaldehyde, toluene, and xylene. **Table 12** below provides a summary of the Modeling Unit's analysis. All modeled concentrations were below their respective reference concentrations.

Table 12
Hazardous Air Pollutants Modeling Results

Pollutant	CAS No.	Averaging Period	Maximum Modeled Concentration (µg/m³)	Standard (µg/m³)	Reference
Acetaldehyde	75-07-0	1-hour	25.99	470	OEHHA REL(1)
		8-hour	11.84	300	
		Annual	0.06	9	IRIS RfC (2)
Acrolein	107-02-8	24-hour	0.01	5	MDH HRV (3)
Benzene	71-43-2	24-hour	0.34	30	MDH HRV (3)
		Annual	2.80E-04	30	IRIS RfC (2)
Diethanolamine	111-42-2	24-hour	2.30	51	TCEQ ESL(4)
		Annual	0.01	3	OEHHA REL(1)
Formaldehyde	50-00-0	24-hour	0.78	50	MDH HRV (3)
		Annual	0.01	9	
Toluene	108-88-3	1-hour	0.42	5,000	OEHHA REL(1)
		8-hour	0.19	830	
Xylene	1330-20-7	1-hour	0.29	22,000	OEHHA REL(1)
		Annual	9.20E-04	100	IRIS RfC (2)

(1) OEHHA Reference Exposure Levels (REL) are established for pollutants based on exposure durations.
(2) IRIS reference concentrations for inhalation exposure (RfCs) provide an estimate of concentrations that human populations could inhale over a lifetime without an appreciable risk of negative health outcomes.
(3) MN Health Risk Values (HRV) are concentrations of a chemical that are likely to pose little or no risk to human health during that exposure duration.
(4) PPRTV inhalation reference concentrations (p-RfCs) provide a provisional estimate of concentrations that human populations could inhale over a lifetime without an appreciable risk of negative health outcomes.

Additional Impacts Analysis

Growth Analysis

The proposed project is not expected to cause an appreciable increase in population. The facility would be staffed with employees from the current population. Employment within this area (i.e., within the modeling domain) would not significantly increase as a result of the proposed project. Also, there would not be any significant impacts due to any changes in the population size or density, or changes in the type of development in the area. Therefore, possible adverse impacts from this project are not expected.

In addition, there are no anticipated increases in industrial, commercial, or residential growth as a result of the proposed project. Thus, there would be no perceptible, negative growth impacts due to the project. Power does not expect any industrial, commercial, or residential growth to result from the proposed project.

Soils and Vegetation

As part of its additional impact analysis, Power assessed how emissions from BEC would affect the environment surrounding the proposed project, particulary any soils or vegetation within the modeling domain. In its review, Power utilized A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals, Smith and Levenson, USEPA 450/2-81-078, December 12, 1980 (Screening Procedure). This document provides screening-level concentration thresholds for common pollutants to assess possible damage to plants, soils, and animals.

Utilizing this document, Power assessed the project's potential to adversely affect air quality related values (AQRV).

The results are summarized in **Table 13** for pollutants included in Screening Procedure and for which modeling was required. Predicted concentrations were compared with the AQRV screening concentrations, PSD Class II increment consumption limits and the NAAQS. Predicted concentrations are not predicted to exceed AQRV screening concentrations for potential impacts to plants, soils and animals.

Table 13
Air Toxics Modeling Results Impacts on Plants, Soils, and Animals

Pollutant	Averaging Period	Maximum Modeled Concentration (µg/m³)	AQRV Screening Concentration[1] (µg/m³)
CO	1-hour	1815.15	-
	8-hour	513.21	-
	1-week	513.21[2]	1,800,000
NO_2	1-hour	18.12	3,760
	8-hour	11.30	3,760
	1-Month	1.36	564
	Annual	0.80	100[3]
SO_2	1-hour	4.67	917
	8-hour	3.99	786
	24-Hour	1.68	-
	Annual	0.02	18

1. Table 3.1, A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals, Smith & Levenson, EPA 450/2-81-078, December 12, 1980.
2. Predicted 8-hour modeling results conservatively utilized.
3. The screen value expected to be controlling for this pollutant. A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals, Smith & Levenson, USEPA 450/2-81-078, December 12, 1980

Power performed deposition modeling for the potential of trace metals in the soil. The maximum predicted deposition results at any off-property location were used to calculate the concentration of fluoride and other trace metals listed in Screening Procedure that would be deposited in the soil. These maximum deposited soil concentrations were compared against the soil screening concentrations in **Table 14**. The maximum deposited soil concentrations were each less than the soil screening concentrations. Therefore, adverse impacts from this project are not expected.

Table 14

Deposition Impacts on Plants and Animals

Pollutant	**Averaging Period**	**Maximum Deposition Concentration (G/M2-YR)**	**Potential Deposited soil conentration' (PPMW)**	**Sreening concentration for exposure of vegation to pollutant concentrations in Soil (PPMW)**
Arsenic	Annual	2.09E-07	4.26E-05	3
Beryllium	Annual	1.20E-08	2.45E-06	-
Cadmium	Annual	1.19E-06	2.44E-04	2.5
Chromium	Annual	1.71E-06	3.48E-04	8.4
Mercury	Annual	2.60E-07	5.30E-05	455
Manganese	Annual	5.02E-07	1.02E-04	2.5
Nickel	Annual	2.47E-06	5.03E-04	500
Selenium	Annual	2.40E-08	4.90E-06	13

Visibility

As part of its additional impacts analysis, Power examined how the proposed project would affect visibility at Class I and Class II areas. The closest Class I areas to BEC are Mammoth Cave National Park (Kentucky) and Mingo Wilderness Area (Missouri). The Mammoth Cave National Park is approximately 385 km southeast of BEC and Mingo Wilderness area is approximately 340 km southwest of BEC. Because the distance between the proposed project site and the nearest Class I areas is greater than 300km, emissions from the proposed project are not expected to have adverse impacts on visibility at the nearest Class I areas.

Power provided an analysis of Class II visibility impacts using the USEPA-developed VISCREEN model. The VISCREEN model allows the user to evaluate plume perceptibility and contrast against two backgrounds: sky and terrain. Power applied the VISCREEN model to determine if the proposed project would affect visibility at Spitler Woods State Natural Area, a Class II area located approximately 11 kilometers to the southeast of BEC.

Based on information initially submitted by Power, it used inputs of 221 tons per year of PM_{10} and 228 tons per year of NO_2 during its visibility impact analysis. These values represent the direct particulate and NO_2 emission increases associated with the proposed project and were selected consistent with USEPA guidance[5], with PM_{10} used as a surrogate for particulate matter because it represents the largest proposed emissions increase among available species of particulates. The Modeling Unit used an input of 165 tons per year of PM_{10} and 224 tons per year of NO_2 proposed project emissions from the revised permit application in its visibility impact analysis.

Based on the VISCREEN modeling indicating plume perceptibility and contrast below the applicable screening values at the Class II receptors, Power concluded that emissions from the proposed project would not result in adverse visibility impacts at the Spitler Woods State Natural Area. The Modeling Unit results of this analysis also concluded Class II visibility impacts would not be anticipated from the proposed project.

Summary

Based upon the applicant's submittal and the Modeling Unit review of Power's modeling results, the air quality analysis satisfies the PSD requirements for the proposed construction of a natural-gas fired turbine generator equipped with a carbon capture system in Decatur, Macon County, Illinois.

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[5] USEPA. *Workbook for Plume Visual Impact Screening and Analysis (Revised)*, October 1992.