Air Quality Effects Analysis (AQEA)
for
Applied Digital Corporation
FAR Generation Plant

6805 County Road 81
Harwood, ND 58042

Associated with Permit No.:

ACP-18345 v1.0

North Dakota Department of Environmental Quality

Division of Air Quality

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Date of Final Analysis: [Reserved]	**Update Post Comment Period:** [Reserved]
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1. Executive Summary

Applied Digital (AD) submitted a Permit to Construct (PTC) application to the North Dakota Department of Environmental Quality – Division of Air Quality (Department) on March 9, 2026. The application was for the construction and operation of diesel generators at the data center near Fargo (FAR Generation Plant or facility) in Cass County, North Dakota. The proposed Project was classified as a Synthetic Minor under Prevention of Significant Deterioration (PSD), an area source of hazardous air pollutants (HAPs), and is planned to be a non-Title V permit to operate source.

After a complete review of the proposed Project (see Section 2) indicating that the facility is expected to comply with applicable federal and state air pollution rules and regulations, the Department will make a recommendation on PTC issuance for the FAR Generation Plant following the completion of a 30-day public comment period.

A. Update post comment period:

[Reserved]

2. Project Description

The purpose of the FAR Generation Plant is to provide back-up power to the AD data center near Fargo. Back-up power is needed in the event of electrical grid failure or to help prevent electrical grid failure (i.e., when demand exceeds, or the electrical provider expects demand to exceed, available supply).

The Project will consist of 192 diesel fueled emergency generator engines located in multiple generator buildings at the facility. Building FAR01 will contain ninety-six Caterpillar 3516E generator engines rated at 4,393 hp and capable of producing 3,000 kW of power. Building FAR02 will also contain ninety-six of the Caterpillar 3516E generator engines. Upon completion of this project, the FAR Generation Plant will consist of 192 diesel fueled emergency generator engines.

The facility is subject to a federally enforceable total facility planned (i.e., non-emergency) hour limitation of 3,039 hours per year for maintenance and readiness testing purposes, see ACP-18345 v1.0 Condition 2.D. This equates to approximately 15.8 hours per year, per generator. The facility is also subject to conditions established in ACP-18345 v1.0 Condition 2.F and 2.G which restricts planned operations. Additionally, Conditions 2.E, 2.H and 2.I detail ambient air monitoring requirements, notification and response requirements, and unplanned (i.e., loss of grid power and emergency) requirements, respectively.

The Project emission units are found in ACP-18345 v1.0:

Table 1-1 lists all emissions units associated with the facility upon Project completion.

A. Permit Description:

The facility is adopting a total facility planned operation hour limitation to remain below PSD and Title V major source thresholds, making the facility classified as a synthetic minor source of air pollution.

3. Facility Emission Profile

For all emission units associated with the Project, Table 1 lists various emissions scenarios, including the potential to emit (PTE) for all criteria air pollutants and selected HAP. Table 1 abbreviations are as follows: filterable particulate matter (PM_F), condensable particulate matter (PM_C), sulfur dioxide (SO_2), oxides of nitrogen (NO_X), carbon monoxide (CO), volatile organic compounds (VOC), and hazardous air pollutants (HAP) as defined in Section 112(b) of the Clean Air Act.

Table 1 – Facility Emissions

Emission Scenario Description	Units	NO_X	CO	SO_2	VOCs	PM_F	PM_C	Total HAPs	Benzene (Largest HAP)
Caterpillar 3516E single engine	pounds/hour	65	12	0	1	1	0	0	0
All facility engines [B]		12,570	2,231	8	112	112	42	9	4
Permit limited non-emergency operations [C]	tons/year	99	18	0	1	1	0	0	0
All facility engines [D]		55,058	9,774	36	489	489	184	38	19

[A] Calculations were done conservatively at 100% engine load

[B] Facility engines consist of 192 Caterpillar engines

[C] Non-emergency operations are limited to 3,039 total facility hours of operation

[D] This scenario would occur if grid power was lost for a full year. This is highly unlikely and included for informational purposes.

The permit limited planned operations emission scenario in Table 1 is the facility wide potential to emit (PTE) during planned operations. Planned operational hours are restricted to limit emissions below 100 tons per year (tpy) for all criteria air pollutants, below 10 tpy for any single hazardous air pollutant (HAP), and below 25 tpy for the combined HAP emissions. Detailed calculations have been provided in the permit application. The Department has reviewed these calculations and believes they accurately represent the proposed facility emissions during planned operations.

The planned operations emission scenario is based on federally enforceable restrictions put in place on the 192 diesel generator engines. These restrictions limit the total annual operating hours during planned operations to 3,039 hours, approximately15.8 hours per year, per generator. The operation restriction means the facility will be a synthetic minor source of air pollution, as the emissions are limited to below major source thresholds for the prevention of significant deterioration (PSD) program, Title V program, and the national emissions standards for hazardous air pollutant (NESHAP) standards.

Unplanned operations may occur when grid power becomes unavailable after notification from the Regional Transmission Organization such as Midcontinent Independent System Operator (MISO) or an uncontrollable power emergency occurs such as a North American Electric Reliability Corporation (NERC) Energy Emergency Alert (EEA) level 2 or above event. Notification, Recordkeeping, and Root Cause Analysis Requirements for unplanned operations are found in ACP-18345 v1.0 Condition 2.I.

A modeling analysis was submitted with the permit application intending to demonstrate compliance with the 1-hour nitrogen dioxide (NO_2) Ambient Air Quality Standard (AAQS) during planned operations. The analysis utilized AERMOD and a Monte Carlo R script developed by the State of Washington's Department of Ecology. AERMOD has known limitations when evaluating intermittent sources against the 1-hour NO_2 standard. These limitations are elaborated on in the March 1, 2011, memo issued by the EPA titled "Additional Clarification Regarding Application of Appendix W Modeling guidance for the 1-hour NO_2 National Ambient Air Quality Standard."[1] A Monte Carlo analysis is a method that has been utilized to overcome AERMOD's limitations when evaluating intermittent sources. However, the submitted analysis evaluated each generator bank separately and not the facility as a whole and did not evaluate the impacts of unplanned operations. The potential magnitude of unplanned operations is shown in the "All facility generators" emission scenarios in Table 1. Due to the AERMOD and Monte Carlo analysis limitations, and the significant potential emissions during unplanned operations, the Department determined that NO_2 monitoring was needed to evaluate impacts to the local airshed during all operating scenarios.

[1] Available at: https://www.epa.gov/sites/default/files/2020-10/documents/additional_clarifications_appendixw_hourly-no2-naaqs_final_03-01-2011.pdf (Last visited June 8, 2026)

The NO_2 monitors will operate year-round and will primarily be used to identify any Air Quality Index (AQI) concerns. Notification and response requirements associated with AQI values are found in ACP-18345 v1.0 Condition 2.H and shown in Table 2 below.

Table 2 - Monitored 1-hour NO_2 Concentrations and Required Response

1-hour NO_2 (ppb) [A]	**Monitored Concentration Duration (hours) [B]**	**Facility Response**
0-100	All	None
101-360	4 or more	• Discontinue non-critical operations • Notify the Department within the 5th hour • If monitored concentration persists for 5 hours, shutdown of generators is required and notice to local authority is to be provided
361-650	3	• Immediate shutdown • Notify the Department and local authority within the 4th hour
650+	1	• Immediate shutdown • Notify the Department and local authority within the 2nd hour

[A] Valid hourly average.
[B] Consecutive valid hourly average monitored concentration.

The monitoring station required by Condition 2.E will be classified as Facility Monitors and will not be utilized as a State and Local Air Monitoring Station (SLAMS). Monitoring requirements are detailed in Condition 2.E. A monitoring plan must be submitted to the Department for review and approval. The plan must include the location of the monitoring station, the NO_2 sampling methodology, and quality assurance procedures for operation and data handling. Upon approval, the plan will be incorporated into the permit record and will be attached to an operating permit. The Department reserves the right to modify the Monitoring Plan based on the data gathered.

1. Rules Analysis

This section details the potential applicability and expected compliance status of each rule under the North Dakota Administrative Code (NDAC) 33.1-15—Air Pollution Control Rules.

A. NDAC 33.1-15-01 – General Provisions:

This chapter covers the following topics: entry onto premises - authority, variances, circumvention, severability, land use plans and zoning regulations (only to provide air quality information), measurement of air contaminants, shutdown and malfunction of an installation - requirements for notification, time schedule for compliance, prohibition of air pollution, confidentiality of records, enforcement, and compliance certifications.

Applicability and Expected Compliance

Based on the review of the information provided, the facility will comply with all applicable sections of this rule.

B. NDAC 33.1-15-02 – Ambient Air Quality Standards:

This chapter requires that the facility complies with the North Dakota and Federal Ambient Air Quality Standards (AAQS).

Applicability and Expected Compliance

Due to AERMOD limitations when modeling intermittent sources and the potential for significant emissions during unplanned operations, the Department determined that NO_2 monitoring is required to determine potential impacts to the local airshed. The Facility Monitor will not be SLAMS. If monitored levels appear to affect the NO_2 AAQS, the Monitoring Plan will be modified accordingly to ensure compliance.

C. NDAC 33.1-15-03 – Restriction of Emission of Visible Air Contaminants:

This chapter requires all non-flare emission sources at new facilities to comply with an opacity limit of 20% except for one six-minute period per hour when 40% opacity is permissible. For all flare emission sources, the limits are 20% and 60% respectively. Fugitive emissions must not exceed 40% for more than one six-minute period per hour. The chapter establishes exceptions to opacity requirements and that compliance shall be determined using EPA Reference Method 9 or 22.

Applicability and Expected Compliance

Based on Department experience with diesel fired emergency generator engines, the facility is expected to comply with the 20% opacity limit.

D. NDAC 33.1-15-04 – Open Burning:

No person may cause, conduct, or permit open burning of refuse, trade waste, or other combustible material—as part of a salvage operation or otherwise—except as provided under NDAC 33.1-15-04-02 or 33.1-15-10-02.

Applicability and Expected Compliance

No open burning operations are permitted unless approved in advance by the Department.

E. NDAC 33.1-15-05 – Emissions of Particulate Matter Restricted:

This chapter establishes particulate matter emission limits, restrictions, and measurement methods for industrial processes, fuel burning equipment used for indirect heating (where emissions do not interact with process materials), waste incinerators, and crematoriums.

Applicability and Expected Compliance

The diesel fired emergency generator engines are subject to the Tier 2 emissions standards for particulate matter under 40 CFR Part 1039 and compliance with this standard is more restrictive than this chapter's requirements, therefore, compliance with this chapter is expected.

F. NDAC 33.1-15-06 – Emissions of Sulfur Compounds Restricted:

This chapter applies to any installation in which SO_2 emissions are substantially due to the sulfur content of burned fuel used primarily to produce heat. This chapter establishes requirements for measurement methods, continuous emission monitoring, reporting, and recordkeeping. This chapter is not applicable to installations which are subject to an SO_2 emission limit under NDAC 33.1-15-12 (NSPS, see Section 0) or which burn pipeline quality natural gas.

Applicability and Expected Compliance

The diesel fired emergency generator engines are subject to the sulfur standard in new source performance standard (NSPS) Subpart IIII. The generators will burn diesel fuel with a maximum sulfur content of 15 parts per million by weight (ppmw) and are thus compliant with sulfur restrictions in this chapter.

G. NDAC 33.1-15-07 – Control of Organic Compounds Emissions:

This chapter establishes requirements for the construction of organic compound facilities related to closed-vent systems, control devices, and seals. This chapter requires organic compound vapors to be controlled by a continuously burning pilot flare or other equally effective control device. This chapter also requires hydrogen sulfide (H_2S) to be controlled effectively.

Applicability and Expected Compliance

The facility is not subject to the requirements of this chapter since it is not an organic compound facility and will not produce any organic compounds subject to the disposal requirements.

H. NDAC 33.1-15-08 – Control of Air Pollution from Vehicles and Other Internal Combustion Engines:

This chapter restricts the operation of internal combustion engines which emit, from any source, unreasonable and excessive smoke, obnoxious or noxious gas, fumes or vapor. This chapter also prohibits the removal or disabling of motor vehicle pollution control devices.

Applicability and Expected Compliance

The diesel fired emergency generator engines are also subject to opacity requirements under NDAC 33.1-15-03-02 and subject to the requirements of NSPS Subpart IIII. As a result of expected compliance with these provisions, the generators are not expected to emit any unreasonable and excessive smoke, obnoxious or noxious gases, fumes, or vapor.

I. NDAC 33.1-15-09 – [repealed]

J. NDAC 33.1-15-10 – Control of Pesticides:

This chapter provides restrictions on pesticide use, disposal, and the proper handling of empty pesticide containers.

Applicability and Expected Compliance

The facility is subject to this chapter and is expected to comply with all applicable requirements should pesticides be used.

K. NDAC 33.1-15-11 – Prevention of Air Pollution Emergency Episodes:

This chapter requires facilities to develop abatement strategy plans for use during an air pollution episode—as determined by the Department—to prevent emergencies and adverse effects to human health.

Applicability and Expected Compliance

When an air pollution emergency episode is declared by the Department, the facility shall comply with the requirements in Chapter 33.1-15-11 of the North Dakota Air Pollution Control (NDAPC) rules.

L. NDAC 33.1-15-12 – Standards of Performance for New Stationary Sources (40 CFR 60):

This chapter adopts most of the New Source Performance Standards (NSPS) and appendices under 40 CFR 60 as of July 1, 2019, to which the facility is subject:

1) NSPS A – General Provisions

This subpart is applicable to any facility in which an NSPS applies and contains general requirements for control devices and work practices, notification, performance tests, monitoring, reporting and recordkeeping.

Applicability and Expected Compliance

The facility will comply with all requirements of this subpart. In addition, any physical or operational changes to the facility after it is built will be evaluated with respect to this subpart and others.

2) NSPS IIII – Standards of Performance for Stationary Compressor Ignition Internal Combustion Engines

This subpart applies to stationary compression ignition internal combustion engines that commence construction after July 11, 2005. Engines are categorized based on usage and size. This subpart establishes emission standards and requirements for fuel, compliance, testing, monitoring, reporting, and recordkeeping.

Applicability and Expected Compliance

The diesel fired emergency generator engines are subject to Subpart IIII. The Caterpillar 3516E generators will have a maximum rating capacity of 4,393 hp and are capable of producing 3,000 kW of power. The model year of the engines is post 2011, the generators are certificated, and will be installed, configured, operated, and maintained according to the manufacture's emission related written instructions. The facility will maintain applicable records for the emergency engines that will serve as demonstration of compliance with the following emission standards from 40 CFR Appendix I to Part 1039(b) :

- NOx + NMHC of 6.4 g/KW-hr
- CO: 3.5 g/KW-hr
- PM: 0.20 g/KW-hr

If the generators are not operated according to manufacturer's recommendations, compliance with the limits must be demonstrated consistent with 40 CFR 60.4211(g)(3) requirements.

To remain classified as emergency engines, each diesel generator engine is restricted to operating no more than 100 hours per year on a calendar year basis and shall operate in accordance with 40 CFR 60.4211(f). Note per 40 CFR 60.4211(f)(1), there is no time limit on the use of emergency stationary ICE in emergency situations.

The facility is required to submit an annual report according to the requirements of 40 CFR 60.4214.

M. NDAC 33.1-15-13 – Emission Standards for Hazardous Air Pollutants (40 CFR 61):

This chapter adopts most of the National Emission Standards for Hazardous Air Pollutants (NESHAP) and appendices under 40 CFR 61 as of July 2, 2010.

Applicability and Expected Compliance

The facility does not appear to have any applicable requirements under this chapter.

N. NDAC 33.1-15-14 – Designated Air Contaminant Sources, Permit to Construct, Minor Source Permit to Operate, Title V Permit to Operate:

This chapter designates air contaminant sources that are required to obtain a PTC and a Permit to Operate (PTO) and the requirements for permits of various types, including public comment.

Applicability and Expected Compliance

The facility has submitted an application for a permit to construct and has met all requirements necessary to obtain a PTC. The facility will be considered a synthetic minor source via federally enforceable restrictions that result in criteria air pollutant PTE being below 100 tons per year for NOx. The restriction is placed on total annual operating hours during planned operations.

The permit must undergo public comment per NDAC 33.1-15-14-02-6.a.5.

Once the facility completes construction and meets the permit to construct requirements, a facility inspection will be performed by the Department. Pending a satisfactory facility inspection, the facility will be issued a synthetic minor source permit to operate by the Department.

O. NDAC 33.1-15-15 – Prevention of Significant Deterioration of Air Quality (40 CFR 52.21):

This chapter adopts the federal provisions of the PSD program (40 CFR 52.21) as of January 1, 2019. A facility is subject to PSD review if it is classified as a "major stationary source" or undergoes a "major modification" as defined by 40 CFR 52.21(b)(1-2). Major stationary sources are either: (1) facilities which fall under one of the specified source categories and the PTE exceeds 100 tpy of any NSR pollutant or, (2) facilities that do not fall under a specified category and the PTE exceeds 250 tpy of any NSR pollutant.

Applicability and Expected Compliance

This facility is not classified as a "major stationary source" under 40 CFR 52.21(b)(1)(i)(a) and is therefore only subject to PSD review if emissions of a regulated new source review (NSR) pollutant[2] exceed 250 tpy (excluding fugitive emissions). The PTE for this facility,

[2] See 40 CFR 52.21(b)(50). Available at: https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-52/subpart-A/section-52.21#p-52.21(b)(50)

as shown in Table 1, is below the 250 tpy threshold and therefore not subject to PSD review.

P. NDAC 33.1-15-16 – Restriction of Odorous Air Contaminants:

This chapter restricts the discharge of objectionable odorous air contaminants which measure seven odor concentration units or greater outside the property boundary. This chapter addresses emissions of H_2S. This chapter also establishes the method of measurement using certified inspectors, scentometers, and other approved instruments.

Applicability and Expected Compliance

Based on Department experience with sources having similar emission units, processes, and low H_2S concentrations, the facility is expected to comply with this chapter without additional controls. Any odor-related complaints received by the Department will be investigated and resolved in accordance with this chapter.

Q. NDAC 33.1-15-17 – Restriction of Fugitive Emissions:

This chapter restricts PM and gaseous fugitive emissions that would violate Chapters 2 (AAQS), 3 (visible emissions), 15 (PSD), 16 (odor), or 19 (visibility), providing suggested abatement measures.

Applicability and Expected Compliance

The facility will be required to take reasonable precautions to prevent fugitive emissions in violation of the above referenced NDAC chapters.

R. NDAC 33.1-15-18 – Stack Heights:

This chapter restricts the use of stack heights above good engineering practices (GEP) and dispersion techniques to affect pollutant concentrations in the ambient air as defined by 40 CFR 51.100(hh-kk). Stack heights in exceedance of GEP are permissible if they undergo a demonstration study which is made available for review by the Department and the public.

Applicability and Expected Compliance

The proposed stacks at the facility do not exceed GEP and will not use dispersion techniques to affect the pollutant concentration in the ambient air.

The stack heights at the facility are listed in Table 5-1 in ACP-18345 v1.0.

S. NDAC 33.1-15-19 – Visibility Protection:

This chapter requires new major stationary sources or major modifications[3] to demonstrate the emissions will not cause or contribute to adverse impact on visibility in federal Class I areas. This chapter establishes requirements for visibility impact analysis, visibility models, notification, review by federal land managers, public participation, and visibility monitoring.

Applicability and Expected Compliance

The facility is not a new major stationary source and therefore is not subject to the requirements of this chapter. Given the minor source levels of the visibility impairing air pollutants, such as NO_X, SO_2, and $PM_{2.5}$, it is expected that the facility will not adversely contribute to visibility impairment within the three units of the Theodore Roosevelt National Park, the Lostwood National Wildlife Refuge, Badlands National Park in South Dakota, or Wind Cave National Park in South Dakota (nearest federal Class I areas).

T. NDAC 33.1-15-20 – Control of Emissions from Oil and Gas Well Production Facilities:

This chapter regulates emissions from oil and gas well production facilities, requiring operators to register new wells and report gas composition changes. It establishes PSD applicability for major sources and mandates compliance with air quality standards for pollutants like sulfur dioxide and hydrogen sulfide.

Applicability and Expected Compliance

The facility is not an oil or gas well facility and is therefore not subject to the requirements of this chapter.

U. NDAC 33.1-15-21 – Acid Rain Program:

This chapter adopts the acid rain provisions under 40 CFR 72, 75, & 76 and appendices as of January 1, 2012.

Applicability and Expected Compliance

This chapter adopts the acid rain provisions of the Clean Air Act specified under 40 CFR Parts 72-78. The facility is not subject to the acid rain provision as they are not an electric utility.

V. NDAC 33.1-15-22 – Emissions Standards for Hazardous Air Pollutants for Source Categories [40 CFR 63 a.k.a. MACT (Maximum Achievable Control Technology)]:

This chapter adopts most of the MACT standards and appendices under 40 CFR 63 as of July 1, 2019.

1) MACT A – General Provisions

[3] Chapter 19 applies to a "new major stationary source" or "major modification" as defined in NDAC 33.1-15-15-01.

This subpart is applicable to any facility to which a MACT standard applies and contains general requirements for control devices and work practices, notification, performance tests, monitoring, reporting and recordkeeping.

Applicability and Expected Compliance

The facility's potential HAP emissions (see Table 1) are less than 10 tpy of any single HAP and less than 25 tpy for combined HAP, so the facility is an area (minor) source of HAP.[4]

The facility will comply with all requirements of this subpart.

2) MACT ZZZZ – National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

This subpart applies to stationary reciprocating internal combustion engines (RICE) at major and area sources of HAP, establishing HAP emission and operating limits and requirements for compliance, testing, reporting, and recordkeeping.

Applicability and Expected Compliance

The requirements of Subpart ZZZZ for the diesel fired emergency generator engines are met by complying with the requirements of NDAC 33.1-15-12 [40 CFR 60], Subpart IIII.

W. NDAC 33.1-15-23 – Fees:

This chapter establishes a filing fee of $325 for PTC applications, plus any additional fees based on actual processing costs assessed upon issuance of the draft PTC. This chapter also requires an annual PTO fee for Title V major and minor sources and well registrations.

Applicability and Expected Compliance

The applicant has paid the $325 filing fee and may be required to pay the additional fees associated with the permit processing.

X. NDAC 33.1-15-24 – Standards for Lead-Based Paint Activities:

This chapter establishes standards and requirements for the accreditation, notification, and fees of procedures, training programs, certification, and licensing for individuals and firms engaged in lead-based paint activities.

Applicability and Expected Compliance

The facility will not perform any lead-based paint activities and is therefore not subject to this chapter.

[4] 40 CFR 63.2 "Major Source"

Y. NDAC 33.1-15-25 – Regional Haze Requirements (40 CFR 51.308):

This chapter establishes requirements for stationary sources (which were in existence between 1962 and 1977) which have the potential to "contribute to visibility impairment" in Class I Federal areas, as defined by 40 CFR 51.301, to implement best available retrofit technology. In addition, existing stationary sources or groups of sources are required to implement emission reduction measures to make reasonable progress toward North Dakota's reasonable progress goals established in accordance with 40 CFR 51.308 at the discretion of the Department.

Applicability and Expected Compliance

The facility is a new source and based on low PTE of visibility impairment pollutants is not expected to contribute to visibility impairment. Therefore, the facility is not subject to the requirements of this chapter.