

DEPARTMENT OF ENVIRONMENTAL QUALITY  
AIR QUALITY DIVISION  
ACTIVITY REPORT: On-site Inspection

P058258630

<b>FACILITY:</b> Wolverine Power Supply Co-op - Alpine Power Plant		<b>SRN / ID:</b> P0582
<b>LOCATION:</b> 7432 M-32 Highway, ELMIRA		<b>DISTRICT:</b> Gaylord
<b>CITY:</b> ELMIRA		<b>COUNTY:</b> OTSEGO
<b>CONTACT:</b> Joseph Hazewinkel , Environmental Policy Coordinator		<b>ACTIVITY DATE:</b> 05/25/2021
<b>STAFF:</b> Sharon LeBlanc	<b>COMPLIANCE STATUS:</b> Compliance	<b>SOURCE CLASS:</b> MAJOR
<b>SUBJECT:</b> Onsite inspection on records review for 2021 FCE. No Compliance issues noted. sgl		
<b>RESOLVED COMPLAINTS:</b>		

On May 25, 2021, AQD District Staff conducted a scheduled site inspection of the Wolverine Power Supply Cooperative Incorporated, Alpine Power Plant (AKA Wolverine Alpine Power) located at 7432 N-32, Elmira, Otsego County, Michigan (P0582). The referenced Facility presently operates under MI-ROP-P0583-2019. The referenced ROP was issued on August 28, 2019. One ROP modification (MI-ROP-P0582-2019a) was issued on May 25, 2021.

The Facility is a natural gas-fired electric utility, located in a rural portion of Otsego County. District Staff met with Joe Hazewinkel (Environmental Policy Coordinator), Jesse Genter (Generation Manager - North), Zach Ackeman and Dan Boulter (Chief Operator) at the time of the inspection. A records request was submitted electronically to the Facility on May 18, 2019. Documents were received on May 19, 2021. A supplemental request was submitted electronically on May 27, 2021, with data provided on June 8, 2021 and June 22, 2021. A review of all documents provided has been incorporated into this document.

The most recent site inspection was conducted on February 21, 2019. No compliance issues were noted at the time of the inspection.

Weather conditions at the time of the inspection included mostly cloudy skies, clearing to partly cloudy skies, variable winds to the N-NE and temperatures of 73 degrees F. The Facility was operating at the time of the inspection, no visible emissions were noted at the time of the inspection.

**FACILITY –**

The present Facility completed instruction and was on-line in 2016, the Wolverine Alpine Power Plant is a natural gas-fired electric utility located in Elmira, Michigan. The Facility generates electricity and supplies it to the general electrical power grid. The facility was designed to operate primarily at times of peak electrical demand. It is therefore meant to operate for limited periods of time, not baseload generation. Facility staff indicate that Facility operations are upon request of electrical needs of the grid. Operation of the plant is determined by "MISO" , the Midcontinent Independent System Operator, Inc. that provides an open-access transmission service and high-voltage transmission system in the Midwest, part of the southern U.S.A and Manitoba Canada. MISO also is reported to represent one of the world's largest real-time energy markets.

Equipment associated with the Plant includes the following:

- Two NG-fired, simple cycle turbines which run electrical generators. (EUCTG1 and EUCTG2) (FG-CTG)

FG-CTG consists of two NG-fired, 7FA.05 GE Turbines. Each turbine has a peak heat input of 2.045 MMBTU/hr. No wet compression or like technology is utilized by the Facility. The turbines are filled with hydrogen gas. The CAT Gen Set 3512 electrical generator ( with CAT 3512C engine) is rated at 203 MW. EUCTG1 and EUCTG2 were reported to be installed on June 13, 2016 and May 23, 2016, respectively.

Emissions are reported to be estimated using stack test data. Stack testing is conducted every 5-years. Testing is presently scheduled for August 2021. Facility Staff report that the Test Plan for had been submitted to AQD TPU Staff.

- Two NG-fired fuel heaters (EUFUELHTR1 and EUFUELHTR2)(FGFUELHTR)

The two 3.3 MMBTU, glycol, bath heaters preheat NG fuel before it goes to the generators. One fuel heater for each turbine. Target fuel gas temperatures are reported to be 95 degrees. Installation dates for EUHTR1 and EUHTR2 are reported to be June 13, 2016 and May 23, 2016, respectively.

- One emergency generator (EUEMERGEN)

Installed on August 23, 2016, the generator is identified as Model SR-5, SN 61W02158 rated at 1,500 kW and powered by a certified 2015, CAT 3512C diesel engine (SN 3689723) with a displacement of less than 10 liters/cylinder. The facility reported that they have a maintenance contract with CAT to conduct quarterly maintenance and load testing, to meet Federal RICE requirements.

Fuel for the RICE is stored in a AST located immediately under the emergency generator building. Facility staff indicated that the AST is approximately 1650-1850 gallons.

- One emergency fire pump (EUFIREPUMP)

Installed on April 18, 2016, the EU consists of a 2015 model year, certified, 175 Hp, John Deere diesel RICE powering an emergency fire pump. The engine is reported to be operated weekly for approximately one-half hour for functionality testing. Diesel fuel for the EU is reported to be stored in an approximately 280 gallon AST.

Exempt devices previously identified with the Facility included two NG-fired furnaces for office heat as well as four NG-fired shop heaters. Other equipment identified onsite included:

- Oil-less electric air compressor for the air driven controls onsite.
- Cooling units for closed systems such as the generator oils.
- Water-mist fire suppression system for the turbine compartment.
- Transformers and step downs.
- Bulk hydrogen storage system, maintained by "Air Gas" to supply hydrogen gas to the turbine core.
- One 130K gallon water tank.

Operational data for the various emission units and systems is collected by a Data Acquisition Handling System (DAHS). Facility staff reported that a NOx CEMS is to be installed before the end of the calendar year. The installation is required as the result of a NOx exceedance during the previous ozone season.

PERMIT HISTORY --

The Facility was initially permitted under Permit to Install (PTI) 206-14 issued on May 15, 2015. Evaluation of that permit prior to issuance included a public comment period, evaluation of potential toxic air emissions and analysis for Best Available Control Technology. The initial ROP application incorporating the PTI into an ROP was received on March 27, 2017.

PTI-100-20 was issued on November 19, 2020, and an application for a minor modification was received on January 29, 2021. The EPA comment period for the minor modification ended on May 24, 2021. MI-ROP-P0582-2019a was issued on May 25, 2021. The modification was made to include rain caps on the stacks of FGFUELHTR.

Notification of changes were received by the District Office on December 17, 2018, and December 13, 2019. In each case the responsible official was changed. The present responsible official is a Mr. J. Baumann.

**REGULATORY**

The Facility is considered a Major source of CO and NOx, and a true minor for Hazardous Air Pollutants (HAPs). The Facility is considered a synthetic minor source with regards to Prevention of Significant Deterioration (PSD) (40 CFR 52.21) because the Facility accepted legally enforceable permit conditions limiting the potential to emit of CO and NOx to less than 250 tons per year.

Emission Unit	Federal Regulation
EUCTG1 & EUCTG2	40 CFR Part 60 Subparts A and KKKK Standards of Performance for Stationary Combustion Turbines
	40 CFR Part 60 Subparts A and TTTT Standards of Performance for Greenhouse Gas Emissions for Electric Generating Units
	Federal Acid Rain Program promulgated in 40 CFR Part 72
	Cross-State Air Pollution Rule NOx Annual Trading Program pursuant to 40 CFR Part 97 Subpart AAAAA
	Cross-State Air Pollution Rule NOx Ozone Season Group 2 Trading Program pursuant to 40 CFR Part 97. Subpart EEEEE
	Cross-State Air Pollution Rule SO2 Group 1 Trading Program pursuant to 40 CFR Part 97, Subpart CCCCC

<p><b>EU EUFIREPUMP</b></p>	<p><b>&amp; Standards of Performance for Stationary Reciprocating Internal Combustion Engines promulgated in 40 CFR Part 60, Subparts A and IIII</b></p>
	<p><b>National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines promulgated in 40 CFR Part 63, Subparts A and ZZZZ*</b></p>

\*Compliance under the subpart is demonstrated by compliance with 40 CFR Part 60 Subpart IIII

**COMPLIANCE --**

Since the previous site inspection, no complaints, violation notices or consent orders are of record. They report annual emissions under MAERS. A review of MAERs submittals indicated that the submittals have been received in a timely manner. The first submittal being for the 2016 calendar year.

Reporting requirements under MI-ROP-P0582-2019 include semi-annual and annual compliance reporting (SC VII.2 and VII.3). A review of records indicate that the referenced reporting has been conducted in timely manner.

Compliance with respect to permit conditions are summarized below.

**Source-Wide Conditions -**

**Emissions -** These conditions include the following 12-month rolling emission limits:

Calendar Year	NOx Emissions	CO Emissions
April 2021	105.0	43.0
2020	123.047	42.51
2019	55.26	54.86
LIMIT (TPY)	< 249 TPY (SC I.1)	<240 TPY (SC I.2)

**Monitoring/Recordkeeping-** The Facility is required by the 30<sup>th</sup> day of the calendar month, to complete all required calculations for the previous month, unless otherwise specified in another special condition (SC VI.1). These records include determination of monthly and 12-month rolling

NOx and CO emissions for SOURCE-WIDE (SC VI.2). The required records were maintained by the Facility and provided upon request.

**EUEMERGEN –**

A certified, 2015 CAT 3512C diesel engine (Sn 3689723) powering an emergency electrical generator rated at 1,500 kW. The generator is identified as Model SR-5, Sn 61W02158,

Emissions – Emission limits associated with EUEMERGEN include the following, compliance of which is determined by either verification testing for uncertified engines or manufacturer certification:

Pollutant	Limits
NMHC & NOx	6.4 g/kW-hr (SC I.1)
CO	3.5 g/kW-hr (SC I.2)
PM	0.20 g/kW-hr (SC I.3)
NOx	18.1 pph (SC I.4)
CO	2.0 pph (SC I.5)
PM10	0.2 pph (SC I.6)
PM2.5	0.2 pph (SC 1.7)

Under 40 CFR 60.4211, the permittee may meet compliance with the above referenced limits by purchase of an appropriately certified engine, and through operation of the engine per the manufacturer's instructions/recommendations, and only changing those emission related settings allowed by the manufacturer. Documentation provided by the Facility indicates that they have contracted CAT to provide the required servicing to maintain their certified engine status.

A review of monthly emissions for EUEMERGEN indicates that the Facility is using the emission limits for NOx (18.1 pph) and CO (2.0 pph) to determine monthly and 12-month rolling total emissions for the EU.

Material Limits – The permittee is allowed to only burn diesel fuel with a maximum sulfur content of 15 ppm (0.0015%) by weight and a minimum Cetane index of 40, or a maximum aromatic content of 35 volume percent. (SC II.1) A review of purchase records for diesel fuel maintained by

the facility verifies the fuel content was in compliant with conditions. In addition to the vendor verification, the Facility reports that it collects on fuel sample per shipment (normally 1 or 2 shipments per year) for laboratory verification. SPL laboratory analytical reports for the fuel sample analysis dated January 20, 2021 reported sulfur content of 6.6 ppm by weight. Well below the permit limit.

**Process/Operational Limits** - Per the permit limits the permittee is limited to the following:

- No more than 100 hours per 12-month rolling time period determined monthly (SC III.1)
- No more than 100 hours per calendar year for the purpose of necessary maintenance checks and readiness testing (SC III.2)

Records reviewed indicated that the Emergency generator is operated approximately 2.0-2.4 hours every third month for the period of January 2020 to the present. These operations are reported to be for maintenance activities and are in compliance with permit conditions.

**Design** – The permittee is required to install and maintain EUEMERGEN shall be equipped with a non-resettable hours meters to track the operating hours (SC IV.1) The unit installed is in compliance with the indicated requirement.

The nameplate electrical capacity for EUEMERGEN is limited to a not to exceed 1,500 kW as certified by the equipment manufacturer (SC IV .2). As previously verified, the nameplate electrical capacity is 1,500 kW and in compliance with the permit condition.

**Testing/Sampling** - Verification of emissions at or below limits identified in SC I.1 – I.7 is required for engines with initial testing required within one-year after the EU no longer meets certified status. (SC V.1) As previously indicated, the Facility operates a certified RICE, which negates the initial testing requirement at this time.

Verification testing for NO<sub>x</sub> (SC I.4), CO (SC I.5), PM<sub>10</sub> (SC I.6) and PM<sub>2.5</sub> (SC I.7) may be required upon request of the AQD District Supervisor (SC V.2). As no request is of record, verification testing as well as conditions SC V.3 and SC V.4 are also no applicable at this time. SC V.3 outlines the required test methods associated with SC V.1 and V.2. SC V.4 requires notification of AQD Technical Programs Unit and the District Office no less than 7 days prior to testing.

**Monitoring/Recordkeeping** - The permittee is required to keep copies of testing required (SC V.1) or manufacturer certification documentation. (SC VI.1) Copies of manufacturer certification documentation were maintained onsite and reviewed as part of the onsite inspection.

The permittee shall monitor and record both the total hours of operation of EUEMERGEN and total non-emergency hours of operation on a monthly and 12-month rolling basis. (SC VI.2). Records provided indicated non-emergency operations. Facility staff reported that no emergency operations of the EU had been required since the previous site inspection.

The permittee must maintain copies of fuel supplier certification records or fuel sample test data for each delivery of diesel fuel oil used in EUEMERGEN that demonstrates that the fuel meets the requirements of SC II.1. As previously indicated, the fuel vendor provides documentation that the fuel meets the permit conditions. In addition, the facility also collects fuel samples for laboratory analysis, analytical records for the most recent shipment were reviewed as part of the site inspection. Total sulfur content was reported well below permit conditions.

**Stack –** Stack construction requirements for EUEMERGEN include a maximum diameter of 12-inches and minimum height above ground of 14-feet above ground level. Facility staff reported that the stacks associated with various EUs onsite were constructed to meet permit conditions, and copies of as built construction diagrams are maintained to further document the construction details.

**High Level Citations -** The permittee is required to meet high level citations to 40 CFR Part 60, Subpart IIII, and 40 CFR Part 63, Subpart ZZZZ as they apply to EUEMERGEN. As previously indicated, Facility staff have contracted CAT to provide appropriate services to meet requirements. Compliance with the subpart are met by complying with 40 CFR Part 60 Subpart IIII conditions which have been incorporated into the ROP.

**EUFIREFUMP –**

This emission unite consists of one diesel-fired RICE Engine, a 2015 model year, certified, 175 Hp, John Deere diesel RICE which powers the Facility's Emergency fire pump EUFIREFUMP.

**Emissions –** The permittee is required to meet the following emission limits:

Pollutant	Limits
NMHC & NOx	4.0 g/kW-hr (SC I.1)
CO	3.5 g/kW-hr (SC I.2)
PM	0.20 g/kW-hr (SC I.3)
NOx	1.7 pph (SC I.4)
CO	1.1 pph (SC I.5)
PM10	0.1 pph (SC I.6)
PM2.5	0.1 pph (SC 1.7)

Under 40 CFR 60.4211, the permittee may meet compliance with the above referenced limits by purchase of an appropriately certified engine, and through operation of the engine per the manufacturers instructions/recommendations, and only changing those emission related settings allowed by the manufacturer. Documentation provided by the Facility indicates that the engine is certified, and that Facility staff provide the required servicing to maintain their certified engine status.

A review of monthly and 12-month rolling total emissions for EUFIREPUMP indicated that the Facility determines emissions based on hours of operation and emission limits for NOx (1.7 lb/hr) and CO (1.1 lb/hr).

**Material Limits** – The permittee is allowed to only burn diesel fuel with a maximum sulfur content of 15 ppm (0.0015%) by weight and a minimum Cetane index of 40, or a maximum aromatic content of 35 volume percent. (SC II.1) A review of purchase records for diesel fuel maintained by the facility verifies the fuel content was in compliant with conditions. In addition to the vendor verification, the Facility reports that it collects on fuel sample per shipment (normally 1 or 2 shipments per year) for laboratory verification. SPL laboratory analytical reports for the fuel sample analysis dated January 20, 2021 reported sulfur content of 6.6 ppm by weight. Well below the permit limit.

**Process/Operational Limits** - Per the permit limits the permittee is limited to the following:

- No more than 100 hours per 12-month rolling time period determined monthly (SC III.1)
- No more than 100 hours per calendar year for the purpose of necessary maintenance checks and readiness testing (SC III.2)

The Facility reports that the emergency fire pump is operated for a half-hour weekly for functionality tests. Records provided indicated operations of approximately 2 hours per month, which would be consistent with the reported operations.

**Design** – The permittee is required to install and maintain EUFIREPUMP shall be equipped with a non-resettable hours meters to track the operating hours (SC IV.1) Compliance with this permit condition was verified as part of the site inspection.

The nameplate electrical capacity for EUFIREPUMP is limited to a not to exceed 347 Hp as certified by the equipment manufacturer (SC IV .2). The nameplate electrical capacity for the John Deere engine is 175 Hp and under the 347 Hp threshold.

**Testing/Sampling** - Verification of emissions at or below limits identified in SC I.1 – I.7 is required for EUFIREPUMP with initial testing required within one-year after the EU no longer meets certified status. (SC V.1) As the Facility has maintained the engine certification status, initial testing is not required at this time.

Verification testing for NOx (SC I.4), CO (SC I.5), PM10 (SC I.6) and PM2.5 (SC I.7) may be required upon request of the AQD District Supervisor (SC V.2). SC V.3 outlines the required test methods associated with SC V.1 and V.2. SC V.4 requires notification of AQD Technical Programs Unit and the District Office no less than 7 days prior to testing. No correspondence was found in the files at the time of report preparation. Therefore, the referenced conditions are not applicable at this time.

**Monitoring/Recordkeeping** - The permittee is required to keep copies of testing required (SC V.1) or manufacturer certification documentation. (SC VI.1) As previously indicated, the Facility maintains a certified engine for EUFIREPUMP, and maintain copies of the documentation onsite.

The permittee shall monitor and record both the total hours of operation of EUFIREPUMP and total non-emergency hours of operation on a monthly and 12-month rolling basis. (SC VI.2) Records provided consisted of a spreadsheet indicating monthly total operating and 12-month



total operating hours. The Facility reports that no emergency operations have occurred since the previous inspection.

The permittee must maintain copies of fuel supplier certification records or fuel sample test data for each delivery of diesel fuel oil used in EUFIREPUMP that demonstrates that the fuel meets the requirements of SC II.1. As previously indicated the fuel vendor provides assurance that the fuel meets permit conditions, which is verified by laboratory analysis of fuel samples collected by the Facility from each fuel shipment for independent analysis.

Stack – Stack construction requirements for EUFIREPUMP include a maximum diameter of 8-inches and minimum height above ground of 16-feet above ground level. Facility staff reports that the stack was constructed to permit conditions and maintain copies of the as built diagrams further documenting compliance with the permit conditions.

High Level Citations - The permittee is required to meet high level citations to 40 CFR Part 60, Subpart IIII, and 40 CFR Part 63, Subpart ZZZZ as they apply to EUFIREPUMP. Compliance with the subpart are met by complying with 40 CFR Part 60 Subpart IIII conditions which have been incorporated into the ROP.

**FGCTG**

This FG consists of the two 203-MW natural gas fired turbines (7FA.05 GE Turbines) located onsite, and associated generator. ( EUCTG1 and EUCTG2).

Emission Limits- Emission limits associated with the two 203-MW NG-fired combustion turbines include:

Pollutant	Limits
NOx	3.27 E-2 lb/MMbtu) Not including startup/shutdown (SC I.1)
NOx	15 ppm at 15% O2 or 0.43 lb/MWh (SC I.2)
NOx	66.8 pph Not including startup/shutdown (SC I.3)
NOx	30 lb/startup event (SC I.4)

<b>NOx</b>	<b>25 lb/shutdown event (SC I.5)</b>
<b>NOx</b>	<b>244 TPY (SC I.6)*</b>
<b>CO</b>	<b>2.0 E-2 lb/MMbtu) Not including startup/shutdown (SC I.7)</b>
<b>CO</b>	<b>40.9 pph Not including startup/shutdown (SC I.8)</b>
<b>CO</b>	<b>320 lb/startup event (SC I.9)</b>
<b>CO</b>	<b>336 lb/shutdown event (SC I.10)</b>
<b>CO</b>	<b>246 TPY (SC I.11)*</b>
<b>VOC as Methane</b>	<b>1.40 E-3 lb/MMbtu) Not including startup/shutdown (SC I.12)</b>
<b>VOC as Methane</b>	<b>2.9 pph Not including startup/shutdown (SC I.13)</b>
<b>PM10</b>	<b>6.6 E-3 lb/MMbtu) Not including startup/shutdown (SC I.4)</b>
<b>PM10</b>	<b>13.5 pph Not including startup/shutdown</b>

	(SC I.15)
PM2.5	6.6 E-3 lb/MMbtu) Not including startup/shutdown (SC I.16)
PM2.5	13.5 pph Not including startup/shutdown (SC I.17)
CO2	120 lb/MMBTU (SC I.18)

\*These limits are for the FG, and do not represent limits for each turbine in the FG.

NOx and CO 12-month rolling total emissions for FGCTG are summarized below:

12-month rolling period	NOx Emissions (TPY)	CO Emissions (TPY)
Ending April 2021	104.06	42.16
2020	121.98	41.75
Limit	244 TPY (SC I.6)	246 TPY (SC I.11)

**Material Limits – EUs in FGCTG are limited to:**

- only burning NG (SC II.1)
- No fuels may be burned which contain total potential sulfur emissions in excess of 26 ng SO<sub>2</sub>/J (0.060 lb SO<sub>2</sub>/MMBtu) heat input (SC II.3) and
- total NG use for the FG will not exceed 14,567 MMSCF/year on a 12-month rolling time period as determined at the end of each calendar month (SC II.2)

The Facility report 0.6 ppm SO<sub>2</sub> (or 5.64 E-5 lb/MMBtu). The Facility reports using only pipeline quality NG and maintains records of NG combustion for each EU on a daily basis. Documentation reviewed summarized usage on a monthly and 12-month rolling basis. NG usage reported by the Facility for FGCTG is summarized below:

Calendar Year	NG Consumption (MMSCF)

2021 to date	745
2020	7897
2019	3283
Limit	14,567 MMSCF (SC II.2)

Note that the 12-month rolling total NG consumption for FGCTG for the period of January 2020 through May 2021 ranged from 3,087 – 8,029 MMCF. Monthly and 12-month rolling total NG usage by the FG is monitored and recorded by the Facility, and totals reported are in compliance with permit conditions.

Process/ Operational Conditions – Under the ROP, the Facility is required to prepare and implement plans to minimize emissions in the case of start-ups, shutdowns and malfunctions. SC III.3 defines startup as the time from initial combustion of fuel until the unit reaches a minimum load of 101.2 MW of electrical output. The same condition defines shutdowns were defined as that period of time from the initial lowering of the turbine output below 101.2 MW of electrical output with the intent to shut down, until fuel is no longer burned in the unit.

Data provided indicates that the Facility documents each startup and shutdown event for EUCTG1 and EUCTG2. The following presents a summary of events for the 2020 calendar year and 2021 calendar year to date:

Event Type	EUCTG1	EUCTG2
Highest No. Startup-Shutdown per month	9	30
Lowest No. Startup-Shutdown per month	1	1
Months with no Startup-Shutdown events	2	5

In order to minimize emissions during startup-shutdown and malfunction, the Facility is required to develop the following plans:

Document	Approval Date	Condition

Malfunction Abatement Plan (MAP)	11/22/2016	SC III.1
Startup/Shutdown Plan (SSMAP)	5/3/2016	SC III.2

District Files contain copies of the above referenced documents. The MAP indicates that hourly inspections are conducted by the Facility, and copies of hourly logs were requested at the time of the site visit. Review of the logs and the MAP indicated that though the form is identified as an hourly log, that operations checks are not necessarily conducted on an hourly basis. However, they are completed multiple times over the course of an operating day to confirm parameters are within appropriate ranges.

Per the MAP the facility will keep records of inspections which are outside of normal operating ranges (aka exception reports) as well as records of all significant, unscheduled maintenance activities performed on the CTs. The Facility reported that no significant or unscheduled maintenance activities have occurred since the Facility initiated operation.

Startup and shutdown procedures have been defined to not only help maintain proper operation of the CTs and minimize the opportunity for equipment failure but to protect worker safety and minimize emissions. The startup or shutdown procedures may be initiated either locally or remotely.

In addition, the permittee is not allowed to operate EUCTG1 or EUCTG2 unless low NOx and CO manufacturer installed combustion technologies are maintained and operated in a satisfactory manner, for each combustion turbine generator. (SC III.4) Facility staff confirmed that the required technologies have been installed and are operated in a satisfactory manner. The low NOx burners are equipped with an alarm system, once an alarm is issued, the units are unable to operate under normal conditions until the unit parameters return to the normal operating ranges.

Design/Equipment Parameters - FGCTG is limited to a maximum design heat capacity of a not to exceed, on a fuel heat input basis to 2.045 MMBtu per hour for each combustion turbine generator. (SC IV.1) As previously indicated a peak heat input of 2.045 MMBTU/hr.

The permittee shall install calibrate, maintain and operate in a satisfactory manner a device to monitor and record the natural gas flow rate to EUCTG1 and EUCTG2 each on a continuous basis. (SC IV.2) Facility Staff indicated that NG flow is monitored by a corealis meter by Endress & Hauser (E&H), one for each turbine. The most recent calibrations were conducted on September 26, 2019. The Facility reports keeping a calibrated spare onsite for replacement should it be required.

The permittee shall install, calibrate, maintain and operate in a satisfactory manner a device to monitor and record the gross energy output from EUCTG1 and EUCTG2 on a continuous basis. (SC IV.3) Energy is monitored and recorded using a "con-ed billing meter".

Testing/Sampling Conditions – The permittee is required to verify on an annual basis compliance with NOx emission rate in SC I.2. (015 ppm at 15% O2 or 0.43 lb/MWh) from each turbine at loads

of 50%, 75% and 100%. (SC V.1) If emission result from performance testing is less than or equal to 75% of the NOx emission limit, the permittee may reduce the frequency of subsequent performance tests to once every 2 years (no more than 26 calendar months following the previous test). If the emission result from performance testing exceeds 75% of the NOx emission limit, the permittee must resume annual performance tests. A review of stack test data in district files indicated that initial testing was conducted from July 19 through July 25, 2016, and the Facility reports annual testing for subsequent years. Annual NOx testing was conducted on:

EUCTG1	EUCTG2
July 21, 22 & 25 2016	July 19 – 21, 2016
August 2, 2017	August 3, 2017
August 24 & 25, 2018	August 24 & 25, 2018
July 15, 2019	July 16, 2019
June 22, 2020	June 23, 2020

NOx emissions reported in annual testing are summarized below:

Calendar Year of Testing	EUCTG1 NOx (lb/hr)	EUCTG1 NOx (lb/MMBtu)	EUCTG2 NOx (lb/hr)	EUCTG2 NOx (lb/MMBtu)
2016	31.97 – 57.67	0.023 – 0.028	31.76 – 45.22	0.021 – 0.025
2017	31.03 – 55.85	0.022 – 0.028	32.00 – 40.96	0.019 – 0.027
2018	44.75 – 64.50	0.0285 – 0.0319	44.67 – 56.42	0.0269 – 0.0295
2019	40.88 – 63.42	0.0261 – 0.0309	37.98 – 55.06	0.025 – 0.027

<b>2020</b>	<b>42.44 – 56.34</b>	<b>0.027 – 0.029</b>	<b>42.87 – 60.81</b>	<b>0.027 – 0.030</b>
<b>Limit</b>	<b>66.8</b>	<b>0.03</b>	<b>66.8</b>	<b>0.03</b>

In addition to the annual NOx verification testing requirements, the permittee shall verify for each turbine once every 5 years:

- NOx and CO emission rates in SC I.1, SC I.3, SC I.7 and SC I.8. (SC V.2)
- VOC, PM10 and PM2.5 emission rates in SC I.12-17. (SC V.3)

District files contained copies of Stack Test Reports for testing activities conducted July 19 – 25, 2016. Test results reported the following:

<b>Turbine Load</b>	<b>NOx (lb/hr) EUCTG1</b>	<b>NOx (lb/MMBtu)</b>	<b>NOx (lb/hr) EUCTG2</b>	<b>NOx (lb/MMBtu) EUCTG2</b>
<b>50%</b>	<b>31.97</b>	<b>0.025</b>	<b>31.76</b>	<b>0.025</b>
<b>75%</b>	<b>37.84</b>	<b>0.025</b>	<b>34.87</b>	<b>0.023</b>
<b>85%</b>	<b>40.29</b>	<b>0.023</b>	<b>37.09</b>	<b>0.021</b>
<b>100%</b>	<b>57.67</b>	<b>0.028</b>	<b>45.22</b>	<b>0.022</b>
<b>Limit</b>	<b>66.8</b>	<b>0.0327</b>	<b>66.8</b>	<b>0.0327</b>
	<b>(SC I.3)</b>	<b>(SC I.1)</b>	<b>(SC I.3)</b>	<b>(SC I.1)</b>

<b>Turbine Load</b>	<b>CO (lb/hr) EUCTG1</b>	<b>CO (lb/MMBtu)</b>	<b>CO (lb/hr) EUCTG2</b>	<b>CO (lb/MMBtu) EUCTG2</b>
<b>100%</b>	<b>1.65</b>	<b>0.001</b>	<b>2.11</b>	<b>0.001</b>

Limit	40.9 (SC I.7)	0.020 (SC I.8)	40.9 (SC I.7)	0.020 (SC I.8)
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Turbine Load	VOC (lb/hr) EUCTG1	VOC (lb/MMBtu) EUCTG1	VOC (lb/hr) EUCTG2	VOC (lb/MMBtu) EUCTG2
100%	1.65	0.001	2.11	0.001
Limit (VOC as Methane)	2.9 (SC I.7)	0.00140 (SC I.8)	2.9 (SC I.7)	0.00140 (SC I.8)

Turbine Load	PM10 (lb/hr) EUCTG1	PM10 (lb/MMBtu) EUCTG1	PM10 (lb/hr) EUCTG2	PM10 (lb/MMBtu) EUCTG2
100%	6.15	0.002	6.48	0.002
Limit	13.5 (SC I.15)	0.0066 (SC I.14)	13.5 (SC I.15)	0.0066 (SC I.14)

At the time of the May 25, 2021, site inspection Facility Staff indicated that stack testing has been scheduled for the Week of August 2, 2021. Which would be in compliance with the 5 year requirement.

Monitoring/Recordkeeping - The ROP conditions include completion of all required calculations in a format acceptable to the AQD District Supervisor by the 30<sup>th</sup> day of the calendar month, for the previous calendar month, unless otherwise specified in any monitoring/recordkeeping special condition. (SC VI.1)

VI.2 requires that daily, monthly and 12-month rolling NOx and CO emission records for EUCTG1 and EUCTG2 as required by SC I.5 and SC I.10 (each shutdown event). The calculations shall be



performed as specified in Appendix A. Appendix A is a carryover from the PTI. Appendix 7 of the ROP provides methods of emission calculations for the turbines. Daily records include the operating status, operating load and fuels usage for each turbine, and are maintained in the Facility's DAHS system.

The permittee is required to keep daily records of each startup and shut down event, including duration of the event. The permittee shall calculate startup and shut down emissions using the data as supplied by the vendor on a per event basis. (SC VI.3) A review of the emissions spreadsheet provided indicates that the Facility uses the per event emission limit for NO<sub>x</sub> and CO startups and shutdowns, SC I.4, I.5 and SC I.9, I.10, respectively. Which would represent a conservative emissions estimate, and a link to per event emissions data provided by the turbine vendor in compliance with the permit conditions.

Documentation of the natural gas usage for EUCTG1 and EUCTG2 on a daily, monthly and 12-month rolling time period basis. (SC VI.4) As previously indicated, the Facility's DAHS system monitors and records the required daily, monthly and 12-month rolling total NG usage. In addition, the Facility collects metered data as part of operator inspection logs, which are completed at multiple points per day, some hourly others once per shift.

Records required to be maintained per SC VI.5 and provided by the Facility upon request included:

- Compliance tests and any testing required under the special conditions of this permit
- Monitoring data
- Total Sulfur content of the NG as required by 40 CFR 60.4365(a)
- Verification of heat input capacity required to show compliance with SC IV.1
- Amounts of fuel combusted in each turbine on a calendar month basis
- All records required by 40 CFR 60.7
- Records of the dates, times, duration and associated number of startup and shutdown events, and
- All calculations necessary to show compliance with the limits contained in this permit
- Purchase record for the natural gas burned in FGCTG

Note that per Appendix 7 of the ROP, data required to be recorded for FGCTG includes but is not limited to daily combustion turbine operating status, operating loads and fuel usage. This information as well as the information required under SC VI.5 is kept onsite, in three ring binders and in the DAHS system.

**Stack Restrictions** – Stack and vent associated with EUCTG1 and EUCTG2 were constructed to meet permit requirements. The information is documented in the asbuilt diagrams for the EUs.

**Other Conditions** – The permittee shall not allow the emission of an air pollutant to exceed the amount of any emission allowances that an affected source lawfully holds as of the allowance transfer deadline (IX.4). Compliance with this condition is reported directly to US EPA.

**High Level Citations** – Turbines in FGCT included high-level citations for the following federal standards:

- 40 CFR Part 60, Subpart A and KKKK (SC IX.1)
- 40 CFR Part 60, Subpart A and TTTT (SC IX.2)
- 40 CFR 72.1 to 72.94, as outlined in a complete Phase II, Acid Rain Permit issued by AQD (SC IX.3)

- 40 CFR Part 97, Subpart AAAAA (SC IX.5)
- 40 CFR Part 97, Subpart BBBBB (SC IX.6) and
- 40 CFR Part 97, Subpart CCCCC (SC IX.7)

AQD is delegated permitting authority for the above referenced citations. A compliance determination has not been made as part of this compliance evaluation.

**FGFUELHTR**

This FG consists of two 3.5 MMBTU/hr heat input, NG-fired fuel heaters (EUFUELHTR1 and EUFUELHTR2). One fuel heater per turbine. It should be noted that no testing requirements are associated with the FG.

Emission Limits – NOx and CO emissions for the FG are limited to the following:

12-Month Rolling Time Period	NOx (TPY)	CO (TPY)
2021 to date	0.8	0.6
2020	1.0	0.7
2019	0.48	0.37
Limit	3.7 TPY (SC I.1)	2.8 TPY (SC I.2)

12-month rolling total NOx emissions for the period of January 2020 to April 2021 ranged from 0.5-0.8 tons. 12-month rolling total CO emissions for the same period ranged from 0.4-0.7 tons. Well under the permit limits.

Material Limits – Under the existing ROP, FGFUELHTR is restricted to a not to exceed material usage of 29.9 MMSCF/12 month rolling time period as determined at the end of each calendar month. (SC II.1). Available records indicate the following usages:

12-month Rolling Time Period	NG-Consumption (MMSCF)
2021 to date	7.6
2020	8.3

2019	3.81
Limit	29.9 (SC II.1)

12-month rolling total usage rates ranged from 3.6 MMcf to 8.6 MMcf for the period for January 2020 through April 2021.

**Stack Requirements** – Under the existing ROP, stack construction for both of the fuel heaters is restricted to a maximum diameter of 10-inches and a minimum height of 16 feet above land surface. Prior to PTI 100-20 incorporated into the ROP under, the stacks were required to be unobstructed. This most recent PTI allowed for installation of rain caps on FGFUELHTR stacks. Asbuilt diagrams confirm compliance with stack construction requirements.

#### SUMMARY

On May 25, 2021, AQD District Staff conducted a scheduled site inspection of the Wolverine Power Supply Cooperative Incorporated, Alpine Power Plant (AKA Wolverine Alpine Power) located at 7432 N-32, Elmira, Otsego County, Michigan (P0582). The referenced Facility presently operates under MI-ROP-P0583-2019. The referenced ROP was issued on August 28, 2019. One ROP modification (MI-ROP-P0582-2019a) was issued on May 25, 2021.

The Facility is a natural gas-fired electric utility, located in a rural portion of Otsego County. The present Facility completed instruction and was on-line in 2016, the Wolverine Alpine Power Plant is a natural gas-fired electric utility located in Elmira, Michigan. The Facility generates electricity and supplies it to the general electrical power grid. The facility was designed to operate primarily at times of peak electrical demand. It is therefore meant to operate for limited periods of time, not continuously. Facility staff indicate that Facility operations are upon request of electrical needs of the grid. Operation of the plant is determined by "MISO" , the Midcontinent Independent System Operator, Inc. that provides an open-access transmission service and high-voltage transmission system in the Midwest, part of the southern U.S.A and Manitoba Canada. MISO also is reported to represent one of the world's largest real-time energy markets.

District Staff met with Joe Hazewinkel (Environmental Policy Coordinator), Jesse Genter (Generation Manager - North), Zach Ackeman and Dan Boulter (Chief Operator) at the time of the inspection. A records request was submitted electronically to the Facility on May 18, 2019 with additional records requested following the site inspection. Documents were received on May 19, 2021, and June 22, 2021. The review of those documents provided has been incorporated into this document.

The most recent site inspection was conducted on February 21, 2019. No compliance issues were noted at the time of the inspection.

Weather conditions at the time of the inspection included mostly cloudy skies, clearing to partly cloudy skies, variable winds to the N-NE and temperatures of 73 degrees F. The Facility was operating at the time of the inspection, no visible emissions were noted at the time of the inspection.

Sharon LeBlanc Digitally signed by Sharon LeBlanc  
Date: 2021.07.22 10:35:06 -04'00'

Shane Nixon Digitally signed by Shane Nixon  
Date: 2021.09.08 13:22:19 -04'00'

NAME \_\_\_\_\_

DATE \_\_\_\_\_

SUPERVISOR \_\_\_\_\_