

State Registration Number  
N3341

**RENEWABLE OPERATING PERMIT  
STAFF REPORT**

ROP Number  
MI-ROP-N3341-2022

**DTE Gas Company Kalkaska Compressor Station**

State Registration Number (SRN): N3341

Located at

1250 MichCon Lane, Kalkaska, Kalkaska County, Michigan 49646

Permit Number: MI-ROP-N3341-2022

Staff Report Date: May 9, 2022

This Staff Report is published in accordance with Sections 5506 and 5511 of Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451). Specifically, Rule 214(1) of the administrative rules promulgated under Act 451, requires that the Michigan Department of Environment, Great Lakes, and Energy (EGLE), Air Quality Division (AQD), prepare a report that sets forth the factual basis for the terms and conditions of the Renewable Operating Permit (ROP).

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**RENEWABLE OPERATING PERMIT**

**MAY 9, 2022 - STAFF REPORT**

ROP Number

MI-ROP-N3341-2022

**Purpose**

Major stationary sources of air pollutants, and some non-major sources, are required to obtain and operate in compliance with an ROP pursuant to Title V of the federal Clean Air Act; and Michigan’s Administrative Rules for Air Pollution Control promulgated under Section 5506(1) of Act 451. Sources subject to the ROP program are defined by criteria in Rule 211(1). The ROP is intended to simplify and clarify a stationary source’s applicable requirements and compliance with them by consolidating all state and federal air quality requirements into one document.

This Staff Report, as required by Rule 214(1), sets forth the applicable requirements and factual basis for the draft ROP terms and conditions including citations of the underlying applicable requirements, an explanation of any equivalent requirements included in the draft ROP pursuant to Rule 212(5), and any determination made pursuant to Rule 213(6)(a)(ii) regarding requirements that are not applicable to the stationary source.

**General Information**

Stationary Source Mailing Address:	DTE Gas Company 1250 MichCon Lane Kalkaska, Michigan 49646
Source Registration Number (SRN):	N3341
North American Industry Classification System (NAICS) Code:	486210
Number of Stationary Source Sections:	1
Is Application for a Renewal or Initial Issuance?	Renewal
Application Number:	202100027
Responsible Official:	Karla Shawhan-Bonnee, Manager - Transmission Storage and Operations 231-258-3750
AQD Contact: Field Inspector	Caryn Owens, Senior Environmental Engineer 231-878-6688
AQD Contact: ROP Writer	Michael Conklin, Senior Environmental Engineer 906-202-0013
Date Application Received:	February 5, 2021
Date Application Was Administratively Complete:	February 5, 2021
Is Application Shield in Effect?	Yes
Date Public Comment Begins:	May 9, 2022
Deadline for Public Comment:	June 9, 2022

## Source Description

The DTE Gas Company – Kalkaska Compressor Station is a natural gas compressor station that is owned and operated by DTE Gas Company (DTE Gas). DTE Gas is involved in the transportation and storage of natural gas throughout the Midwest. The DTE Gas transmission network consists of 140 billion cubic feet of storage capacity and 2,118 miles of transmission pipelines. Compressor stations, or booster stations, are part of the natural gas utility process that transport natural gas from well sites, to processing facilities, to end users. They are utilized to maintain pressure and flow throughout the pipeline network.

The Kalkaska Compressor Station is located on the east side of Highway US-131, about two miles south of the city of Kalkaska. The surrounding area of the facility is considered rural and in attainment for all criteria pollutants. The station operates three natural gas-fired engine/compressor units. All three units are Cooper 2,700 HP two-stroke, lean burn engines that were installed in 1992. Each engine exhausts out a vertical stack with no add-on controls. The engines are shaft coupled to a compressor where natural gas is fed through from an initial “suction” state to a more compressed “discharge” state at higher pressure.

Pollutants emitted from the combustion process of natural gas-fired engines include nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), volatile organic compounds (VOCs), and particulate matter (PM). Sulfur oxides emissions are very low since sulfur compounds are removed from natural gas at processing plants. The formation of NO<sub>x</sub> is related to the combustion temperature in the engine cylinder, and CO and VOC emissions are primarily a result of incomplete combustion. PM emissions can include trace amounts of metals and condensables, semi-volatile organics which result from incomplete combustion, volatilized lubricating oil, and engine wear. Emissions vary according to the air-to-fuel ratio, ignition timing, torque, speed, ambient temperature, humidity, and other factors.

A natural gas engine and generator set are used as backup electrical power in the event power is lost from the primary grid to the site. The facility also contains many furnaces and heaters for building heat, hot water heaters, and small storage tanks for hydrocarbon liquids, glycol, wastewater, and lubricating oil.

The following table lists stationary source emission information as reported to the Michigan Air Emissions Reporting System (MAERS) for the year **2020**.

### **TOTAL STATIONARY SOURCE EMISSIONS**

<b>Pollutant</b>	<b>Tons per Year</b>
Carbon Monoxide (CO)	19.25
Lead (Pb)	Not Reported
Nitrogen Oxides (NO <sub>x</sub> )	13.77
Particulate Matter less than 10 microns (PM10)	2.54
Particulate Matter less than 2.5 microns (PM2.5)	2.54
Sulfur Dioxide (SO <sub>2</sub> )	<1
Volatile Organic Compounds (VOCs)	5.31

The following table lists Hazardous Air Pollutant emissions as calculated for the year 2020 by AQD MAERS data:

<b>Individual Hazardous Air Pollutants (HAPs) **</b>	<b>Tons per Year</b>
Formaldehyde	2.9
Acetaldehyde	0.41
Acrolein	0.41
Benzene	0.10
Methanol	0.13
<b>Total Hazardous Air Pollutants (HAPs)</b>	<b>4.0</b>

\*\*As listed pursuant to Section 112(b) of the federal Clean Air Act.

See Parts C and D in the ROP for summary tables of all processes at the stationary source that are subject to process-specific emission limits or standards.

### **Regulatory Analysis**

The following is a general description and history of the source. Any determinations of regulatory non-applicability for this source are explained below in the Non-Applicable Requirement part of the Staff Report and identified in Part E of the ROP.

The stationary source is in Kalkaska County, which is currently designated by the United States Environmental Protection Agency (USEPA) as attainment/unclassified for all criteria pollutants.

The stationary source is subject to Title 40 of the Code of Federal Regulations (CFR) Part 70, because the potential to emit of nitrogen oxides and carbon monoxide exceeds 100 tons per year, and the potential to emit of any single HAP regulated by Section 112 of the federal Clean Air Act, is equal to or more than 10 tons per year and/or the potential to emit of all HAPs combined is equal to or more than 25 tons per year.

The stationary source is considered a “synthetic minor” source in regards to the Prevention of Significant Deterioration regulations of the Michigan Air Pollution Control Rules Part 18, Prevention of Significant Deterioration of Air Quality and 40 CFR 52.21 because the stationary source accepted legally enforceable permit conditions limiting the potential to emit of NOx to less than 250 tons per year.

Permit to install (PTI) No. 1443-91 contained emissions limits for CO, NOx and VOC in terms of grams per horsepower-hour (g/HP-hr) and pounds per hour (pph) for each engine, plus corresponding tons per year (tpy) limits on a 12-month rolling basis. The annual limits are based on 8760 hours per year (hr/yr) of operation. It was found during testing, in 1993, that operating at the manufacturer’s specification of 0.7 g/HP-hr of VOC proved to be an inefficient operating point, resulting in increased emissions of NOx and CO. Efficient operation was achieved with VOC emissions at about 0.8 g/HP-hr. Some cushion was provided and the new emission limit was set at 1.0 g/HP-hr. An ROP was issued on August 15, 2000. At some point during the ROP renewals, the g/HP-hr limits were modified to read “g/HP-hr at 100% power,” because it was clear the engine could not meet the limit over the entire power range. The original limits were based on the engine manufacturer’s data for g/HP-hr emission rates. The emission rates were worst-case for CO and VOC, but not for NOx. NOx emissions were highest at less than 100% power.

A previous ROP specified the limits in terms of g/HP-hr at 100% power. The 2011 ROP removed “at 100% power,” as a result of the District’s concern over testing at 100% power when the emissions are actually greater at lesser power. Furthermore, testing at exactly 100% power is not necessarily practical. In PTI No.1443-91A, dated January 18, 2013, the company requested to replace the NOx, CO and VOC g/HP-hr limits with pounds per hour limits corresponding to the worst-case operating scenario. The permit engineer determined, CO and VOC emission rates will not increase, since their existing grams per brake horsepower-hour (g/BHP-hr) limits represent the maximum short-term emission rate. The requested increase in NOx is greater than 40 tpy, therefore modeling was conducted to demonstrate compliance with

the National Ambient Air Quality Standards (NAAQS) and Increment. Additionally, the company requested to raise the stacks from 40 to 45 feet in order to use the Rule 225 Variance for natural gas fueled equipment. Upon further review of the stacks at the facility, it was found they were already at 45 feet from ground level and no modifications were performed. On March 13, 2013, a letter was sent to the AQD Gaylord District Office to notify the stack heights were already at 45 feet and were in compliance with the stack requirements. Testing established emission factors at a range of data points consisting of percent of maximum load (% load), percent of maximum speed (% speed), and the corresponding horsepower (HP). PTI No. 1443-91A was incorporated into the ROP July 8, 2013.

The company used the Rule 225 Natural Gas Variance, which suspends the requirement to demonstrate compliance with the health-based screening levels if the following conditions are met, per emission unit:

1. Maximum natural gas use is less than 50,000 SCF per hour.
  - Each engine is rated at 19,000 SCF per hour.
2. Stack height is at least 1.5x the height of the building of influence.
  - Compressor building = 30 ft
  - Stack = (30 ft)(1.5) = 45 ft
3. The equipment fires exclusively on natural gas.

Each engine meets these requirements, so the variance is satisfied.

EUBACKUPGENSET and FGGMVHS at the stationary source are subject to the National Emission Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines promulgated in 40 CFR Part 63, Subparts A and ZZZZ. However, no regulation requirements are applicable for EUBACKUPGENSET and FGGMVHS based on 40 CFR 63.6590(b)(3)(ii) and 40 CFR 63.6590(b)(3)(i), respectively.

EUBOILER1 and EUHEX at the stationary source are subject to the National Emission Standard for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters promulgated in 40 CFR Part 63, Subparts A and DDDDD.

The monitoring conditions contained in the ROP are necessary to demonstrate compliance with all applicable requirements and are consistent with the "Procedure for Evaluating Periodic Monitoring Submittals."

No emission units have emission limitations or standards that are subject to the federal Compliance Assurance Monitoring rule pursuant to 40 CFR Part 64, because all emission units at the stationary source either do not have a control device or those with a control device do not have potential pre-control emissions over the major source thresholds.

Please refer to Parts B, C and D in the draft ROP for detailed regulatory citations for the stationary source. Part A contains regulatory citations for general conditions.

### **Source-Wide Permit to Install (PTI)**

Rule 214a requires the issuance of a Source-Wide PTI within the ROP for conditions established pursuant to Rule 201. All terms and conditions that were initially established in a PTI are identified with a footnote designation in the integrated ROP/PTI document.

The following table lists all individual PTIs that were incorporated into previous ROPs. PTIs issued after the effective date of ROP No. MI-ROP-N3341-2016 are identified in Appendix 6 of the ROP.

PTI Number			
1443-91	1443-91A		

**Streamlined/Subsumed Requirements**

This ROP does not include any streamlined/subsumed requirements pursuant to Rules 213(2) and 213(6).

**Non-applicable Requirements**

Part E of the ROP lists requirements that are not applicable to this source as determined by the AQD, if any were proposed in the ROP Application. These determinations are incorporated into the permit shield provision set forth in Part A (General Conditions 26 through 29) of the ROP pursuant to Rule 213(6)(a)(ii).

**Processes in Application Not Identified in Draft ROP**

The following table lists processes that were included in the ROP Application as exempt devices under Rule 212(4). These processes are not subject to any process-specific emission limits or standards in any applicable requirement.

PTI Exempt Emission Unit ID	Description of PTI Exempt Emission Unit	Rule 212(4) Citation	PTI Exemption Rule Citation
EUFURNACE1	165,000 BTU/hr forced air furnace	R 336.1212(4)(c)	R 336.1282(2)(b)(i)
EUFURNACE2	165,000 BTU/hr forced air furnace	R 336.1212(4)(c)	R 336.1282(2)(b)(i)
EUFURNACE3	165,000 BTU/hr forced air furnace	R 336.1212(4)(c)	R 336.1282(2)(b)(i)
EUFURNACE4	165,000 BTU/hr forced air furnace	R 336.1212(4)(c)	R 336.1282(2)(b)(i)
EUFURNACE5	165,000 BTU/hr forced air furnace	R 336.1212(4)(c)	R 336.1282(2)(b)(i)
EUFURNACE6	125,000 BTU/hr forced air furnace	R 336.1212(4)(c)	R 336.1282(2)(b)(i)
EUFURNACE7	125,000 BTU/hr forced air furnace	R 336.1212(4)(c)	R 336.1282(2)(b)(i)
EUFURNACE8	50,000 BTU/hr forced air furnace	R 336.1212(4)(c)	R 336.1282(2)(b)(i)
EUFURNACE9	80,000 BTU/hr forced air furnace	R 336.1212(4)(c)	R 336.1282(2)(b)(i)
EUWATERHEATER1	75,500 BTU/hr water heater	R 336.1212(4)(c)	R 336.1282(2)(b)(i)
EUWATERHEATER2	32,000 BTU/hr water heater	R 336.1212(4)(c)	R 336.1282(2)(b)(i)
EUUNITHEATER1	110,000 BTU/hr unit heater	R 336.1212(4)(c)	R 336.1282(2)(b)(i)
EUUNITHEATER2	110,000 BTU/hr unit heater	R 336.1212(4)(c)	R 336.1282(2)(b)(i)
EUUNITHEATER3	110,000 BTU/hr unit heater	R 336.1212(4)(c)	R 336.1282(2)(b)(i)
EUUNITHEATER4	110,000 BTU/hr unit heater	R 336.1212(4)(c)	R 336.1282(2)(b)(i)
EUUNITHEATER5	110,000 BTU/hr unit heater	R 336.1212(4)(c)	R 336.1282(2)(b)(i)
EUUNITHEATER6	110,000 BTU/hr unit heater	R 336.1212(4)(c)	R 336.1282(2)(b)(i)
EUUNITHEATER7	110,000 BTU/hr unit heater	R 336.1212(4)(c)	R 336.1282(2)(b)(i)
EUUNITHEATER8	110,000 BTU/hr unit heater	R 336.1212(4)(c)	R 336.1282(2)(b)(i)
EUUNITHEATER9	75,000 BTU/hr unit heater	R 336.1212(4)(c)	R 336.1282(2)(b)(i)
EUUNITHEATER10	110,000 BTU/hr unit heater	R 336.1212(4)(c)	R 336.1282(2)(b)(i)
EUUNITHEATER11	75,000 BTU/hr unit heater	R 336.1212(4)(c)	R 336.1282(2)(b)(i)
EUUNITHEATER12	110,000 BTU/hr unit heater	R 336.1212(4)(c)	R 336.1282(2)(b)(i)
EUUNITHEATER13	90,000 BTU/hr unit heater	R 336.1212(4)(c)	R 336.1282(2)(b)(i)
EUUNITHEATER14	90,000 BTU/hr unit heater	R 336.1212(4)(c)	R 336.1282(2)(b)(i)
EUUNITHEATER15	125,000 BTU/hr unit heater	R 336.1212(4)(c)	R 336.1282(2)(b)(i)
EURADIANTHEATER	2,500 BTU/hr radiant heater	R 336.1212(4)(c)	R 336.1282(2)(b)(i)

<b>PTI Exempt Emission Unit ID</b>	<b>Description of PTI Exempt Emission Unit</b>	<b>Rule 212(4) Citation</b>	<b>PTI Exemption Rule Citation</b>
EUFUELLAST	1,000 gallon above ground gasoline storage tank	R 336.1212(4)(d)	R 336.1284(2)(e)
EUTANK08	6,000 gallon hydrocarbon liquid tank	R 336.1212(4)(d)	R 336.1284(2)(e)
EUBACKUPGENSET	6.4 MMBTU/hr (Waukesha L36GL natural gas engine, 880 horsepower) engine used as backup electrical power source in event of power loss to the site	R 336.212(4)(e)	R 336.1285(2)(g)

**Draft ROP Terms/Conditions Not Agreed to by Applicant**

This draft ROP does not contain any terms and/or conditions that the AQD and the applicant did not agree upon pursuant to Rule 214(2).

**Compliance Status**

The AQD finds that the stationary source is expected to be in compliance with all applicable requirements as of the effective date of this ROP.

**Action taken by EGLE, AQD**

The AQD proposes to approve this ROP. A final decision on the ROP will not be made until the public and affected states have had an opportunity to comment on the AQD's proposed action and draft permit. In addition, the USEPA is allowed up to 45 days to review the draft ROP and related material. The AQD is not required to accept recommendations that are not based on applicable requirements. The delegated decision maker for the AQD is Christopher Ethridge, Field Operations Manager. The final determination for ROP approval/disapproval will be based on the contents of the ROP Application, a judgment that the stationary source will be able to comply with applicable emission limits and other terms and conditions, and resolution of any objections by the USEPA.

State Registration Number  
N3341

**RENEWABLE OPERATING PERMIT**  
**JUNE 10, 2022 - STAFF REPORT ADDENDUM**

ROP Number  
MI-ROP-N3341-2022

**Purpose**

A Staff Report dated May 9, 2022, was developed to set forth the applicable requirements and factual basis for the draft Renewable Operating Permit (ROP) terms and conditions as required by Rule 214(1) of the administrative rules promulgated under Act 451. The purpose of this Staff Report Addendum is to summarize any significant comments received on the draft ROP during the 30-day public comment period as described in Rule 214(3). In addition, this addendum describes any changes to the draft ROP resulting from these pertinent comments.

**General Information**

Responsible Official:	Karla Shawhan-Bonnee, Manager - Transmission Storage and Operations 231-258-3750
AQD Contact: Field Inspector	Caryn Owens, Senior Environmental Engineer 231-878-6688
AQD Contact: ROP Writer	Michael Conklin, Senior Environmental Engineer 906-202-0013

**Summary of Pertinent Comments**

No pertinent comments were received during the 30-day public comment period.

**Changes to the May 9, 2022 Draft ROP**

No changes were made to the draft ROP.