

FACT SHEET FOR: OP26R2-037**DATE:****DWEE ID:** 59060**Name of Source:** Callaway Municipal Power Plant**Source Classification:** Class II Synthetic Minor at time of issuance
Area Source of Hazardous Air Pollutants (HAPs)

Regulatory changes may supersede information in this document. If the source should add or change equipment or change processes such that a NESHAP or NSPS subpart becomes an applicable requirement, it is the source's obligation to comply with that subpart and applicable requirements whether or not they are identified in the associated permitting action or Title 129. Also note that the NESHAP and NSPS subparts are subject to change. Detailed information related to NESHAP and NSPS subparts can be found on the DWEE Air Toxics Notebook and DWEE NSPS Notebook located on the DWEE website (<https://dwee.nebraska.gov/>). The DWEE website can also be used to find other permit related and facility specific information that is not identified in this fact sheet.

The source is subject to and will comply with all applicable requirements found in Title 40 Protection of Environment, Code of Federal Regulations that apply to the source including those found at 40 CFR Part 52, Subpart CC or 40 CFR Part 70, Appendix A (federally enforceable requirements); the State Implementation Plan (SIP) approved Title 129 as amended September 28, 2022 cited in this permit and denoted by an asterisk () are federally enforceable; and the Environmental Protection Act, Neb. Rev. Stat. §§ 81-1501 to 81-1532, and Nebraska Administrative Code Title 129 as amended June 28, 2026. When Title 129 as amended June 28, 2026 cited in this permit becomes SIP approved and federally enforceable it will supersede Title 129 as amended September 28, 2022.*

DESCRIPTION OF THE SOURCE OR ACTIVITY:

This operating permit OP26R2-037 approves the operation of the Callaway Municipal Power Plant (Callaway) for three (3) stationary compression ignition reciprocating internal combustion engines (CI RICE).

PERMIT HISTORY

Date Issued	Number	Status
05/03/1999	OPEG-0009	Not active; superseded by OPSPR2-0023
07/29/2004	OPSPR2-0023	Not active; superseded by OP08R2-019
05/28/2009	OP08R2-019	Not active; superseded by OP15R2-028
10/20/2016	OP15R2-028	Not active; superseded by OP21R2-019
11/21/2021	OP21R2-019	Not active; superseded by OP26R2-037
Tbd	OP26R2-037	Active

PERMIT ACTION:

Permitted Emission Points are detailed in the table below:

Control Equipment ID# and Description	Emission Unit Description	Applicable NSPS Requirements	Applicable NESHAP Requirements
Emission Point ID#: EP-2			
None	EU-2 – Compression ignition reciprocating internal combustion engine (CI RICE), maximum capacity: 266 HP, permitted fuel type: diesel, displacement less than 30 liters per cylinder, installed in 1949	None	40 CFR Part 63, Subpart A; Title 129, Chapter 13, Section <u>002.01</u> *; Title 129, Chapter 13, Section <u>002.01</u>
		None	40 CFR Part 63, Subpart ZZZZ; Title 129, Chapter 13, Section <u>002.78</u> *; Title 129, Chapter 13, Section <u>002.79</u>
Emission Point ID#: EP-3			
Catalytic Oxidizer	EU-3 – CI RICE, maximum capacity: 670 HP, permitted fuel type: diesel, displacement of 27.8 liters per cylinder, installed in 1959	None	40 CFR Part 63, Subpart A; Title 129, Chapter 13, Section <u>002.01</u> *; Title 129, Chapter 13, Section <u>002.01</u>
		None	40 CFR Part 63, Subpart ZZZZ; Title 129, Chapter 13, Section <u>002.78</u> *; Title 129, Chapter 13, Section <u>002.79</u>
Emission Point ID#: EP-4			
Catalytic Oxidizer	EU-4 – CI RICE, maximum capacity: 536 HP, permitted fuel type: diesel, displacement of 18.12 liters per cylinder, installed in 2004	None	40 CFR Part 63, Subpart A; Title 129, Chapter 13, Section <u>002.01</u> *; Title 129, Chapter 13, Section <u>002.01</u>
		None	40 CFR Part 63, Subpart ZZZZ; Title 129, Chapter 13, Section <u>002.78</u> *; Title 129, Chapter 13, Section <u>002.79</u>

TYPE AND QUANTITY OF AIR CONTAMINANT EMISSIONS ANTICIPATED:

The following table summarizes the potential and actual emissions:

Regulated Pollutant	Potential Emissions as limited by permit (tons/year)	Actual Emissions^[2] (tons/year)
Particulate Matter (PM)	6.89	--
Particulate Matter less than or equal to 10 microns (PM ₁₀)	6.89	0.0067
Particulate Matter less than or equal to 2.5 microns (PM _{2.5})	6.89	0.0066
Sulfur Dioxide (SO ₂)	6.44	0.0401
Oxides of Nitrogen (NO _x)	98.00	0.4437
Carbon Monoxide (CO)	21.11	0.0236
Volatile Organic Compounds (VOCs)	8.00	0.0125
Greenhouse Gases		
Total GHGs (mass basis) ^[1]	3,622.57	--
Carbon Dioxide Equivalents (CO ₂ e) ^[1]	3,634.30	--
Hazardous Air Pollutants (HAPs)		
Formaldehyde (Greatest Single HAP)	0.0262	0.00007
All Other HAPs	0.0609	0.00017
Total HAPs	0.0871	0.00024

^[1] The U.S. Supreme Court ruled in 2014 that greenhouse gases (GHGs) may not be used to determine whether a source is a Class I (major) source. Utility Air Regulatory Group v. EPA, 134 S.Ct. 2427 (2014). Therefore, potential emissions of GHGs will not be used to determine a source's operating permit classification at this time. However, GHGs are still regulated air pollutants so GHGs and CO₂e will continue to be calculated and reported in this fact sheet.

^[2] Actual Emissions are from 2025 air emissions inventory.

SUPPLEMENTAL INFORMATION:

Title 129, Chapter 4*; Title 129, Chapter 4 - Prevention of Significant Deterioration (PSD) of Air Quality

This source is major for purposes of the PSD program. Although this permit limits the emissions to below the PSD thresholds, the limits were taken so that the source can obtain a Class II operating permit as per Chapter 5 of Title 129 and not to avoid PSD. The source may decide to eliminate/relax the emissions limits and obtain a Class I permit in the future by following the appropriate permitting procedures. Such relaxation will not trigger 40 CFR Part 52.21 (r)(4) since, as discussed above, the limits were taken for operating permit purposes only and not for PSD purposes. If Callaway modifies anything at the source, the modification must be reviewed in accordance with PSD regulations.

Title 129, Chapter 12*; Title 129, Chapter 12 - New Source Performance Standards (NSPS) and Emission Limits for Existing Sources

There are no applicable NSPS for Callaway at this time. NSPS that appear to be applicable, but are not, are discussed below.

Subpart K – Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After June 11, 1973, and Prior to May 19, 1978: This subpart applies to each petroleum liquid storage vessel that has a capacity greater than 151,416 liters (40,000 gallons), but not exceeding 246,052 liters (65,000 gallons), and commences construction or modification after March 8, 1974, and prior to May 19, 1978 or has a capacity greater than 246,052 liters (65,000 gallons) and commences construction or modification after June 11, 1973, and prior to May 19, 1978. The diesel storage tanks at Callaway have capacities of less than 40,000 gallons; therefore, this subpart does not apply.

Subpart Ka – Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After May 18, 1978, and Prior to July 23, 1984: This subpart applies to each petroleum liquids storage vessel with a storage capacity greater than 151,416 liters (40,000 gallons) for which construction is commenced after May 18, 1978, and before July 23, 1984. The diesel storage tanks at Callaway were installed in 1998 and have capacities of less than 40,000 gallons; therefore, this subpart does not apply.

Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction or Modification Commenced After July 23, 1984: The subpart applies to storage vessels with a capacity greater than or equal to 75 cubic meters (m³) (~19,810 gallons) that is used to store volatile organic liquids (VOL) for which construction, reconstruction, or modification is commenced after July 23, 1984. The diesel storage tanks at Callaway have capacities of less than 19,810 gallons; therefore, this subpart does not apply.

Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines: The subpart applies to the owner or operator of stationary compression ignition (CI) internal combustion engines (ICE) that commenced construction or have been modified or reconstructed after July 11, 2005 where the stationary CI ICE are manufactured after April 1, 2006 and are not fire pump engines, or manufactured as a certified National Fire Protection Association (NFPA) fire pump engine after July 1, 2006. Subpart IIII does not apply because EU-2, EU-3, and EU-4 were constructed prior to July 11, 2005. If any of the engines are modified or reconstructed in the future as described in §60.14 or §60.15, these engines would become subject to this subpart.

Title 129, Chapter 13, Sections 002* and 003*; Title 129, Chapter 13, Sections 002 and 003 - National Emission Standards for Hazardous Air Pollutants (NESHAP)

The source is considered an area source of HAPs because the PTE for a single HAP and total HAPs are below 10 and 25 tons per year, respectively. This facility is subject to NESHAP as summarized below:

Subpart A – General Provisions

This subpart is an applicable requirement for engines EU-2, EU-3, and EU-4, because these engines are subject to NESHAP Subpart ZZZZ.

Subpart ZZZZ – National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines:

This subpart applies to existing, new, or reconstructed stationary reciprocating internal combustion engines located at a major or area source of HAP emissions. All engines at the source (EU-2, EU-3, and EU-4) are subject to this subpart because they are existing stationary RICE units located at an area source (§63.6590(a)(iii)).

EU-2 is an existing non-black start, diesel powered, emergency CI RICE, with displacement of less than 30 liters per cylinder, and less than 300 hp. EU-3 and EU-4 are existing non-black start, diesel-powered, non-emergency, CI RICE, with displacement of less than 30 liters per cylinder, and more than 500 hp each. Both EU-3 and EU-4 are equipped with catalytic oxidizers to control CO and have had the required initial performance tests to demonstrate compliance with NESHAP Subpart ZZZZ on January 21, 2014, with subsequent testing September 12, 2018.

A notification received on March 28, 2016, identified EU-3 and EU-4 as limited use engines, which was confirmed in a submittal received on April 11, 2016. A limited use engine is defined in the subpart as any stationary RICE that operates less than 100 hours per year. As required in Condition III.(A)(3)(e), the operating hours of the engines must be tracked on a calendar year basis (January-December) using a non-resettable hour meter to determine the engine classification (limited use or not limited use). Condition III.(A)(1)(c) requires that the source notify the DWEE if/when their classification changes; this change would include when the engine operates in excess of 100 hours per calendar year thus no longer being considered a limited use engine, or if the engine then operates less than 100 hours the next year and is again considered a limited use engine. Due to the lack of specified testing and reporting frequency in NESHAP Subpart ZZZZ for situations in which the engine classification can change depending on the operating hours year to year, this notification to DWEE must also describe the proposed testing and reporting frequency of the engine(s). The DWEE will inform the source if the proposed testing and reporting frequencies are not acceptable.

Title 129, Chapter 15*; Title 129, Chapter 15 - Compliance**Particulate Emissions from Combustion Sources**

All of the PM emission points subject to the Chapter 15, Section 001.02*; Chapter 15, Section 001.02 limitations are in compliance with those limitations, as the potential to emit for each emission point is less than the limitations. Therefore, these PM limitations were not included in Condition III of this permit.

Opacity Limitations from Emission Units (Section 001.04)*; (Section 001.04)

Specific Condition I.(J) specifies that no person shall cause or allow emissions, from any source, which has an opacity equal to or greater than twenty percent (20%). Opacity must be determined using an EPA-approved method or recorded by a continuous opacity monitoring system which has been operated and maintained pursuant to 40 CFR Part 60 Appendix B except as provided for in Chapter 15, Sections 001.05 and 001.05E*; Chapter 15, Sections 001.05 and 001.05E; (Title 129, Chapter 15, Section 001.04)*; (Title 129, Chapter 15, Section 001.04). Therefore, while not specifically stated in Condition III, this requirement is still applicable to all emission units at the source.

Title 129, Chapter 16, Section 001*; Title 129, Chapter 16, Section 001 - Sulfur Compound Emissions

Title 129, Chapter 16, Section 001*; Title 129, Chapter 16, Section 001 applies to combustion emission units that existed prior to February 26, 1974. All EUs at the source were installed prior to this date; therefore, the SO_x limit in Chapter 24 applies to EU-2 and EU-3.

SPECIFIC PERMIT CONDITIONS DISCUSSION:

Condition III includes conditions that are specific to the emissions units and emission points listed in each respective condition. Permit conditions that require no additional discussion are not included in this section.

(A) Specific Conditions for Reciprocating Internal Combustion Engines

(A)(2)(a) This condition identifies the emissions limitations applicable to EU-2, EU-3, and EU-4. In the case of the Callaway plant, NO_x is the pollutant with the highest emissions rate. By limiting NO_x to 98 tpy, this permit has indirectly limited the PTE for all other pollutants to below Class I thresholds. Therefore, the NO_x limitation is what allows the source to receive an OP as a Class II Synthetic Minor. The facility has equipped emission units EU-3 and EU-4 with catalytic oxidizers to decrease CO emissions. Initial performance tests were conducted on these units in January 2014, with subsequent testing on September 2018. Both engines tested showed outlet concentrations of CO below 23 ppmvd at 15% O₂ as required by NESHAP Subpart ZZZZ. The table identifies all emission limitations that are applicable under III.(A)(2) of the Operating Permit.

(A)(3)(e) This condition requires that each engine be equipped with a non-resettable hour meter to measure operating hours of each engine to properly classify each under NESHAP Subpart ZZZZ (as either limited use or not limited use). (Title 129, Chapter 8, Sections 004.01 and 015).

(A)(4)(b) The source must notify the DWEE if the total kWh generated exceeds 3,513,960 kWh (75% of the limit in Condition III.(A)(3)(c)) in any period of twelve consecutive rolling calendar months. Notification is required within 15 days of performing the calculations to ensure that the DWEE is made aware of times when the source is utilized at high levels. Upon such notification, the DWEE will make a determination if stack testing is required to verify the actual emissions and ensure compliance with their permitted NO_x limit.

Insignificant Activities

The following table contains a description of insignificant activities at the source at the time of permit issuance:

Insignificant Activity ID	Unit Description	Insignificance Criteria
T1	500 gal/yr diesel storage tank	Total facility annual throughput less than 1 million gallons.
T2	500 gal/yr diesel storage tank	

Although not required, DWEE recommends that the source submit a written notification to DWEE if there are additions or changes to the list of insignificant activities identified above, containing the following suggested information:

- A brief description of the addition or change within the permitted source;
- The date on which the addition or change occurred;
- Any change in potential emissions; and
- The criteria, as defined in the Operating Permit Application Forms, used to determine that the addition or change to the list of insignificant activities qualifies as insignificant.

This notification helps the DWEE keep an up-to-date list on file for compliance purposes. In addition, because emissions from insignificant activities must be counted toward major source (Class I) applicability, it is important to know if a source makes additions or changes to the list of insignificant activities that would cause a change in potential to emit at the source, and ultimately whether the source has a change in classification (i.e., Class I vs. Class II).

Fact Sheet Attachment

Emission Calculations - Reciprocating Internal Combustion Engines (RICE):

EU-2, EU-3, and EU-4 (all diesel-fueled)

Engine Specifications

Emission Units	Maximum Horsepower Capacity⁽¹⁾	Maximum Capacity MMBtu/hr⁽¹⁾	Title 129 Chapter 15, Section <u>001.02</u> Max. filt. PM (lbs/MMBtu)	Title 129 Chapter 15, Section <u>001.02</u> Max. filt. PM (lbs/hr)
EU-2	266	3.10	0.60	1.86
EU-3	670	8.50	0.60	5.10
EU-4	536	4.00	0.60	2.40
Total Capacity	1,472	15.60		

⁽¹⁾ Engine capacities as reported in the Air Quality Operating Permit Application, received April 21, 2021.

Facility Wide MMBtu/hr = 15.60

Facility Wide MMBtu/year = 136,656.00

Limited Facility Wide MMBtu/yr⁽²⁾ = 44,444.44

⁽²⁾ Limiting NO_x emissions to 98 ton/yr: 98 tons/yr*2000 lbs/ton*(1 MMBtu/4.41 lbs) = x MMBtu/yr

Limited Facility Wide kWh/yr = 4,685,280.00

Limited Facility Wide kWh/yr = MMBtu/yr * 292.83⁽³⁾ * .36⁽⁴⁾

⁽³⁾ Conversion factor found in AP-42 Appendix A - Miscellaneous Data and Conversion Factors, Conversion Factors table

⁽⁴⁾ Assuming 64% power loss, based on the AP-42 conversion from engine fuel input in MMBtu/hr to mechanical output in hp. The ideal conversion 1 MMBtu/hr = 393 hp, becomes, accounting for engine heat loss (inefficiency) due to friction (AP-42 Table 3.3-1, footnote (a),) about 1 MMBtu/hr = 143 hp: 393 hp – 143 hp = 250 hp lost; 250/393 = 0.64 = 6 % lost, or an efficiency of 34%.”

Fact Sheet Attachment

Emission Calculations - Reciprocating Internal Combustion Engines (RICE)

EU-2, EU-3, and EU-4 (all diesel-fueled)

Pollutant	Emission Factor (lb/MMBtu)^[1]	Unrestricted Potential Emissions^[2] (tons/yr)	Limited Potential Emissions^[3] (tons/yr)
Particulate Matter (filterable)	0.31	21.18	6.89
Particulate Matter ≤ 10µm	0.31	21.18	6.89
Particulate Matter ≤ 2.5µm	0.31	21.18	6.89
Sulfur Oxides	0.29	19.82	6.44
Nitrogen Oxides	4.41	301.33	98.00
Carbon Monoxide	0.95	64.91	21.11
Volatile Organic Compounds	0.36	24.60	8.00
Hazardous Air Pollutants (HAPs)	(lb/MMBtu)^[1]	(tons/yr)^[2]	(tons/yr)^[3]
Acetaldehyde	7.67E-04	5.24E-02	1.70E-02
Acrolein	9.25E-05	6.32E-03	2.06E-03
Benzene	9.33E-04	6.38E-02	2.07E-02
1,3-Butadiene	3.91E-05	2.67E-03	8.69E-04
Formaldehyde	1.18E-03	8.06E-02	2.62E-02
Naphthalene	1.30E-04	8.88E-03	2.89E-03
Polycyclic Organic Matter	8.33E-05	5.69E-03	1.85E-03
Toluene	4.09E-04	2.79E-02	9.09E-03
Xylenes	2.85E-04	1.95E-02	6.33E-03
Total HAPS		0.27	8.71E-02
Greenhouse Gases (GHG)	(lb/MMBtu)^[4]	(tons/yr)^[2]	(tons/yr)^[3]
Carbon Dioxide (CO ₂)	163.01	11,138.00	3,622.40
Methane (CH ₄)	6.61E-03	0.45	0.15
Nitrous Oxide (N ₂ O)	1.32E-03	9.04E-02	2.94E-02
Total GHG (mass basis) ^[5]		11,138.54	3,622.57
Total GHG (CO ₂ e) ^[6]		11,174.59	3,634.30

^[1] EU-2 and EU-4 are < 600 Hp, thus emission factors from AP-42 Chapter 3.3 (4/2025) Tables 3.3-1 and 3.3-2 apply {assumes PM = PM₁₀ = PM_{2.5}}. EU-3 is > 600 Hp, thus emission factors from AP-42 Chapter 3.4 (4/2025) Tables 3.4-1 through 3.4-4 apply {assumes PM = total filterable particulate; and PM₁₀ and PM_{2.5} are filterable + condensable}. The higher emission factors from AP-42 Tables 3.3 and 3.4 are used above to calculate the worst case scenario.

^[2] Calculated based on engines EU-2, EU-3 and EU-4 operating 8,760 hrs/yr

^[3] Limited Potential Emissions based on the limited facility wide MMBtu/yr calculated on Page 1

^[4] CO₂, CH₄, and N₂O calculated using the emission factors in Tables C-1 and C-2 of 40 CFR Part 98, *Mandatory Greenhouse - Gas Reporting Rule* (5/2024); Emission factors provided in tables converted from kg/MMBtu to lbs/MMBtu by multiplying by 2.204

^[5] Greenhouse Gases mass basis = Sum of Carbon Dioxide, Methane and Nitrous Oxide

^[6] CO₂e calculated using Global Warming Potential (GWP) found in 40 CFR 98, Subpart A, Table A-1 as published 4/25/2025 (effective 1/1/2025): CO₂ =1; CH₄ = 28; and N₂O = 265.