**D R A F T**

**FACT SHEET FOR: CP26-019** **DATE: DRAFT**

**NDWEE ID:** 062743

**Name of Source:** Butler County Landfill, Inc

**Source Classification:** Minor NSR a 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 NDWEE Air Toxics Notebook and NDWEE NSPS Notebook located on the NDWEE website (https://dwee.nebraska.gov/). The NDWEE website can also be used to find other permit related and facility specific information that is not identified in this fact sheet.*

## DESCRIPTION OF THE SOURCE OR ACTIVITY:

Butler County Landfill, Inc (Butler)is a municipal solid waste landfill facility in David City, Nebraska. The facility receives and disposes of municipal solid waste and generates landfill gas (LFG) as a result of the anaerobic decomposition of organic waste. The LFG is collected through a gas collection system and routed to a flare for combustion and control of landfill gas emissions.

## PERMIT HISTORY:

| Date Issued | Number | Status |
|---|---|---|
| 01/15/2017 | CP16 -016 | Not Active, superseded by CP26-019 |
| tbd | CP26-019 | Active |

## PERMIT ACTION:

On June 01, 2026 the Department received a construction permit application (#26-019) from Butler County Landfill, Inc for a significant permit revision (SPR) to permit CP16-016 for an increase in the permitted operating capacity of the existing landfill gas utility flare.

The facility receives and disposes of municipal solid waste, which generates landfill gas (LFG) through the anaerobic decomposition of organic waste. The LFG is collected through a gas collection system and routed to the utility flare (EP-006) for combustion.

The proposed project is to revise the permitted operating capacity of the existing utility flare from 1,850 standard cubic feet per minute (scfm) to 3,014 scfm. The increase in flare capacity results in revised potential to emit (PTE) calculations for pollutants associated with combustion of LFG.

Anticipated emissions from processing units include significant contributions to greenhouse gas emissions, $SO_x$, CO, and $NO_x$ emissions and minor contributions to PM, $PM_{10}$, $PM_{2.5}$ and volatile organic compound (VOC) emissions due to the flare.

## TYPE AND QUANTITY OF AIR CONTAMINANT EMISSIONS ANTICIPATED:

The emissions for this project, including fugitive emissions, are shown in the potential-to-emit (PTE) table below:

| Regulated Pollutant | Pre-Project PTE [1] (ton/yr) | Post-Project PTE (ton/yr) | Project PTE (ton/yr) |
|---|---|---|---|
| Particulate Matter (PM) | 212.76 | 215.31 | 2.55 |
| PM smaller than or equal to 10 microns ($PM_{10}$) | 59.51 | 62.06 | 2.55 |
| PM smaller than or equal to 2.5 microns ($PM_{2.5}$) | 13.44 | 16.00 | 2.56 |
| Sulfur Dioxide ($SO_2$) | 39.73 | 64.73 | 25.00 |

| Regulated Pollutant | Pre-Project PTE [1] (ton/yr) | Post-Project PTE (ton/yr) | Project PTE (ton/yr) |
|---|---|---|---|
| Oxides of Nitrogen ($NO_x$) | 16.53 | 26.93 | 10.40 |
| Carbon Monoxide (CO) | 89.95 | 146.54 | 56.59 |
| Volatile Organic Compounds (VOC) | 32.47 | 35.14 | 2.67 |
| Hazardous Air Pollutants (HAPs) | | | |
| Highest Individual HAP: Toluene | 0.27 | 0.20 | -0.07 |
| Total HAPs | 23.70 | 22.19 | -1.51 |

[1] Previous PTE obtained from cp062743f01

**SUPPLEMENTAL INFORMATION:**

**Title 129, Chapter 2 – Ambient Air Quality Standards**

The change in potential emissions from this permitting action are below the threshold for which modeling is required as summarized below; therefore, the NDWEE is not requiring ambient air quality dispersion modeling to support this permitting action. The NDWEE generally follows these thresholds.

| Pollutant | Project Potential Emissions Change (ton/yr) | Emission Change Threshold (ton/yr) |
|---|---|---|
| $PM_{10}$ | 2.55 | 15 |
| $PM_{2.5}$ | 2.56 | 10 |
| $SO_2$ | 25.00 | 40 |
| $NO_2$ | 10.40 | 40 |
| CO | 56.59 | 100 |
| VOC | 2.67 | 40 |

**Title 129, Chapter 12 – New Source Performance Standards (NSPS)**

Butler County Landfill, Inc. must comply with all applicable NSPS subparts and requirements regardless of their inclusion in this permitting action or Title 129. These rules are subject to change. Additional and updated information on all NSPS is available on the NDWEE NSPS Notebook, which can be located by visiting the NDWEE website at https://dwee.nebraska.gov, by first selecting "Menu" at the top of the page, then the "Air" dropdown menu tab, then the "NSPS Program" dropdown menu tab, and then "NSPS Notebook".

**Title 129, Chapter 13 – National Emission Standards for Hazardous Air Pollutants (NESHAP)**

Butler County Landfill, Inc. is subject to NESHAP Subparts A and AAAA under 40 CFR Part 63. The subparts which are applicable to the facility are summarized below.

Subpart A – General Provisions (40 CFR Part 63): This subpart, adopted by reference in Title 129, Chapter 13, Section 002.01, applies to sources subject to a NESHAP standard under 40 CFR Part 63 unless otherwise stated in the applicable subpart. Butler County Landfill, Inc. is subject to Subpart A because it is subject to 40 CFR Part 63, Subpart AAAA.

Subpart AAAA –Municipal Solid Waste Landfills: This subpart, adopted by reference in Title 129, Chapter 13, Section 002.56, applies to qualifying municipal solid waste landfills and establishes requirements for controlling emissions of nonmethane organic compounds (NMOC) from landfill gas. Butler County Landfill, Inc. is subject to this subpart. Applicable requirements include operation of landfill gas collection and control

systems, monitoring, compliance demonstrations, recordkeeping, and reporting. The utility flare (EP-006) is part of the landfill gas collection and control system used to control emissions from the landfill.

For a discussion of other applicable NESHAP subparts, refer to previous fact sheets for the facility.

Butler County Landfill, Inc. must comply with all applicable NESHAP requirements regardless of their inclusion in this permitting action or Title 129. These rules are subject to change. Information regarding NESHAP is available on the NDEE Air Toxics Notebook, which can be located by visiting the NDWEE website at https://dwee.nebraska.gov, by first selecting "Menu" at the top of the page, the "Air" dropdown menu tab, then the "Air Toxics Program" dropdown menu tab, and then "Air Toxics Notebook".

**Title 129, Chapter 15, Section 001 - Particulate Emissions; Limitations and Standards**

Particulate Emissions from Process Weight Rates (Section *001.01*)

Each of the permitted emission rate limitations applied in the proposed construction permit for Butler County Landfill, Inc ensures the process weight rate limitations specified in Chapter 15, Section 001.01 will not be exceeded in standard operating scenarios. Butler County Landfill, Inc is expected to be in compliance with the process weight rate limitations because the particulate emitting units will have implemented control devices and/or particulate mitigation requirements. The process weight rate limitations are included in the Fact Sheet Attachment.

Particulate Emissions from Combustion Sources (Section *001.02*)

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

Opacity Limitations from Emission Units (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 by 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 001.06 (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.

**40 CFR Part 62, Subpart OOO – Federal Plan Requirements for Municipal Solid Waste Landfills**

40 CFR Part 62, Subpart OOO: Federal Plan Requirements for Municipal Solid Waste Landfills: This subpart establishes requirements for municipal solid waste landfills that commenced construction, reconstruction, or modification on or before July 17, 2014. The requirements include landfill gas collection and control system operation, emission limits, monitoring, testing, reporting, and recordkeeping requirements.

Butler County Landfill, Inc. is subject to this subpart. The landfill gas collection and control system, including the utility flare (EP-006), is subject to the applicable requirements of this subpart.

## REVISED SPECIFIC PERMIT CONDITIONS DISCUSSION:

Below is a mark-up that identifies all of the revisions to the original conditions. Additions are **bolded and underlined**, deletions are in ~~strikethrough~~, and NDWEE comments are in *italics*.

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*References to the "Nebraska Department of Environmental Quality" or "Nebraska Department of Environment and Energy" have been revised to "Nebraska Department of Water, Energy, and Environment" and references to "NDEQ" or "NDEE" have been revised to "NDWEE" to reflect the agency name change, effective July 01, 2025.*

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*Nebraska Administrative Code - Title 129 was amended on June 28, 2026. As part of this permitting action, the NDWEE is updating "I. Standard Conditions" and "II. General Construction Permit Conditions" to reflect updated Title 129 chapter citations. Additionally, as part of this permitting action, NDWEE is also updating all citations in the applicable Specific Conditions to reflect updated Title 129 chapter citations. Previously issued construction permits with active conditions are still subject to the Title 129 requirements as effective at the time of permit issuance.*

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*As part of this permitting action, every Specific Condition containing "Reporting and Recordkeeping Requirements" has included a preface to the sub-condition stating "The owner or operator shall maintain the following records:"*

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*Condition III.(A) now reads:*

**III.(A) Specific Conditions for Flaring**

(1) Permitted Emission Points:

**(a)** The source is permitted to construct the emission point and associated emission units identified in the following table:

| Emission Point ID# | Control Equipment ID# and Description | Emission Unit Description | Design Capacity | Permitted Fuel Type | Pilot Fuel Type |
|---|---|---|---|---|---|
| EP-005 | CE-006: LFG Flare | EU-005: Municipal Solid Waste Landfill | 4,276,400 (Mg) | - | - |
| EP-006 | | EU-006: LFG Flare | ~~55.5~~ **90.4** (MMBtu/hr) | **Landfill Gas** | **Propane Gas** |

(2) Emission Limitations and Testing Requirements:

(a) The emissions limitations of Chapter ~~20~~ **15**, Sections ~~002~~ **001.02** and ~~004~~ **001.04** apply to EU-006. ~~{Chapter 20}~~ **(Chapter 15)**

(b) The source shall comply with all the applicable emission limitations and testing requirements as specified in ~~40 CFR Part 60, Subparts A and WWW~~ **40 CFR Part 62, Subpart OOO** for emission units listed in III.(A)**(1)(a)**. ~~{Chapter 18}~~ **(Chapter 12)**

(3) Operational and Monitoring Requirements and Limitations:

(a) Landfill gas collected by the Gas Control and Collection System shall not be emitted to the atmosphere. ~~{Chapter 17}~~ **(Chapter 3)**

(b) When emissions are routed to EU-006, a flame shall be present in the flare. The ~~permittee~~ **source** shall install an appropriate safety device or flame monitoring system to ensure that emissions cannot be sent to the flare without the presence of a spark or flame. ~~{Chapter 17}~~ **(Chapter 3)**

(c) The flare shall be equipped with an operational flow meter to record the landfill gas flow rates sent to and combusted by the flare. The flow meter shall be installed, operated, and maintained in accordance with manufacturer's documentation, or the equivalent. The flow meter shall be calibrated at least once per year or more frequently per manufacturer's instructions. ~~{Chapter 17}~~ **(Chapter 3)**

(d) ~~The flow of landfill gas sent to EU-006 shall not exceed more than 972,360,000 standard cubic feet (scf) per any twelve (12) consecutive calendar months. At no time during the first eleven (11) calendar months after startup, shall the total flow of landfill gas sent to EU-006 exceed 972,360,000 scf. {Chapter 17}~~ **The flow of landfill gas sent to EU-006 shall not exceed the manufacturer's rated maximum capacity of 3,014 standard cubic feet per minute (scfm). (Chapter 3)**

(e) The source shall comply with all the applicable operational and monitoring requirements and limitations as specified in ~~40 CFR Part 60, Subparts A and WWW~~ **40 CFR Part 62, Subpart OOO** for EU-006. ~~{Chapter 18}~~ **(Chapter 12)**

(4) Applicable NSPS, NESHAP, and MACT Requirements:

(a) The following standards apply to the flare, ~~EU-006~~ **III.(A)(1)(a)**:

| Applicable Standard | Title | Rule Citation |
|---|---|---|
| ~~NSPS, Subpart A~~ | ~~General Provisions~~ | ~~Title 129, Chapter 18, Sec. 001.01 40 CFR 60.1~~ |
| ~~NSPS, Subpart WWW~~ | ~~Municipal Solid Waste Landfills~~ | ~~Title 129, Chapter 18, Sec. 001.65 40 CFR 60.750~~ |
| **NESHAP, Subpart A** | **General Provisions** | **Title 129, Chapter 13, Sec. 002.01 40 CFR 63.1** |
| **NESHAP, Subpart AAAA** | **Municipal Solid Waste Landfills** | **Title 129, Chapter 13, Sec. 002.56 40 CFR 63.1930** |
| **Federal Plan, Subpart OOO** | **Federal Plan Requirements for Municipal Solid Waste Landfills** | **Title 129, Chapter 12, Sec. 003 40 CFR 62.16710** |

(5) Reporting and Recordkeeping Requirements:

**The owner or operator shall maintain the following records:**

(a) Daily records of a flame presence at the flare tip to demonstrate compliance with Condition III.(A)(3)(b).

(b) Records regarding flow meter calibration and maintenance to demonstrate compliance with Condition III.(A)(3)(c).

(c) The source shall record and maintain records documenting ~~the throughput of landfill gas combusted by the flare, in standard cubic feet, for each calendar month and for each period of twelve (12) consecutive calendar months~~ **the maximum flow rate of landfill gas sent to EU-006, in scfm, to demonstrate compliance with Condition III.(A)(3)(d)**.

(d) The source shall comply with all applicable reporting and recordkeeping requirements of ~~40 CFR Part 60, Subparts A and WWW~~ **40 CFR Part 62, Subpart OOO**.

*Updated the utility flare design capacity from 55.5 to 90.4 MMBtu/hr; revised the applicable regulatory citations from 40 CFR Part 60, Subparts A and WWW to 40 CFR Part 62, Subpart OOO, to reflect that the landfill is subject to the Federal Plan requirements for municipal solid waste landfills rather than the previously cited NSPS requirements; and replaced the annual landfill gas throughput limit with a maximum operating capacity limit of 3,014 scfm. Associated monitoring, recordkeeping, and operational requirements were updated accordingly to reflect the revised regulatory applicability and flare operating requirements.*

# Fact Sheet Attachment

Potential Emissions Summary

**PTE Facility Wide Summary Table**

| Pollutant | Pre-Project Facility PTE (ton/yr)[1] | Post Project Facility PTE (ton/yr)[2] | Change in PTE (ton/yr) |
|---|---|---|---|
| PM | 212.76 | 215.31 | 2.55 |
| $PM_{10}$ | 59.51 | 62.06 | 2.55 |
| $PM_{2.5}$ | 13.44 | 16.00 | 2.56 |
| $NO_x$ | 16.53 | 26.93 | 10.40 |
| $SO_x$ | 39.73 | 64.73 | 25.00 |
| CO | 89.95 | 146.54 | 56.59 |
| VOC [3] | 32.47 | 35.14 | 2.67 |
| **HAPs** | | | |
| Toluene | 0.266 | 0.20 | -0.07 |
| **Total HAPs:** | 23.70 | 22.19 | -1.51 |
| **Greenhouse Gases (GHGs)** | | | |
| $CO_2$ [3] | 87,465 | 105,023 | 17,558 |
| $CH_4$ [3] | 11,934 | 11,937 | 3 |
| $N_2O$ | 0.34 | 0.56 | 0.22 |
| **GHG (mass basis)** | 27,907 | 45,467 | 17,560 |
| **GHG ($CO_2e$ basis)[4]** | 28,046 | 45,687 | 17,641 |

[1] From cp062743f01

[2] Facility Wide PTE calculated based on the flare plus the values in Operating Permit OP09R1-041.

[3] Derived from maximum landfill gas flow rate obtained from LandGEM model in Operating Permit renewal application 15-R1-027. Based on LandGem modeling assumptions this value is set to occur in 2028.

[4] 40 CFR 98, Subpart A, Table A-1 (January 1, 2025)

# Fact Sheet Attachment

LFG Flare: EU 006

**Site Specific Information**

| | | |
|---|---|---|
| Maximum Landfill Gas Flow[1] | 3,014 | scfm |
| Maximum Methane Flow[1] | 1,507 | scfm |
| Limited Landfill Gas Flow | 3,014 | scfm |
| Limited Landfill Gas Flow | 44,858,328 | $m^3$/yr |
| Limited Methane Flow | 1,507 | scfm |
| Limited Methane Flow | 22,429,164 | $m^3$/yr |
| Flare Destruction Efficiency[2] | 98% | |
| Operating Hours | 8,760 | hr |
| Lower Heating Value of LFG[1] | 500 | Btu/scf |
| Heat Release of Flare | 90.42 | MMBtu/hr |
| Heat Release of Pilot | 6 | MMBtu/hr |

[1] Provided by source in application

[2] From manufacturer specifications

**Sulfur Dioxide Emissions**

| | | |
|---|---|---|
| Molecular Weight of Sulfur | 32 | g/mol |
| Molecular Weight of $SO_2$ | 64 | g/mol |
| Concentration of Total Reduced Sulfur[1] | 500 | ppmv |
| Maximum Sulfur Emission Rate[2] | 22,429 | $m^3$/yr |
| Sulfur Mass Emission Rate[3] | 29,354 | kg/yr |
| $SO_2$ emissions[4] | 64.73 | ton/yr |

[1] Provided by the source as a conservative estimation. The value is much higher than the suggested value in AP-42 Section 2.4.4.2, and therefore was deemed acceptable by the DWEE.

[2] Equation (3) in AP-42 Ch. 2.4 (5/2025). The coefficient of 1.82 replaced with 2 based on 50% methane.

[3] Equation (4) in AP-42 Ch 2.4 (5/2025)

[4] $MR_S$ x ($MW_{SO2}$ / $MW_S$) ; Where $MR_S$ = Sulfur Mass Emission Rate directed to flare (kg/hr); $MW_{SO2}$ = Sulfur Dioxide Molecular Weight; and $MW_S$ = Sulfur Molecular Weight.

**PTE for Flare Combustion**

| Pollutant | Emission Factor | Emission Factor Units | PTE (lb/hr) | PTE (ton/yr) |
|---|---|---|---|---|
| PM [1] | 0.001 | lb/hr/scfm methane | 1.51 | 6.60 |
| $PM_{2.5}$ [1] | 0.001 | lb/hr/scfm methane | 1.51 | 6.60 |
| $PM_{10}$ [1] | 0.001 | lb/hr/scfm methane | 1.51 | 6.60 |
| **$NO_X$** [2] | 0.068 | lb/MMBtu | 6.15 | 26.93 |
| $SO_X$ | - | - | - | 64.73 |
| CO [2] | 0.37 | lb/MMBtu | 33.46 | 146.53 |

[1] $PM_{2.5}$ and $PM_{10}$ obtained from AP-42 CH 2.4 Table 2.4-5. A conservative assumption was made that the same emission factor would apply to PM.

[2] Provided in application as a manufacturer's guarantee.

## Fact Sheet Attachment

LFG Flare: EU 006 Pilot

| | | |
|---|---|---|
| Heat Input Capacity of Pilot [1] | 6.00 | MMBtu/hr |
| Propane Heating Value | 97,400 | MMBtu/$10^3$gal |
| Propane Heating Value | 2,500 | Btu/$ft^3$ |
| Operating Time | 8,760 | hr/yr |

**PTE for Pilot Emissions**

| Pollutant | Emission Factor[1] | Emission Factor Units | Emission Rate (lb/hr) | Emission Rate (ton/yr) |
|---|---|---|---|---|
| PM | 0.20 | lb/$10^3$ gal | 1.23E-05 | 5.40E-05 |
| $PM_{10}$ | 0.70 | lb/$10^3$ gal | 4.31E-05 | 1.89E-04 |
| $PM_{2.5}$ | 0.70 | lb/$10^3$ gal | 4.31E-05 | 1.89E-04 |
| $SO_x$ [2] | 0.05 | lb/$10^3$ gal | 3.33E-06 | 1.46E-05 |
| $NO_x$ | 13.00 | lb/$10^3$ gal | 8.01E-04 | 3.51E-03 |
| CO | 7.50 | lb/$10^3$ gal | 4.62E-04 | 2.02E-03 |
| VOC [3] | 0.80 | lb/$10^3$ gal | 4.93E-05 | 2.16E-04 |
| Total HAPs[4] | 1.89 | lb/MMscf | 4.54E-09 | 1.99E-08 |
| **Greenhouse Gases** | | | | |
| $CO_2$ [5] | 61.46 | kg/MMBtu | 812.98 | 3,561 |
| $CH_4$ [6] | 1.00E-03 | kg/MMBtu | 0.01 | 5.79E-02 |
| $N_2O$ [6] | 1.00E-04 | kg/MMBtu | 1.32E-03 | 5.79E-03 |
| GHG (mass basis) | | | 812.99 | 3,561 |
| GHG ($CO_2e$ basis)[6] | | | 813.66 | 3,564 |

[1] Emission Factors from AP-42 Tables 1.4-1 and 1.4-2

[2] AP-42 Table 1.5-1 defines emission factor as 0.10S, where S is the sulfur content of propane.
EPA has assigned a value of S= 0.54 grains/100$ft^3$ (A National Methodology and Emission Inventory for Residential Fuel Combustion)

[3] VOC calculated by subtracting CH4 from TOC emission factor in AP-42 Table 1.5-1

[4] HAPs from Natural Gas (AP-42 Tables 1.4-3 and 1.4-4 (07/98)) were assumed
HAPs = 1.893 lb/MMscf (Combined Natural Gas HAPs as listed by EPA (*The Clean Air Act Amendments of 1990 List of Hazardous Air Pollutants* ). Assumed to be the same as HAPs emitted by propane.

[5] 40 CFR 98 Tables C-1 and C-2 (11/2013)

[6] 40 CFR 98 Table A-1 (10/2009)

## Fact Sheet Attachment

Landfill HAP and VOC: EU 005

Volume of ideal gas at std conditions = 0.0245 $m^3$/mole

std conditions are 25°C and 1 atm

Maximum LFG Flow[1] 44,858,328 $m^3$/yr

Flare Control Efficency 98%

Grams per Ton 907,185

**PTE Calculations for HAP and VOC**

| Speciated LFG Compounds | Concentration[2] (ppmv) | NMOC Concentration (%) | Concentration[2] (ppmv) | Molecular Weight (g/mol) | HAP | VOC | HAP/VOC Generated ($m^3$/yr) | HAP PTE (ton/yr) | VOC PTE (ton/yr) |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 0.48 | 0.08% | 0.66 | 133.41 | x | | 29.46 | 3.54E-03 | |
| 1,1,2,2-Tetrachloroethane | 1.1 | 0.18% | 1.51 | 167.85 | x | x | 67.52 | 0.01 | 0.01 |
| 1,1-Dichloroethane | 2.4 | 0.40% | 3.28 | 98.97 | x | x | 147 | 0.01 | 0.01 |
| 1,1-Dichloroethene | 0.2 | 0.03% | 0.27 | 96.94 | x | x | 12.28 | 1.07E-03 | 1.07E-03 |
| 1,2-Dichloroethane | 0.41 | 0.07% | 0.56 | 98.96 | x | x | 25.17 | 2.24E-03 | 2.24E-03 |
| 1,2-Dichloropropane | 0.18 | 0.03% | 0.25 | 112.99 | x | x | 11.05 | 1.12E-03 | 1.12E-03 |
| 2-Propanol | 50 | 8.33% | 68.42 | 60.11 | | x | 3,069 | | 0.17 |
| Acetone | 7 | 1.17% | 9.58 | 58.08 | | | 430 | | |
| Acrylonitrile | 6.3 | 1.05% | 8.62 | 53.06 | x | x | 387 | 0.02 | 0.02 |
| Benzene | 1.9 | 0.32% | 2.60 | 78.11 | x | x | 117 | 8.21E-03 | 8.21E-03 |
| Bromodichloromethane | 3.1 | 0.52% | 4.24 | 163.83 | | x | 190 | | 0.03 |
| Butane | 5 | 0.83% | 6.84 | 58.12 | | x | 307 | | 0.02 |
| Carbon disulfide | 0.58 | 0.10% | 0.79 | 76.13 | x | x | 35.60 | 2.44E-03 | 2.44E-03 |
| Carbon tetrachloride | 0.004 | 0.00% | 0.01 | 153.84 | x | x | 0.25 | 3.40E-05 | 3.40E-05 |
| Carbonyl sulfide | 0.49 | 0.08% | 0.67 | 60.07 | x | x | 30.08 | 1.63E-03 | 1.63E-03 |
| Chlorobenzene | 0.25 | 0.04% | 0.34 | 112.56 | x | x | 15.35 | 1.56E-03 | 1.56E-03 |
| Chlorodifluoromethane | 1.3 | 0.22% | 1.78 | 86.47 | | | 79.80 | | |
| Chloroethane | 1.3 | 0.22% | 1.78 | 64.52 | x | x | 79.80 | 4.64E-03 | 4.64E-03 |
| Chloroform | 0.03 | 0.01% | 0.04 | 119.39 | x | x | 1.84 | 1.98E-04 | 1.98E-04 |
| Chloromethane | 1.2 | 0.20% | 1.64 | 50.49 | x | x | 73.66 | 3.35E-03 | 3.35E-03 |
| Dichlorobenzene | 0.21 | 0.04% | 0.29 | 147.00 | | x | 12.89 | | 1.71E-03 |
| Dichlorodifluoromethane | 16 | 2.67% | 21.89 | 120.91 | | | 982.10 | | |
| Dichlorofluoromethane | 2.6 | 0.43% | 3.56 | 102.92 | | x | 160 | | 0.01 |
| Dichloromethane | 14 | 2.33% | 19.16 | 84.94 | x | | 859 | 0.07 | |
| Dimethyl sulfide | 7.8 | 1.30% | 10.67 | 62.13 | | x | 479 | | 0.03 |
| Ethane | 890 | 148.33% | 1,217.82 | 30.07 | | | 54,629 | | |
| Ethanol | 27 | 4.50% | 36.95 | 46.08 | | x | 1,657 | | 0.07 |
| Ethyl mercaptan | 2.3 | 0.38% | 3.15 | 62.13 | | x | 141 | | 7.90E-03 |
| Ethylbenzene | 4.6 | 0.77% | 6.29 | 106.16 | x | x | 282 | 0.03 | 0.03 |
| Ethylene dibromide | 0.001 | 0.00% | 0.00 | 187.88 | x | x | 6.14E-02 | 1.04E-05 | 1.04E-05 |
| Fluorotrichloromethane | 0.76 | 0.13% | 1.04 | 137.38 | | x | 46.65 | | 5.77E-03 |
| Hexane | 6.6 | 1.10% | 9.03 | 86.18 | x | x | 405 | 0.03 | 0.03 |
| Hydrogen Chloride[3][5] | 42 | 7.00% | 57.47 | 36.50 | x | | 2,578 | 0.08 | |
| Mercury (total) | 0.0003 | 0.00005% | 0.00 | 200.61 | x | | 0.02 | 3.33E-06 | |
| Methyl ethyl ketone | 7.1 | 1.18% | 9.72 | 72.11 | x | x | 436 | 0.03 | 0.03 |
| Methyl isobutyl ketone | 1.9 | 0.32% | 2.60 | 100.16 | x | x | 117 | 0.01 | 0.01 |
| Methyl mercaptan | 2.5 | 0.42% | 3.42 | 48.11 | | x | 153 | | 6.65E-03 |
| Pentane | 3.3 | 0.55% | 4.52 | 72.15 | | x | 203 | | 0.01 |
| Perchloroethylene | 3.7 | 0.62% | 5.06 | 165.83 | x | | 227 | 0.03 | |
| Propane | 11 | 1.83% | 15.05 | 44.09 | | x | 675 | | 0.03 |
| t-1,2-Dichloroethene | 2.8 | 0.47% | 3.83 | 96.94 | | x | 172 | | 0.02 |
| Toluene | 39 | 6.50% | 53.37 | 92.13 | x | x | 2,394 | 0.20 | 0.20 |
| Trichloroethylene | 2.8 | 0.47% | 3.83 | 131.40 | x | x | 172 | 0.02 | 0.02 |
| Vinyl chloride | 7.3 | 1.22% | 9.99 | 62.50 | x | x | 448 | 0.03 | 0.03 |
| Xylenes | 12 | 2.00% | 16.42 | 106.16 | x | x | 737 | 0.07 | 0.07 |
| NMOC | 600 | | 821 | 86.18 | | x | 36,828.69 | | 2.86 |
| | | | | | | | | **Total HAP[4]** | **Total VOC[4]** |
| | | | | | | | | 0.67 | 2.67 |

[1] Value obtained from maximum flare capacity.

[2] LFG concentrations used a ratio of Tier 2 site specific data (2013) and LandGEM default values.

These were deemed acceptable because of the conservative nature of the concentrations.

[3] HCl emissions were estimated using Equation 10 of AP-42 Chapter 2, Section 4 (11/1998). This method assumes that all the chloride ions are converted to HCl as a result of combustion. This value is therefore not utilized in pre-project calculations.

Note: Used Equation (3), Equation (4), then Equation (10)

[4] Pollutants calculated as VOC and/or HAP based on LandGEM determinations.

[5] Corrected from Past CP due to calc error.

## Fact Sheet Attachment

LFG Flare: EU 006 GHG calculations

| | | |
|---|---|---|
| LFG Flow Rate | 44,858,328 | $m^3$/yr |
| LFG Flow Rate | 1,584,158,400 | $ft^3$/yr |
| LFG Heating Value | 500 | Btu/scf |
| LFG Heating Value | 5.00E-04 | MMBtu/scf |
| Molecular Weight $CO_2$ | 44.01 | g/mol |

| Green House Gas [1] | Emission Factor | Units | PTE (kg/yr) | PTE (ton/yr) |
|---|---|---|---|---|
| $CO_2$ | 52.07 | kg/MMBtu | 41,243,564 | 45,463 |
| $CH_4$ | 3.20E-03 | kg/MMBtu | 2534.65 | 2.79 |
| $N_2O$ | 6.30E-04 | kg/MMBtu | 499.01 | 0.55 |
| GHG (mass basis) | - | - | 41,246,598 | 45,467 |
| GHG ($CO_2e$ basis) [2] | - | - | 41,446,772 | 45,687 |

[1] Emission Factors From 40 CFR 98 Tables C-1 and C-2

[2] 40 CFR 98, Subpart A, Table A-1 (January 1, 2025)

## Fact Sheet Attachment

Ch. 15 Calculations for Flare

| Total Heat Input (MMBtu/Hr) | Maximum Allowable Emissions of PM (lb/MMBtu) |
|---|---|
| Between 10 and 10,000 | $1.026/I^{0.233}$ |
| | Where I = The total heat Input in MMBtu/Hr) |

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| Heat Input (MMBtu/hr) | PM Threshold (lb/MMBtu) | PM Threshold (lb/hr) | PM PTE (lb/hr) |
|---|---|---|---|
| 90.4 | 0.45 | 41.07 | 1.51 |