CITY OF RAPID CITY

RAPID CITY SOUTH DAKOTA

Public Works Department
Solid Waste Division
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July 11, 2023

Air Quality Program
PMB 2020
South Dakota Department of Agricultural and Natural Resources
523 East Capitol Ave.
Pierre, South Dakota 57501-3182

RE: EG/NESHAP Semi-Annual Report (Reporting Period 1/1/23 – 6/30/23)
Rapid City Regional Landfill, Rapid City, Pennington County, South Dakota
Facility Title V Permit No. 28.1101-02

To Whom It May Concern:

This letter and the attached documentation represent the EG/NSPS/NESHAP Semi-Annual Report prepared on behalf of The City of Rapid City – Rapid City Regional Landfill (RCRL) located in Rapid City, SD to address the reporting period of 1/1/2023 – 6/30/2023.

If you have any questions concerning this information, please feel free to call Juene Franklin at (281) 205-8415 (phone)/jfranklin@franklinengineers.com (email) or me at (605) 355-3496 (phone)/ jeff.barber@rcgov.org (email).

Sincerely,

CITY OF RAPID CITY

Jeff Barber
Solid Waste Superintendent

Enclosure: NESHAP Semi-Annual Report – 1ST Half 2023

cc: w/attachment

John Leahy – City of Rapid City (Electronic)
Juene Franklin, P.E. – Franklin Engineers & Consultants, LLC.

RAPID CITY REGIONAL LANDFILL
RAPID CITY, SOUTH DAKOTA
(TITLE V PERMIT #: 28.1101-02)

EG/NESHAP SEMI-ANNUAL REPORT

REPORTING PERIOD JANUARY 1, 2023 – JUNE 30, 2023

Prepared for

The City of Rapid City

July 11, 2023

Prepared by

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Project Number: 23-006

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1 SEMI-ANNUAL REPORTING

The City of Rapid City (City) submits this Report because it owns and operates an active landfill gas collection and control system. The following summarizes the report requirements pursuant to §63.1981(h)/ 74:36:07:140.

1.1 Exceedance of Applicable Parameters §63.1981(h)(1)/74:36:07:140(1)

§63.1981(h)(1)
Number of times that applicable parameters monitored under § 63.1958(b), (c), and (d) were exceeded and when the gas collection and control system was not operating under § 63.1958(e) including periods of SSM. For each instance, report the date, time, and duration of each exceedance.

74:36:07:140(1)
V Value and length of time for exceedance of applicable parameters monitored under subdivision 74:36:07:117(1), §§ 74:36:07:118 through 74:36:07:123, and § 74:36:07:121.

1.1.1 Wellhead Monitoring (Pressure, Temperature, and Oxygen) 74:36:07:117

74:36:07:117
The owner or operator of an existing municipal solid waste landfill that seeks to comply with an active gas collection system must install a sampling port and a thermometer, other temperature measuring device, or an access port for temperature measurements at each wellhead. The owner or operator shall:

(1) Measure the gauge pressure in the gas collection header on a monthly basis;

(2) Monitor nitrogen or oxygen concentration in the landfill gas on a monthly basis as follows:

(a) The nitrogen level shall be determined using 40 C.F.R. Part 60, Appendix A, Method 3C (July 1, 2018), unless an alternative test method is established; and

(b) Unless an alternative test method is established, the oxygen level shall be determined by an oxygen meter using 40 C.F.R. Part 60, Appendix A, Method 3A or 3C (all July 1, 2018) or ASTM D6522-11, if the sample location is prior to combustion, except that the following apply:

(i) The span shall be set between 10 and 12 percent oxygen;

(ii) A data recorder is not required;

(iii) Only two calibration gases are required, a zero and span;

(iv) A calibration error check is not required; and

(v) The allowable sample bias, zero drift, and calibration drift are ±10 percent; and

(c) A portable gas composition analyzer may be used to monitor the oxygen levels provided the analyzer is calibrated and meets all quality assurance and quality control requirements for 40 C.F.R. Part 60, Appendix A, Method 3A (July 1, 2018) or ASTM D6522-11; and

(3) Monitor the temperature of the landfill gas on a monthly basis. The temperature measuring device shall be calibrated annually using the procedure in 40 C.F.R. Part 60, Appendix A-1, Method 2, Section 10.3 (July 1, 2018).

Each landfill gas collector is equipped with an access port allowing for measuring temperature at each wellhead. On a monthly basis operations and maintenance personnel measure the gauge pressure, temperature, and oxygen concentration at each well head. The gauge pressure taken at the wellhead is used in determining the presence of vacuum at the collector. Measurements are taken with a portable meter which is calibrated per the manufacturer's specifications. All exceedance data is included in Appendix A of this report.

1.1.2 Enclosed Combustor Monitoring 74:36:07:118

74:36:07:118
The owner or operator of an existing municipal solid waste landfill that seeks to comply with § 74:36:07:109 using an enclosed combustor shall install, calibrate, maintain, and operate according to the manufacturer's specifications, the following equipment:

(1) A temperature monitoring device equipped with a continuous recorder and having a minimum accuracy of ±1 percent of the temperature being measured expressed in degrees Celsius or ±0.5 degrees Celsius, whichever is greater. A temperature monitoring device is not required for boilers or process heaters with design heat input capacity equal to or greater than 44 megawatts; and

(2) A device that records flow to the control device and bypass of the control device, if applicable, at least every 15 minutes. The owner or operator shall secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism shall be performed at least once every month to ensure the valve is maintained in the closed position and the gas flow is not diverted through the bypass line.

RCL currently operates the existing enclosed combustor in accordance with the manufacturer's specifications utilizing a flow meter and a temperature monitoring device.

1.1.3 Non-enclosed Combustor Monitoring 74:36:07:119

74:36:07:119
The owner or operator of an existing municipal solid waste landfill that seeks to comply with § 74:36:07:109 using a non-enclosed flare shall install, calibrate, maintain, and operate according to the manufacturer's specifications, the following equipment:

(1) A heat sensing device at the pilot light or the flame itself to indicate the continuous presence of a flame; and

(2) A device that records flow to the flare and bypass of the flare, if applicable, at least every 15 minutes. The owner or operator shall secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism shall be performed at least once every month to ensure the valve is maintained in the closed position and the gas flow is not diverted through the bypass line.

RCL does not operate a non-enclosed flare; therefore, 74:36:07:119 is not applicable.

1.1.4 Alternative Control Device Monitoring 74:36:07:123

74:36:07:123
The owner or operator of an existing municipal solid waste landfill that seeks to demonstrate compliance with § 74:36:07:109 using a device other than a non-enclosed flare, an enclosed combustor, or a treatment system shall provide information satisfactory to the secretary describing the operation of the control device, the operating parameters that would indicate proper performance, and appropriate monitoring procedures. The secretary shall review the information and approve it or request that additional information be submitted. The secretary may specify additional appropriate monitoring procedures.

RCL does not operate a device other than a non-enclosed flare, enclosed combustor, or a treatment system; therefore, 74:36:07:123 is not applicable.

1.1.5 Wellhead Monitoring (Pressure) §63.1958(b)/74:36:07:117(1)

§63.1958(b)
Operate the collection system with negative pressure at each wellhead except under the following conditions: (1) A fire or increased well temperature. The owner or operator must record instances when positive pressure occurs in efforts to avoid a fire. These records must be submitted with the semi-annual reports as provided in § 63.1981(h); (2) Use of a geomembrane or synthetic cover. The owner or operator must develop acceptable pressure limits in the design plan; (3) A decommissioned well. A well may experience a static positive pressure after shut down to accommodate for declining flows. All design changes must be approved by the Administrator as specified in § 63.1981(d)(2);

74:36:07:117 (1)
Measure the gauge pressure in the gas collection header on a monthly basis;

Each landfill gas collector is equipped with an access port allowing for measuring temperature at each wellhead. On a monthly basis operations and maintenance personnel measure the gauge pressure, temperature, and oxygen concentration at each well head. The gauge pressure taken at the wellhead is used in determining the presence of vacuum at the collector. Measurements are taken with a portable meter which is calibrated per the manufacturer's specifications. All exceedance data is included in Appendix A of this report.

1.1.6 Wellhead Monitoring (Temperature) §63.1958(c)[1]

§63.1958(c)
Operate each interior wellhead in the collection system as specified in 40 CFR 60.753(c), until the landfill owner or operator elects to meet the operational standard for temperature in paragraph (c)(1) of this section. (1) Beginning no later than September 27, 2021, operate each interior wellhead in the collection system with a landfill gas temperature less than 62.8 degrees Celsius (145 degrees Fahrenheit). (2) The owner or operator may establish a higher operating temperature value at a particular well. A higher operating value demonstration must be submitted to the Administrator for approval and must include supporting data demonstrating that the elevated parameter neither causes fires nor significantly inhibits anaerobic decomposition by killing methanogens. The demonstration must

1 It is important to note that State EG allows for a temperature of only 131°F (55°C). The site has a Design Plan and Addendum dated August 1, 2020 that can be used to establish Higher Operating Values (HOV).

satisfy both criteria in order to be approved (i.e., neither causing fires nor killing methanogens is acceptable).

Each landfill gas collector is equipped with an access port allowing for measuring pressure, temperature, and oxygen at each wellhead. On a monthly basis operations and maintenance personnel measure the gauge pressure, temperature, and oxygen concentration at each well head. The gauge pressure taken at the wellhead is used in determining the presence of vacuum at the collector. All information concerning exceedances are taken with a portable meter which is calibrated per the manufacturer's specifications. Each extraction wellhead is operated in accordance with the temperature standards less than 62.8°C (145°F) or a higher operating value (HOV) established in accordance with the existing GCCS Design Plan and Addendum dated August 1, 2020. All exceedance data is included in Appendix A of this report.

1.1.7 Wellhead Monitoring (Surface Emissions) §63.1958(d)/74:36:07:120

§63.1958(d)
(1) Operate the collection system so that the methane concentration is less than 500 parts per million (ppm) above background at the surface of the landfill. To determine if this level is exceeded, the owner or operator must conduct surface testing around the perimeter of the collection area and along a pattern that traverses the landfill at no more than 30-meter intervals and where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover. The owner or operator may establish an alternative traversing pattern that ensures equivalent coverage. A surface monitoring design plan must be developed that includes a topographical map with the monitoring route and the rationale for any site-specific deviations from the 30-meter intervals. Areas with steep slopes or other dangerous areas may be excluded from the surface testing.

(2) Beginning no later than September 27, 2021, the owner or operator must:

(i) Conduct surface testing using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications provided in § 63.1960(d).

(ii) Conduct surface testing at all cover penetrations. Thus, the owner or operator must monitor any cover penetrations that are within an area of the landfill where waste has been placed and a gas collection system is required.

(iii) Determine the latitude and longitude coordinates of each exceedance using an instrument with an accuracy of at least 4 meters. The coordinates must be in decimal degrees with at least five decimal places.

74:36:07:120
The owner or operator of an existing municipal solid waste landfill that seeks to demonstrate compliance with the 500 parts per million surface methane operational standard shall monitor surface concentrations of methane quarterly according to the procedures provided in § 74:36:07:114 and the instrument specifications in § 74:36:07:115. Any closed landfill that has no monitored exceedances of the operational standard in three consecutive quarterly monitoring periods may skip to annual monitoring. Any methane reading of 500 parts per million or more above background detected during the annual monitoring returns the frequency for that landfill to quarterly monitoring.

Quarterly Surface Emissions Monitoring (SEM) was conducted in accordance with 40 CFR 63.1958(d)/ 74:36:07:120. No exceedances were recorded during this monitoring period. The results of the monitoring are included in Appendix B of this report.

1.1.8 Treatment System Monitoring §63.1961(g)/74:36:07:121

§63.1961(g)
Each owner or operator seeking to demonstrate compliance with 63.1959(b)(2)(iii)(C) using a landfill gas treatment system must calibrate, maintain, and operate according to the manufacturer's specifications a device that records flow to the treatment system and bypass of the treatment system (if applicable). Beginning no later than September 27, 2021, each owner or operator must maintain and operate all monitoring systems associated with the treatment system in accordance with the site-specific treatment system monitoring plan required in §63.1983(b)(5)(ii). The owner or operator must: (1) Install, calibrate, and maintain a gas flow rate measuring device that records the flow to the treatment system at least every 15 minutes; and (2) Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism must be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.

74:36:07:121
The owner or operator of an existing municipal solid waste landfill that seeks to demonstrate compliance with the control system requirements in § 74:36:07:109 using a landfill gas treatment system shall maintain and operate all monitoring systems associated with the treatment system in accordance with the site-specific treatment system monitoring plan required in subdivision 74:36:07:131(5) and shall calibrate, maintain, and operate according to the manufacturer's specifications a device that records flow to the treatment system and bypass of the treatment system, if applicable. The owner or operator shall:

(1) Install, calibrate, and maintain a gas flow rate measuring device that records the flow to the treatment system at least every 15 minutes; and

(2) Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism shall be performed at least once every month to ensure the valve is maintained in the closed position and the gas flow is not diverted through the bypass line.

RCL owns and operates a landfill gas treatment system in accordance with the existing Design Plan and Addendum dated August 1, 2020. The facility uses a flow meter which monitors flow to the treatment system.

1.2 Gas Stream Diversion §63.1981(h)(2)/74:36:07:140(2)

§63.1981(h)(2)
Description and duration of all periods when the gas stream was diverted from the control device or treatment system through a bypass line or the indication of bypass flow as specified under §63.1961/74:36:07:117-74:36:07:124.

The gas collection system is not designed nor equipped to bypass the control device(s); therefore §63.1961/74:36:07:117-74:36:07:124 is not applicable.

1.3 Control Device / Treatment System Downtime §63.1981(h)(3)/ 74:36:07:140(3)

§63.1981(h)(3)/74:36:07:140(3) Description and duration of all periods when the control device or treatment system was not operating and length of time the control device or treatment system was not operating.

All control device/treatment system shutdowns/downtime are included in Appendix B of this report.

1.4 Collection System Downtime §63.1981(h)(4)/ 74:36:07:140(4)

All periods when the collection system was not operating.

All collection system downtime is included in Appendix C of this report.

1.5 Surface Emission Monitoring §63.1981(h)(5)/74:36:07:140(5)

The location of each exceedance of the 500 parts per million (ppm) methane concentration as provided in §63.1958(d)/§ 74:36:07:114 and the concentration recorded at each location for which an exceedance was recorded in the previous month. For location, you must determine the latitude and longitude coordinates using an instrument with an accuracy of at least 4 meters. The coordinate must be in decimal degrees with at least five decimal places.

The 1st quarter 2023 SEM Event (conducted March 30, 2023) indicated that there were zero (0) locations where surface methane emissions greater than 500 parts-per million was detected during the initial monitoring event.

The 2nd quarter 2023 SEM Report (conducted June 1, 2023) indicated that there were zero (0) locations where surface methane emissions greater than 500 parts-per million were detected during the initial monitoring event.

The results of the SEM events are included in Appendix D of this report.

1.6 Collection system expansions §63.1981(h)(6)/74:36:07:140(6)

63.1981(h)(6)
The date of installation and the location of each well or collection system expansion added pursuant to 63.1960(a)(3), (a)(4), (b), and (c)(4)/ § 60.765(a)(3), (a)(5), (b), and (c)(4).

74:36:07:140(h)(6)
The date of installation and the location of each well or collection system expansion added pursuant to subdivision 74:36:07:112(3) and (4), § 74:36:07:113, and subdivision 74:36:07:114(4); and

No GCCS expansion occurred during this reporting period.

1.7 Root Cause / Corrective Action Analyses §63.1981(h)(7)/74:36:07:140(7)

§63.1981(h)(7)
For any corrective action analysis for which corrective actions are required in 63.1960(a)(3)(i) or (a)(5) and that take more than 60 days to correct the exceedance the root cause analysis conducted, including a description of the recommended corrective action(s), the date for corrective action(s) already completed following the positive pressure reading, and, for action(s) not already completed a schedule for implementation including proposed commencement and completion dates.

74:36:07:140(h)(7)
For any corrective action analysis for which corrective actions are required and that take more than 60 days to correct the exceedance, the root cause analysis conducted, including a description of any recommended corrective action, the date for any corrective action already completed following the positive pressure reading, and, for any action not already completed, a schedule for implementation, including proposed commencement and completion dates.

No exceedances that required more than 60 days to correct were recorded during this reporting period.

1.8 Enhanced Monitoring §63.1981(h)(8)

Each owner or operator required to conduct enhanced monitoring in §§ 63.1961(a)(5) and (6) must include the results of all monitoring activities conducted during the period. (i) For each monitoring point, report the date, time, and well identifier along with the value and units of measure for oxygen, temperature (wellhead and down well), methane, and carbon monoxide. (ii) Include a summary trend analysis for each well subject to the enhanced monitoring requirements to chart the weekly readings over time for oxygen, wellhead temperature, methane, and weekly or monthly readings over time, as applicable for carbon monoxide. (iii) Include the date, time, staff person name, and description of findings for each visual observation for subsurface oxidation event.

No enhanced monitoring was required during this monitoring period.

1.9 Combustion Temperature Exceedances §63.1983(c)(1)(ii)/ 74:36:07:132(1)(a)

For enclosed combustors except for boilers and process heaters with design heat input capacity of 44 megawatts (150 million British thermal unit per hour) or greater, all 3-hour periods of operation during which the average temperature was more than 28 degrees Celsius (82 degrees Fahrenheit) below the average combustion temperature during the most recent performance test at which compliance with §62.16714(c)/74:36:04:109 was determined.

No exceedances of this parameter were recorded during this reporting period.

APPENDIX A

GCCS EXCEEDANCE DATA

APPENDIX B

CONTROL DEVICE/TREATMENT SYSTEM SHUTDOWNS

APPENDIX C

COLLECTION SYSTEM DOWNTIME

APPENDIX D

SURFACE EMISSIONS MONITORING INFORMATION

APPENDIX E

GCCS EXPANSION SITE PLAN
(NO EXPANSION OCCURRED DURING THIS REPORTING PERIOD.)

APPENDIX F

COMBUSTION TEMPERATURE EXCEEDANCES (NO EXCEEDANCES OCCURRED DURING THIS REPORTING PERIOD.)

APPENDIX G

REPORT CERTIFICATION