Connecticut
Department of Energy &
Environmental Protection

BUREAU OF AIR MANAGEMENT
NEW SOURCE REVIEW PERMIT
TO CONSTRUCT AND OPERATE A STATIONARY SOURCE

Issued pursuant to Title 22a of the Connecticut General Statutes (CGS) and Section 22a-174-3a of the Regulations of Connecticut State Agencies (RCSA).

Owner/Operator	Town of Manchester, Sanitation Division
Address	321 Olcott Street, P.O. Box 191, Manchester, CT 06045
Equipment Location	Manchester Landfill, 1 Landfill Way, Manchester, CT 06040
Equipment Description	Municipal Solid Waste Landfill, Gas Collection and Odor Control System, and Perennial Energy XLE Enclosed Landfill Flare
Town-Permit Numbers	097-0114
Premises Number	0225
Stack Number	2
Modification Issue Date	January 10, 2024
Prior Permit Issue Dates	January 16, 2009 October 26, 2000
Expiration Date	None

for Katherine S. Dykes
Commissioner

January 10, 2024
Date

This permit specifies necessary terms and conditions for the operation of this equipment to comply with state and federal air quality standards. The Permittee shall at all times comply with the terms and conditions stated herein.

PART I. DESIGN SPECIFICATIONS

A. General Description

The Town of Manchester, Sanitation Division (Manchester Landfill) owns and operates a regional bulky and special waste landfill. The Manchester Landfill has accepted waste, including municipal solid waste (MSW), since the 1950's. The landfill ceased acceptance of MSW on January 1, 2000. The landfill has a design capacity greater than 2.5 million megagrams by mass and 2.5 million cubic meters by volume. The wastes currently being disposed of at the landfill consist of commercial and residential construction debris, bulky waste, and certain Connecticut-regulated special wastes.

The Manchester Landfill voluntarily installed a gas collection and odor control system (GCOCS) in 2001 for the control of odors from this landfill. Although the landfill is subject to 40 CFR Part 60 Subpart XXX – Standards of Performance for Municipal Solid Waste Landfills, the Manchester Landfill is not required to install and operate the GCOCS system to comply with Subpart XXX since the non-methane organic compound (NMOC) generation rate is below 34 megagrams per year.

The GCOCS currently consists of the following components: 1) 45 landfill gas (LFG) collection wells, 2) lateral piping from the LFG collection wells to a main header pipe, 3) leachate discharge piping and condensate collection sumps, air-pumps and discharge piping, 4) a combined leachate/condensate pumping station with discharge piping to the sanitary sewer, and 5) an enclosed flare (Perennial Energy Extreme Low Emissions Burner System (XLE) Flare). Changes to the existing system could occur in the future based on the system's age, existing conditions at the landfill and any proposed closure design.

B. Equipment Design Specifications

1. Manufacturer/Model No: Perennial Energy XLE Enclosed Landfill Flare

2. Maximum Fuel Firing Rate (scfm): 650

3. Minimum Flare Residence Time (sec): 0.6

4. Maximum Gross Heat Input (MMBtu/hr): 19.7 (@ Estimated LFG Heat Content of 506 Btu/ft3)

5. Fuel Filter Performance
   a. Capture Efficiency (%): 100
   b. Removal Efficiency (%): 99.5 (≥ 3 micrometers)
   c. Overall Efficiency (%): 99.5 (≥ 3 micrometers)

C. Control Equipment Design Specifications

Adsorption Device: Dry Scrubber

1. Pollutants Controlled: H_2S and SO_2

2. Manufacturer/Model: TBD

3. Adsorbent: TBD

4. Number of Beds: 2

5. Pressure Drop (in H_2O): TBD

D. Stack Parameters

1. Minimum Stack Height (ft): 30.6

2. Minimum Exhaust Gas Flow Rate (acfm): 35,256

3. Minimum Stack Exit Temperature (°F): 1,000

4. Minimum Distance from Stack to Nearest Property Line (ft): 1,076

PART II. OPERATIONAL CONDITIONS

A. Landfill Flare

1. Fuel Type: Landfill Gas

2. Maximum Fuel Consumption over any consecutive 12 month period (MMcf/yr): 341.64

3. Minimum Flare Allowable Combustion Temperature (°F): 1,400

B. Adsorption Device: Dry Scrubber

1. Type of Regeneration: Replacement

2. Method of Regeneration: Alternate use of beds

3. Maximum Operating Time Before Generation: TBD

4. Capture Efficiency (%): 100

5. Removal Efficiency (%): 97

6. Overall Efficiency (%): 97

PART III. ALLOWABLE EMISSION LIMITS

The Permittee shall not cause or allow this equipment to exceed the emission limits stated herein at any time.

A. Criteria Pollutants

Pollutant	lb/hr	ppmv[(i)]	tpy
PM	1.09		4.77
PM_{10}	1.09		4.77
$PM_{2.5}$	1.09		4.77
SO_2	0.60		2.63
NOx	1.08		4.72

Pollutant	lb/hr	ppmv[(i)]	tpy
VOC (NMOC as hexane)	0.86	20	3.77
CO	1.52		6.68

[(i)] dry basis @ 3% O_2

B. Hazardous Air Pollutants

This equipment shall not cause an exceedance of the Maximum Allowable Stack Concentration (MASC) for any hazardous air pollutant (HAP) emitted and listed in RCSA Section 22a-174-29. [STATE ONLY REQUIREMENT]

C. Opacity

This equipment shall not exceed 10% opacity during any six-minute block average as measured by 40 CFR 60, Appendix A, Reference Method 9.

D. Demonstration of compliance with the above emission limits may be met by calculating the emission rates using emission factors from the following sources:

- Most recent approved performance test results
- Manufacturer's Emissions Data

The commissioner may require other means (e.g. stack testing) to demonstrate compliance with the above emission limits, as allowed by state or federal statute, law or regulation.

PART IV. MONITORING, REPORTING AND RECORD KEEPING REQUIREMENTS

A. Monitoring

1. The Permittee shall comply with the allowable emission limits of this permit.

2. The Permittee shall install, operate and routinely calibrate a device or devices, in accordance with manufacturer's recommendations, to continuously measure and monitor the volumetric flow of landfill gas into this flare.

3. The Permittee shall monitor the hours of operation of the flare during each calendar month.

4. The Permittee shall continuously monitor and continuously record the pressure drop and the replacement of adsorbent in the dry scrubber. The Permittee shall maintain these parameters within the ranges recommended by the manufacturer to achieve compliance with the emission limits in this permit.

5. The Permittee shall perform inspections of the control devices as recommended by the manufacturer.

6. a. On a monthly basis, the Permittee shall monitor gauge pressure in the gas collection header at each individual well. If a positive pressure exists, action shall be initiated to correct the exceedance within five calendar days, except under the following conditions [§60.765(a)(3) and §60.763(b)]:

i. A fire or increased well temperature. The Permittee shall record instances when positive pressure occurs in efforts to avoid a fire;
ii. Use of a geomembrane or synthetic cover. The Permittee shall develop acceptable pressure limits in their O&M plan; or
iii. A decommissioned well. A well may experience a static positive pressure after shutdown to accommodate for declining flows.

b. If negative pressure cannot be achieved without excess air infiltration within 15 calendar days of the first measurement of positive pressure, the Permittee shall conduct a root cause analysis and correct the exceedance as soon as practicable, but no later than 60 days after positive pressure was first measured. [§60.765(a)(3)(i)]
c. If corrective actions cannot be fully implemented within 60 days following the positive pressure measurement for which the root cause analysis was required, the Permittee shall also conduct a corrective action analysis and develop an implementation schedule to complete the corrective action(s) as soon as practicable, but no more than 120 days following the positive pressure measurement. [§60.765(a)(3)(ii)]
d. If corrective action is expected to take longer than 120 days to complete after the initial exceedance, the Permittee shall submit the root cause analysis, corrective action analysis, and corresponding implementation timeline to the commissioner. [§60.765(a)(3)(iii)]
e. If measured levels are due to declining flows, LFG quality, or GCOCS condition, then the well shall be decommissioned or the installation of a replacement well or header pipe will be performed on a schedule based on good engineering judgment for the control of odors from landfills. The Permittee shall notify the commissioner in writing, within 30 days of the initial reading of a measured level due to the factors above. If a final landfill closure plan exists, the schedule shall be based in consideration of the final closure plan.

7. a. On a monthly basis, the Permittee shall monitor the LFG temperature, and either the oxygen or the nitrogen concentration of the LFG at each wellhead. If the measured temperature is 55°C or greater, the measured oxygen concentration is 5% or greater, or the measured nitrogen concentration is 20% or greater, action shall be initiated to correct the exceedance within 5 calendar days. [§60.765(a)(5)]
b. If LFG temperature less than 55°C, LFG oxygen concentration less than 5%, or LFG nitrogen concentration less than 20% cannot be achieved within 15 calendar days of the first measured exceedance, the Permittee shall conduct a root cause analysis and correct the exceedance as soon as practicable, but no later than 60 days after the exceedance was first measured. [§60.765(a)(5)(i)]
c. If corrective actions cannot be fully implemented within 60 days following the first measured exceedance for which the root cause analysis was required, the Permittee shall also conduct a corrective action analysis and develop an implementation schedule to complete the corrective action(s) as soon as practicable, but no more than 120 days following the initial measured exceedance. [§60.765(a)(5)(ii)]
d. If corrective action is expected to take longer than 120 days to complete after the initial exceedance, the Permittee shall submit the root cause analysis, corrective action analysis, and corresponding implementation timeline to the commissioner. [§60.765(a)(5)(iii)]
e. If measured levels are due to declining flows, LFG quality, or GCOCS condition, then the well shall be decommissioned or the installation of a replacement well or header pipe will be performed on a schedule based on good engineering judgment for the control of odors from landfills. The Permittee shall notify the commissioner in writing, within 30 days of the initial reading of a measured level due to the factors above. If a final landfill closure plan exists, the schedule shall be based in consideration of the final closure plan.

8. a. The Permittee shall monitor landfill surface methane concentrations quarterly for all active portions of the landfill using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications provided in §60.765(d).

b. The monitoring of landfill surface methane concentrations shall be conducted around the perimeter of the collection area and along a pattern that traverses the landfill at 30-meter intervals and where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover. A surface monitoring design plan shall be developed and kept on site 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. [§60.763(d)]
c. Any surface emissions monitoring reading of 500 parts per million or more above background at any location must be recorded as a monitored exceedance. The location of each monitored exceedance must be marked, and the location and concentration recorded. Cover maintenance or adjustments to the vacuum of the adjacent wells to increase the gas collection in the vicinity of each exceedance must be made and the location must be re-monitored within 10 calendar days of detecting the exceedance. [§60.765(c)(4)]
d. If the re-monitoring of the location shows a second exceedance, additional corrective action must be taken, and the location must be monitored again within 10 days of the second exceedance. [§60.765(c)(4)(iii)]
e. If the re-monitoring shows a third exceedance for the same location, a new well or other collection device must be installed within 120 calendar days of the initial exceedance. [§60.765(c)(4)(iii)]
f. Any location that initially showed an exceedance but has a methane concentration less than 500 ppm methane above background at the 10-day re-monitoring must be re-monitored one month from the initial exceedance. If the 1-month re-monitoring shows a concentration less than 500 parts per million above background, no further monitoring of that location is required until the next quarterly monitoring period. [§60.765(c)(4)(iv)]
g. Any location where monitored methane concentration equals or exceeds 500 parts per million above background three times within a quarterly period, a new well or other collection device must be installed within 120 calendar days of the initial exceedance. An alternative remedy to the exceedance, such as upgrading the blower, header pipes or control device, and a corresponding timeline for installation may be submitted to the commissioner for approval. [§60.765(c)(4)(v)]

9. The Permittee shall not be required to conduct periodic methane landfill surface monitoring when the landfill is snow covered and required cover maintenance can be delayed by safety concerns due to weather conditions.

10. The Permittee shall implement a program to monitor for cover integrity and implement cover repairs as necessary on a monthly basis. [§60.765(c)(5)]

B. Record Keeping

1. The Permittee shall keep records of the monthly and consecutive 12-month quantity of the landfill gas consumption. The consecutive 12-month landfill gas consumption shall be determined by adding the current month's quantity to that of the previous 11 months. The Permittee shall make these calculations within 30 days of the end of each month.

2. The Permittee shall keep records of the number of hours of flare operation during each calendar month. Such records shall include the date of the recording period and the number of flare operating hours during each recording period.

3. The Permittee shall calculate and record the monthly and consecutive 12-month PM, PM_{10}, $PM_{2.5}$, SO_2, NOx, VOC (NMOC), and CO emissions in units of tons. The consecutive 12-month

emissions shall be determined by adding (for each pollutant) the current month's emissions to that of the previous 11 months. Such records shall include a sample calculation for each pollutant. The Permittee shall make these calculations within 30 days of the end of the previous month.

4. The Permittee shall keep records of the results of all GCOCS operation and maintenance as required in PART VI of this permit and as detailed in the facility's amended Operations and Maintenance Plan.

5. The Permittee shall keep records of all testing conducted pursuant to the stack emission test requirements of this permit as well as any periodic testing required in the facility's amended Operations and Maintenance Plan.

6. The Permittee shall keep, for the life of the GCOCS system, an up-to-date, readily accessible plot map showing each existing and planned collector in the system and providing a unique identification location label for each collector. Such records shall include the installation date of all newly installed collectors. [40 CFR 60.768(d)]

7. The Permittee shall keep all records required by this permit for a period of no less than five years and shall submit such records to the commissioner upon request.

C. Reporting

The Permittee shall notify the commissioner, in writing, of the following:

1. the date of installation of the dry scrubber; and

2. the date of expansion of the wellfield into the area outside of the zone of influence of the LFG collection system or the landfill has reached final closure or final grade.

Any required written notification(s) above shall be submitted to DEEP.CACU@ct.gov, DEEP.SEM@ct.gov and DEEP.BAM.AirPermits@ct.gov no later than 30 days after the subject event.

PART V. STACK EMISSION TEST REQUIREMENTS

Stack emission testing shall be performed in accordance with the Emission Test Guidelines available on the DEEP website at www.ct.gov/deep/stacktesting.

Stack testing shall be required for the following pollutants:

☒ SO_2 ☒ VOC (NMOC) ☒ HAPs[1]

[1]Measurements and compliance demonstrations shall be required for the HAP compounds listed in RCSA Section 22a-174-29 that are associated with MSW landfills and that are listed in AP-42 Section 2.4 Municipal Solid Waste Landfills.

A. The Permittee shall conduct stack testing for SO_2 within 180 days of the installation of the dry scrubber.

B. The Permittee shall conduct stack testing for all pollutants specified above within 180 days of either of the following:

1. Any expansion of the wellfield into the area outside of the zone of influence of the LFG collection system; or

2. The landfill has reached final closure or final grade.

The zone of influence shall be defined as no more than 150 feet from the nearest wellhead in the current LFG network. The current LFG network, for this modification, shall be the LFG network as it existed during the September 2019 stack test.

C. The following site-specific testing and compliance demonstrations shall also be conducted during the required stack test in Part V.B above:

1. Re-characterization of LFG with respect to total reduced sulfur, NMOC, methane, oxygen, nitrogen, and HAPs common to MSW landfills

2. The Permittee shall ensure at least 90% of the wells in the GCOCS network are fully operational 24 hours prior to the initiation of LFG characterization.

D. Recurrent stack testing shall be conducted for SO_2 within five years from the date of the previous stack test.

E. The Permittee shall submit test results within 60 days after completion of testing.

PART VI. OPERATION AND MAINTENANCE REQUIREMENTS

A. The Permittee shall operate and maintain the enclosed flare and GCOCS in accordance with the manufacturer's specifications and written recommendations. The Permittee shall maintain a full, legible copy of the manufacturer's specifications and written operations manual on-site at all times. The permittee shall provide a copy of the manufacturer's specifications and written operations manual upon request of the commissioner.

B. The Permittee shall operate the enclosed flare with no visible emissions as determined by Reference Method 22, Visual Determination of Fugitive Emissions from Material Sources and Smoke Emissions from Flares, except for periods not to exceed a total of five minutes during any two consecutive hours.

C. The Permittee shall operate the enclosed flare with a flame present at all times except as required during maintenance. The presence of a flare pilot flame shall be monitored by thermocouple or any other equivalent device to detect the presence of a flame.

D. The Permittee shall only allow personnel who have been trained in the proper operation of the enclosed flare and GCOCS to operate such equipment.

E. The Permittee shall train the enclosed flare operating personnel annually on the operation of the flare according to the manufacturer's operating procedures and troubleshooting techniques.

F. The Permittee shall promptly shutdown the GCOCS blower whenever the enclosed flare or other in place controls are inoperable. All valves in the collection and control system contributing to venting of the gas to the atmosphere shall be closed within 1 hour.

G. The Permittee shall not inject LFG condensate and/or landfill leachate into the enclosed flare.

H. The Permittee shall restrict the public from uncontrolled access to any location on the premises/landfill.

I. The Permittee shall maintain the integrity and collection efficiency of the LFG collection system.

Such maintenance activities assuring the continued effectiveness of the LFG collection system shall be completed in a timely manner and shall include, but not be limited to, the following:

1. repairing or replacing any damaged LFG well or other component of the LFG collection system on a schedule based on good engineering judgment for the control of odors from landfills. If a final landfill closure plan exists, the schedule shall be based in consideration of the final closure plan;

2. modifying any LFG well or other component of the LFG collection system to assure its continued effectiveness on a schedule based on good engineering judgment for the control of odors from landfills. If a final landfill closure plan exists, the schedule shall be based in consideration of the final closure plan;

3. providing reasonable safeguards to prevent damage to the LFG wells or other components of the LFG collection system; and

4. accounting for the collection and control of additional LFG and odorous compounds (e.g. hydrogen sulfide) generated as a result of any future landfill expansion.

J. The Permittee shall amend its Operations and Maintenance Plan to include such procedures as required assuring compliance with the monitoring, record keeping and reporting requirements and stack emission test requirements of this permit.

K. The Permittee shall include in the facility's amended Operations and Maintenance Plan procedures to mitigate nuisance odors from the landfill.

L. The Permittee shall submit an amended Operations and Maintenance Plan to the commissioner for review and approval within 90 days of the effective date of this modified permit.

PART. VII. SPECIAL REQUIREMENTS

A. The Permittee shall operate this source and premises at all times in a manner so as not to violate or significantly contribute to the violation of any applicable state requirements for the control of fugitive particulate matter emissions and take reasonable precautions to prevent particulate matter from becoming airborne, as set forth in RCSA Section 22a-174-18(c).

B. The Permittee shall operate this facility at all times in a manner so as not to violate or contribute significantly to the violation of any applicable state noise control regulations, as set forth in Sections 22a-69-1 through 22a-69-7.4 of the RCSA.

C. The Permittee shall comply with state odor regulations, as set forth in RCSA Section 22a-174-23.

D. The Permittee shall comply with all applicable sections of the following New Source Performance Standard(s) at all times.

Title 40 CFR Part 60, Subparts A and XXX

Copies of the Code of Federal Regulations (CFR) are available online at the U.S. Government Printing Office website.

E. The modification, replacement, repair, or retiring of any LFG well(s) shall not constitute a

modification of this permit.

F. The Permittee shall install final cover over the landfill as stipulated in the O&M Plan and any applicable landfill waste permit. This shall be completed within 8 months of the final closure or reaching of final design capacity, whichever is earliest, or another schedule approved by the commissioner.

G. The Permittee shall amend its O&M plan to incorporate operational conditions to assure acceptable wellhead pressure limitations are maintained within the landfill area should the Permittee be required by the commissioner to also install a geomembrane or synthetic cover as a component of final cover for the landfill area. In addition, the Permittee shall submit in writing to the commissioner for review and approval the amended operational conditions incorporated into the plan assuring the proper wellhead pressure is maintained. Final cover for the landfill shall be installed in accordance with the applicable conditions of RCSA Section 22a-209-7 Solid Waste Disposal Areas, or by other design approved by the commissioner.

H. Premises Emissions Summary

1. On January 1st of each calendar year, if the potential emissions of NOx or VOC from the premises are equal to or greater than 25 tons per year per pollutant, then for such pollutant(s), the Permittee shall:
   a. Monitor NOx and/or VOC emissions, as applicable, from the premises for such calendar year.
   b. Calculate and record annual NOx and/or VOC emissions, as applicable, from the premises for such calendar year, in units of tons. The Permittee shall make these calculations on or before February 1st of the following year with respect to the previous calendar year. Such records shall include a sample calculation(s).
   c. If actual NOx and/or VOC emissions, as applicable, from the premises are equal to or greater than 25 tons for such calendar year, the Permittee shall submit to the commissioner, on or before March 1st of the following year, an annual emissions summary with respect to the premises for the previous calendar year. Such summary shall be submitted on forms prescribed or provided by the commissioner.

2. A Permittee is exempt from the premises emissions summary, Part VII.H.1 requirements of this permit if, on January 1st of the subject year, the premises was operating in accordance with any of the following:
   a. A valid Title V permit issued pursuant to RCSA Section 22a-174-33;
   b. RCSA Section 22a-174-33a; or
   c. RCSA Section 22a-174-33b

PART VIII. ADDITIONAL TERMS AND CONDITIONS

A. This permit does not relieve the Permittee of the responsibility to conduct, maintain and operate the regulated activity in compliance with all applicable requirements of any federal, municipal or other state agency. Nothing in this permit shall relieve the Permittee of other obligations under applicable federal, state and local law.

B. Any representative of DEEP may enter the Permittee's site in accordance with constitutional limitations at all reasonable times without prior notice, for the purposes of inspecting, monitoring and enforcing the terms and conditions of this permit and applicable state law.

C. This permit may be revoked, suspended, modified or transferred in accordance with applicable law.

D. This permit is subject to and in no way derogates from any present or future property rights or other rights or powers of the State of Connecticut and conveys no property rights in real estate or material, nor any exclusive privileges, and is further subject to any and all public and private rights and to any federal, state or local laws or regulations pertinent to the facility or regulated activity affected thereby. This permit shall neither create nor affect any rights of persons or municipalities who are not parties to this permit.

E. Any document, including any notice, which is required to be submitted to the commissioner under this permit shall be signed by a duly authorized representative of the Permittee and by the person who is responsible for actually preparing such document, each of whom shall certify in writing as follows: "I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that any false statement made in the submitted information may be punishable as a criminal offense under section 22a-175 of the Connecticut General Statutes, under section 53a-157b of the Connecticut General Statutes, and in accordance with any applicable statute."

F. Nothing in this permit shall affect the commissioner's authority to institute any proceeding or take any other action to prevent or abate violations of law, prevent or abate pollution, recover costs and natural resource damages, and to impose penalties for violations of law, including but not limited to violations of this or any other permit issued to the Permittee by the commissioner.

G. Within 15 days of the date the Permittee becomes aware of a change in any information submitted to the commissioner under this permit, or that any such information was inaccurate or misleading or that any relevant information was omitted, the Permittee shall submit the correct or omitted information to the commissioner.

H. The date of submission to the commissioner of any document required by this permit shall be the date such document is received by the commissioner. The date of any notice by the commissioner under this permit, including but not limited to notice of approval or disapproval of any document or other action, shall be the date such notice is personally delivered or the date three days after it is mailed by the commissioner, whichever is earlier. Except as otherwise specified in this permit, the word "day" means calendar day. Any document or action which is required by this permit to be submitted or performed by a date which falls on a Saturday, Sunday or legal holiday shall be submitted or performed by the next business day thereafter.

I. Any document required to be submitted to the commissioner under this permit shall, unless otherwise specified in writing by the commissioner, be directed to: Office of Director; Enforcement Division; Bureau of Air Management; Department of Environmental Protection; 79 Elm Street, 5th Floor; Hartford, Connecticut 06106-5127.