



pennsylvania

DEPARTMENT OF ENVIRONMENTAL
PROTECTION

SOUTHWEST REGIONAL OFFICE – AIR QUALITY PROGRAM

MEMO

TO Air Quality Permit File PA-65-00767C

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DATE July 8, 2022

RE PA-65-00767C Review Memo Addendum
Westmoreland Sanitary Landfill, LLC
Leachate Evaporator
Rostraver Township, Westmoreland County
APS 1003567 Auth 1291604 PF 514148

Background

On October 9, 2019, the Department of Environmental Protection (Department) received a plan approval application from The Hillcrest Group, LLC on behalf of Westmoreland Sanitary Landfill, LLC for authorization to install and operate a leachate evaporator at the facility located in Rostraver Township, Westmoreland County. Westmoreland Sanitary Landfill (WSL) proposes to install the following air contamination sources under PA-65-00767C authorization at this site:

- Leachate Evaporation System (Source ID 113): One (1) Pentair Hydrocarbon Recovery Unit; One (1) Cleaver Brooks, ProFire MYHG 25.2, natural gas-fired burner, 25.2 MMBtu/hr; One (1) Heartland Water Technology, LM-HT Concentrator, Evaporator and Entrainment Separator, 45,000 gallons per day (gpd)

The plan approval application was received on October 9, 2019. On October 10, 2019, the Department sent an administratively incomplete determination and received a response on October 18, 2019. The application was determined to be administratively complete on November 5, 2019. A technical deficiency notice was sent by the Department on November 5, 2019. A response to the technical deficiency notice was received on November 13, 2019. A second technical deficiency notice was emailed by the Department on March 24, 2020. A response to the technical deficiency notice was received by email on April 1, 2020.

Notice of intent to issue the plan approval was published in the *Pennsylvania Bulletin* on May 9, 2020; published in *The Mon Valley Independent* on October 12-14, 2020; sent to United States Environmental Protection Agency (“EPA”) on May 1, 2020; and sent to West Virginia Department of Environmental Protection and Maryland Department of the Environment on May 6, 2020, in accordance with the requirements of 25 Pa. Code §§127.44-127.46. All required methods of public notice were fulfilled as of May 9, 2020, and the regulatory 30-day public comment period would have ended at the close of business on June 8, 2020. A substantial amount of comments were received from the public. This addendum to the memo summarizes the Department’s review after May 9, 2020, and any subsequent updates to the draft plan approval. The topics covered in this addendum include radionuclide emissions and leachate pre-treatment. The original review memo, dated April 30, 2020, is an attachment to this addendum.

The Department received a substantial amount of comments concerning the applicant’s failure to address the possibility of radionuclides being emitted from the evaporator. A deficiency notice was sent by the Department to WSL on July 2, 2020, requiring additional information pertaining to the potential emissions of radionuclides.

The deficiency letter requested that WSL provide the analytical results of leachate sampling and data from an earlier bench scale testing. The previous bench scale study was based on two leachate samples, with the first leachate sample collected on February 3, 2020 and the second leachate sample collected on June 17, 2020. As part of the deficiency letter, the Department requested additional bench scale testing to determine radiological parameters of the final effluent which would go to the evaporator. This additional data is needed to calculate potential radiological emission rates from the evaporator and will be compared to the United States Nuclear Regulatory Commission’s (NRC’s) limits and “less than unity” rule specified Standards for Protection Against Radiation, 10 CFR 20, Appendix B. See the attached memo, dated March 9, 2022, from the Department’s Radiation Protection Program regarding proposed radionuclide emissions, monitoring, and applicable standards.

The deficiency letter requested that WSL provide supporting documentation for system performance from the manufacturer, including Total and Dissolved Solids (TDS) and Total Suspended Solids (TSS) concentrations in the raw leachate and in the treated effluent from the hydrocarbon recovery technology (HRT) system.

The deficiency letter also requested that WSL provide a proposal which demonstrates: (a) that the air emissions from the evaporator will be equipped with reasonable and adequate facilities to monitor and record the emissions of radionuclide air contaminants (either appropriately sensitive radiation detectors or periodic analysis of the particulate matter collected during periodic air emissions source testing) and operating conditions which may affect the emissions of radionuclide air contaminants; (b) that the records of radionuclide air contaminants are being and will continue to be maintained; and (c) that the records of radionuclide air contaminants will be submitted to the Department at specified intervals or upon request.

On August 31, 2020, the Department received a response to the deficiency letter.

On September 11, 2020, the Department received a stack testing proposal from Lemos Labs on behalf of WSL. On September 23, 2020, the Department received calculations for total radium (Ra_{226} and Ra_{228}) emission estimates from the evaporator at WSL.

On November 13, 2020, the Department sent an additional deficiency letter to WSL. This deficiency was a follow up to the responses received on August 31, 2020, September 11, 2020, and September 23, 2020. The second deficiency letter requested additional information pertaining to the physical state of radionuclide emissions, emission calculations for radium-226 and radium-228, manufacturer guarantee demonstrations, and monitoring, record keeping, and testing of radionuclide air contaminants. On February 4, 2021, the Department received a response to the second deficiency letter. On May 7, 2021, the Department sent an additional deficiency letter to WSL as a follow up to the responses received on February 4, 2021.

On June 8, 2021, WSL and the Department had a preapplication meeting for air dispersion modeling associated with the proposed leachate evaporator. On June 25, 2021, Civil & Environmental Consultants, Inc. (CEC), on behalf of WSL, submitted an Air Dispersion Modeling Protocol to the Department. On July 15, 2021, in coordination with Department's Southwest Regional Office and Bureau of Radiation Protection, the Department's Air Quality Modeling Section provided comments to WSL on the proposed air dispersion modeling protocol. On August 11, 2021, CEC, on behalf of WSL, submitted to the Department a revised air dispersion modeling protocol. On August 23, 2021, the Department accepted the revised air dispersion modeling protocol.

On October 1, 2021, the Department received a response to the May 7, 2021, deficiency letter. This response also included the air dispersion modeling report. On October 29, 2021, the Department's Air Quality Modeling Section provided comments to WSL on the air dispersion modeling. On November 30, 2021, the Department received a response to the Department's comments on air dispersion modeling.

Environmental Justice

The Department's *Environmental Justice Public Participation Policy* (012-0501-002; April 24, 2004, revised December 20, 2004) was established to expand the Department's public participation activities for certain permits in areas with specific boundaries and demographic characteristics to ensure enhanced public notice and opportunities for input to accommodate environmental justice concerns. With respect to permitting of air pollution sources under 25 Pa. Code Chapter 127, this policy only applies to approvals of *new major sources of hazardous air pollutants or criteria pollutants* and/or *major modifications of major sources (changes that could result in an increase in emissions or a facility expansion)* when such sources are located in Environmental Justice Areas. WSL appears to be located within ½ mile of an Environmental Justice Area; however, the application type is not on the list of application/permits types subject to the current Environmental Justice Public Participation Policy.

Compressed Natural Gas (CNG) Filling Operation

On March 24, 2021, WSL submitted a revised request for determination (RFD) via the Department's RFD*Online system for installation and temporary operation of a mobile compressed natural gas (CNG) fueling station. The original RFD was submitted by WSL on January 15, 2021, and the Department sent a deficiency response to the RFD on February 10, 2021. After review, the Department of Environmental Protection has determined that the temporary operation of a mobile compressed natural gas (CNG) fueling station at WSL is a source of minor significance and is exempt from plan approval requirements per 25 Pa. Code §127.14(d) listed as No. 33.b. in the Department's Plan Approval and Operating Permit Exemptions list under 25 Pa. Code §127.14(a)(8). The Department has also determined that this operation is not exempt from the Operating Permit requirements of 25 Pa. Code Chapter 127 Subchapter F (Operating Permit Requirements). WSL shall submit documents necessary to revise TVOP-65-00767 as described in this RFD within 180 days of plan approval issuance. It is the Department's understanding that the CNG mobile unit fuels waste hauling vehicles owned and operated by WSL; that the CNG mobile unit began operation in May 2020 and will be utilized on a temporary basis until a permanent CNG station is permitted and constructed; that the mobile CNG unit utilizes purchased natural gas from Peoples Gas Company and converts the purchased natural gas into a usable CNG product; that the mobile CNG unit is powered by electricity from the grid; that a leak detection and repair program (LDAR) will be performed annually as outlined in Exemption No. 33.b.iii of 25 Pa. Code §127.14(a)(8); and that VOC emissions from the mobile CNG unit are estimated to be 0.01 tons per year and will not exceed 2.7 tons per year. It is also the Department's understanding that temporary operation of a mobile CNG fueling station will not trigger the requirements of 40 CFR Part 52 relating to Prevention of Significant Deterioration or 25 Pa Code Chapter 127 Subchapter E relating to Non-Attainment New Source Review. This exemption does not affect the operator's obligation to meet all applicable Pennsylvania Air Quality Regulations for this source. All air contamination sources and air cleaning devices must be operated in a manner consistent with the manufacturer's

specifications and good engineering practice. This exemption is only valid for the equipment and emission levels proposed in this RFD. A revised RFD or plan approval application may be required prior to any changes which increase atmospheric emissions and would be required for the permanent CNG station.

The plan approval does not contain conditions regarding the CNG Filling Operation. This determination will be processed and finalized via the Department's electronic RFD*Online system in Greenport.

Source/Process Description

The leachate at WSL has the potential to contain radionuclides, because the landfill accepts drill cuttings from natural gas operations for disposal. The Department's Radiation Protection Program has informed the Air Quality Program that radionuclides could also be present in the leachate from other legacy waste streams and naturally occurring isotopes in the soils that exist onsite. See the attached memo, dated March 9, 2022, from the Department's Radiation Protection Program regarding proposed radionuclide emissions, monitoring, and applicable standards. The evaporator is proposed to operate at temperatures of 600 to 1,000 °F. Potential radionuclide emissions will be in the form of particulate matter as radium-226 and radium-228. Radium exists in a solid state to 1,285 °F and if emitted through the evaporator would be in the form of particulate or attached to entrained particulate. All leachate from the landfill will pass through the Pentair HRT pre-treatment system prior to passing through the leachate evaporator. During periods of high leachate flow, leachate will pass through the HRT, enter the process tank and bypass the evaporator by temporarily being stored in the onsite leachate storage tanks. Once the leachate flows reduce to a normal level, the liquid temporarily stored in the open tanks will be pumped back up to the leachate evaporator. The leachate temporarily stored in the onsite storage tanks will pass through the HRT system a second time prior to being sent to the evaporator. The annual rainwater estimated to enter the two (2) open top leachate storage tanks combined is less than 1-percent of the total volume of leachate.

The proposed pre-treatment system is estimated to remove 99.89% of total suspended solids (TSS), which are considered particles 2-micron and larger, and 99.97% of particles 3-micron and larger. The HRT pre-treatment system proposed to be installed at WSL includes four stages of filtration where the first two stages remove larger particles, the third stage removes finer particles, and the fourth stage separates and removes hydrocarbons from the leachate. Two bench scale studies were performed by Pentair in December 2020 to demonstrate the effectiveness of the proposed filtration system. The bench scale testing will be discussed further below.

The proposed evaporator includes a three-stage mist eliminator which is estimated to remove 99% of total dissolved solids (TDS), or particles less than 2-micron, that may be present within the leachate, which was already treated by the HRT system. The proposed evaporator will evaporate approximately 90% of the leachate passing through and approximately 10% will discharge as concentrated liquid residual, which will be continuously collected in a dual-

contained storage box adjacent to the evaporator. WSL intends to dispose of the concentrated residual discharge at the WSL facility in accordance with the facility's permits and Department regulations. Specifically, each load of waste from the evaporator will be scanned for radiation by passing through the landfill's fixed portal radiation detectors in accordance with PADEP Form X and each box will follow the PADEP Form U process for disposal. Wastes will be characterized and disposed in accordance with the approved Waste Analysis and Classification Plan.

Bench Scale Testing & Results

An analysis was performed on a sample of leachate from WSL by Pentair at their Starscan Analysis facility in Conroe, Texas in April 2019. The leachate sample was processed through a bench scale HRT pre-treatment system. Influent and effluent samples were analyzed for total hydrocarbon content and TSS. The influent sample analysis resulted in a total hydrocarbon content of 116.9 mg/L and TSS concentration of 75.0 mg/L. The effluent sample analyses showed a total hydrocarbon content of 0.7 mg/L and a TSS concentration of 4.2 mg/L resulting in a hydrocarbon reduction of 99.4% and a TSS reduction of 94.4%.

The results from the April 2019 bench scale test were not consistent with the guarantee by Pentair of 99.97% reduction in particles 3-micron and larger and 99.9% reduction in hydrocarbons. As noted above, the test showed a hydrocarbon reduction of 99.4% and TSS reduction of 94.4%. As part of the November 13, 2020 additional deficiency letter, the Department requested more information that demonstrates that the applicant can achieve the manufacturer's guarantee reductions in practice. As a result, in December 2020, WSL performed two new bench scale studies to demonstrate the effectiveness of stage 3 and stage 4 of the HRT pre-treatment system. The first bench scale study utilized the filter media originally proposed for stage 3 of the pre-treatment system and the second bench scale study utilized improved filter media for stage 3 of the pre-treatment system.

The results of the December 2020 bench scale test demonstrated a reduction of 99.73% of particles 2-micron and larger (TSS) and a reduction of 99.84% of particles 3-micron and larger using the stage 3 filters originally selected for WSL. The improved Stage 3 filters resulted in a 99.89% reduction of particles 2-micron and larger (TSS) and a 99.98% reduction of particles 3-micron and larger. This bench scale test using improved stage 3 filters also demonstrated a hydrocarbon removal of 99.9%.

The results from the December 2020 bench scale test utilizing improved filters within stage 3 of the HRT system showed results meeting the guarantees for particulate and hydrocarbon removal provided by Pentair in the plan approval application. WSL will utilize the improved filters within stage 3 of the HRT system. No changes will be required for installation or operation of the system other than using an improved stage 3 filter cartridge in the currently proposed filter housing. The applicant has provided information indicating that the HRT pre-

treatment system will provide a hydrocarbon removal of 99.9%, a 3-micron particle size removal of 99.98% and a 2-micron particle size removal of 99.89%.

Calculations

Based on discussions with the Department's Radiation Protection Program, the two radionuclides of concern are radium-226 and radium-228. Potential radionuclide emissions will be in the form of particulate matter as radium-226 and radium-228. Radium exists in a solid state under the conditions that would be experienced at the evaporator and if emitted through the evaporator would be in the form of particulate. Perma-Fix Environmental Services, on behalf of WSL, submitted calculations estimating potential emissions of radium-226 and radium-228 from the leachate evaporator.

The maximum concentrations of radium-226 and radium-228 obtained from laboratory testing of representative samples of the facility's leachate were used to model the radium within the leachate in the calculations. Composite samples of the facilities leachate were collected over one-week periods to provide two approximate 50-gallon representative samples for testing the Pentair HRT pre-treatment system. During the bench scale test, smaller samples were collected prior to passing through the pre-treatment system (unfiltered) and after passing through the pre-treatment system (filtered) and sent to a laboratory for testing. The emissions calculations used the maximum concentration of radium-226 and radium-228 from leachate samples.

As described above, 99.89% of particles 2-micron and larger are estimated to be removed from the leachate prior to evaporation. To be conservative, the radiological emissions calculations did not assume any pre-treatment filtering, but instead assumed that 100% of all particles would be routed through the evaporator; the three-stage mist eliminator would remove 99% of the TDS, and any remaining particles containing radium-226 and radium-228 would be emitted through the evaporator stack.

To evaluate potential radium emissions from the evaporator, the Department's Radiation Protection Program recommended following the NRC's limits and "less than unity" rule as specified in their Standards for Protection Against Radiation, 10 CFR 20, Appendix B. The formula and limits specified in Appendix B are as follows:

$$\frac{[\text{Ra}_{226}] \text{ in air}}{0.0009 \text{ pCi/L}_{\text{air}}} + \frac{[\text{Ra}_{228}] \text{ in air}}{0.002 \text{ pCi/L}_{\text{air}}} < 1$$

Where 0.0009 pCi/L_{air} and 0.002 pCi/L_{air} are the do not exceed annual average air concentrations for radium-226 and radium-228, respectively, at the boundary of the unrestricted area specified in Table 2 of Appendix B to part 20.

For concentrations of radium-226 and radium-228 the applicant conservatively used the stack emission rate, rather than the much lower atmospheric concentration determined by air dispersion modeling.

Using the maximum tested concentrations of radium-226 (8.74 pCi/L) and radium-228 (4.09 pCi/L) within the leachate sampled, assuming no prior removal / filtration of particles as worst case, applying the 99% removal of TDS by the evaporator three-stage mist eliminator, and factoring in the proposed process rates (45,000 gallons per day and 30,400 scfm) results in maximum radium-226 and radium-228 emissions from the stack of $1.20E^{-5}$ pCi/L and $5.61 E^{-6}$ pCi/L, respectively.

Applicant then evaluated the radium-226 and radium-228 emissions using the “less than unity rule” and the Department has reviewed the applicant’s calculations. The unity rule calculation yields the following:

$$\frac{1.20E^{-5} \text{ pCi/L}_{\text{air}}}{0.0009 \text{ pCi/L}_{\text{air}}} + \frac{5.61 E^{-6} \text{ pCi/L}_{\text{air}}}{0.002 \text{ pCi/L}_{\text{air}}} = 0.016$$

Since the calculation results in a value <1, the less than unity rule is satisfied. If this operation were an Nuclear Regulatory Commission (NRC) regulated operation and subject to the limits under 10 CFR 20, Appendix B, worker exposure by inhalation from the operation would be permissible at the stack.

The VOC potential-to-emit calculations were updated to reflect the 99.9% removal guarantee provided by the manufacturer for the HRT pre-treatment system. The previous calculations used a 99.8% VOC removal for the HRT pre-treatment system. Potential VOC emissions were based on the maximum VOC content from leachate sampled of 1,843 mg/l and evaporator capacity of 45,000 gallons/day, or 31.25 gallons/minute. Potential VOC emissions were updated to 0.72 tpy as follows:

$$1,843 \frac{\text{mg}}{\text{l}} \times 0.001\% \times 31.25 \frac{\text{gal}}{\text{min}} \times 3.78 \frac{\text{l}}{\text{gal}} \times 2.204^{-6} \frac{\text{lb}}{\text{mg}} \times 60 \frac{\text{min}}{\text{hr}} \times 8,760 \frac{\text{hrs}}{\text{yr}}$$

$$= 0.13 \text{ tpy (from leachate)} + 0.59 \text{ tpy (from natural gas burner)} = 0.72 \text{ tpy VOC}$$

Radiological Monitoring and Emissions Testing

WSL provided a monitoring and testing plan in Attachment 3 of its February 4, 2021 Additional Information submittal. A revised monitoring and testing plan was provided in Attachment 3 of WSL’s October 1, 2021 Additional Information submittal. The monitoring and testing plan proposed by WSL included perimeter monitoring, area monitoring, and particulate matter testing directly from the evaporator stack. The plan included details on the selection of monitoring and testing equipment, testing frequencies and the location of testing devices to be installed at the facility.

Perimeter Monitoring

Perimeter monitoring proposed includes four (4) outdoor air monitors that will run continuously. These monitors will pull air through a filter designed to collect particles. The filters will be changed out on a weekly basis and analyzed for total alpha and total beta/gamma radiation. Alpha and beta/gamma are associated with the decay of radium-226 and radium-228. The weekly results of the filter analysis will be compared against the NRC air discharge limits for radium-226 and radium-228. The locations of the air monitoring devices were selected based upon the results of the air dispersion modeling performed by CEC, on behalf of WSL. The dispersion model analyzed the existing configuration of the landfill as well as the future final configuration of the landfill and utilized local meteorological data (Pittsburgh International Airport) to generate concentration contours of potential radiological emissions. Areas which contained the highest estimated concentration of radiological emissions were selected to place perimeter monitors and area monitoring devices. A copy of the air dispersion modeling report can be found in Attachment 4 of WSL's October 1, 2021 response to the Department's May 7, 2021 deficiency letter.

Area Monitoring

Area monitoring proposed included six (6) thermoluminescent dosimeter (TLD) radiation measurement devices. TLDs are passive radiation dosimeters used to measure the external exposure to ionizing radiation. The dosimeters will be sent to a laboratory for analysis on a quarterly basis. Each quarter, the results will be compared against the Pennsylvania gamma radiation exposure limits to members of the public. The locations of four of the TLDs were selected to be consistent with the perimeter air monitors. The remaining two locations were selected based on areas where workers are most likely to be present, including one outside of the landfill office and one outside of the maintenance garage.

Radiological Emissions Testing

In addition to the perimeter and area monitoring, WSL will perform stack testing of the evaporator exhaust on a quarterly basis. PM, PM₁₀, and PM_{2.5} will be collected from the evaporator exhaust stack utilizing EPA approved methods and will be submitted to a certified laboratory for radiological analysis including gross alpha, gross beta, radium-226, radium -228, and PM₁₀/PM_{2.5}. WSL will submit a pre-test protocol to the Department for review within 60 days of plan approval issuance. All proposed performance test methods will be identified in the pre-test protocol and must be approved by the Department prior to testing.

WSL evaluated the potential for continuous air monitoring for radioactivity at the evaporator stack; however, found this option to be infeasible. The applicant determined that real-time radiation continuous air monitors (CAMs) would not have the required sensitivity to detect radium as low as the NRC effluent values would require. The Department's Radiation Protection Program agreed with this determination.

Air Dispersion Modeling and Radiation Protection Program Memos (see attached memos)

Summary of Air Dispersion Modeling of Radium 226 and Radium 228 Emissions

On December 17, 2021, Daniel Roble of the Department's Air Quality Modeling Section provided a memo regarding the Summary of Air Dispersion Modeling for Estimating Radionuclide Concentrations. The summary was based on an air dispersion modeling report from WSL included as Attachment 4 of the October 1, 2021 Additional Information Response. WSL proposed and conducted air dispersion modeling and a comparison to the NRC air discharge limits of 10 CFR Part 20, Appendix B and 10 CFR Part 20, Subpart D. The air dispersion modeling was conducted by CEC, on behalf of WSL.

According to the December 17, 2021, memo from Daniel Roble, "...The DEP's technical review concludes that WSL's air dispersion modeling for estimating radionuclide concentrations is consistent with the EPA's relevant air dispersion modeling policy and guidance. Additionally, WSL provided adequate responses to the DEP's comment on its air dispersion modeling."

Radiation Protection Program Memo

On March 9, 2022, Dwight Shearer, P.E. of the Department's Radiation Protection Program provided a memo regarding radionuclide related aspects of the proposed evaporator emissions. See the attached memo.

According to the March 9, 2022, memo from Dwight Shearer, "WSL's leachate that contains TENORM¹ can be evaporated through the proposed process and still be within the safe discharge limits established by the NRC and adopted by the Commonwealth through agreement status, and generally accepted by radiation professionals. The monitoring plan as proposed is also acceptable as means to detect radiation and stop operations, if needed. Therefore, it is my recommendation that the proposed operation and monitoring of the evaporator would be protective of public health from a radiation protection perspective."

Conclusions and Recommendations

The Department will be inviting a new round of public comments on this proposed plan approval and will not address the public comments received on the previous draft of the plan approval in a formal comment and response document. Previously submitted public comments have been addressed in this review memo addendum and through the changes made to this proposed plan approval.

A notice of intent (NOI) to issue this plan approval will appear in the Pennsylvania Bulletin to initiate a second round of public and EPA input for this proposed authorization. The NOI will also include a notice of a public hearing.

¹ Technologically Enhanced Naturally Occurring Radioactive Material or (TENORM)

After review, I have determined that the applicant has demonstrated in this application that the construction and initial operation of the proposed leachate evaporator at the Westmoreland Sanitary Landfill located in Rostraver Township, Westmoreland County meets all applicable requirements. Therefore, I recommend issuance of a plan approval for a period of 18-months with the following special conditions.

Modified/New Special Conditions

Site Level Requirements

TESTING REQUIREMENTS

1. Performance testing shall be conducted as follows [25 Pa. Code §127.12b and §139.11]:
 - (a) The permittee shall submit ~~two hard copies and~~ one electronic copy of a pre-test protocol to the Department for review within 60 days of plan approval issuance. All proposed performance test methods shall be identified in the pre-test protocol and approved by the Department prior to testing.
 - (b) The permittee shall notify the Regional Air Quality Manager and Division of Source Testing and Monitoring at least 15 days prior to any performance test so that an observer may be present at the time of the test. This notification may be sent by email. Notification shall not be made without prior receipt of a protocol acceptance letter from the Department.
 - (c) Pursuant to 40 CFR Part 60.8(a), a complete test report shall be submitted to the Department no later than 60 calendar days after completion of the on-site testing portion of an emission test program.
 - (d) Pursuant to 25 Pa. Code Section 139.53(b), a complete test report shall include a summary of the emission results on the first page of the report indicating if each pollutant measured is within permitted limits and a statement of compliance or non-compliance with all applicable permit conditions. The summary results will include, at a minimum, the following information:
 - (1) A statement that the owner or operator has reviewed the report from the emissions testing body and agrees with the findings.
 - (2) Permit number(s) and condition(s) which are the basis for the evaluation.
 - (3) Summary of results with respect to each applicable permit condition.
 - (4) Statement of compliance or non-compliance with each applicable permit condition.
 - (e) Pursuant to 25 Pa. Code § 139.3, all submittals shall meet all applicable requirements specified in the most current version of the Department's Source Testing Manual.

(f) All testing shall be performed in accordance with the provisions of Chapter 139 of the Rules and Regulations of the Department of Environmental Protection.

(g) All submittals shall be sent as an electronic submittal to ra-epstacktesting@pa.gov, with a cc to ra-epswwstacktesting@pa.gov.

(h) Pursuant to 25 Pa. Code Section 139.53(a)(1) and 139.53(a)(3) all hard copy submittals shall be sent to the Pennsylvania Department of Environmental Protection, Air Quality Program, 400 Waterfront Drive, Pittsburgh, PA 15222 with deadlines verified through document postmarks. Electronic submittals shall be sent to RA-epstacktesting@pa.gov. Alternatively, electronic copies may be provided on a CD along with hard copy submittals.

Source Level Requirements

LEACHATE EVAPORATION SYSTEM (Source ID 113)

RESTRICTIONS

1. The hydrocarbon recovery unit of the Leachate Evaporation System shall be operated to control VOC content of the landfill fluids by 99.8%, or shall have an outlet VOC concentration not to exceed 3.4 mg/l. [25 Pa. Code §127.12b]
2. The emissions from the leachate evaporation system (Source ID 113) shall not exceed the following on a lb/hr and 12-month rolling tpy basis: [25 Pa. Code §127.12b]

Pollutant	lb/hr	tpy
CO	0.23	1.00
NOx	0.38	1.65
PM (Total)	1.70	7.45
PM ₁₀	1.70	7.45
PM _{2.5}	1.70	7.45
SOx	0.03	0.12
VOC	0.18 0.16	0.78 0.72
HAP	0.05	0.22
NH ₃	0.02	0.08

3. The emissions of Radium-226 and Radium-228 from the leachate evaporation system shall not equal or exceed the Nuclear Regulatory Commission's (NRC) air discharge limits of 10 CFR Part 20, Appendix B, Table 2.
4. Compliance with 10 CFR 20, Subpart D- *Radiation Dose Limits for Individual Members of the Public* shall be demonstrated by determining the total effective dose equivalent

and comparing against the annual dose limit in 10 CFR §20.1301 for each of the six (6) thermoluminescent dosimeter TLD radiation measure devices.

5. **Visible emissions from the Leachate Evaporation System (Source ID 113) stack shall not exceed 10% at any time. [25 Pa. Code §127.12b]**

TESTING REQUIREMENTS

1. (a) The permittee shall conduct ~~weekly~~ **monthly** sampling of the ~~landfill wastewater~~ **leachate** prior to the hydrocarbon recovery unit (**prior to the pre-treatment unit**) and post hydrocarbon recovery (**post pre-treatment unit**) for VOC, Total Suspended Solids (TSS), Total Dissolved Solids (TDS), **Gross Alpha, Gross Beta, Radium-226, Radium-228,** Sulfur Compounds, and HAP Metals (**Antimony (Sb), Arsenic (As), Beryllium (Be), Cadmium (Cd), Chromium (Cr), Cobalt (Co), Lead (Pb), Manganese (Mn), Mercury (Hg), Nickel (Ni), and Selenium (Se)**) concentration. **The analysis shall be able to detect to a level adequate to demonstrate compliance with the emission limits and the NRC's air discharge limits of 10 CFR Part 20, Appendix B.** ~~After the first quarter of sampling, if all weekly results are within 10% of each other, the facility may proceed to monthly sampling for VOC, TDS, Sulfur Compounds, and HAP concentration. Any change in the frequency of sampling shall be approved by the Department in writing prior to implementation by the permittee. [25 Pa. Code §127.12b]~~

(b) The permittee shall submit a leachate sampling and analysis protocol to the Department for review within 30 days of plan approval issuance to be approved by the Department in writing prior to sampling. The Heartland Water Technology, LM-HT Concentrator, Evaporator and Entrainment Separator (Source ID 113) shall not commence initial operation until the owner/operator receives all analytical results from initial leachate sampling event and the analytical results are received by the Department. [25 Pa. Code §127.12b]

(c) Within 180 days after initial startup, or on an alternative schedule as approved by the Department **in writing**, and at a minimum of once every five years thereafter, the permittee shall conduct EPA reference method stack testing for NO_x, CO, SO₂, VOC, **Dioxins/Furans EPA Reference Method 23,** and HAP Metals/**EPA Reference Method 29 Metals (Antimony (Sb), Arsenic (As), Beryllium (Be), Cadmium (Cd), Chromium (Cr), Cobalt (Co), Lead (Pb), Manganese (Mn), Mercury (Hg), Nickel (Ni), and Selenium (Se) or alternative test methods as approved by the Department in writing,** in accordance with 25 Pa Code Chapter 139 and applicable EPA reference methods. ~~Water Leachate~~ sampling as specified in part (a) shall be performed during the testing. **The analysis shall be able to detect to a level adequate to demonstrate compliance with the emission limits. The frequency of such subsequent testing may be altered based on the test results and only with prior written approval from the Department.**

(d) Within 180 days after initial startup, or on an alternative schedule as approved by the Department in writing, and at a minimum of once every quarter calendar year thereafter, the permittee shall conduct EPA reference method stack testing for PM₁₀ (filterable and condensable), PM_{2.5} (filterable and condensable), Gross Alpha, Gross Beta, Radium-226, and Radium-228, or alternative test methods as approved by the Department in writing, in accordance with 25 Pa Code Chapter 139 and applicable EPA reference methods. The analysis shall be able to detect to a level adequate to demonstrate compliance with the emission limits and the NRC's air discharge limits of 10 CFR Part 20, Appendix B. The frequency of such subsequent testing may be altered based on the test results and only with prior written approval from the Department [25 Pa. Code §127.12b]

(e) Stack testing shall verify compliance with the NO_x, CO, SO_x, VOC, PM₁₀ (filterable and condensable), and PM_{2.5} (filterable and condensable) emission limitations, as well as filterable solids and hydrocarbon removal efficiency.

~~2. The permittee shall conduct subsequent EPA reference method stack testing for NO_x, CO, SO₂, VOC, PM (filterable and condensable), PM₁₀ (filterable and condensable), and PM_{2.5} (filterable and condensable) no less than once every five years after initial testing. The frequency of such subsequent testing may be altered based on the test results and only with prior written approval from the Department [25 Pa. Code §127.12b].~~

MONITORING REQUIREMENTS

- 3. The permittee shall implement the radiological monitoring and testing plan titled “Westmoreland Sanitary Landfill – Leachate Evaporator Radiological Emissions Monitoring and Test Plan” (Radiological Monitoring Plan) - Revised 9/21 - and any subsequent revisions and/or supplements to the plan that have been approved by the Department in writing.**
- 4. The permittee shall install and operate a minimum of four (4) outdoor perimeter air monitors and six (6) thermoluminescent dosimeter (TLD) radiation measurement devices as presented in the “Westmoreland Sanitary Landfill – Leachate Evaporator Radiological Emissions Monitoring and Test Plan” (Radiological Monitoring Plan) - Revised 9/21. [25 Pa. Code §127.12b]**
- 5. The leachate evaporation system shall operate at an evaporation zone temperature less than or equal to 1,000 degrees F.**
- 6. The permittee shall continuously monitor the temperature of the leachate evaporation system and shall record the temperature hourly, at a minimum, when the source is operating.**

7. **Within 180 days of commencement of operation of the hydrocarbon recovery unit and at a minimum of every five years thereafter, the permittee shall have an audit inspection performed by either the hydrocarbon recovery unit manufacturer and leachate evaporation system manufacturer or an equivalently specialized third-party entity to evaluate the Pentair Hydrocarbon Recovery Unit and Heartland Water Technology, LM-HT Concentrator, Evaporator and Entrainment Separator performance, condition, and maintenance. The resulting audit inspection report shall be made available to the Department upon request.**

RECORDKEEPING REQUIREMENTS

8. The permittee shall maintain the following comprehensive and accurate records [25 Pa. Code §127.12b]:
 - (a) Volumetric flowrate of leachate to the Leachate Evaporation System on a daily, monthly, and 12-month rolling total basis.
 - (b) Hours of operation of the Leachate Evaporation System on a monthly and 12-month rolling total basis.
 - (c) Natural gas fuel consumption on a monthly and 12-month rolling total basis.
 - (d) **Waste heat consumption on a monthly and 12-month rolling total basis;**
 - (e) **Temperature of the Leachate Evaporation System evaporation zone on an hourly basis at a minimum when the source is operating;**
 - (f) The date and detailed description of any maintenance conducted on the Leachate Evaporation System;
 - (g) Records of annual tune-ups/inspections on the burner which shall, at a minimum, include the following:
 - (i) The concentrations of CO and NO_x in the effluent stream in parts per million by volume **and lb/hr equivalent rate**, and oxygen in volume percent, measured at high fire or typical operating load, before and after the tune-up of the burner;
 - (ii) A description of any corrective actions taken as part of the tune-up; and
 - (iii) The date(s) the annual tune-up/inspection was conducted.
 - (h) **Records of weekly air monitoring analytical data;**
 - (i) **Records of quarterly TLD area monitor analytical data;**
 - (j) **Records of monthly leachate sampling results for VOC, TSS, TDS, Gross Alpha, Gross Beta, Radium-226, Radium-228, Sulfur Compounds, and HAP Metals (Antimony (Sb), Arsenic (As), Beryllium (Be), Cadmium (Cd), Chromium (Cr), Cobalt (Co), Lead (Pb), Manganese (Mn), Mercury (Hg), Nickel (Ni), and Selenium (Se));**
 - (k) **Calculations comparing weekly air monitoring results of Radium-226 and Radium-228 to the Nuclear Regulatory Commission's (NRC) air discharge limits of 10 CFR Part 20, Appendix B. and a statement whether weekly air monitoring results are in compliance with the NRC air discharge limits; and**

- (1) **Calculations comparing monthly leachate sampling results for Radium-226 and Radium-228 to the Nuclear Regulatory Commission's (NRC) air discharge limits of 10 CFR Part 20, Appendix B. The calculations shall utilize control efficiencies determined by the initial and quarterly stack testing results for Radium-226 and Radium-228 as applicable.**

REPORTING REQUIREMENTS

9. **The permittee shall submit quarterly reports of the results of onsite radiological air monitoring and stack testing. The results shall include: [25 Pa. Code §127.12b]**
 - **A comparison to the NRC air discharge limits of 10 CFR Part 20, Appendix B for Radium-226 and Radium-228 and a statement as to whether the results are in compliance with the NRC air discharge limits;**
 - **A comparison to the NRC rule of unity and a statement as to whether the results are in compliance with the NRC rule of unity; and**
 - **An ongoing list comparing NRC rule of unity values to past values.**
10. **The permittee shall submit initial leachate sampling results to the Department within seven (7) days of receipt. Subsequent leachate sampling results shall be submitted to the Department monthly.**

WORK PRACTICE REQUIREMENTS

11. **If, at any time, the results from the radiological air monitoring and stack testing analyses indicate exceedance of NRC air discharge limits of 10 CFR Part 20, Appendix B or the limits of 10 CFR Part 20, Subpart D, the facility shall shutdown operation of the leachate evaporator and immediately notify the Department. [25 Pa. Code §127.12b]**