

Introduction

Westmoreland Sanitary Landfill (WSL) is currently utilizing a mobile CNG fueling station at the facility to fill up waste hauling vehicles owned and operated by WSL. The CNG mobile unit began operation in May 2020. The system will be utilized on a temporary basis until a permanent CNG station is permitted and constructed on an adjacent property of the landfill under a separate entity. The mobile CNG unit utilizes purchased natural gas from Peoples and converts the purchased natural gas into a usable CNG product. The following sections present a description of the mobile equipment, estimated emission from operation of the equipment, and a summary of applicability under RFD Exemption 33.

CNG Mobile Fueling Station

The CNG mobile fueling station is located just south of the existing gas plant at the WSL facility within the permitted facility boundary as shown on the Site Layout (Fig-1) included with this narrative. The mobile fueling trailer, model IMW50, was provided by IMW Industries, a subsidiary of Clean Energy Fuels Corp. The IMW50 trailer utilizes purchased natural gas from Peoples Gas company. The WSL facility previously installed two pipelines from the gas plant to a connection to Peoples along the northwestern limits of the facility. An 8-inch pipeline was installed to transmit processed landfill gas from the gas plant to Peoples and a 6-inch pipeline was installed to transmit purchased natural gas from Peoples to the WSL facility. The 6-inch natural gas line is connected to the Peoples natural gas line upstream of the 8-inch landfill gas line. A temporary 3-inch line was installed to route purchased natural gas from the 6-inch line to the mobile CNG unit. The location of the CNG unit, the 8-inch landfill gas line, the 6-in natural gas line and the 3-inch temporary natural gas line which provides natural gas to the CNG unit are all shown on the Plan View drawing (Fig-2) included in Attachment 1 with this Narrative.

The IMW50 fueling station is a fully enclosed trailer that includes a CNG compressor, compressed air storage bottles, a CNG recirculation tank and dispensing system, making it a fully operable mobile unit. A product sheet from the manufacturer is included as Attachment 2 with this Narrative.

The mobile fueling station is being used on a temporary basis until a longer-term CNG facility is permitted and constructed. The longer-term facility is being proposed on a property adjacent to the landfill under a separate entity. Currently, the project is working towards obtaining local permits and an NPDES permit. Air permitting will be pursued in the near future, prior to construction. It is currently estimated the temporary mobile unit will be utilized through Fall 2022.

Air Emissions Estimates

As described throughout this Narrative, the CNG station is a mobile and enclosed system. The equipment within the enclosed system includes an electric compressor and a recirculation tank. The recirculation tank is used to capture any CNG within the fueling lines after a truck is fueled and recirculate it to minimize waste and emissions. A set of calculations has been prepared to estimate potential emission from the mobile CNG filling operations and is included as

Attachment 3 with this Narrative.

The following conservative assumptions were utilized in the calculations.

- Total CNG Trucks Owned / Operated by WSL: 30 to 40 Trucks
- Total Truck Refueling Events Per Day: 2 Refueling Events
- Average Fuel Per Refueling Event: 9 Gasoline Gallon Equivalent (GGE)

Therefore, each day the maximum fuel to dispensed through the mobile CNG unit on a given operating day is approximately (40 trucks x 2 events x 9 GGE) 720-GGE or 91,200 SCF. Utilizing these conservative assumptions, the estimated potential emissions for from the mobile CNG unit are as follows.

From the Fugitive Emission Calculation included in Attachment 3, the following potential emissions could be expected from fueling operations:

Methane and Ethane = **1.89-tons/year**
VOC's = **0.0051-tons/year**
Nitrogen = **0.0095-tons/year**
Carbon Dioxide = **0.0057-tons/year**
Hydrogen = **0.0004-tons/year**

Exemption Criteria

WSL is requesting the CNG mobile fueling station be exempt from Plan Approval Requirements under Exemption 33.b – Compressed Natural Gas Dispensing Facilities as follows.

33. b. Compressed natural gas dispensing facilities meeting the following requirements.

- i. Combined NO_x emissions from the stationary internal combustion engines at a facility less than 100 lbs/hr, 1000 lbs/day, 2.75 tons per ozone season (the period beginning May 1 of each year and ending on September 30 of the same year) and 6.6 tons per year on a 12-month rolling basis. The emissions criteria do not include emissions from sources which are approved by the Department in plan approvals, general plan approval/general operating permits or emissions from sources at the facility approved under Category No. 33a.

As described throughout this Narrative and the information presented in the Attachments, the mobile CNG fueling station is an enclosed system that utilizes electric power compressors and pumps. No internal combustion engines are utilized with this system.

- ii. Combined VOC emissions from all the sources at the facility less than 2.7 tons on a 12-month rolling basis. If the VOCs include HAPs, the HAP exemption criteria in this

paragraph must be met. Compliance with this criterion will be determined using any generally accepted model or calculation methodology. Combined HAP emissions [not including Polychlorinated Biphenyls (PCBs), Chromium (Cr), Mercury (Hg), Lead (Pb), Polycyclic Organic Matter (POM), Dioxins and Furans] at the facility less than 1000 lbs. of a single HAP or one ton of a combination of HAPs in any consecutive 12-month period. The emissions criteria do not include emissions from sources which are approved by the Department in plan approvals, general plan approval/general operating permits, or emissions from sources approved under Category No. 33a. at the facility.

As described throughout this Narrative and the information presented in the Attachments, the mobile CNG fueling station is an enclosed system that utilizes electric power compressors and pumps. A set of conservative calculations were prepared and are included in Attachment 3 to estimate potential fugitive and refueling emissions.

From the Fugitive Emission Calculation included in Attachment 3, the following potential emissions could be expected from fueling operations:

Methane and Ethane = 1.89-tons/year
VOC's = 0.0051-tons/year
Nitrogen = 0.0095-tons/year
Carbon Dioxide = 0.0057-tons/year
Hydrogen = 0.0004-tons/year

- iii. The owner or operator of the compressed natural gas fueling station will annually perform a leak detection and repair (LDAR) program that includes either the use of an optical gas imaging camera such as a FLIR camera or a gas leak detector capable of reading methane concentrations in air of 0% to 5% with an accuracy of +/- 0.2% or other leak detection monitoring devices approved by the Department. The LDAR program will be conducted on valves, flanges, connectors, storage vessels/storage tanks, and compressor seals in natural gas or hydrocarbon liquids service. Leaks are to be repaired no later than 15 days after leak detections unless facility shutdowns or ordering of replacement parts are necessary for repair of the leaks. For the storage vessel, any leak detection and repair are to be performed in accordance with 40 CFR Part 60, Subpart OOOO.

A. A leak is considered repaired if one of the following can be demonstrated.

- 1.No detectable emissions consistent with Method 21 specified in 40 CFR Part 60, Appendix A;
- 2.A concentration of 2.5% methane or less using a gas leak detector;
- 3.No visible leak image when using an optical gas imaging camera;
- 4.No bubbling at leak interface using a soap solution bubble test specified in Method 21. A procedure based on the formation of bubbles in a soap

solution that is sprayed on a potential leak source may be used for those sources that do not have continuously moving parts and that do not have a surface temperature greater than the boiling point or less than the freezing point of the soap solution; or

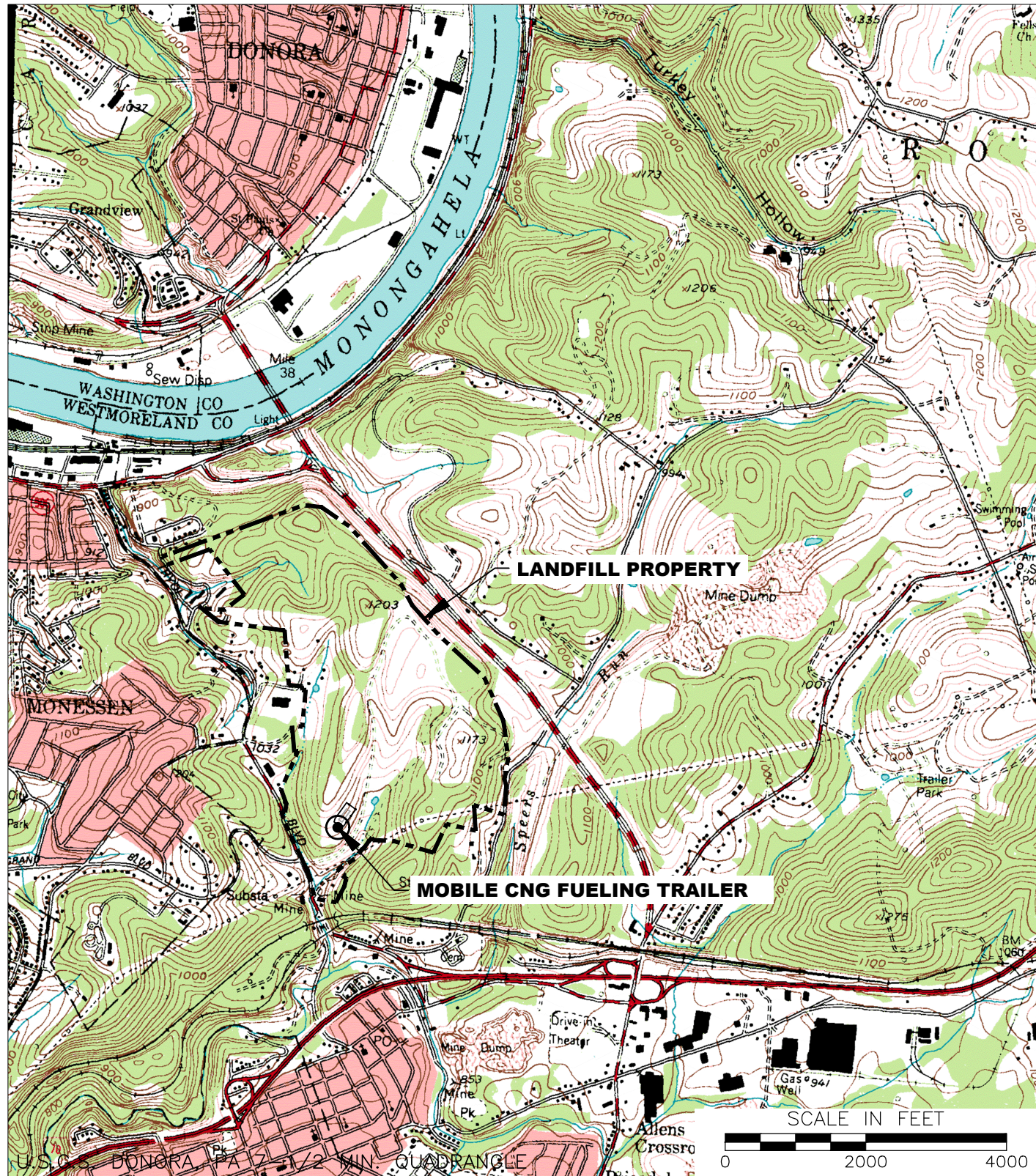
5. Any other method approved by the Department.

- B. Leaks, repair methods and repair delays are to be recorded and those records should be maintained for five years. If a gas leak detector is used, a leak is to be detected by placing the probe inlet at the surface of a component. The Department may grant an extension for leak detection deadlines or repairs upon written request from the owner or operator of the facility documenting the justification for the requested extension.

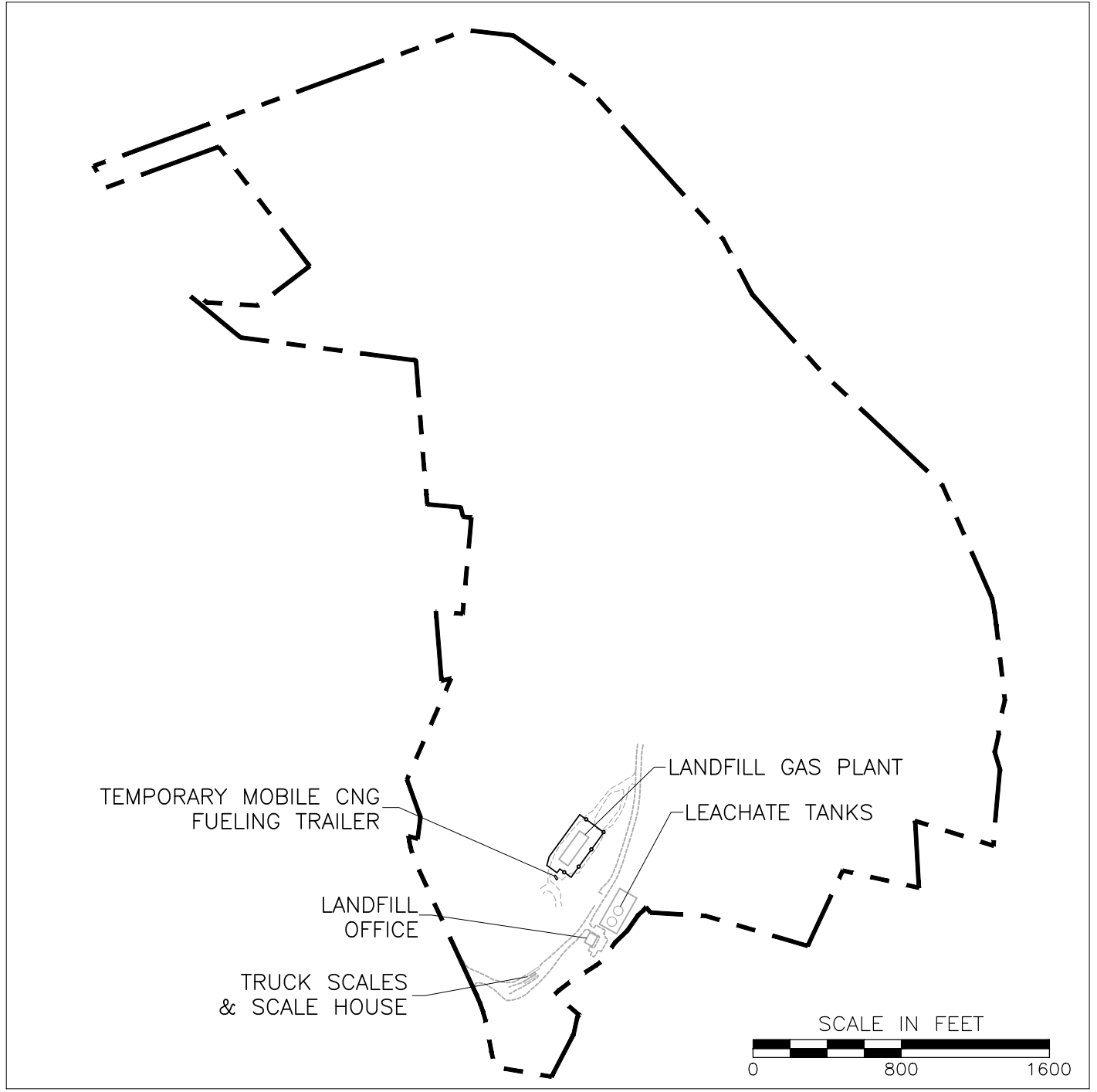
A leak detection and repair (LDAR) program will be performed annually at the facility as outlined under Exemption 33.b, Requirement iii. Records will be maintained onsite for a minimum of 5-years and will be made available upon request.

**WESTMORELAND SANITARY LANDFILL
MOBILE CNG FUELING STATION**

**ATTACHMENT 1
FIGURES**



LOCATION MAP



SITE LAYOUT

DES	SJV	11/24/20
CHECK	SJV	11/24/20
APPROVED	SJV	11/24/20
SCALE	AS NOTED	
ISSUED		

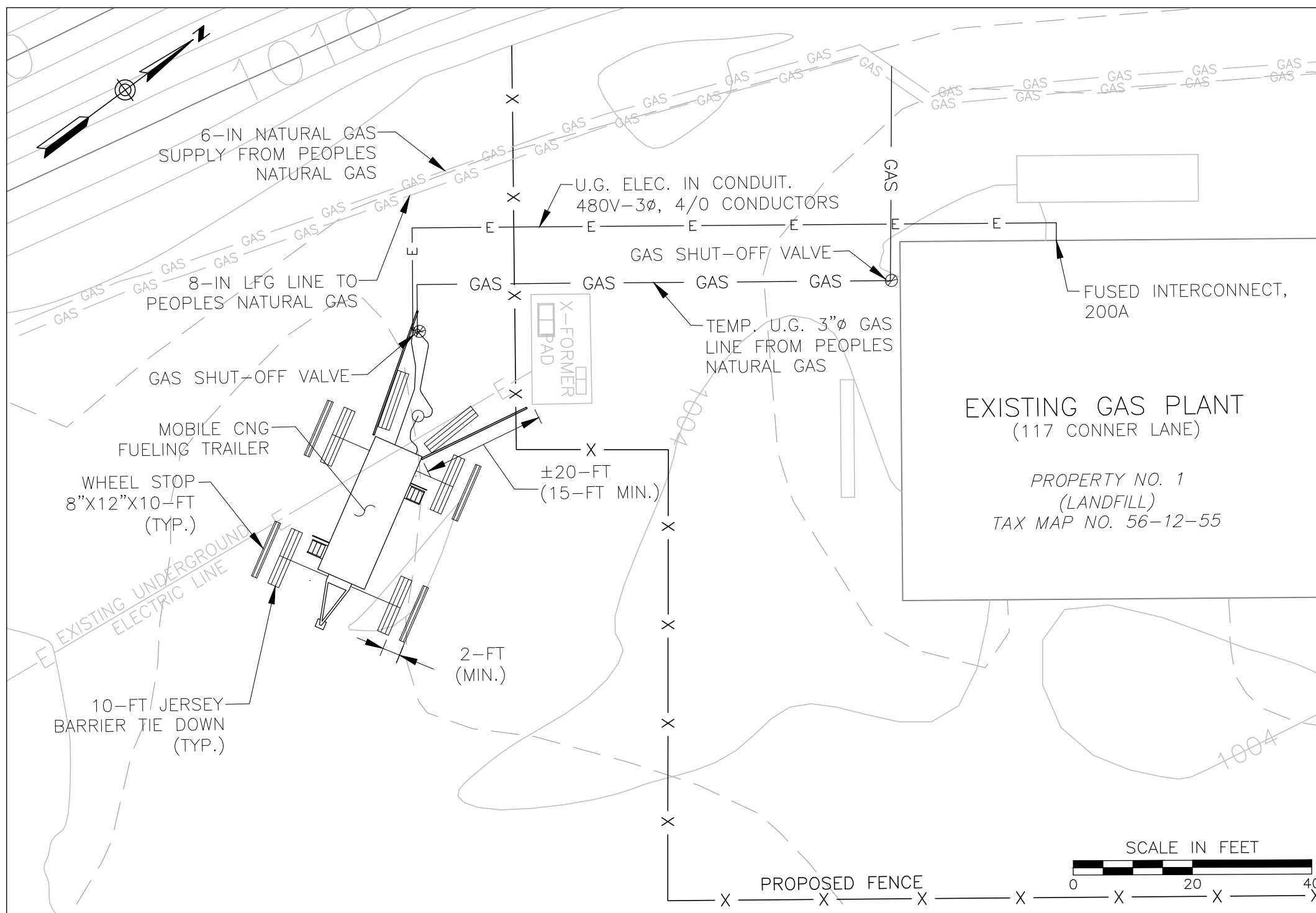
PROJECT: **TEMP. CNG FUELING TRAILER**
 SHEET TITLE:
SITE LAYOUT – TEMP. CNG FUELING TRAILER INSTALLATION

CIVIL DESIGN SOLUTIONS, INC.
 1331 State Avenue • Coraopolis, Pa 15108
 (412) 299-2700 • (412) 299-2922



WESTMORELAND SANITARY LANDFILL, LLC
 111 CONNER LANE
 BELLE VERNON, PA 15012
 ROSTRAVER TOWNSHIP, WESTMORELAND COUNTY

FIGURE:
FIG-1



NOTES:

1. TRAILER GROUNDED TO SITE GROUNDING GRID VIA NO. 2 WIRE. GROUNDING GRID COMPRISED OF 4/0 BARE COPPER.
2. EMERGENCY E-STOP PROVIDED AT TRAILER, 120V CIRCUIT FED FROM UPS BATTERY BACKUP SYSTEM.
3. SEE MOBILE STATION DWG 1 OF 4 FOR JERSEY BARRIOR ANCHORING AND WHEEL STOP PLACEMENT DETAILS.
4. SEE MOBILE STATION DWG. 4 OF 4 FOR REQUIRED CLEARANCES AROUND TRAILER.
5. RIG MATS PROVIDED FOR FOUNDATION PAD.

DES	SJV	11/24/20	PROJECT: TEMP. CNG FUELING TRAILER
CHECK	SJV	11/24/20	
APPROVED	SJV	11/24/20	SHEET TITLE: PLAN VIEW – TEMP. CNG FUELING TRAILER INSTALLATION
SCALE	1" = 20'		
ISSUED			

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FIGURE:
FIG-2

**WESTMORELAND SANITARY LANDFILL
MOBILE CNG FUELING STATION**

**ATTACHMENT 2
MANUFACTURER'S DOCUMENTATION**

IMW50

Mobile CNG fueling system

IMW's mobile CNG fueler includes proven CNG systems in a package that combines ease of mobility with 'plug and play' installation. Each package has an industrial CNG compressor, high-pressure CNG storage, multi-point CNG dispensing, gas controls and electrical controls, all on a unique, purpose-built transport trailer.



Feature	Benefit
IMW50 compressor system onboard	Field-proven model since 1984; very reliable
Non-lubricated cylinder design	Reduces operating and maintenance costs
Low-speed operation	Reduces noise and vibration levels
Variable speed drive (VFD) control for main motor	Reduces wear & maintenance on fueling system
Supply pressure flexibility	Suitable for use at a wide range of sites
Combination time-fill & fast-fill system	Provides flexibility for varying fuel demand
DOT-approved, trailer-mounted package	Reduces regulatory hurdles at site
Compact layout	Reduces tow vehicle capacity requirement
Self-contained fueling system	Minimizes site installation time and cost
	Minimizes site space requirements
System mobility	Shortens wait time for NGV implementation at site
	Simplifies future redeployment

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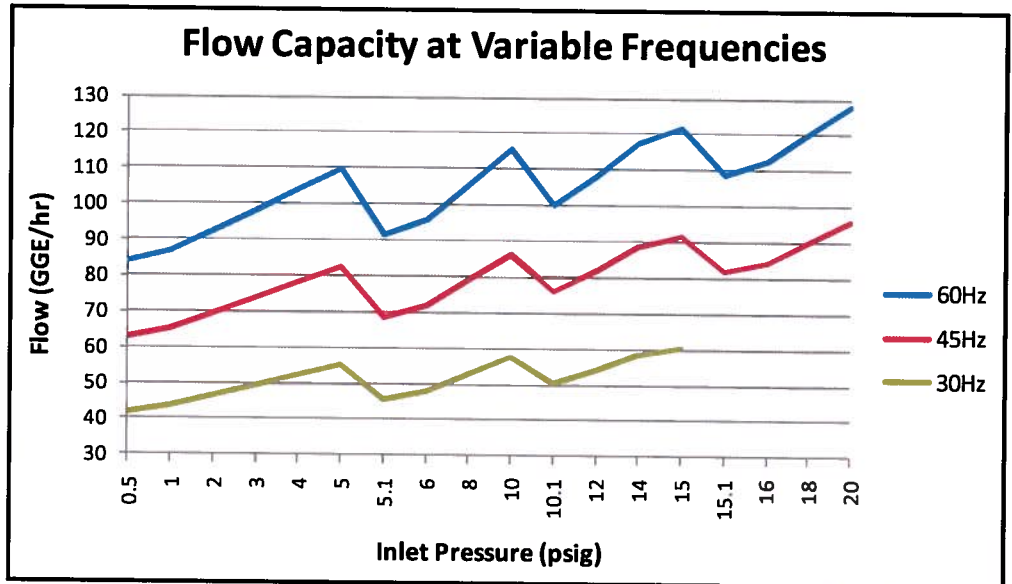
ISO 9001
OMI-SAI Global

IMW50

Mobile CNG Fueling System

Designed for inlet pressures of 0.5 ~ 20 psig and compression to 4500 psig. Each inlet pressure interval, 0~5 psig, 5.1~10 psig, 10.1~15 psig, and 15.1~20 psig, requires a different compressor setup to optimize performance.

CNG dispensing pressure is temperature compensated to 3600 psig (70°F) for time-filling or fast-filling. The IMW50 compressor uses a variable frequency drive (VFD) on the main motor to modulate electrical frequency and change the speed of the compressor. This allows the system to slow-down during low-demand periods and avoid frequent starts and stops, which can increase wear on the compressor.



Mobile Compressor Package Specifications	
Maximum Power	150 HP
Inlet Pressure Range	0.5 - 20 psig
Available Compression Stages	5 stage
Compressor Flow Rate	up to 265 SCFM (127 GGE/hr)
Optional VFD	available
Onboard Storage	buffer (168 WL)
MCC Location	on trailer in electrical room
PLC Location	on trailer in electrical room
Fast-fill Hoses	2 (metered)
Fast-fill flow rate per hose	0.8 - 2.0 GGE/min
Time-fill Hoses	up to 8
External Time-fill Connection	yes
Cooler Fans	horizontal forced draft
Inlet Pressure Regulator	yes
Lighting Location	each filling point
Remote Generator Connection	yes
Walk-in Enclosure	yes



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ISO 9001
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**WESTMORELAND SANITARY LANDFILL
MOBILE CNG FUELING STATION**

**ATTACHMENT 3
EMISSIONS ESTIMATES**

Civil Design Solutions, Inc.

PROJECT	<u>WESTMORELAND SANITARY LANDFILL</u>	PROJECT NO.	<u>2020-147</u>				
	<u>TEMPORARY MOBILE CNG FUELING STATION</u>	PAGE	<u>1</u> OF <u>3</u>				
	<u>CNG FUELING FUGITIVE EMISSIONS CALCULATION</u>						
MADE BY	<u>DTF</u>	DATE	<u>12-Mar-21</u>	CHECKED BY	<u>MEZ</u>	DATE	<u>12-Mar-21</u>

OBJECTIVE

A mobile fueling station is being used on a temporary basis until a longer-term CNG facility is permitted and constructed. The temporary CNG station is a mobile and enclosed system. The equipment within the enclosed system includes an electric compressor and an electric recirculation tank. The recirculation tank is used to capture any CNG within the fueling lines after a truck is fueled and recirculate it to minimize waste and emissions. Potential emissions from the CNG filling are needed to be estimated for the response to PADEP comments for the Request for Determination (RFD) that was originally submitted on January 15, 2021.

ASSUMPTIONS/ REFERENCES

1. Total CNG Trucks Owned / Operated by WSL: 30 to 40 Trucks
2. Total Truck Refueling Events Per Day: 2 Refueling Events.
3. Average Fuel Per Refueling Event: 9 Gasoline Gallon Equivalent (GGE).
4. 1-GGE of CNG is equal to 5.66-lbs (Reference: Wikipedia)

5. Methane and Ethane comprise approximately 98.9% of the CNG, VOC's comprise 0.27% of the CNG and the remaining percentage of CNG consists of Nitrogen (0.5%), Carbon Dioxide (0.3%), Oxygen (0.01%) and Hydrogen (0.02%). (Reference: Enbridge Gas – western Canada, U.S. and Ontario gas producers)

6. From a white paper from the International Council on Clean Transportation (ICCT), dated July 2015, an estimate of the fueling station methane losses from leakage and venting is approximately 0.30%.

7. Parameters associated with the gas interception equation will be estimated based on standard industry practice where site-specific data is not available.

CALCULATIONS

1. Maximum CNG fuel dispensed per year is calculated as follows:
 $40 \text{ trucks} \times 2 \text{ refueling events/day} \times 9 \text{ GGE/ refueling event} = 720\text{-GGE/day}$
 $312\text{-operating days/year} \times 720\text{-GGE} = \mathbf{224,640\text{-GGE/year}}$

2. Maximum CNG fuel leaked/vented per year is calculated as follows:
 $224,640\text{-GGE/year} \times 0.30\% \text{ leaking/venting potential} = 673.92\text{-GGE/year}$

Civil Design Solutions, Inc.

PROJECT	<u>WESTMORELAND SANITARY LANDFILL</u>	PROJECT NO.	<u>2020-147</u>				
	<u>TEMPORARY MOBILE CNG FUELING STATION</u>	PAGE	<u>2</u> OF <u>3</u>				
	<u>CNG FUELING FUGITIVE EMISSIONS CALCULATION</u>						
MADE BY	<u>DTF</u>	DATE	<u>12-Mar-21</u>	CHECKED BY	<u>MEZ</u>	DATE	<u>12-Mar-21</u>

$$673.92\text{-GGE/year} \times 5.66\text{-lbs/GGE} = \mathbf{3,814.39\text{-lbs/year}}$$

3. Quantity of CNG components potentially leaked/vented per year:

Methane and ethane = 98.9% of CNG;

$$3,814.39\text{-lbs/year} \times 98.9\% = 3,772.43\text{-lbs/year} = \mathbf{1.89\text{-tons/year methane/ethane}}$$

VOC's = 0.27% of CNG;

$$3,814.39\text{-lbs/year} \times 0.27\% = 10.30\text{-lbs/year} = \mathbf{0.0051\text{-tons/year VOC's}}$$

Nitrogen = 0.5% of CNG;

$$3,814.39\text{-lbs/year} \times 0.5\% = 19.07\text{-lbs/year} = \mathbf{0.0095\text{-tons/year Nitrogen}}$$

Carbon Dioxide = 0.3% of CNG;

$$3,814.39\text{-lbs/year} \times 0.3\% = 11.44\text{-lbs/year} = \mathbf{0.0057\text{-tons/year Carbon Dioxide}}$$

Hydrogen = 0.02% of CNG;

$$3,814.39\text{-lbs/year} \times 0.02\% = 0.76\text{-lbs/year} = \mathbf{0.0004\text{-tons/year Hydrogen}}$$

SUMMARY/ CONCLUSION

Potential emissions from the CNG filling were estimated for the response to PADEP comments for the Request for Determination (RFD) that was originally submitted on January 15, 2021. From the above calculations, the following potential emissions from the filling of CNG into hauling trucks were calculated and are summarized below:

Methane and Ethane = **1.89-tons/year**

VOC's = **0.0051-tons/year**

Nitrogen = **0.0095-tons/year**

Carbon Dioxide = **0.0057-tons/year**

Hydrogen = **0.0004-tons/year**