



Material Technical Specification	
Biomethane Quality	
Revision: 01	Effective Date: 6/18/2024
Approved: Scott Lundgren	Reviewed: Steiner/DeLucia

1. Scope

This specification establishes the material technical requirements for biomethane that is used in NW Natural’s pipeline system. All biomethane accepted for injection into the NW Natural pipeline system or used in facilities owned and operated by NW Natural shall meet this specification.

Failure to do so may result in rejection of biomethane onto the NW Natural system and/or facilities. Any deviations from this specification must be approved in writing by the NW Natural Engineering Director or a designee.

2. General Requirements

2.1 Definitions

- a. Biomethane – pipeline-quality gas produced from various biomass sources through a biochemical process, such as anaerobic digestion, a type of renewable natural gas (RNG).
- b. Health Protective Constituents: constituents that may impact human health and include two types, carcinogenic and non-carcinogenic.
- c. Pipeline Integrity Protective Constituents: constituents that may impact the pipeline system or end-use equipment.
- d. Action Level: establishes the point at which an immediate shut-off of the Biomethane supply occurs for Parameters in Table 1.

Allowable Level: the maximum value of each Health Protective or Pipeline Integrity Protective Constituents in Table 2 allowed to flow through NW Natural owned and operated facilities.

3. Technical Requirements

3.1 The Biomethane shall also have the following qualitative measures:

- a. The Biomethane shall be commercially free from foreign odors, solid matter, dust, gums, and gum forming constituents, or any other substance which interferes with the intended merchantability of the Biomethane or NW Natural’s ability to properly odorize or causes interference with the proper and safe

operation of the lines, meters, regulators, or other appliances through which it may flow.

- b. Toxic or Hazardous Substance: The Biomethane shall not contain any toxic or hazardous substance in concentrations which, in the normal use of the Biomethane, may be hazardous to health, injurious to pipeline facilities, limit merchantability, or be contrary to applicable government standards.
- c. Biologicals: The Biomethane, including any associated liquids, shall not contain microbiological organisms, active bacteria or bacterial agents at levels that are higher than the natural gas in the existing pipeline system and that are capable of causing or contributing to injury to NW Natural’s pipelines, meters, regulators, or other facilities and appliances through which such Biomethane flows, or interference with the proper operation of NW Natural’s facilities.

Table 1 – Gas Quality Specifications for Continuous Monitoring

Parameters	Unit	Value		Action Level
		Min	Max	
Methane (CH ₄)	%	97.3		< 97.3
Heating Value ^a	BTU ^b /SCF ^c	985	1155	< 985
Wobbe Number	BTU/SCF	1290	1491	N/A
Temperature	°F	35	120	> 120
Carbon Dioxide (CO ₂)	%		2.0	> 2.0
Total Inerts ^d + Oxygen (O ₂)	%		3.0	> 3.0
Oxygen (O ₂)	%		0.20	> 0.20
Hydrogen Sulfide (H ₂ S)	grain/CCF ^e		0.25	> 0.25
Moisture (H ₂ O)	lb/MMSCF ^f		7	> 7
Notes:				
a. Higher Heating Value				
b. British Thermal Unit				
c. Standard Cubic Foot				
d. Includes carbon dioxide and nitrogen				
e. 100 SCF				
f. Million SCF				

Table 2 - Constituent Concentrations for Laboratory Testing

Constituent	Allowable Level	Unit	Landfill	WWTP ^a	Mixed ^{b,c}	LAM ^d
Biomethane Quality Specification ^e			X	X	X	X
Arsenic (As)	0.19	mg/m ³	X	X	(X)	
Copper (Cu)	0.6	mg/m ³	X	X	(X)	
Ammonia (NH ₃)	0.001	%	X	X	X	X
Hydrogen (H ₂)	5	%	X	X	X	X
Mercury (Hg)	0.08	mg/m ³	X	X	(X)	
Siloxanes (Si)	0.1	mg Si/m ³	X	X	(X)	
Chlorine, Total (Cl)	10	mg/m ³	X	X	(X)	
Fluorine, Total (F)	10	mg/m ³	X	X	(X)	
Sulfur, Total (S)	5	grain/CCF ^f	X	X	X	X
<p>Notes:</p> <ul style="list-style-type: none"> a. Wastewater Treatment Plant b. Hybrid Program – Municipal organic waste/industrial grade food waste/mixed organics anaerobic digestion c. (X) denotes constituent testing based upon digester biomass d. Live Animal Manure e. Biomethane Quality Specification is reviewed and approved by NW Natural Engineering and available upon request. f. 100 SCF 						

4. Acceptance Requirements

- 4.1 If any Parameter exceeds the Action Level in Table 1, any Constituent exceeds the Allowable Level in Table 2, or the Biomethane does not have the qualitative measures identified in Section 7, injection may be immediately shut-off to NW Natural owned and operated facilities.
- 4.2 Biomethane injection will resume once all Parameters are within the specified range for the Values identified in Table 1, laboratory results show all Constituents are below the Allowable Level identified in Table 2, the Biomethane has the qualitative measures identified in Section 7, and all specified requirements per the signed Interconnect Agreement are satisfied.

5. References

The quality specifications, constituent concentrations, and testing parameters and frequencies were based on guidance from current standards, tariffs, and industry practices and publications including, but not limited to, references listed in this article.

- 5.1 NW Natural Biomethane RNG Specification and Guidance Document for Safe Introduction to the Pipeline Network, June 2024
- 5.2 Northwest Pipeline LLC FERC Gas Tariff