



## **Northern Natural Gas Operating Guidelines Biomethane Receipts 8/7/2017**

### **GENERAL**

Pursuant to Section 44 of the General Terms and Conditions of Northern Natural Gas Company's Federal Energy Regulatory Commission Gas Tariff, all gas to be received into the Northern pipeline system shall conform to the specifications listed. Specification 44(a) states that the "gas shall be commercially free from objectionable odors, solid matter, dust, gums and gum forming constituents, or any other substance, which might interfere with the merchantability of the gas, or cause injury to or interference with proper operation of the lines, meters, regulators, or other appliances through which it flows." Accordingly, the following operational procedure provides actions required for the acceptance of biomethane gas into Northern's system and the actions required when biomethane gas receipts ("Receipt Gas") exceed certain levels of constituents, listed in the tables below, that would render the gas unmerchantable. The constituents are dependent upon the type of biomethane production. The three types of biomethane production are (1) landfill, (2) sewage treatment, and (3) dairies or feedlots.

#### **A. Landfill Receipt and Sewage Plant Receipt**

The operator of the receipt point shall demonstrate, before gas flow starts or resumes into Northern's pipeline system, that the Receipt Gas is merchantable and meets the gas quality specifications required by Northern's Tariff by providing test results from a reputable analytical laboratory approved by Northern ("Approved Laboratory").

Northern Natural Gas Company prohibits biomethane from a landfill containing hazardous waste, as defined in 40 CFR 261.3, from being injected into its pipeline system.

The operator of a receipt point shall not knowingly supply or cause to supply biomethane from a landfill containing hazardous waste. It is the responsibility of the operator of a landfill receipt point to disclose whether the landfill is a site of hazardous waste, has ever been a site of hazardous waste, contains hazardous waste, or ever accepted hazardous waste. The operator of the landfill receipt point shall demonstrate verification from an approved company that biomethane does not originate from hazardous waste before gas flows into Northern Natural Gas' pipeline system.

The operator of a receipt point with any source of merchantable biomethane from a landfill will be required to provide documentation in the form of an environmental due diligence assessment prior to the execution of an interconnect agreement. The cost of the assessment is to be paid by the biomethane producer.

##### **1. Verification Phase**

Prior to the initial delivery of Receipt Gas into Northern's pipeline, the operator of the receipt point must provide Northern with test results from a sample of the Receipt Gas each week for one month from an Approved Laboratory ("Verification Phase"). These samples must be verified by Northern and must identify an acceptable level for each of the constituents listed in the appropriate table below for landfill receipts or sewage plant receipts before Receipt Gas will be allowed into Northern's system.

##### **2. Monitoring Period One**

After successfully completing the Verification Phase, the operator will enter into Monitoring Period One during which Northern will take continuous recordings from its installed chromatographs to verify the Receipt Gas meets the gas quality specifications in Northern's Tariff. In addition, the operator will provide Northern with monthly test results from an Approved Laboratory of an analysis of the Receipt Gas for the constituents listed in the appropriate table below for each of the next 18 months ("Monitoring Period One"). If at any time Northern's chromatograph recordings or the laboratory test results indicate the Receipt Gas quality does not meet Northern's Tariff specifications or any of the constituent tolerance levels indicated in the appropriate table below, the Receipt Gas will be shut-in and the operator will be required to repeat the Verification Phase and Monitoring Period One testing protocols.



### 3. Monitoring Period Two

After successfully completing the Verification Phase and Monitoring Period One, the operator will enter into Monitoring Period Two during which Northern will continue to take continuous recordings from its installed chromatographs to verify the Receipt Gas meets the gas quality specifications in Northern’s Tariff. In addition, the operator will provide Northern with bi-monthly test results from an Approved Laboratory of an analysis of the Receipt Gas for the constituents listed in the appropriate table below for the next 18-month period (“Monitoring Period Two”). If at any time Northern’s chromatograph recordings or the laboratory test results indicate the Receipt Gas quality does not meet Northern’s Tariff specifications or any of the constituent tolerance levels as indicated in the appropriate table below, the Receipt Gas will be shut-in and the operator will be required to repeat the Verification Phase, Monitoring Period One and Monitoring Period Two testing protocols.

### 4. Monitoring Period Three

After successfully completing the Verification Phase, Monitoring Period One, and Monitoring Period Two, the operator will enter into Monitoring Period Three during which Northern will continue to take continuous recordings from its installed chromatographs. In addition, the operator will provide Northern with quarterly test results from an Approved Laboratory of an analysis of the Receipt Gas for the constituents listed in the appropriate table below for as long as the plant is in operation (Monitoring Period Three”). If at any time Northern’s chromatograph recordings or the laboratory test results indicate the Receipt Gas quality does not meet Northern’s Tariff specifications or any of the constituent tolerance levels listed in the appropriate table below, the Receipt Gas will be shut-in and the operator will be required to repeat the Verification Phase, Monitoring Period One, Monitoring Period Two and Monitoring Period Three testing protocols.

#### Constituents for Landfill Biomethane

Constituent	Tolerance Level
Arsenic	0.06 parts per million
p-Dichlorobenzene	9.5 parts per million
Ethylbenzene	60 parts per million
n-Nitroso-di-n-propylamine	0.06 parts per million
Vinyl Chloride	3.3 parts per million
Antimony	1.2 parts per million
Copper	0.23 parts per million
Hydrogen Sulfide	4 parts per million
Lead	0.09 parts per million
Methacrolein	3.7 parts per million
Alky thiols (Mercaptans)	120 parts per million
Toluene	2,400 parts per million
Ammonia	10 parts per million
Hydrogen	1,000 parts per million
Biologicals	4 times 10 to the fourth per standard cubic foot and free of <0.2 micron filter
Mercury	0.00008 parts per million
Siloxanes	1 part per million



Constituents for Sewage Biomethane

Constituent	Tolerance Level
p-Dichlorobenzene	9.5 parts per million
Ethylbenzene	60 parts per million
Vinyl Chloride	3.3 parts per million
Hydrogen Sulfide	4 parts per million
Alky Thiols (Mercaptans)	120 parts per million
Toluene	2,400 parts per million
Ammonia	10 parts per million
Hydrogen	1,000 parts per million
Biologicals	4 times 10 to the fourth per standard cubic foot and free of <0.2 micron filter
Mercury	0.00008 parts per million
Siloxanes	1 part per million

**B. Dairies and Feedlot Biomethane**

The operator of the receipt point shall demonstrate that the Receipt Gas is merchantable and meets the gas quality specifications as required by Northern's Tariff. Prior to the initial delivery of Receipt Gas into Northern's pipeline, the operator of the receipt point must provide Northern with test results from a sample of the Receipt Gas from an Approved Laboratory. The sample must be verified by Northern and an analysis of the Receipt Gas must demonstrate an acceptable level for each of the constituents listed in the table below before Receipt Gas will be allowed into Northern's system ("Initial Test").

1. Monitoring Period One

After successful completion of the Initial Test, the operator will enter into Monitoring Period One during which Northern will take continuous recordings from its installed chromatographs to verify the Receipt Gas meets the gas quality specifications in Northern's Tariff. In addition, the operator will be required to provide Northern with test results of an analysis of the Receipt Gas from an Approved Laboratory every three months for the next 12-month period; the analysis must test for the constituents listed in the table below ("Monitoring Period One"). If at any time Northern's chromatograph recordings or the laboratory test results indicate the Receipt Gas quality does not meet Northern's Tariff specifications or the constituents' tolerance levels as indicated in the table below, the Receipt Gas will be shut-in and the operator will be required to repeat the Monitoring Period One testing protocol.

2. Monitoring Period Two

After successfully completing Monitoring Period One, the operator will enter into Monitoring Period Two during which Northern will continue to take continuous recordings from its installed chromatographs to verify the Receipt Gas meets the gas quality specifications in Northern's Tariff. In addition, the operator will be required to provide Northern with semi-annual test results from an Approved Laboratory of the Receipt Gas for levels of constituents, as listed in the appropriate table below, for as long as the plant is in operation ("Monitoring Period Two"). If at any time Northern's chromatograph recordings or the laboratory test results indicate the Receipt Gas quality does not meet Northern's Tariff specifications or the constituents' tolerance levels as indicated in the table below, the Receipt Gas will be shut-in and the operator will be required to repeat the Monitoring Period One and Monitoring Period Two testing protocols.



Dairies/Feedlots Biomethane

Constituent	Tolerance Level
Ethylbenzene	60 parts per million
Hydrogen Sulfide	4 parts per million
Alky Thiols (Mercaptans)	120 parts per million
Toluene	2,400 parts per million
Ammonia	10 parts per million
Hydrogen	1,000 parts per million
Biologicals	4 times 10 to the fourth per standard cubic foot and free of <0.2 micron filter

**C. Miscellaneous**

1. Northern shall have the right to share test results provided by the operator with appropriate interested parties downstream of the receipt point of the Receipt Gas and potential shippers.
2. These guidelines will be included by reference in any Interconnect and Operating Agreement for a biomethane receipt point.
3. These guidelines may be revised from time-to-time based at Northern's sole discretion.