

## **GAS QUALITY STANDARDS FOR RENEWABLE GAS**

These Gas Quality Standards set forth the terms and conditions under which Company will accept Renewable Gas onto its system and pursuant to which it will continue to accept and redeliver such gas to Customers receiving service from Company. The terms of these Gas Quality Standards may be modified from time-to-time, with the approval of the Commission, based upon Company's actual operating experience with Renewable Gas and/or any threats to Company's ability to provide safe, reliable, and economic natural gas service to the public.

For purposes of these Gas Quality Standards, "Renewable Gas" shall mean gas capable of combustion in customer appliances or facilities which is similar in heat content and chemical characteristics to natural gas produced from traditional underground well sources and which is intended to act as a substitute or replacement for natural gas. Renewable Gas shall include but not be limited to biogas, biomethane, and landfill gas, as well as any other type of natural gas equivalent produced or manufactured from sources other than traditional underground well sources. For purposes of the application of Company's Rate Schedules and Service Regulations, Renewable Gas shall be treated in a manner equivalent to "Gas" (as that term is defined in the Service Regulations) except to the extent that these Gas Quality Standards specify more restrictive obligations applicable to Renewable Gas, in which case the provisions of these Gas Quality Standards shall control.

### **Receipt of Renewable Gas**

Company's obligation to receive and accept Renewable Gas shall be limited as set forth below and to situations where Company is able to physically receive the Renewable Gas into its system without materially impacting its ability to provide service to Customers, meet its legal, contractual, and regulatory obligations, or safely and reliably operate its system. Construction of facilities needed to receive and accept Renewable Gas shall be governed by Company's standard feasibility analyses and Company shall have no obligation to construct economically infeasible facilities to enable receipt of Renewable Gas. Company may require prospective suppliers of Renewable Gas to enter into interconnection and facilities reimbursement agreements, as discussed below, as a condition to receipt and acceptance of Renewable Gas.

### **Testing Requirements**

**Initial Testing.** Prior to the initial receipt of Renewable Gas by Company, any supplier thereof shall provide the results of an independent laboratory test demonstrating that supplier's Renewable Gas is in conformance with the Gas Quality Standards set forth herein. Supplier shall also provide Company with the results of an additional laboratory test on a second sample of its Renewable Gas taken at least seven (but no more than fourteen) days after the initial test sample, confirming the continuing conformance of supplier's Renewable Gas with the standards set forth herein. After the initial receipt of Renewable Gas by Company, any supplier thereof shall provide the results of three consecutive independent laboratory tests, performed no less than thirty days (or more than 45 days) apart, demonstrating that supplier's Renewable Gas is in conformance with the Gas Quality Standards set forth herein. Such testing shall be performed by an independent third-party laboratory satisfactory to Company at supplier's sole cost and expense.

**Subsequent Testing.** If receipt of supplier's Renewable Gas is interrupted or suspended by Company pursuant to the terms hereof, then prior to resumption of acceptance of deliveries of Renewable Gas from such supplier, and at the reasonable discretion of Company, that supplier may be required to provide the results of an independent laboratory test, demonstrating that supplier's Renewable Gas continues to be or has been restored to be in conformance with the Gas Quality Standards set forth herein. If such subsequent independent laboratory testing is required by Company, Supplier shall also provide Company with the results of an additional laboratory test on its Renewable Gas conducted within seven days of the initial test, confirming the conformance of supplier's Renewable Gas with the standards set forth herein. These provisions for Subsequent Testing shall not apply to (i) simple disruptions in the flow or production of Renewable Gas that occur in the normal course of supplier's business operations and which do not otherwise involve circumstances that would authorize Company to curtail the receipt of such supplies hereunder, or (ii) to non-material and/or incidental deviations from the specific Renewable Gas Quality Standards set forth below related to Temperature, Methane Content, CHDP, Nitrogen, Oxygen, Carbon Monoxide, Total Inerts, Heating Value, Interchangeability, Total Sulfur, Carbon Dioxide, Water, or Hydrogen Sulfide, so long as any such deviations are not recurring in nature and do not pose a threat to Company's equipment or facilities, the equipment or facilities of Customers, or to Company's ability to provide continuous, safe, and reliable service to the public.

**Quarterly Testing.** In addition to the other testing requirements set forth herein, and on no less than a quarterly basis, supplier shall provide to Company the results from independent laboratory testing, satisfactory to Company and at supplier's sole cost and expense, demonstrating that supplier's Renewable Gas continues to conform to the Gas Quality Standards set forth herein. Company may waive the quarterly testing requirement if, in the reasonable exercise of Company's discretion, it concludes that the percentage of Renewable Gas to be received at a specific interconnect

point is immaterial in relation to the amount of geologic natural gas flowing through Company's system at that point such that the receipt of Renewable Gas at that point will not have a detrimental impact on Company's system, its operations, or services provided to Customers.

**Supplemental Testing.** Company reserves the right to request supplier, at supplier's sole expense, to perform additional testing for constituent or contaminant compounds in addition to those expressly listed herein, should (i) the presence of such compounds be determined by Company to be reasonably possible in supplier's Renewable Gas stream, and (ii) should such constituents or compounds pose an actual or prospective threat to Company's system or the provision of safe and reliable natural gas service to Customers.

**Renewable Gas Source.** In the event a supplier flowing Renewable Gas onto Company's system determines to alter its source of production of Renewable Gas or to take action that might otherwise be expected to change the characteristics or constituent components of its gas stream, supplier shall promptly notify Company, in advance, of such prospective change and Company shall have no obligation to receive Renewable Gas from such supplier until it has been provided with the results of two consecutive independent laboratory tests, performed no less than seven days apart, demonstrating that supplier's modified Renewable Gas is in conformance with the Gas Quality Standards set forth herein. Such testing shall be performed by an independent third-party laboratory satisfactory to Company at supplier's sole cost and expense.

With regard to any of the testing provided for above, Company shall be provided reasonable advance notice of such testing and shall have the right to observe the samples being taken. Test results shall be promptly shared between Company and supplier upon receipt of such results from the testing laboratory. With regard to any of the testing provided for above, and upon request of a supplier and in the reasonable exercise of Company's discretion, Company will waive the requirement for laboratory testing for one or more constituent components, on a not unduly discriminatory basis, where certified field testing equipment satisfactory to Company is available to test for those components.

The Renewable Gas testing requirements set forth above shall include tests for and reportable levels of each of the constituent elements set forth below. To the extent that two consecutive laboratory tests demonstrate non-detectable levels of one or more of the constituent compounds set out below from a supplier's Renewable Gas stream at a specific interconnect point, Company will consider, in the reasonable exercise of its discretion, written requests for waiver of the requirement to continue testing for such constituent compounds at that specific interconnect point. Company may grant or deny such petition in the reasonable exercise of its discretion subject only to the requirement that any decision to deny a petition for a waiver or to revoke a waiver once granted shall state the basis for the decision in sufficient detail to facilitate further discussions and/or review of the decision by the Commission. Any such waiver shall be revocable in the reasonable exercise of Company's discretion subject to the requirements of the foregoing sentence.

#### **Renewable Gas Quality Standards**

All Renewable Gas delivered to Company shall fully comply with the quality standards and specifications set forth below.

Renewable Gas delivered to Company shall be free of components which might interfere with its merchantability or cause damage to the operation of Company's system or equipment or those of Customers. All such Renewable Gas delivered to Company shall specifically conform to the following minimum Gas Quality Standards:

**Delivery Temperature:** Minimum of 40°F and maximum of 120°F.

**Methane:** Minimum methane content of 94%.

**Heating Value:** Between 980 and 1100 Btu/SCF at dry gas conditions (14.73 psia at 60°F).

**Interchangeability:** All Renewable Gas delivered by any single supplier thereof shall fall within a WOBBE range of 1290 to 1370.

**Hydrogen Sulfide (H<sub>2</sub>S):** Less than or equal to 0.25 grain/100 SCF.

**Mercaptan:** Shall not exceed 0.5 grain/100 SCF.

**Total Sulfur:** Less than or equal to 10 grain/100 SCF, including sulfur from hydrogen sulfide and mercaptan.

**Water:** Less than or equal to 7 pounds/MMSCF at dry gas conditions (14.73 psia at 60°F).

**CHDP:** Not greater than 20°F.

**Carbon Dioxide (CO<sub>2</sub>):** Not more than 2% by volumetric basis.

**Nitrogen:** Not more than 2% by volumetric basis.

**Oxygen:** Not more than 0.2% by volumetric basis.

**Carbon Monoxide (CO):** Not more than 0.1% by volume.

**Total Inerts:** Not more than 3.2% by volumetric basis. For purposes of this provision, Total Inerts are defined as Oxygen, Nitrogen, and Carbon Dioxide.

**Hydrogen:** No more than 600 ppm.

**Solid Particle Size:** Gas filtration is required and shall be sufficient to remove 99.99% of solid particles 3 microns or larger.

**Dust, Gums & Solid Matter:** The gas shall be free of dust, gums, gum-forming constituents, or other liquid or solid matter which might become separated from the gas in the course of transportation through pipelines.

**Biologicals:** Gas, including any associated liquids, shall not contain any micro-biological organisms exceeding 4 x 10<sup>4</sup>/scf (qPCR per APB, SRB, IOB group), active bacteria or bacterial agents > 0.2 microns.

**Organic Silicon (Siloxanes):** Total Organic Silicon (siloxanes) shall not be greater than 0.40 mg of Si/Nm<sup>3</sup>.

**Odorization Masking/Fading Agents (VOC):** Gas shall be free of agents, compounds, or the like which will interfere with the process of the human olfactory process in the recognition of odorized natural gas through bonding with the odorant or causing interference with the human olfactory senses.

**VOC:** Renewable Gas shall be free from any halogenated compounds that when, through the process of combustion, form dioxins.

**The following Constituents of Concern shall be limited as indicated:**

| Constituent                | Limit mg/m <sup>3</sup> (ppmv) |
|----------------------------|--------------------------------|
| Arsenic                    | 0.48 (0.15)                    |
| p-Dichlorobenzene          | 140 (24)                       |
| Ethylbenzene               | 650 (150)                      |
| n-Nitroso-di-n-propylamine | 0.81 (0.15)                    |
| Vinyl Chloride             | 21 (8.3)                       |
| Antimony                   | 30 (6.1)                       |
| Copper                     | 3.0 (1.2)                      |
| Lead                       | 3.8 (0.44)                     |
| Methacrolein               | 53 (18)                        |
| Alkyl thiols (mercaptans)  | N/A (610)                      |
| Toluene                    | 45,000 (12,000)                |

If additional equipment is required to ensure consistent compliance of supplier's Renewable Gas to the Gas Quality Standards set forth above, Company may require supplier to purchase, and promptly install, any additional equipment necessary to meet the referenced gas quality specifications at supplier's expense. The unreasonable refusal to do so shall be a violation of supplier's obligations hereunder.

**Termination of Obligation to Receive Gas**

Except as otherwise provided below, if Renewable Gas proffered for delivery to Company fails to meet the specifications of the Gas Quality Standards set forth herein, or is otherwise out of conformance with the provisions of these Gas Quality Standards, Company may interrupt or suspend its receipt and acceptance of such Renewable Gas until such Renewable Gas is in conformity with these Gas Quality Standards and such conformity is verified by an independent certified third-party laboratory satisfactory to Company as provided above; except in circumstances where field testing for such compliance is permitted under the provisions of Subsequent Testing set forth above. Notwithstanding Company's right to terminate its receipt of Renewable Gas for non-compliance with the Gas Quality Standards set forth herein, Company will not terminate such receipt for minor non-compliance with such standards applicable to the

enumerated constituent component measurements of a producer's Renewable Gas stream listed under Subsequent Testing above (except Temperature), where:

- (a) Such constituent components can be measured in real time by field equipment operated or monitored by Company;
- (b) Variances for one or more of the constituent component measurements listed under Subsequent Testing (except Temperature) do not exceed standards by more than ten percent (10%);
- (c) Variances for one or more of the constituent component measurements listed under Subsequent Testing (except Temperature) do not exceed four hours in duration; and
- (d) No operational problems or continuity of service issues are created for Company by the variance, as determined in the reasonable exercise of Company's discretion.

Company shall provide electronic notice to any producer of variations from standards found in such producer's Renewable Gas stream. The four-hour limit on the duration of any variances for the constituent component measurements identified above (except Temperature) shall commence upon the issuance of such notice.

Company shall also have the right to interrupt or suspend the receipt of Renewable Gas at any time from any supplier in the event that: (i) constituent compounds or components of supplier's Renewable Gas are determined to pose an actual or potential health risk to the public or to Company's employees that is different in degree or nature from the risks normally attendant upon the use and transportation of natural gas; (ii) testing or other evidence reasonably indicates that supplier's Renewable Gas contains constituent compounds or components reasonably likely to cause or actually causing harm to Company's facilities or equipment (including corrosion damage); (iii) testing or other evidence reasonably indicates that supplier's Renewable Gas contains constituent compounds or components reasonably likely to cause or actually causing harm to the facilities or equipment of Customers (including corrosion damage); or (iv) the chemical characteristics or physical properties of supplier's Renewable Gas are impeding PSNC's ability to provide safe and reliable service to Customers.

In the event of such interruption or suspension of service, Company shall have no obligation to resume receipt of Renewable Gas from supplier until the correction or remediation of the problem prompting such interruption or suspension of service has occurred as determined by Company in the exercise of its reasonable discretion.

#### **Interconnection Agreement**

Prior to and as a condition of delivering Renewable Gas to Company and Company's acceptance thereof, any proposed supplier must enter into an interconnection and facilities reimbursement agreement with Company addressing, to Company's reasonable satisfaction, the terms and conditions applicable to construction and payment for any needed incremental facilities required to accept or receive supplier's Renewable Gas. Company shall have no obligation to accept or receive Renewable Gas until such agreement is executed and its obligations to accept and receive Renewable Gas following such execution shall be governed by the interconnection and reimbursement agreement and these Gas Quality Standards. In the event of a conflict between the provisions set forth in these Gas Quality Standards and the terms and conditions of an interconnection and reimbursement agreement, the provisions of these Gas Quality Standards shall control.

#### **Measurement Requirements**

Company will measure, or receive data from the supplier to measure, on a daily or continuous basis, the quantity, heat content, WOBBE value, and specific gravity of all Renewable Gas delivered to Company at each point of delivery into Company's system utilized by Renewable Gas suppliers.

#### **Indemnity/Liability**

As a condition to the receipt and acceptance of Renewable Gas by Company, all suppliers of Renewable Gas shall indemnify and hold Company harmless from any and all claims, suits, actions, debts, accounts, damages, costs, losses, and expenses, including reasonable attorney fees, (i) arising from or related to the delivery to Company by supplier of any Renewable Gas that fails to meet the Gas Quality Standards set forth herein or otherwise is not in compliance with these Gas Quality Standards, or (ii) arising from or related to damage to Company's equipment or facilities or the equipment or facilities of Customers from receipt of supplier's Renewable Gas.

**COMPANY SHALL HAVE NO RESPONSIBILITY OR LIABILITY TO SUPPLIER, SUPPLIER'S CUSTOMER, OR ANY THIRD-PARTY ASSOCIATED WITH ITS EXERCISE OF THE RIGHT TO INTERRUPT OR SUSPEND RECEIPT OF RENEWABLE GAS AS PROVIDED FOR ABOVE AND IN NO EVENT SHALL BE LIABLE FOR ANY PUNITIVE, CONSEQUENTIAL, OR EXEMPLARY DAMAGES ARISING FROM ITS RECEIPT OR ACCEPTANCE (OR FAILURE TO RECEIVE OR ACCEPT) RENEWABLE GAS UNDER THE TERMS HEREOF OR OTHERWISE.**