

Gas Quality Analytical and Calculation Methods and Procedures for the following pipelines operated by Questar Pipeline Company:

**Questar Pipeline Company
Questar Overthrust Pipeline Company
Questar Southern Trails Pipeline Company
White River Hub, LLC**

Questar uses values obtained from online gas chromatograph analysis through C₉⁺ to determine gas quality. Calculations for Specific Gravity and BTU are determined using compositions and physical constants for the individual gas components.

Questar uses the following GPA, API and AGA standards for compositional analysis:

GPA-2166, Analysis for Natural Gas and Similar Gaseous Mixtures by Gas Chromatography (latest version) is used to determine the compositional makeup of the gas stream using gas chromatography

GPA-2172, Calculation of Gross Heating Value, Relative Density, and Compressibility Factor for Natural Gas Mixtures from Compositional Analysis (latest version) is used to calculate gross heading value and relative density.

GPA-2145, Table of Physical Constants for Hydrocarbons and Other Compounds of Interest to the National Gas Industry (latest version) is used as the source for the physical constants for each gas component. These values are used to calculate the properties of the combined gas stream.

API 14.1, Manual of Petroleum Measurement Standards (latest version) is used for collecting and handling of natural gas samples for custody transfer.

AGA-8, Compressibility Factors of Natural Gas and Other Related Hydrocarbon Gases (latest version) is used to calculate compressibility factors.

Peng-Robinson Equation of State is used with compositional analysis values through C₉⁺ to calculate Cricondenthem Hydrocarbon Dew Point values (CHDP).

At sites where an online gas chromatograph is not available, gas is sampled for analysis using either a continuous sampling bottle or a spot sample is taken. Gas samples are collected on a monthly basis and the compositional makeup of the gas is determined using the chromatographic analysis that is performed using the standards described above.