

# Gas Quality Specifications

## TC Energy and other pipelines

### TC Energy Pipelines

Specs	Canadian Mainline	NGTL/ATCO Pipelines	Foothills (BC) Zone 8	Foothills (Sask.) Zone 9	GTN	North Baja	ANR
Hydrogen Sulphide	Max. 23 mg/m <sup>3</sup>	Max. 23 mg/m <sup>3</sup>	Max. 23 mg/m <sup>3</sup>	Max. 23 mg/m <sup>3</sup>	Max. 0.25 grains/Ccf	Max. 0.25 grains/Ccf	Max. 1 grains/Ccf SE & SW area 1/4 grains/Ccf Mainline area
Total Sulphur	Max. 115 mg/m <sup>3</sup>	Max. 115 mg/m <sup>3</sup>	Max. 230 mg/m <sup>3</sup>	Max. 230 mg/m <sup>3</sup>	Max. 10 grains/Ccf	Max. 0.75 grains/Ccf Total, 0.3 grains/Ccf mercaptan	Max. 20 grains/Ccf
Carbon Dioxide	Max. 2% by volume	Max. 2% by volume	Max. 2% by volume	Max. 2% by volume	Max. 2% by volume	Max. 2% by volume	Max. 2% by volume
Oxygen	Max. 0.4% by volume	Max. 0.4% by volume	Max. 0.4% by volume	Max. 0.4% by volume	Max. 0.4% by volume	Max. 0.2% by volume	Max. 1% by volume
Nitrogen	See TCPL Mainline Tariff	Not specified	Not specified	Not specified	Not specified	Max. 3% incl. CO <sub>2</sub> , N <sub>2</sub> , He, O <sub>2</sub>	Max. 3% by volume
Temperature	Max. 50°C	Max. 49°C	Max. 43.3°C	Max. 49°C	Max. 110°F	Max. 105°F or Min. 50°F	Min. 40°F Max. 120°F
Heating Value	Min. 36 MJ/m <sup>3</sup> Max. 41.34 MJ/m <sup>3</sup>	Min. 36 MJ/m <sup>3</sup>	Min. 36 MJ/m <sup>3</sup>	Min. 36 MJ/m <sup>3</sup>	Min. 995 BTU/ft <sup>3</sup>	Min. 990 BTU/ft <sup>3</sup> or Max. 1150 BTU/ft <sup>3</sup>	Min. 967 BTU/ft <sup>3</sup> Max. 1200 BTU/ft <sup>3</sup>
Water	Max. 65 mg/m <sup>3</sup>	Max. 65 mg/m <sup>3</sup> or Max. dp -10°C at > 8275 kPa	Max. 65 mg/m <sup>3</sup> or Max. dp -10°C at > 8275 kPa	Max. 65 mg/m <sup>3</sup> or Max. dp -10°C at > 8275 kPa	Max. 4 lbs/MMcf	Max. 7 lbs/MMcf	Max. 7 lbs/MMcf
Hydrocarbon Dewpoint	Max. -10°C at 5500kPa absolute	Max. -10°C at operating pressure	Max. -10°C at operating pressure	Max. -10°C at operating pressure	Max. 15°F up to 800 psig	Max. 20°F up to 600 psig	Max. 15°F
Interchangeability	See TCPL Mainline Tariff	Not Specified	Not Specified	Not Specified	Not Specified	Wobbe Number: Min.: 1279 Max.: 1385	Not Specified

### Canadian Pipelines

Specs	Alliance Canada	Union	Enbridge (Tecumseh Pipeline)	TransGas	West Coast	TQM
Hydrogen Sulphide	Max. 23 mg/m <sup>3</sup>	Max. 7 mg/m <sup>3</sup>	Max. 7 mg/m <sup>3</sup>	Max. 6 mg/m <sup>3</sup>	Max. 6 mg/m <sup>3</sup>	Max. 23 mg/m <sup>3</sup>
Total Sulphur	Max. 115 mg/m <sup>3</sup>	Max. 460 mg/m <sup>3</sup>	Max. 460 mg/m <sup>3</sup> , 5 mg/m <sup>3</sup> mercaptan	Max. 23 mg/m <sup>3</sup> total, 6 mg/m <sup>3</sup> mercaptan	Max. 23 mg/m <sup>3</sup>	Max. 115 mg/m <sup>3</sup>
Carbon Dioxide	Max. 2% by volume	Max. 2% by volume	Max. 2% by volume	Max. 2% by volume	Max. 2% by volume	Max. 2% by volume
Oxygen	Max. 0.4% by volume	Max. 0.4% by volume	Max. 0.4% by volume	Max. 0.4% by volume	Max. 0.4% by volume	Max. 0.4% by volume
Nitrogen	Max. 4% by volume incl. N <sub>2</sub> , CO <sub>2</sub> , O <sub>2</sub>	Not specified	Not specified	Max. 15 ml/m <sup>3</sup> each (nitric oxide & total oxides of nitrogen)	Not specified	Not specified
Temperature	Max. 50°C, Min. 5°C	Max. 43°C	Not specified	Max. 50°C	Max. 54°C	Max. 50°C
Heating Value	Min. 36 MJ/m <sup>3</sup> , Max. 60 MJ/m <sup>3</sup>	Min. 36 MJ/m <sup>3</sup> Max. 40.2 MJ/m <sup>3</sup>	Min. 36 MJ/m <sup>3</sup> Max. 40.2 MJ/m <sup>3</sup>	Min. 35 MJ/m <sup>3</sup>	Min. 36 MJ/m <sup>3</sup>	Min. 36 MJ/m <sup>3</sup>
Water	Max. 65 mg/m <sup>3</sup>	Max. 65 mg/m <sup>3</sup>	Max. 80 mg/m <sup>3</sup>	Max. 65mg/m <sup>3</sup> at 101.325 kPa and 15°C	Max. 65 mg/m <sup>3</sup>	Max. 65 mg/m <sup>3</sup>
Hydrocarbon Dewpoint	-5°C at normal opt. conditions	Max. -8°C at operating pressure	Max. -10°C at 5500 kPa	Max. -10°C at opt. Pressure	Max. -9°C at del. pres.	Not specified
Interchangeability	Not Specified	Refer to Union Tariff	Refer to Enbridge Tariff	Refer to TransGas Tariff	Not Specified	Refer to TQM Tariff

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## US Pipelines

Specs	Alliance USA	Empire	GLGT	Iroquois	Northern Border
Hydrogen Sulphide	Max. 1 grains/Ccf	Max. 1 grains/Ccf	Max. 1/4 grains/Ccf	Max. 1/4 grains/Ccf	Max. 0.3 grains/Ccf
Total Sulphur	Max. 5 grains/Ccf	Max. 20 grains/Ccf	Max. 20 grains/Ccf	Max. 1.25 grains/Ccf	Max. 2 grains/Ccf, (0.3 grains mercaptan/Ccf)
Carbon Dioxide	Max. 2% by volume	Max. 2% by volume	Max. 2% by volume	Max. 2% by volume	Max. 2% by volume
Oxygen	Max. 0.4% by volume	Max. 1% by volume	Max. 1% by volume	Max. 0.2% by volume	Max. 0.4% by volume
Nitrogen	Max. 4% N <sub>2</sub> , CO <sub>2</sub> & O <sub>2</sub> by volume	Not specified	Max. 3% by volume	Max. 2.75% N <sub>2</sub> +O <sub>2</sub> 4% N <sub>2</sub> + CO <sub>2</sub>	Not specified
Temperature	Max. 122°F, Min. 41°F	Max. 120°F, Min. 40°F	Max. 120°F, Min. 20°F	Max. 120°F	Min. 32°F Max. 120°F
Heating Value	Min. 962 BTU/ft <sup>3</sup>	Min. 950 BTU/ft <sup>3</sup> Max. 1200 BTU/ft <sup>3</sup>	Min. 967 BTU/ft <sup>3</sup> Max. 1069 BTU/ft <sup>3</sup>	Min. 967 BTU/ft <sup>3</sup> Max. 1110 BTU/ft <sup>3</sup>	Min. 967 BTU/ft <sup>3</sup>
Water	Max. 4 lbs/MMcf	Max. 7 lbs/MMcf	Max. 4 lbs/MMcf	Max. 4 lbs/MMcf at 14.73 psi & 60°F	Max. 4 lbs/MMcf
Hydrocarbon Dewpoint	Max. 23°F at opt. pres.	Not specified	Not specified	Max. 15°F	Max. -5°F (800psia), -10°F (1000 psia), -18°F at (1100 psia)
Interchangeability	Not specified	Not specified	Not specified	See Iroquois Tariff	Not specified

Specs	NWP	PNGTS	SOCAL	Tennessee GP	Viking
Hydrogen Sulphide	Max. 0.25 grains/Ccf	Max. 0.25 grains/Ccf	Max. 0.25 grains/Ccf	Max. 0.25 grains/Ccf	Max. 1/4 grains/Ccf
Total Sulphur	Max. Non Laplata Facilities 5 grains/Ccf, Laplata Facilities 0.75 grains/Ccf, 0.3 grains mercaptan/Ccf	Max. 20 grains/Ccf	Max. 0.75 grains/Ccf (0.3 grains mercaptan/Ccf)	Max. 10 grains/Ccf	Max. 20 grains/Ccf
Carbon Dioxide	Max. 2% by volume	Max. 3% by volume	Max. 3% by volume	Max. 3% by volume	Max. 3% by volume
Oxygen	Max 0.2% by volume	Max. 0.2% by volume	Max. 0.2% by volume	Max. 0.2% by volume	Max. 0.2% by volume
Nitrogen	Max. 3% incl. O <sub>2</sub> , CO <sub>2</sub>	Max. 4% incl. CO <sub>2</sub>	Max. 4% incl. O <sub>2</sub> , CO <sub>2</sub> and inerts	Max. 4% incl. CO <sub>2</sub> , O <sub>2</sub> Max 2.75% N <sub>2</sub> + CO <sub>2</sub>	Max. 4% incl. CO <sub>2</sub>
Temperature	Non Laplata Facilities Max. 120°F Laplata Min. 40°F, Max. 120°F	Max. 120°F	Min. 50°F, Max. 105°F	Max. 120°F	Max. 120°F
Heating Value	Min. 985 BTU/ft <sup>3</sup>	Min. 967 BTU/ft <sup>3</sup> Max. 1100 BTU/ft <sup>3</sup>	Min. 990 BTU/ft <sup>3</sup> Max. 1150 BTU/ft <sup>3</sup>	Min. 967 BTU/ft <sup>3</sup> Max. 1100 BTU/ft <sup>3</sup>	Min. 967 BTU/ft <sup>3</sup> Max. 1100 BTU/ft <sup>3</sup>
Water	Max. 7 lbs/MMcf	Max. 7 lbs/MMcf	Max. 7 lbs/MMcf at <800psi or < 20°F at > 800psi	Max. 7 lbs/MMcf at 14.73psi at 60°F	Max. 7 lbs/MMcf at 14.73psi at 60°F
Hydrocarbon Dewpoint	Max. 15°F (100-1000psia)	Not specified	See SOCAL Tariff	Max.15°F	Not specified
Interchangeability	Not Specified	Not Specified	See SOCAL Tariff	See Tennessee GP Tariff	Not Specified

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