

**GGT**



**G O L D F I E L D S**

**G A S**

**T R A N S M I S S I O N**

**GOLDFIELDS GAS PIPELINE  
GAS SPECIFICATION**

**December 2007**

## Gas Specification

The definitions and interpretation provisions set out in GGT's standard Gas Transportation Agreement apply where relevant to this Gas Specification.

The quality of Gas supplied hereunder at the Receipt Point and delivered to the Delivery Point(s) shall conform to the following.

### 1 Merchantable Gas

The gas shall be merchantable natural gas comprised primarily of methane and free of impurities, objectionable odours, solid and liquid matters, trace metals, waxes, gums and gum-forming constituents, hydrogen, carbon monoxide, helium, aromatic hydrocarbons, mercury, crude oils, lubricants (including compressor lubricant) which may be injurious to, or unsuitable for use in, pipelines, control equipment, gas turbine or reciprocating engines and associated auxiliaries and equipment and to commercial and domestic appliances which are designed to use natural gas.

### 2 Additives

#### (a) Glycols

The gas will not contain glycols in concentration detectable by the test method unless otherwise agreed.

#### (b) Methanol

The gas will not contain methanol in concentration detectable by the test method, unless agreed otherwise.

### 3 Gas Properties

#### (a) Wobbe Index

The Wobbe Index is defined as the Gross Heating Value of the gas ( $\text{MJ/m}^3$ ) divided by the square root of the specific gravity of the gas.

The specific gravity of the gas is relative to air and is to be determined at a temperature of  $15^\circ\text{C}$  and a pressure of 101.325 kPa absolute.

#### (b) Flammability Limit

The ratio of higher flammability limit to lower flammability limit shall exceed 2.2:1 for the gas.

Flammability limits are the upper and lower extremes of fuel air ratio that will permit ignition and sustain combustion of the fuel air mixture at a temperature of  $15^\circ\text{C}$  and a pressure of 101.325 kPa absolute.

### 4 Test Methods

The suggested methods for testing that gas supplied at the Inlet Point complies with the agreed specification are detailed below.

#### 4.1 Fuel Components

(a) Merchantable Gas

Not applicable.

(b) Oxygen

ASTM D 1945 Chemical analysis of natural gas by gas chromatography.

(c) Total Inert Gases

To be agreed.

#### 4.2 Gas Contaminants

(a) Total Sulphur

ASTM D 1072 Test method for total sulphur in fuelled gases.

(b) Hydrogen Sulphide

ASTM D 2385 Hydrogen sulphide content by methylene blue method.

(c) Water

ASTM D 1142 Water vapour content of gas fuel by measurement of dew point temperatures.

(d) Carbon Dioxide

ASTM D 1945 Chemical analysis of natural gas by gas chromatography.

#### 4.3 Additives

(a) Glycols

Thermal desorption Perkin-Elmer Model ATD-50.

(b) Methanol

Limits and test method to be advised where use of methanol is agreed.

#### 4.4 Gas Properties

(a) Gross Heating Value

GPA 2145-92 Calculation method of natural gas parameters from compositional data using gas analysis obtained by ASTM D 1945.

(b) Wobbe Index

ASTM D 1070 Test methods for specific gravity. Gross Heating Value is to be calculated using the method specified in clause 4.1(a) of this Schedule.

**5 Temperature and Pressure of Gas at Receipt Point**

- (a) The Shipper shall deliver Gas to GGT at the Receipt Point at temperature not exceeding 45°C and not less than 2°C.
- (b) Any Gas delivered by the Shipper to GGT at the Receipt Point will be at a pressure of between 7,800 kPa and 10,200 kPa.

**6 Pressure of Gas at Delivery Point**

GGT will use reasonable endeavours consistent with the standard of a reasonable and prudent pipeline operator to deliver Gas to the Shipper at a pressure in excess of 3,000 kPa at any Delivery Point.

### Receipt Point - Gas Specification

Component	Units	Minimum	Maximum
Carbon Dioxide	mol %		4.0
Total Inerts	mol %		7.0
Hydroc. Dewpoint 102 to 10,000 kPa	Deg C		0
Oxygen by Volume	mol %		0.2
Total Sulphur	mg/m <sup>3</sup>		10.0 <sup>1</sup>
Hydrogen Sulphide	mg/m <sup>3</sup>		5.0
Wobbe Index	MJ/m <sup>3</sup>	46.0	51.5
Water Vapour	mg/m <sup>3</sup>		48.0
Gross Heating Value	MJ/m <sup>3</sup>	37.0	42.5
Radioactive Components	Becq/m <sup>3</sup>		600

### Delivery Point - Gas Specification

Component	Units	Minimum	Maximum
Carbon Dioxide	mol %		4.0
Total Inerts	mol %		7.0
Hydroc. Dewpoint 102 to 10,000 kPa	Deg C		0
Oxygen by Volume	mol %		0.2
Total Sulphur	mg/m <sup>3</sup>		10.0 <sup>2</sup>
Hydrogen Sulphide	mg/m <sup>3</sup>		5.0
Wobbe Index	MJ/m <sup>3</sup>	46.0	51.5
Water Vapour	mg/m <sup>3</sup>		48.0
Gross Heating Value	MJ/m <sup>3</sup>	37.0	42.5
Radioactive Components	Becq/m <sup>3</sup>		600

1 Including hydrogen sulphide and mercaptans.

2 Including hydrogen sulphide and mercaptans.