

PG&E's Natural Gas

Compositional Data

May 2, 2013
Biomethane OIR Workshop II





On-going analysis of PG&E's natural gas

Gas analyses

- Performed on a continuous basis.
- Used for heating value calculation.
- Used for specific gravity calculation.
- Used to verify proper odorization levels.



Gas Analyses performed by PG&E gas chromatographs on April 16, 2013

Antioch Terminal Milpitas Terminal

		Mole%
C ₁	Methane	94.851
C ₂	Ethane	3.443
C ₃	Propane	0.214
i-C ₄	iso-Butane	0.024
n-C ₄	n-Butane	0.026
i-C ₅	iso-Pentane	0.006
n-C ₅	n-Pentane	0.004
C ₆₊	Hexane	0.004
CO ₂	Carbon Dioxide	0.857
N ₂	Nitrogen	0.572

		ppmv
	Hydrogen Sulfide	0.95
	Total Sulfur	2.55
	Total Odorant	1.50

		Mole%
C ₁	Methane	95.506
C ₂	Ethane	2.761
C ₃	Propane	0.195
i-C ₄	iso-Butane	0.024
n-C ₄	n-Butane	0.027
i-C ₅	iso-Pentane	0.007
n-C ₅	n-Pentane	0.004
C ₆₊	Hexane	0.007
CO ₂	Carbon Dioxide	0.879
N ₂	Nitrogen	0.59

		ppmv
	Hydrogen Sulfide	0.22
	Total Sulfur	2.44
	Total Odorant	1.83



Trace Constituent Analyses

(hydrocarbon analyses performed by AirTechnology Laboratories, Inc. using EPA Method TO-15)

Antioch Terminal

	ppmv	ppmv
Benzene	1.3	1.7
1,3-Butadiene	ND	ND
Acrylonitrile	ND	ND

Milpitas Terminal

	ppmv	ppmv
Benzene	1.3	1.4
1,3-Butadiene	ND	ND
Acrylonitrile	ND	ND

Notes:

Benzene is a natural constituent of crude oil and natural gas, and is one of the most basic petrochemicals.

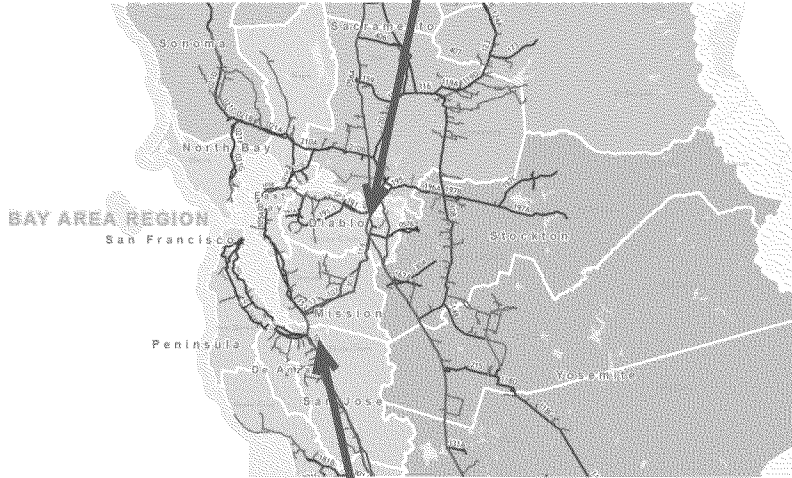
1,3-Butadiene is a chemical made from the processing of petroleum. About 75% of the manufactured **1,3-butadiene** is used to make synthetic rubber. **1,3-Butadiene** is also used to make plastics including acrylics.

Acrylonitrile is a chemical compound with the formula C_3H_3N . It is an important monomer for the manufacture of plastics such as polyacrylonitrile.

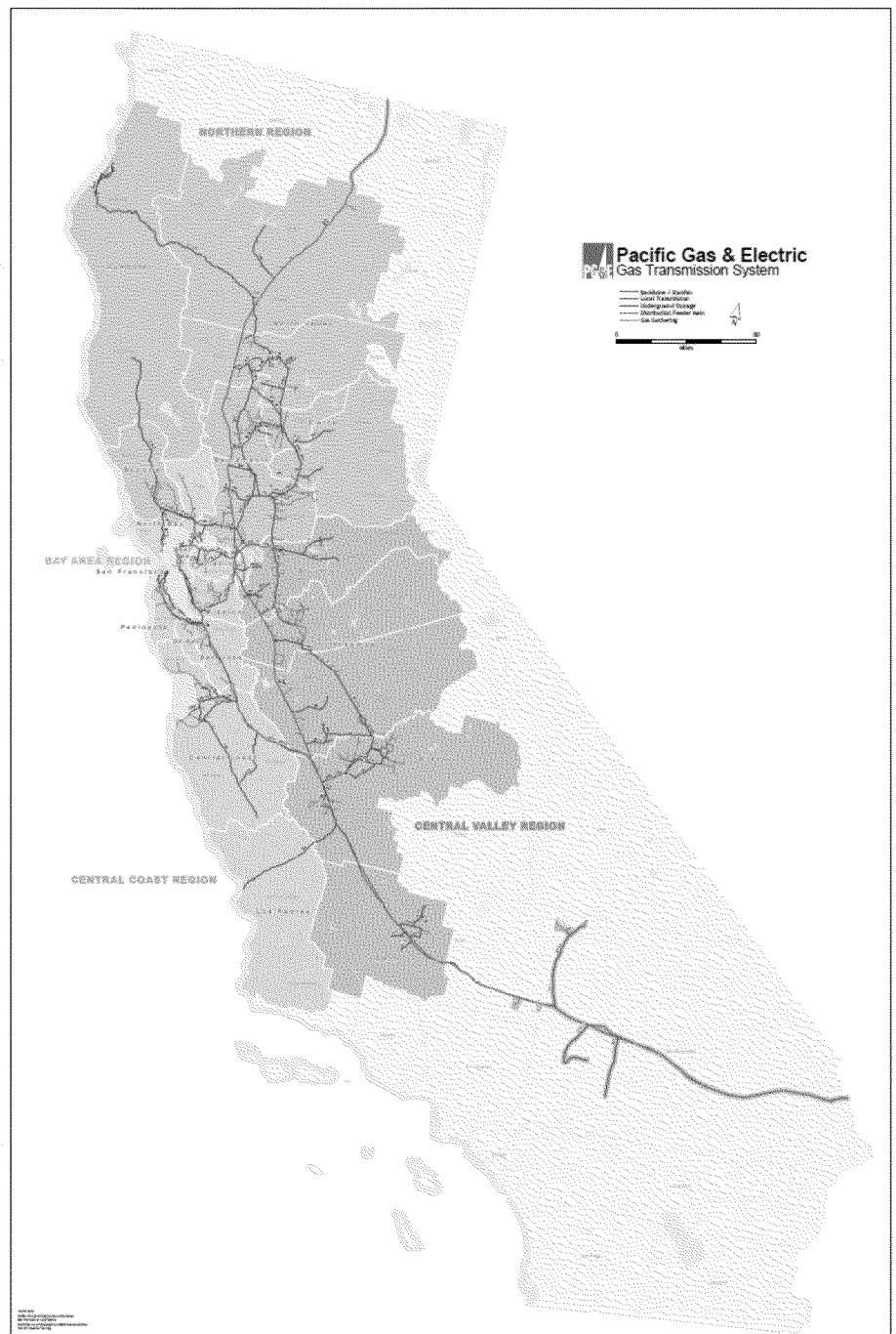
Acrylonitrile butadiene styrene (ABS) is a common thermoplastic made by polymerizing styrene and acrylonitrile in the presence of polybutadiene.



Antioch



Milpitas



PG&E's Proposed Biomethane Acceptance Policies

- Biomethane must conform to all standards at point of delivery into pipeline system; downstream blending is not permitted as a means of meeting standards.
- Initially, PG&E will limit biomethane volume to 10% of the flow in the receiving pipeline. The percentage will be increased over time if gas quality standards are consistently met, and there are no negative impacts to the pipeline system or downstream customers.
- Testing will be performed at the point of delivery to verify compliance.

Redacted

