Sample Matrix: Gas
Sample Type: Spot
Preservative: N/A
Sample Container: 1610

Method(s): ASTM D 5443
Multi-Isomer analysis by Gas Chromatography

Lab #: 2510-170912K005
Quality Control Report: 4842

Client: Kinder Morgan
Project Location: Dolores, Co.
Sample Id.: Doe Plant Inlet
Sample Temp.: N/A
Atmospheric Temp.: 90ºF
Pressure: 372 psig
Field Data: N/A
Sample Date: 9/08/17
Time: 13:05
Sampled By: Rick
Analysis Date: 9/13/17
Analysis By: Jana Spence

Analytical Results

Gas Composition		
	Mol %	**GPM**
Nitrogen (N2):	2.8505	0.3135
Carbon Dioxide (CO2):	96.2954	16.4276
Hydrocarbon Composition	**Mol %**	**GPM**
Methane (CH4):	0.7835	0.1328
Ethane (C2H6):	0.0112	0.0030
Propane (C3H8):	0.0235	0.0065
Iso-Butane (C4H10):	0.0099	0.0032
N-Butane (C4H10):	0.0116	0.0036
Iso-Pentane (C5H12):	0.0026	0.0010
N-Pentane (C5H12):	0.0037	0.0014
Hexane+ (C6H14):	0.0081	0.0035
Totals	100.0000	16.8961

Comments - Additional Data

BTU -dry (BTU/ft3):	10.1	Z-Comp. Factor-dry:	0.99470
BTU -water vapor sat.(BTU/ft3):	10.9	Z-Comp. Factor-water vapor sat.:	0.98133
Specific Gravity -dry:	1.5036	14.65 psi Pressure Base	
Specific Gravity-water vapor sat.:	1.5241		

*See Next Page for Compositional breakdown of C6+ Fractions

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Analytical Results

C6+ Fractions Composition		
Hexane Isomers (C6's)		**Mol %**
2,2-dimethylbutane	P	0.0002
2,3-dimethylbutane	PN	0.0003
2-methylpentane	P	0.0012
3-methylpentane	P	0.0006
methylcyclopentane	N	0.0009
benzene	A	0.0000
cyclohexane	N	0.0007
n-hexane	P	0.0026
Heptane Isomers (C7's)		
2,2-dimethylpentane	P	0.0000
2,4-dimethylpentane		0.0000
3-methylhexane	P	0.0001
1,t3-dimethylcyclopentane	N	0.0000
1,c3-dimethylcyclopentane	N	0.0000
1,t2-dimethylcyclopentane	N	0.0000
toluene	A	0.0000
methylcyclohexane	N	0.0004
ethylcyclopentane	N	0.0000
n-heptane	P	0.0007
Octane Isomers (C8's)		
2,4 + 2,5-dimethylhexane	P	0.0000
1,t2,c4-trimethylcyclopentane	N	0.0000
1,t2,c3-trimethylcyclopentane	N	0.0000
2-methylheptane	P	0.0000
1,c2,t4-trimethylcyclopentane	N	0.0000
3-methylheptane	P	0.0000
1,c3-dimethylcyclohexane	N	0.0000
1,t4-dimethylcyclohexane	N	0.0000
methyl-ethylcyclopentanes	N	0.0000
1,c4 & 1,t3-dimethylcyclohexane	N	0.0000
1,c2-dimethylcyclohexane	N	0.0000
ethylcyclohexane	N	0.0000
ethylbenzene	A	0.0000
m + p-xylene	A	0.0000
o-xylene	A	0.0000
n-octane	P	0.0001

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C6+ Fractions Composition (cont.)		
Nonane Isomers (C9's)		**Mol %**
trimethylhexanes	P	0.0000
dimethylheptanes	P	0.0000
isopropylcyclopentane	N	0.0000
n-propylcyclopentane	N	0.0000
3-methyloctane	P	0.0000
trimethylcyclohexanes	N	0.0000
isopropylbenzene	A	0.0000
isopropylcyclohexane	N	0.0000
n-propylcyclohexane	N	0.0000
n-propylbenzene	A	0.0000
m-ethyltoluene	A	0.0000
p-ethyltoluene	A	0.0000
1,3,5-trimethylbenzene + 4&5-methylnonane	A/P	0.0000
o-ethyltoluene + 3-methylnonane	A/P	0.0000
1,2,3-trimethylbenzene	A	0.0000
n-nonane	P	0.0000
Decane Isomers (C10's)		
2-methylnonane	P	0.0000
tert-butylbenzene	A	0.0000
1,2,4-trimethylbenzene	A	0.0000
Isobutylcyclohexane + t-butylcyclohexane	N	0.0000
isobutylbenzene	A	0.0000
sec-butylbenzene	A	0.0000
n-butylcyclohexane	N	0.0000
1,3-diethylbenzene	A	0.0000
1,2-diethylbenzene + n-butylbenzene	A	0.0000
1,4-diethylbenzene	A	0.0000
n-decane	P	0.0000
unidentified C9 naphthenes + C10 paraffins		0.0000
unidentified C10 aromatics + C11 paraffins		0.0000
Ungrouped C10's		0.0000
Undecane Isomers (C11's)		
n-undecane	P	0.0000
Dodecane Isomers (C12's)		
isododecane +	P	0.0000

Comments - Additional Data

A – Aromatic (Ring Hydrocarbons), N – Naphthene (Cyclic Paraffins & Alkanes), P – Paraffin (Alkanes)

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Gas Composition		
	ppm vol.	**Grains/100 ft^3**
Hydrogen Sulfide	0.28	0.018
Carbonyl Sulfide	0.08	0.005
Methyl Mercaptan	0.46	0.029
Ethyl Mercaptan	0.04	0.003
Dimethyl Sulfide	0.11	0.007
Carbon Disulfide	0.00	0.000
2-Propanethiol	0.00	0.000
Tert-butyl Mercaptan	0.09	0.006
1-Propanethiol	0.00	0.000
Thiophene	0.00	0.000
N-Butanethiol+Diethyl Sulfide	0.01	0.001
Methyl Ethyl Sulfide	0.00	0.000
2-Methyl-1-Propanethiol	0.01	0.001
1-Methyl-1-Propanethiol	0.02	0.001
Total Sulfur	1.12	0.071