

Linam Ranch Throughput for June 2011

Date	East Inlet	West Inlet MMscf/d	Combined MMscf/d
6/1/2011	65520	79818	145338
6/2/2011	72784	86835	159619
6/3/2011	80794	93552	174346
6/4/2011	80390	93016	173406
6/5/2011	78088	91486	169574
6/6/2011	73907	86887	160794
6/7/2011	80389	94970	175359
6/8/2011	82203	96732	178935
6/9/2011	79084	93103	172187
6/10/2011	79173	93282	172455
6/11/2011	81680	96342	178022
6/12/2011	80038	94131	174169
6/13/2011	69337	83051	152388
6/14/2011	64082	76601	140683
6/15/2011	60140	72525	132665
6/16/2011	58575	70393	128968
6/17/2011	57114	68457	125571
6/18/2011	56603	67933	124536
6/19/2011	61969	74791	136760
6/20/2011	69365	81361	150726
6/21/2011	71359	83712	155071
6/22/2011	67667	80886	148553
6/23/2011	70986	83822	154808
6/24/2011	74115	88443	162558
6/25/2011	76922	90541	167463
6/26/2011	71638	82339	153977
6/27/2011	70588	80574	151162
Average Throughput for June 1-27,2011			156300

Current (156MMCFD)

0.89 MMCFD H₂S TAG

3.96 MMCFD CO₂ TAG

4.85 MMCFD Combined TAG

Max Plant (225MMCFD)

1.28

5.72

7.00

treated and go

SUMMARY OF INJECTION PRESSURES AT LINAM AGI #1 FROM C-115 REPORTS

Date	Avg. Pressure (psi)
Dec. 2009	931
Jan. 2010	931
Feb. 2010	1025
Mar. 2010	1025
Apr. 2010	908
May. 2010	1051
Jun. 2010	1051
Jul. 2010	1111
Aug. 2010	1356
Sept. 2010	1218
Oct. 2010	1274
Nov. 2010	1276
Dec. 2010	1280
Jan. 2011	1302
Feb. 2011	1210
Mar. 2011	1191
Apr. 2011	1209
May. 2011	1330
Average Pressure (psi)	1149
Median Pressure (psi)	1149

Default	AGI_WELL	AGI_WELL			
Start Date = 07/05/11	TT71403	TT71406			
Start Time = 00 00 00	RINP	RINP			
Total Time = 365days					
Period = 720hrs lin	LINDCS	LINDCS			
Month					
			Comp1410	Comp1420	Combined Injection Temp (°F)
06/11 00 00 00	103 55903	76 99653	104	77	104
05/11 00 00 00	90 45139	60 98090	90	61	90
04/11 00 00 00	92 53472	63 41146	93	63	93
03/11 00 00 00	49 86979	83 59375	50	84	84
02/11 00 00 00	28 51563	29 25347	29	29	29
01/11 00 00 00	114 88715	41 92709	115	42	115
12/10 00 00 00	39 75695	110 50347	40	111	111
11/10 00 00 00	51 86632	107 29167	52	107	107
10/10 00 00 00	105 85938	62 32639	106	62	106
09/10 00 00 00	103 68924	70 48611	104	70	104
08/10 00 00 00	103 03819	69 53125	103	70	103
07/10 00 00 00	94 22743	70 18229	94	70	94
					104 Median Injection Temp (°F)
					95 Average Injection Temp (°F)



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Telephone: (575) 397-3713

FOR: DCP Midstream
Attention: Harvey Hargrove
139 W. US Hwy. 62-180
Hobbs, New Mexico 88240

SAMPLE: IDENTIFICATION Combined Inlet
COMPANY: DCP Midstream
LEASE:
PLANT: Linam Ranch

SAMPLE DATA: DATE SAMPLED: 6/16/11 12:10 pm
ANALYSIS DATE: 6/17/11
PRESSURE - PSIG
SAMPLE TEMP. °F
ATMOS. TEMP. °F 99

REMARKS: H2S = 5,729 PPM

COMPONENT ANALYSIS

COMPONENT		MOL PERCENT	GPM
Hydrogen Sulfide	(H2S)	0.573	
Nitrogen	(N2)	2.720	
Carbon Dioxide	(CO2)	2.539	
Methane	(C1)	72.970	
Ethane	(C2)	11.371	3.034
Propane	(C3)	5.821	1.600
I-Butane	(IC4)	0.698	0.228
N-Butane	(NC4)	1.693	0.533
I-Pentane	(IC5)	0.435	0.159
N-Pentane	(NC5)	0.442	0.160
Hexane Plus	(C6+)	0.738	0.320
		100.000	6.034
BTU/CU.FT. - DRY		1241	MOLECULAR WT. 22.4233
AT 14.650 DRY		1237	
AT 14.650 WET		1216	
AT 14.73 DRY		1244	
AT 14.73 WET		1223	
SPECIFIC GRAVITY -			
CALCULATED		0.777	
MEASURED			

SUMMARY OF COMPARISON OF ORIGINAL LINAM AGI #1 ASSUMPTIONS AND PROJECTED OPERATIONAL CONDITIONS												
	MAXIMUM PLANT THROUGHPUT (MMCFD)	CONCENTRATION OF H2S IN INLET GAS (MOL%)	CONCENTRATION OF CO2 IN INLET GAS (MOL%)	COMBINED TAG VOLUME (MMCFD)	H2S TAG VOLUME (MMCFD)	CO2 TAG VOLUME (MMCFD)	CO2 H2S RATIO IN TAG	100 PPM ROE AT PLANT (FT)	500 PPM ROE AT PLANT (FT)	100 PPM ROE AT WELL AND PIPELINE (FT)	500 PPM ROE AT WELL AND PIPELINE (FT)	INJECTION ZONE AFFECTED AREA (ACRES)
1. EXISTING ASSUMPTIONS IN APPROVED H2S PLAN	225.0	0.6	1.5	4.6	1.3	3.3	3.0	8877	4057	8914	4073	286.0
2. CURRENT ASSUMPTIONS BASED ON INLET GAS AND EXPANSION PROJECT	225.0	0.6	2.5	7.0	1.3	5.7	3.4	8877	4057	8914	4073	445.0

Table 1 Pressure and Volume Calculations for TAG, Linam under Previous CO₂ Inlet Concentrations at Maximum Plant Capacity of 225 MMCFD

PROPOSED INJECTION STREAM CHARACTERISTICS

TAG	H ₂ S	CO ₂	H ₂ S	CO ₂	TAG
Gas vol MMSCFD	conc mol %	conc mol %	inject rate lb/day	inject rate lb/day	inject rate lb/day
4.6	28	72	122260	405973	528233

CONDITIONS AT WELL HEAD

Well Head Conditions		TAG							
Temp F	Pressure psi	Gas vol MMSCFD	Comp CO ₂ H ₂ S	Inject Rate lb/day	Density ¹ kg/m ³	SG ²	density lb/gal	volume ft ³	volume bbl
100	1150	4.6	72.28	528233	543.46	0.54	4.54	15562	2772

CONDITIONS AT BOTTOM OF WELL

Injection Zone Conditions					TAG				
Temp F	Pressure ³ psi	Depth _{top} ft	Depth _{bottom} ft	Thickness ⁴ ft	Density ¹ kg/m ³	SG ²	density lb/gal	volume ft ³	volume bbl
100	3376	8710	9100	280.00	879.04	0.88	7.34	9621	1714

CONDITIONS IN RESERVOIR AT EQUILIBRIUM

Injection Reservoir Conditions					TAG				
Temp ⁵ F	Pressure ³ psi	Ave Porosity ⁶ %	Swr	Porosity ft	Density ¹ kg/m ³	SG ²	density lb/gal	volume ft ³	volume bbl
124	3376	6.0	0.45	9.2	809.02	0.81	6.76	10454	1862

CONSTANTS

SCF/mol	
Molar volume at STD	0.7915
g/mol	lb/mol
Molar weight of H ₂ S	34.0809
Molar weight of CO ₂	44.0096
Molar weight of H ₂ O	18.015

CALCULATION OF MAXIMUM INJECTION PRESSURE LIMITATION

SG _{TAG}	0.71
PG = 0.2 + 0.433 (1.04 - SG _{TAG})	0.342 psi/ft
IP _{max} = PG * Depth	2982 psi

Where SG_{TAG} is specific gravity of TAG, PG is calculated pressure gradient, and IP_{max} is calculated maximum injection pressure

¹ Density calculated using AQUALIBrium software

² Specific gravity calculated assuming a constant density for water

³ PP is taken from well tests of Linam AGI #1

⁴ Thickness is the net thickness of the perforated intervals

⁵ Reservoir temp is extrapolated from bottomhole temp measured in logs

⁶ Porosity is estimated using geophysical logs from nearby wells

H₂S concentration and ratio of H₂S and CO₂ in TAG as calculated in H₂S Contingency Plan

CALCULATION OF 30 YEAR AREA OF INJECTION:

Cubic Feet/day (5.6146 ft ³ /bbl)	10454 ft ³ /day
Cubic Feet/30 years	114548337 ft ³ /30 years
Area = V/Net Porosity (ft)	12435387 ft ² /30 years
Area = V/Net Porosity (ft) (43560 ft ² /ac)	285.5 acres/30 years
Radius =	1990 ft
Radius =	0.38 miles

Table2 Pressure and Volume Calculations for TAG, Linam under Current Maximum Plant Capacity of 225 MMCFD and Measured Inlet Gas Concentrations

PROPOSED INJECTION STREAM CHARACTERISTICS

TAG	H ₂ S	CO ₂	H ₂ S	CO ₂	TAG
Gas vol	conc	conc	inject rate	inject rate	inject rate
MMSCFD	mol %	mol %	lb/day	lb/day	lb/day
7	18.4	81.6	122260	700156	822416

CONDITIONS AT WELL HEAD

Well Head Conditions		TAG							
Temp	Pressure	Gas vol	Comp	Inject Rate	Density ¹	SG ²	density	volume	volume
F	psi	MMSCFD	CO ₂ H ₂ S	lb/day	kg/m ³		lb/gal	ft ³	bbl
104	1150	7	82.18	822416	339.96	0.34	2.84	38732	6898

CONDITIONS AT BOTTOM OF WELL

Injection Zone Conditions					TAG				
Temp	Pressure ³	Depth _{top}	Depth _{bottom}	Thickness ⁴	Density ¹	SG ²	density	volume	volume
F	psi	ft	ft	ft	kg/m ³		lb/gal	ft ³	bbl
104	3376	8710	9100	280.00	879.04	0.88	7.34	14979	2668

CONDITIONS IN RESERVOIR AT EQUILIBRIUM

Injection Reservoir Conditions					TAG				
Temp ⁵	Pressure ³	Ave Porosity ⁶	Swr	Porosity	Density ¹	SG ²	density	volume	volume
F	psi	%		ft	kg/m ³		lb/gal	ft ³	bbl
124	3376	6.0	0.45	9.2	809.02	0.81	6.76	16276	2899

CONSTANTS

SCF/mol	
Molar volume at STD	0.7915
g/mol lb/mol	
Molar weight of H ₂ S	34.0809 0.0751
Molar weight of CO ₂	44.0096 0.0970
Molar weight of H ₂ O	18.015 0.0397

CALCULATION OF MAXIMUM INJECTION PRESSURE LIMITATION

SG _{TAG}	0.61
PG = 0.2 + 0.433 (1.04 - SG _{TAG})	0.386 psi/ft
IP _{max} = PG * Depth	3366 psi

Where SG_{TAG} is specific gravity of TAG; PG is calculated pressure gradient, and IP_{max} is calculated maximum injection pressure

¹ Density calculated using AQUALibrium software

² Specific gravity calculated assuming a constant density for water

³ PP is taken from well tests of Linam AGI #1

⁴ Thickness is the net thickness of the perforated intervals

⁵ Reservoir temp is extrapolated from bottomhole temp measured in logs

⁶ Porosity is estimated using geophysical logs from nearby wells

Note that total Mass of H₂S remains constant – for this reason ROE in H₂S Contingency Plan Remains the Same

CALCULATION OF 30-YEAR AREA OF INJECTION

Cubic Feet/day (5.6146 ft ³ /bbl)	16276 ft ³ /day
Cubic Feet/30 years	178342498 ft ³ /30 years
Area = V/Net Porosity (ft)	19360892 ft ² /30 years
Area = V/Net Porosity (ft) (43560 ft ² /acre)	444.5 acres/30 years
Radius =	2482 ft
Radius =	0.47 miles