MPSC CASE NO GR-2014-0086

SURREBUTTAL TESTIMONY OF TIMOTHY R JOHNSTON

SCHEDULE TRJ - 4

Summit Natural Gas of Missouri, Inc.
MPSC Case No. GR-2014-0086
Account 105 Transfer from Warsaw and Branson

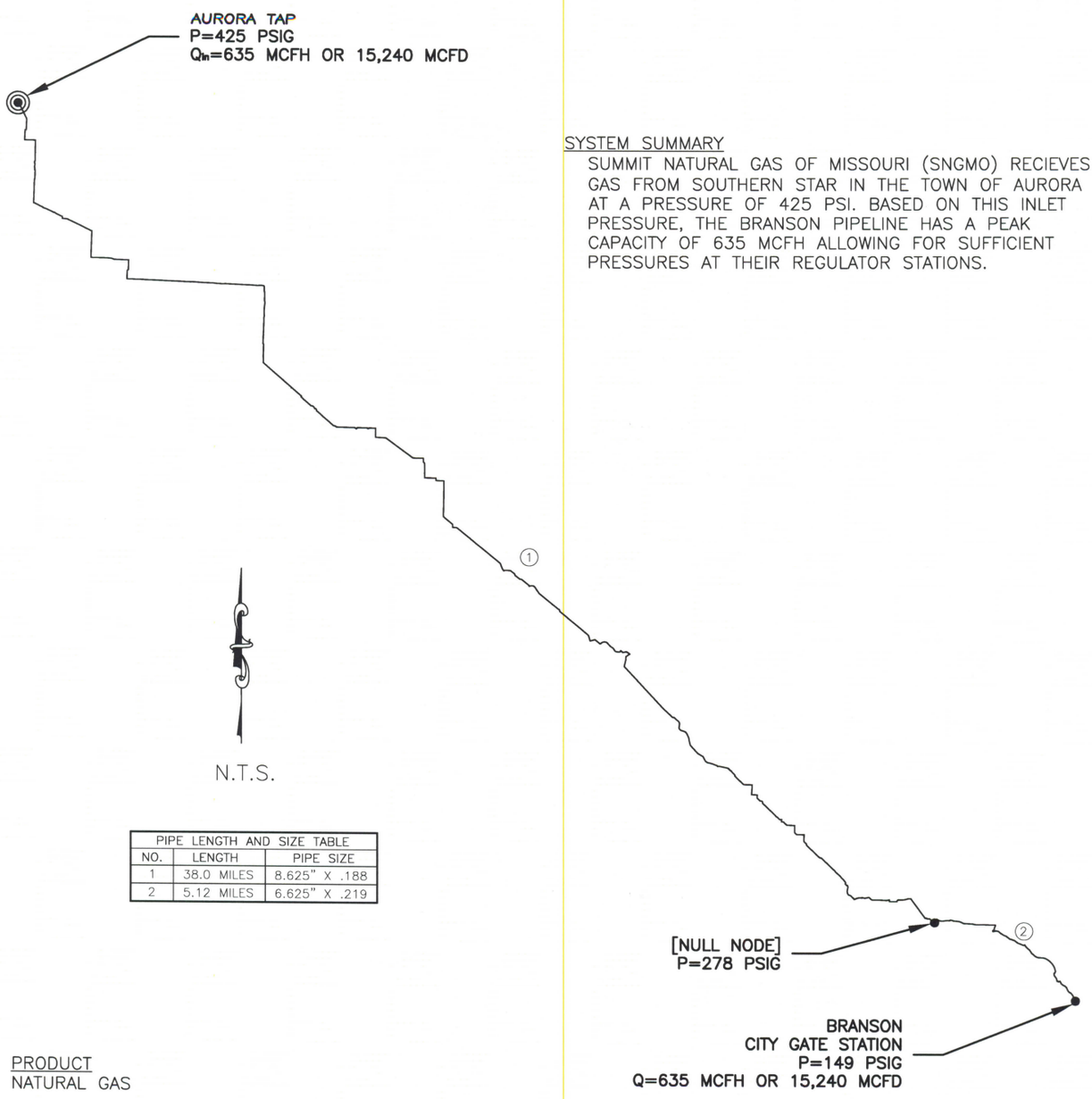
Line No	Particulars	References	SNG filed data at 9-31-13 Warsaw	SNG filed data at 9-31-13 Branson	Staff EMS runs 12-31-13 Warsaw	Staff EMS runs 12-31-13 Branson
	(a)	(b)	(c)	(d)	(e)	(f)
	Rate Base Adjustment					
	Gross Plant					
1	Account 101-376 - SNG as filed	as filed, TDP-2, exh 2	$ 12,821,542	$ 36,789,304	$ 13,310,226	$ 36,985,144
2	Account 101-378 - SNG as filed	as filed, TDP-2, exh 2	49,057	304,960	79,254	319,932
3	percent of account to acct 105	capacity percent tab	63.92%	81.18%	63.92%	81.18%
4	reduction to settlement gross plant - acct 101-376	line 10 * line 13	$ 8,195,144	$ 29,865,161	$ 8,507,496	$ 30,024,142
5	reduction to settlement gross plant - acct 101-378	line 11 * line 13	31,356	247,564	50,657	259,717
6	**total Gross Plant reduction**	line 4 + line 5	**$ 8,226,499**	**$ 30,112,725**	**$ 8,558,153**	**$ 30,283,859**
	Reserve for Depreciation				**Staff EMS**	
7	Account 108-376 - SNG as filed	as filed, TDP-2, exh 3	$ (912,293)	$ (1,932,841)	(1,090,989)	(2,117,624)
8	Account 108-378 - SNG as filed	as filed, TDP-2, exh 3	(3,422)	(6,667)	(6,823)	(8,242)
9	percent of account to acct 105	capacity percent tab	63.92%	81.18%	63.92%	81.18%
10	reduction to settlement RDA - acct 108-376	line 21 * line 24	$ (583,110)	$ (1,569,060)	$ (697,327)	$ (1,719,064)
11	reduction to settlement RDA - acct 108-378	line 22 * line 14	(2,187)	(5,412)	(4,361)	(6,691)
12	**total Reserve for Depreciation reduction**	line 10 + line 11	**$ (585,297)**	**$ (1,574,472)**	**$ (701,688)**	**$ (1,725,755)**

GR-2014-0086
Surrebuttal Schedule TRJ-4

Summit Natural Gas of Missouri, Inc.
MPSC Case No. GR-2014-0086
Main Line Capacity Utilization Percentage Calculation

Line No	Particulars	Reference	Warsaw	Branson
	(a)	(b)	(c)	(d)
1	**Relevant pipe capacity (Mcf/day)**	note 1	6,288	15,240
	Relevant Peak day calculations			
	Warsaw			
	2012-2013 winter regression statistics			
2	base load per retail customer - Dt's	2013-14 Gas Supply Plan	0.0983	
3	retail usage per HDD - Dt's	2013-14 Gas Supply Plan	0.0241	
4	peak HDD'S - Sedalia WTP	2013-14 Gas Supply Plan	82	
5	test period total retail customer count	Rebuttal Schedule TDP-3	1,111	
6	peak retail usage in Dt's	(ln 4 * ln 3 + ln 2) * ln 5	2,301	
7	peak retail usage in Mcf at 1.014 BTU factor - 2013 PGA	ln 6 ÷ 1.014	2,269	
8	transportation customer usage	NA	-	
9	Mainline capacity usage factor	ln 7 ÷ ln 1	36.08%	
10	Mainline capacity reduction factor	1 - ln 9	63.92%	
	Branson			
	2013-2014 winter regression statistics			
11	base load per retail customer	2014-15 Gas Supply Plan		0.4018
12	retail usage per HDD	2014-15 Gas Supply Plan		0.0223
13	peak HDD'S	2014-15 Gas Supply Plan		73
14	test period total retail customer count	Rebuttal Schedule TDP-3		843
15	peak retail usage in Dt's	(ln 13 * ln 12 + ln 11) * ln 14		1,709
16	peak retail usage in Mcf at 1.025 BTU factor - 2013 PGA	ln 15 ÷ 1.025		1,667
17	transportation customer usage - Jan 6, 2014 - Mcf	imbalance management analysis		1,201
18	total usage in Mcf	ln 16 + ln 17		2,868
19	Mainline capacity usage factor	ln 18 ÷ ln 1		18.82%
20	Mainline capacity reduction factor	1 - ln 19		81.18%

Notes (1) capacity values taken from System Flow Diagrams attached



SYSTEM SUMMARY

SUMMIT NATURAL GAS OF MISSOURI (SNGMO) RECIEVES GAS FROM SOUTHERN STAR IN THE TOWN OF AURORA AT A PRESSURE OF 425 PSI. BASED ON THIS INLET PRESSURE, THE BRANSON PIPELINE HAS A PEAK CAPACITY OF 635 MCFH ALLOWING FOR SUFFICIENT PRESSURES AT THEIR REGULATOR STATIONS.

N.T.S.

PIPE LENGTH AND SIZE TABLE		
NO.	LENGTH	PIPE SIZE
1	38.0 MILES	8.625" X .188
2	5.12 MILES	6.625" X .219

PRODUCT
NATURAL GAS

PIPE
ROUGHNESS: 0.00070 INCHES
EFFICIENCY: 100%
GRADE: B

MODEL
SOFTWARE: GASWORKS 9.0
FORMULA: PANHANDLE–A

NOTES
1. ALL PIPE LENGTH DIMENSIONS ARE FROM NODE–TO–NODE
2. ALL LOADS ARE PEAK PROJECTED LOADS TO DESIGN PIPELINE CAPACITY
3. PEAK CAPACITY LOAD OF 635 MCFH ALLOWS FOR SUFFICIENT INLET PRESSURES AT ALL REGULATOR STATIONS
4. PIPELINE SIZED TO ACCOMMODATE FUTURE GROWTH

Summit Natural Gas

Branson, MO
System Flow Diagram
Peak Capacity Modeling

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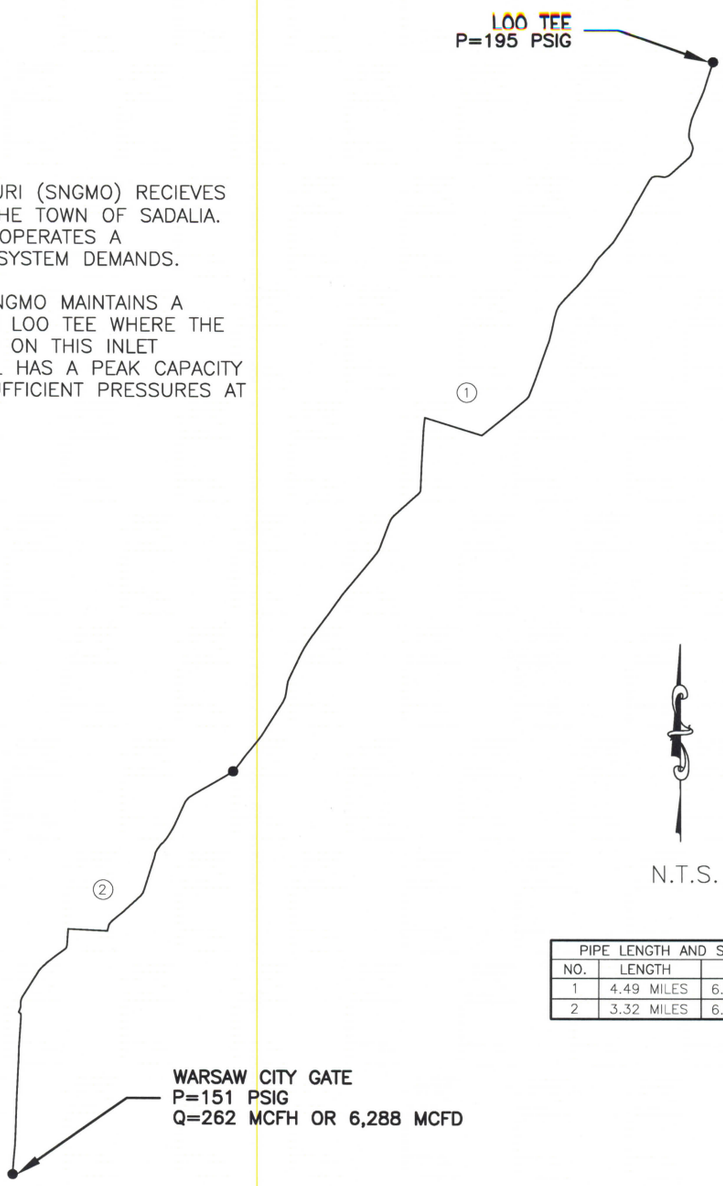
Revision	Date
Modeled by: GDC	06-27-14
Checked by: BEW	06-27-14

LOO TEE
P=195 PSIG

SYSTEM SUMMARY

SUMMIT NATURAL GAS OF MISSOURI (SNGMO) RECIEVES GAS FROM SOUTHERN STAR IN THE TOWN OF SADALIA. ALONG WITH THEIR TAP, SNGMO OPERATES A COMPRESSOR STATION TO MEET SYSTEM DEMANDS.

UNDER CURRENT CONDITIONS, SNGMO MAINTAINS A PRESSURE OF 195 PSI AT THEIR LOO TEE WHERE THE WARSAW LATERAL BEGINS. BASED ON THIS INLET PRESSURE, THE WARSAW LATERAL HAS A PEAK CAPACITY OF 262 MCFH ALLOWING FOR SUFFICIENT PRESSURES AT THEIR REGULATOR STATIONS.



N.T.S.

PIPE LENGTH AND SIZE TABLE		
NO.	LENGTH	PIPE SIZE
1	4.49 MILES	6.625" X .188
2	3.32 MILES	6.625" X .188

WARSAW CITY GATE
P=151 PSIG
Q=262 MCFH OR 6,288 MCFD

PRODUCT
NATURAL GAS

PIPE
ROUGHNESS: 0.00070 INCHES
EFFICIENCY: 100%
GRADE: B

MODEL
SOFTWARE: GASWORKS 9.0
FORMULA: PANHANDLE–A

NOTES
1. ALL PIPE LENGTH DIMENSIONS ARE FROM NODE–TO–NODE
2. ALL LOADS ARE PEAK PROJECTED LOADS TO DESIGN PIPELINE CAPACITY
3. PEAK CAPACITY LOAD OF 262 MCFH ALLOWS FOR SUFFICIENT INLET PRESSURES AT ALL REGULATOR STATIONS
4. PIPELINE SIZED TO ACCOMMODATE FUTURE GROWTH

Summit Natural Gas

Warsaw, MO
System Flow Diagram
Peak Capacity Modeling

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Revision	Date
Modeled by: GDC	06-27-14
Checked by: BEW	06-27-14

Panhandle-A Equation

$$Q = 435.87\left(\frac{T_{sc}}{P_{sc}}\right)^{1.0788} * \left(\frac{P_1^2 - P_2^2}{G^{.8539} * L_e * T_m * Z}\right)^{.5394} * D^{2.6182} * E$$

$$L_e = \frac{(e^S - 1)L}{S}$$

$$S = \frac{.0375 * G * \Delta z}{T_m}$$

Variables

$T_{sc} = Temperature\ at\ standard\ conditions$

$P_{sc} = Pressure\ at\ standard\ conditions\ (atmospheric\ pressure)$

$T_m = Average\ temperature\ of\ the\ pipeline\ (Absolute)$

$P_1 \& P_2 = Pressure\ at\ the\ pipeline\ entrance\ and\ exit\ (absolute)$

$L = Length\ of\ pipe\ in\ miles$

$G = Gas\ density\ with\ respect\ to\ water$

$Z = Compressibility\ factor\ for\ gas$

$E = Pipeline\ efficiency$

$L_e = Effective\ length\ of\ the\ pipeline$

$\Delta z = Elevation\ difference\ from\ entrance\ to\ the\ exit\ of\ the\ pipe$