



MONTANA-DAKOTA

UTILITIES CO.

A Division of MDU Resources Group, Inc.

400 North Fourth Street
Bismarck, ND 58501
(701) 222-7900

April 15, 2014

Executive Secretary
North Dakota Public Service Commission
State Capitol Building
Bismarck, ND 58505-0480

Re: Case No. 11,006 (Therm Billing)
Monthly Report – February 2014

Montana-Dakota Utilities Co., a Division of MDU Resources Group, Inc., herewith submits the following information, pursuant to the Ordering paragraphs one and two of the Order issued in the above-referenced docket, dated October 20, 1987:

1. Attachment A is a schedule showing the thermal billing factors by community that reflect the BTU values shown on Attachment B and were used for billing purposes in March 2014.
2. Attachment B consists of copies of the monthly Heating Value Test Reports received from our supplier for the month of February 2014. There is a report for each of the 17 thermal zones for the month.
3. Attachment C is a listing which states the type of measuring device in place at each zone.
4. Attachment D is a monthly list of the heating value data, by zone, for the most recent 12-month period and an average thereof. It is being provided pursuant to a Staff request.
5. Attachment E provides a brief explanation of the thermal variances, where applicable, for the month of February 2014.

Please acknowledge receipt by stamping or initialing the duplicate copy of this letter attached hereto and returning the same in the enclosed self-addressed, stamped envelope. Should the Commission or its Staff have any comments or questions with respect to these reports, please call me.

Sincerely,

Tamie Aberle
Director of Regulatory Affairs

Montana-Dakota Utilities Co.
Therm Billing Factors - North Dakota
March 2014

Town	Heat Zone	Therm Factor
MDU-303-ALEXANDER	025	1.1381
MDU-308-ARNEGARD	025	1.1381
MDU-314-APPLE VALLEY	271	1.0874
MDU-318-BEACH	032	0.9777
MDU-319-BELFIELD	032	0.9849
MDU-323-BERTHOLD	262	1.1334
MDU-327-BISMARCK	028	1.0343
MDU-330-BOWMAN	034	0.9605
MDU-337-BURLINGTON	262	1.1578
MDU-343-CARRINGTON	273	1.0874
MDU-344-CLEVELAND	272	1.0798
MDU-364-CAVALIER	273	1.1104
MDU-365-DAWSON	271	1.0798
MDU-368-DES LACS	262	1.1415
MDU-369-DICKINSON	031	1.0062
MDU-374-FT TOTTEN	273	1.0951
MDU-375-DEVILS LAKE	273	1.0951
MDU-379-BARLOW	273	1.0874
MDU-384-EPPING	264	1.1117
MDU-387-ELDRIDGE	272	1.0874
MDU-407-GLADSTONE	031	1.0062
MDU-411-GLEN ULLIN	311	1.1306
MDU-413-GOLVA	032	0.9633
MDU-416-GARRISON	262	1.1415
MDU-417-GRAFTON	273	1.1180
MDU-429-HEBRON	311	1.1306
MDU-432-HETTINGER	903	2.3875
MDU-449-JAMESTOWN	272	1.0951
MDU-459-KILLDEER	033	1.1155
MDU-463-LANGDON	273	1.0874
MDU-469-LEFOR	031	1.0062
MDU-474-LIGNITE	263	0.9998
MDU-475-LINTON	802	1.0025
MDU-478-LINCOLN	028	1.0343
MDU-494-MEDINA	271	1.0798
MDU-498-MANDAN	028	1.0343
MDU-500-MARMARTH	034	0.9676
MDU-505-MINOT	262	1.1578
MDU-510-MOTT	031	1.0062
MDU-512-MAX	262	1.1578
MDU-522-NEW ENGLAND	031	0.9989
MDU-524-NEW SALEM	028	1.0343
MDU-532-NEW ROCKFORD	273	1.0874
MDU-539-PARK RIVER	273	1.1104
MDU-540-PALERMO	262	1.1334
MDU-558-RAY	264	1.1117
MDU-561-REGENT	031	1.0062
MDU-563-RHAME	034	0.9534
MDU-564-RICHARDTON	311	1.1143

MDU-568-ROSS	261	1.1112
MDU-572-RUTHVILLE	262	1.1578
MDU-574-SANBORN	272	1.0951
MDU-583-SENTINEL BUTTE	032	0.9777
MDU-588-SOUTH HEART	031	0.9989
MDU-717-SPIRITWOOD	272	1.0950
MDU-590-SPRINGBROOK	264	1.1117
MDU-591-STANLEY	261	1.1192
MDU-593-STEELE	271	1.0798
MDU-598-SHEYENNE	273	1.0951
MDU-605-SURREY	262	1.1578
MDU-610-TAPPEN	271	1.0798
MDU-611-TAYLOR	031	0.9989
MDU-616-TIOGA	261	1.1112
MDU-619-TURTLE LAKE	262	1.1415
MDU-620-TRENTON	024	1.1197
MDU-624-UNDERWOOD	262	1.1415
MDU-625-VALLEY CITY	272	1.1027
MDU-629-WALHALLA	273	1.1104
MDU-632-WATFORD CITY	025	1.1381
MDU-636-WHEELOCK	264	1.1037
MDU-637-WHITE EARTH	261	1.1192
MDU-642-WILLISTON	024	1.1197
MDU-646-WASHBURN	262	1.1497
MDU-647-WILTON	262	1.1334
MDU-664-RIVERDALE	262	1.1415
MDU-691-FAIRVIEW	241	1.1387
MDU-712-MINOT AFB	262	1.1578
MDU-732-MSR SITE	273	1.1038

GQ Source Analysis

GQ Source Number:	0602160	Specific Gravity:	0.7204
GQ Source Name:	FAIRVIEW BORDER	Dry Heat Value:	1197.15
Effective Date:	2/1/2014 9:00:00 AM	Wet Heat Value:	1176.31
Effective End Date:	1/18/2038 9:14:07 PM	As Deliv. Heat Value:	1197.15
Pressure Base:	14.730	Sample Pressure:	
Viscosity:		Sample Temperature:	

	<u>Mol %</u>	<u>Liquid Content</u>			<u>Mol %</u>	
C1	Methane	69.438		CO2	Carbon Dioxide	0.653
C2	Ethane	22.875	6.0995	N2	Nitrogen	3.605
C3	Propane	3.241	0.8903	O2	Oxygen	0.009
IC4	Isobutane	0.068	0.0222	He	Helium	
NC4	n-Butane	0.107	0.0337	H2	Hydrogen	
IC5	Isopentane	0.000	0.0000	H2S	Hydrogen Sulfide	
NCS	n-Pentane	0.004	0.0013	Ar	Argon	
C6	Hexanes	0.000	0.0000	CO	Carbon Monoxide	
C7	Heptanes			H2	Water	
C8	Octanes			Neo-C5	Neopentane	
C9	Nonanes					
C10	Decanes					
		Totals	100.000%		7.047 GPM	

Sample Date: 3/3/2014 9:00:00 AM
Sample Type: Composite
Sample Tech: RR
H2S: ppm

Sample Remarks:

Analysis Tech: MB

Analysis Remarks:

Zone 241

GQ Source Analysis

GQ Source Number:	0602230	Specific Gravity:	0.7428
GQ Source Name:	WATFORD CITY BORDER	Dry Heat Value:	1205.49
Effective Date:	2/1/2014 9:00:00 AM	Wet Heat Value:	1184.51
Effective End Date:	1/18/2038 9:14:07 PM	As Deliv. Heat Value:	1205.49
Pressure Base:	14.730	Sample Pressure:	
Viscosity:		Sample Temperature:	

	<u>Mol %</u>	<u>Liquid Content</u>			<u>Mol %</u>	
C1	Methane	68.299		CO2	Carbon Dioxide	0.820
C2	Ethane	19.848	5.2924	N2	Nitrogen	4.943
C3	Propane	5.133	1.4099	O2	Oxygen	0.006
IC4	Isobutane	0.272	0.0887	He	Helium	
NC4	n-Butane	0.589	0.1853	H2	Hydrogen	
IC5	Isopentane	0.044	0.0159	H2S	Hydrogen Sulfide	
NC5	n-Pentane	0.044	0.0158	Ar	Argon	
C6	Hexanes	0.004	0.0000	CO	Carbon Monoxide	
C7	Heptanes			H2	Water	
C8	Octanes			Neo-C5	Neopentane	
C9	Nonanes					
C10	Decanes					
		Totals	100.000%	7.008 GPM		

Sample Date: 3/3/2014 9:00:00 AM
Sample Type: Composite
Sample Tech: ES
H2S: ppm

Sample Remarks:

Analysis Tech: MB

Analysis Remarks:

Zone 25

GQ Source Analysis

GQ Source Number:	2501030	Specific Gravity:	0.6268
GQ Source Name:	LIGNITE PLANT	Dry Heat Value:	1051.25
Effective Date:	2/1/2014 9:00:00 AM	Wet Heat Value:	1032.95
Effective End Date:	1/18/2038 9:14:07 PM	As Deliv. Heat Value:	1051.25
Pressure Base:	14.730	Sample Pressure:	
Viscosity:		Sample Temperature:	

		<u>Mol %</u>	<u>Liquid Content</u>			<u>Mol %</u>
C1	Methane	84.835		CO2	Carbon Dioxide	0.032
C2	Ethane	10.252	2.7336	N2	Nitrogen	4.506
C3	Propane	0.354	0.0973	O2	Oxygen	0.008
IC4	Isobutane	0.012	0.0040	He	Helium	
NC4	n-Butane	0.000	0.0000	H2	Hydrogen	
IC5	Isopentane	0.000	0.0000	H2S	Hydrogen Sulfide	
NC5	n-Pentane	0.000	0.0000	Ar	Argon	
C6	Hexanes	0.000	0.0000	CO	Carbon Monoxide	
C7	Heptanes			H2	Water	
C8	Octanes			Neo-C5	Neopentane	
C9	Nonanes					
C10	Decanes					

Totals 100.000% 2.835 GPM

Sample Date: 3/3/2014 9:00:00 AM
Sample Type: Composite
Sample Tech: 0
H2S: ppm

Sample Remarks:

Analysis Tech: MB

Analysis Remarks:

Zone 263

*** End of Report ***

GQ Source Daily Summary

February 2014

Number: 063	Pressure Base: 14.730	Contract Day: 1
Name: CLEVELAND STATION-MAPLETON	Temperature Base:	Contract Hour: 9

Day	Relative Density	Heating Value Wet	Heating Value Dry	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.6771	1108.5	1128.1	0.530	3.900	77.586	15.561	2.211	0.069	0.121	0.013	0.010	0.000	0.000	0.000	0.000	0.000	1370.92	
2	0.6832	1115.3	1135.0	0.555	4.017	76.629	16.126	2.433	0.076	0.138	0.014	0.012	0.000	0.000	0.000	0.000	0.000	1373.19	
3	0.6870	1118.2	1138.0	0.616	4.105	76.074	16.369	2.579	0.079	0.150	0.015	0.013	0.000	0.000	0.000	0.000	0.000	1372.96	
4	0.6810	1111.6	1131.3	0.614	3.946	77.017	15.874	2.317	0.073	0.133	0.015	0.012	0.000	0.000	0.000	0.000	0.000	1370.88	
5	0.6772	1108.3	1127.9	0.583	3.835	77.632	15.558	2.166	0.071	0.128	0.015	0.012	0.000	0.000	0.000	0.000	0.000	1370.64	
6	0.6760	1106.6	1126.2	0.577	3.836	77.860	15.355	2.141	0.073	0.130	0.016	0.013	0.000	0.000	0.000	0.000	0.000	1369.73	
7	0.6767	1107.1	1126.7	0.603	3.835	77.799	15.338	2.187	0.075	0.134	0.017	0.013	0.000	0.000	0.000	0.000	0.000	1369.64	
8	0.6767	1106.9	1126.5	0.613	3.835	77.791	15.350	2.174	0.075	0.133	0.016	0.013	0.000	0.000	0.000	0.000	0.000	1369.33	
9	0.6720	1099.8	1119.2	0.592	3.849	78.654	14.590	2.077	0.074	0.134	0.017	0.014	0.000	0.000	0.000	0.000	0.000	1365.39	
10	0.6610	1084.9	1104.1	0.597	3.713	80.601	13.080	1.795	0.069	0.115	0.016	0.012	0.000	0.000	0.000	0.000	0.000	1358.08	
11	0.6666	1092.6	1112.0	0.623	3.739	79.656	13.787	1.962	0.074	0.129	0.016	0.013	0.000	0.000	0.000	0.000	0.000	1361.88	
12	0.6722	1097.1	1116.5	0.588	4.045	78.592	14.398	2.150	0.072	0.129	0.014	0.011	0.000	0.000	0.000	0.000	0.000	1361.76	
13	0.6734	1098.6	1118.0	0.581	4.076	78.412	14.506	2.180	0.076	0.143	0.015	0.013	0.000	0.000	0.000	0.000	0.000	1362.41	
14	0.6787	1105.7	1125.3	0.595	4.122	77.466	15.264	2.298	0.078	0.150	0.015	0.013	0.000	0.000	0.000	0.000	0.000	1365.84	
15	0.6795	1105.4	1124.9	0.603	4.198	77.286	15.363	2.308	0.075	0.142	0.013	0.011	0.000	0.000	0.000	0.000	0.000	1364.72	
16	0.6742	1100.1	1119.6	0.554	4.098	78.135	14.840	2.146	0.072	0.131	0.014	0.011	0.000	0.000	0.000	0.000	0.000	1363.54	
17	0.6886	1117.2	1137.0	0.605	4.332	75.668	16.573	2.576	0.076	0.146	0.013	0.010	0.000	0.000	0.000	0.000	0.000	1370.13	
18	0.7009	1133.2	1153.3	0.644	4.449	73.800	17.751	3.038	0.093	0.193	0.017	0.016	0.000	0.000	0.000	0.000	0.000	1377.56	
19	0.7022	1135.3	1155.4	0.639	4.456	73.560	17.956	3.066	0.094	0.195	0.017	0.017	0.000	0.000	0.000	0.000	0.000	1378.75	
20	0.6955	1127.8	1147.8	0.602	4.341	74.613	17.332	2.809	0.089	0.181	0.017	0.016	0.000	0.000	0.000	0.000	0.000	1376.25	
21	0.6874	1118.8	1138.6	0.561	4.193	75.935	16.485	2.553	0.081	0.161	0.016	0.015	0.000	0.000	0.000	0.000	0.000	1373.24	
22	0.6843	1115.0	1134.7	0.549	4.153	76.495	16.063	2.458	0.082	0.166	0.018	0.017	0.000	0.000	0.000	0.000	0.000	1371.66	
23	0.6804	1108.9	1128.5	0.572	4.119	77.229	15.437	2.361	0.082	0.165	0.018	0.017	0.000	0.000	0.000	0.000	0.000	1368.10	
24	0.6754	1102.3	1121.8	0.562	4.061	78.109	14.772	2.223	0.079	0.158	0.018	0.017	0.000	0.000	0.000	0.000	0.000	1365.07	
25	0.6691	1093.6	1113.0	0.559	4.006	79.183	13.944	2.050	0.076	0.148	0.017	0.016	0.000	0.000	0.000	0.000	0.000	1360.64	
26	0.6674	1091.1	1110.4	0.541	4.022	79.504	13.650	2.027	0.076	0.147	0.018	0.016	0.000	0.000	0.000	0.000	0.000	1359.29	
27	0.6697	1093.8	1113.2	0.548	4.067	79.116	13.900	2.107	0.077	0.151	0.017	0.016	0.000	0.000	0.000	0.000	0.000	1360.26	
28	0.6732	1096.9	1116.3	0.580	4.160	78.657	14.037	2.262	0.086	0.177	0.020	0.020	0.000	0.000	0.000	0.000	0.000	1360.53	
Avg	0.6788	1107.0	1126.8	0.585	4.054	77.466	15.331	2.309	0.078	0.147	0.016	0.014	0.000	0.000	0.000	0.000	0.000	1367.58	

Zone 272

GQ Source Daily Summary

February 2014

Number: 061

Pressure Base: 14.730

Contract Day: 1

Name: CLEVELAND STATION-GRAFTON BORDER

Temperature Base:

Contract Hour: 9

Day	Relative Density	Heating Value Wet	Heating Value Dry	CO2	N2	C1	C2	C3	IC4	NC4	IC5	NC5	C6	C7	C8	C9	C10	Wobbe	CCT
1	0.6771	1108.3	1127.9	0.529	3.906	77.592	15.549	2.210	0.069	0.121	0.013	0.010	0.000	0.000	0.000	0.000	0.000	1370.77	
2	0.6830	1115.0	1134.7	0.555	4.018	76.659	16.100	2.428	0.076	0.138	0.014	0.012	0.000	0.000	0.000	0.000	0.000	1373.01	
3	0.6869	1118.0	1137.8	0.616	4.109	76.084	16.360	2.574	0.079	0.150	0.015	0.013	0.000	0.000	0.000	0.000	0.000	1372.79	
4	0.6809	1111.3	1131.0	0.614	3.951	77.043	15.845	2.314	0.073	0.133	0.014	0.012	0.000	0.000	0.000	0.000	0.000	1370.63	
5	0.6770	1107.9	1127.6	0.583	3.839	77.656	15.536	2.161	0.071	0.128	0.015	0.012	0.000	0.000	0.000	0.000	0.000	1370.40	
6	0.6758	1106.3	1125.9	0.577	3.839	77.882	15.336	2.136	0.073	0.129	0.016	0.013	0.000	0.000	0.000	0.000	0.000	1369.53	
7	0.6766	1106.8	1126.4	0.603	3.838	77.827	15.311	2.182	0.075	0.134	0.016	0.013	0.000	0.000	0.000	0.000	0.000	1369.40	
8	0.6767	1106.7	1126.3	0.612	3.839	77.800	15.342	2.171	0.075	0.133	0.016	0.013	0.000	0.000	0.000	0.000	0.000	1369.21	
9	0.6717	1099.4	1118.8	0.592	3.852	78.688	14.557	2.073	0.075	0.133	0.016	0.013	0.000	0.000	0.000	0.000	0.000	1365.12	
10	0.6610	1084.9	1104.1	0.596	3.721	80.595	13.080	1.795	0.069	0.115	0.016	0.012	0.000	0.000	0.000	0.000	0.000	1357.99	
11	0.6666	1092.5	1111.9	0.623	3.740	79.663	13.780	1.964	0.074	0.129	0.016	0.013	0.000	0.000	0.000	0.000	0.000	1361.84	
12	0.6721	1096.9	1116.3	0.589	4.046	78.617	14.376	2.147	0.072	0.129	0.014	0.011	0.000	0.000	0.000	0.000	0.000	1361.62	
13	0.6731	1098.0	1117.4	0.578	4.085	78.458	14.468	2.164	0.076	0.143	0.015	0.013	0.000	0.000	0.000	0.000	0.000	1362.02	
14	0.6787	1105.6	1125.2	0.595	4.124	77.473	15.257	2.297	0.078	0.149	0.015	0.013	0.000	0.000	0.000	0.000	0.000	1365.77	
15	0.6794	1105.2	1124.8	0.603	4.202	77.297	15.348	2.307	0.075	0.142	0.014	0.011	0.000	0.000	0.000	0.000	0.000	1364.57	
16	0.6740	1099.7	1119.2	0.554	4.097	78.184	14.803	2.136	0.071	0.130	0.014	0.011	0.000	0.000	0.000	0.000	0.000	1363.33	
17	0.6884	1116.9	1136.6	0.606	4.331	75.706	16.545	2.566	0.077	0.146	0.013	0.011	0.000	0.000	0.000	0.000	0.000	1369.96	
18	0.7006	1132.7	1152.8	0.642	4.453	73.849	17.714	3.022	0.093	0.193	0.016	0.016	0.000	0.000	0.000	0.000	0.000	1377.26	
19	0.7023	1135.3	1155.4	0.641	4.459	73.555	17.954	3.069	0.094	0.195	0.017	0.017	0.000	0.000	0.000	0.000	0.000	1378.71	
20	0.6957	1127.9	1147.8	0.603	4.347	74.590	17.347	2.811	0.089	0.181	0.017	0.016	0.000	0.000	0.000	0.000	0.000	1376.22	
21	0.6874	1118.5	1138.3	0.563	4.202	75.941	16.472	2.549	0.081	0.160	0.016	0.015	0.000	0.000	0.000	0.000	0.000	1372.95	
22	0.6841	1114.5	1134.2	0.547	4.160	76.538	16.018	2.455	0.082	0.166	0.017	0.017	0.000	0.000	0.000	0.000	0.000	1371.34	
23	0.6803	1108.6	1128.2	0.573	4.126	77.242	15.422	2.356	0.082	0.165	0.018	0.017	0.000	0.000	0.000	0.000	0.000	1367.85	
24	0.6752	1102.0	1121.5	0.559	4.069	78.135	14.747	2.218	0.079	0.158	0.018	0.017	0.000	0.000	0.000	0.000	0.000	1364.81	
25	0.6690	1093.4	1112.8	0.559	4.008	79.200	13.931	2.045	0.076	0.147	0.017	0.016	0.000	0.000	0.000	0.000	0.000	1360.49	
26	0.6673	1091.0	1110.4	0.539	4.027	79.508	13.639	2.029	0.076	0.147	0.018	0.017	0.000	0.000	0.000	0.000	0.000	1359.21	
27	0.6694	1093.4	1112.7	0.547	4.068	79.159	13.873	2.092	0.077	0.151	0.017	0.016	0.000	0.000	0.000	0.000	0.000	1360.00	
28	0.6733	1097.0	1116.4	0.580	4.167	78.635	14.048	2.268	0.086	0.177	0.020	0.020	0.000	0.000	0.000	0.000	0.000	1360.48	
Avg	0.6787	1107.0	1126.5	0.585	4.058	77.485	15.313	2.305	0.077	0.147	0.016	0.014	0.000	0.000	0.000	0.000	0.000	1367.40	

Zone 273

GQ Source Analysis

GQ Source Number:	0202080	Specific Gravity:	0.7165
GQ Source Name:	RICHARDTON-GLEN ULLIN COMPRE	Dry Heat Value:	1197.27
Effective Date:	2/1/2014 9:00:00 AM	Wet Heat Value:	1176.43
Effective End Date:	1/18/2038 9:14:00 PM	As Deliv. Heat Value:	1197.27
Pressure Base:	14.730	Sample Pressure:	336.00
Viscosity:		Sample Temperature:	0.00

		<u>Mol %</u>	<u>Liquid Content</u>			<u>Mol %</u>
C1	Methane	71.277		CO2	Carbon Dioxide	1.154
C2	Ethane	21.914	5.8430	N2	Nitrogen	2.513
C3	Propane	2.681	0.7360	O2	Oxygen	
IC4	Isobutane	0.146	0.0480	He	Helium	
NC4	n-Butane	0.270	0.0850	H2	Hydrogen	
IC5	Isopentane	0.021	0.0080	H2S	Hydrogen Sulfide	
NC5	n-Pentane	0.020	0.0070	Ar	Argon	
C6	Hexanes	0.004	0.0020	CO	Carbon Monoxide	
C7	Heptanes			H2	Water	
C8	Octanes			Neo-C5	Neopentane	
C9	Nonanes					
C10	Decanes					

Totals 100.000% 6.729 GPM

Sample Date: 3/3/2014 10:05:00 AM
Sample Type: Composite
Sample Tech: RR
H2S: ppm

Sample Remarks:

Analysis Tech: MB

Analysis Remarks:

Zone 311

GQ Source Analysis

GQ Source Number:	1202160	Specific Gravity:	0.6537
GQ Source Name:	BOWMAN BORDER	Dry Heat Value:	1046.96
Effective Date:	2/1/2014 9:00:00 AM	Wet Heat Value:	1028.74
Effective End Date:	1/18/2038 9:14:07 PM	As Deliv. Heat Value:	1046.96
Pressure Base:	14.730	Sample Pressure:	
Viscosity:		Sample Temperature:	

		<u>Mol %</u>	<u>Liquid Content</u>			<u>Mol %</u>
C1	Methane	81.063		CO2	Carbon Dioxide	0.725
C2	Ethane	10.592	2.8240	N2	Nitrogen	6.264
C3	Propane	1.172	0.3220	O2	Oxygen	
IC4	Isobutane	0.048	0.0160	He	Helium	
NC4	n-Butane	0.103	0.0320	H2	Hydrogen	
IC5	Isopentane	0.010	0.0040	H2S	Hydrogen Sulfide	
NC5	n-Pentane	0.016	0.0060	Ar	Argon	
C6	Hexanes	0.007	0.0030	CO	Carbon Monoxide	
C7	Heptanes			H2	Water	
C8	Octanes			Neo-C5	Neopentane	
C9	Nonanes					
C10	Decanes					
Totals			100.000%		3.207 GPM	

Sample Date: 3/3/2014 11:42:00 AM
Sample Type: Composite
Sample Tech: MIKE GENTILINI
H2S: ppm

Sample Remarks:

Analysis Tech: MIKE GENTILINI

Analysis Remarks:

Zone 34

Gas Quality Source Daily Summary
February 2014

LOCATION DISC# MICH	CROSS HEATING VALUE BTU/GAL	SPECIFIC GRAVITY	WOBBE (Btu)	CRICONDENTH (BTU (Btu F))	NITROGEN (mole percent)	CARBON DIOXIDE (mole percent)	METHANE (mole percent)	ETHANE (mole percent)	PROPANE (mole percent)	NORMAL BUTANE (mole percent)	ISO BUTANE (mole percent)	PENTANE (mole percent)	HEXANES PLUS (mole percent)	HYDROGEN (mole percent)	HELIUM (mole percent)	PRODUCTION DATE	POSTING DATE	Change/Stamp	
GREEN ULLIN	3097.8	0.5966	1343.6	-57.3	1.2311	0.8599	92.284	4.9389	0.3866	0.0422	0.0329	0.0065	0	0.0055	0.1828	0.0203	2/1/2014	2/1/2014 14:08	
GREEN ULLIN	3093.8	0.5938	1341.5	-72	1.1755	0.8861	92.6979	4.6544	0.3111	0.0272	0.0207	0.0035	0	0.0034	0.2005	0.0203	2/1/2014	2/2/2014 14:09	
GREEN ULLIN	3095.3	0.5945	1342.7	-66.7	1.1637	0.933	92.7225	4.6518	0.3505	0.0356	0.0257	0.0047	0	0.0033	0.1442	0.0203	2/2/2014	2/3/2014 14:08	
GREEN ULLIN	3040.3	0.5977	1345.7	-61.4	1.1156	0.9062	92.3424	5.1711	0.3883	0.0294	0.0294	0.0059	0	0.0042	0.0956	0.0203	2/3/2014	2/4/2014 14:09	
GREEN ULLIN	3034.4	0.5941	1342.1	-65.3	1.1173	0.9129	92.7383	4.6418	0.3124	0.0251	0.0252	0.0048	0	0.0035	0.186	0.0203	2/4/2014	2/5/2014 14:09	
GREEN ULLIN	3031.1	0.5918	1340.4	-81.1	1.1227	0.8999	93.0319	4.4313	0.2571	0.0195	0.0145	0.0022	0	0.0034	0.2002	0.0203	2/5/2014	2/6/2014 14:08	
GREEN ULLIN	1028.9	0.5904	1338.3	-78.3	1.1928	0.8808	93.7416	4.1411	0.2466	0.02	0.0153	0.0023	0	0.0017	0.2005	0.0203	2/6/2014	2/7/2014 14:08	
GREEN ULLIN	1028.5	0.5909	1337.9	-77.8	1.2507	0.8651	93.1932	4.1766	0.2608	0.0212	0.0162	0.0027	0	0.0017	0.1876	0.0203	2/7/2014	2/8/2014 14:09	
GREEN ULLIN	1034.5	0.595	1341.1	-60.9	1.2532	0.8755	92.4555	4.6695	0.3504	0.0363	0.0279	0.0058	0	0.0046	0.1803	0.0203	2/8/2014	2/9/2014 14:09	
GREEN ULLIN	1037.8	0.5969	1343.3	-55.3	1.2392	0.876	92.7777	4.9241	0.3905	0.0443	0.0345	0.0073	0	0.006	0.1684	0.0203	2/9/2014	2/10/2014 14:09	
GREEN ULLIN	1034.4	0.5969	1343.3	-55.3	1.2392	0.876	92.7777	4.9241	0.3905	0.0443	0.0345	0.0073	0	0.006	0.1684	0.0203	2/10/2014	2/11/2014 14:09	
GREEN ULLIN	1045.4	0.602	1347.3	-41.2	1.1809	0.9301	91.5699	5.4477	0.5252	0.0669	0.0524	0.0118	0	0.0114	0.1679	0.0212	2/10/2014	2/11/2014 14:09	
GREEN ULLIN	3097.2	0.6033	1346	-38.7	1.1522	0.964	91.5571	5.5837	0.5812	0.0726	0.0563	0.0127	0	0.0127	0.1924	0.0213	2/11/2014	2/12/2014 14:09	
GREEN ULLIN	3096.7	0.5999	1341.8	-66.6	1.2243	0.9307	92.2034	5.016	0.358	0.0311	0.0239	0.0042	0	0.0032	0.1812	0.0213	2/12/2014	2/13/2014 14:09	
GREEN ULLIN	3094.2	0.5946	1341	-76.4	1.2238	0.8915	92.547	4.811	0.2888	0.0229	0.0176	0.0029	0	0.0018	0.1685	0.0213	2/13/2014	2/14/2014 14:10	
GREEN ULLIN	3034.3	0.5947	1341.2	-87.3	1.2054	0.8994	92.4553	4.9547	0.2594	0.0152	0.0115	0.0014	0	0.0004	0.1672	0.0213	2/14/2014	2/15/2014 14:09	
GREEN ULLIN	1040.2	0.5989	1344.2	-68.4	1.2252	0.9098	91.8596	5.4458	0.3475	0.0296	0.0222	0.0035	0	0.0006	0.1845	0.0213	2/15/2014	2/16/2014 14:09	
GREEN ULLIN	1036.4	0.5955	1343.1	-77.4	1.1251	0.9159	92.3319	4.939	0.3073	0.023	0.0174	0.0028	0	0.0016	0.1135	0.0213	2/16/2014	2/17/2014 14:10	
GREEN ULLIN	1024.6	0.5941	1342.3	-83.7	1.1488	0.8889	92.533	4.8939	0.2697	0.0191	0.0143	0.002	0	0.001	0.2074	0.0213	2/17/2014	2/18/2014 14:10	
GREEN ULLIN	1029.1	0.5981	1343.6	-58.5	1.1661	0.9469	92.0712	5.1521	0.3794	0.0402	0.0311	0.0063	0	0.005	0.1747	0.0213	2/18/2014	2/19/2014 14:10	
GREEN ULLIN	1045.2	0.6021	1346.9	-45.2	1.214	0.9322	91.798	5.5143	0.5188	0.0638	0.05	0.0108	0	0.0092	0.1841	0.021	2/19/2014	2/20/2014 14:10	
GREEN ULLIN	3048.5	0.6045	1348.5	-42.2	1.1569	0.9762	91.1259	5.8149	0.5604	0.0696	0.0547	0.0119	0	0.0104	0.1872	0.021	2/20/2014	2/21/2014 14:10	
GREEN ULLIN	3046.5	0.6022	1346.5	-41.9	1.1729	0.971	91.537	5.4129	0.5371	0.0693	0.0544	0.012	0	0.0107	0.1918	0.021	2/21/2014	2/22/2014 14:10	
GREEN ULLIN	3047.5	0.6031	1348.8	-40.9	1.1189	0.9593	91.3962	5.5973	0.0717	0.0556	0.056	0.0125	0	0.0112	0.1856	0.021	2/22/2014	2/23/2014 14:10	
GREEN ULLIN	1048	0.6058	1348.7	-38.8	1.1573	0.9535	91.3229	5.577	0.6035	0.0771	0.0603	0.0134	0	0.0122	0.1847	0.021	2/23/2014	2/24/2014 14:09	
GREEN ULLIN	1048	0.6043	1348.2	-39.1	1.1765	0.9688	91.4596	5.6291	0.6015	0.0763	0.0598	0.0133	0	0.012	0.1787	0.021	2/24/2014	2/25/2014 14:10	
AVE	1038.9	0.5977	1343.8	-61.1	1.1825	0.9171	92.1511	5.0617	0.3964	0.0423	0.0328	0.0067	0.0089	0.0000	0.0055	0.1764	0.0199		

Zone 802

NORTH DAKOTA HEATING VALUE ZONES		
ZONES	MEASURING DEVICE	LOCATION
211	Chromatograph	Sidney Area
24	Chromatograph	Williston Area
241	Monthly Sampler	Fairview Area
25	Monthly Sampler	Watford City Area
261	Chromatograph	Williston – Tioga – Minot Line
262	Chromatograph	Minot Area
263	Monthly Sampler	Tioga – Portal
264	Chromatograph	Williston – Ray
271	Chromatograph	Bismarck – Cleveland
272	Chromatograph	Cleveland – Mapleton
273	Chromatograph	Cleveland – Grafton
28	Chromatograph	Bismarck
31	Chromatograph	Dickinson
311	Monthly Sampler	Taylor Take-Off – Glen Ullin Comp
32	Chromatograph	Cabin Creek – Dickinson
33	Chromatograph	Killdeer
34	Monthly Sampler	Bowman Area
802	Chromatograph	Linton

MONTANA DAKOTA UTILITIES CO
 NORTH DAKOTA
 HEATING VALUE DATA
 12 MONTH ACCUMULATIVE AT 14.73 psia, 60 f. DRY

STATE	ZONE	ZONE BOUNDARY	12 MONTH AVERAGE	FEB 14	JAN 14	DEC 13	NOV 13	OCT 13	SEPT 13	AUG 13	JULY 13	JUNE 13	MAY 13	APR 13	MAR 13	ZONE
MT/ND	211	Sidney Area	1208	1205	1208	1204	1209	1211	1206	1208	1209	1212	1201	1213	1206	211
ND	24	Williston Area	1200	1177	1201	1201	1207	1204	1199	1196	1198	1196	1197	1216	1204	24
ND	25	Watford City Area	1193	1205	1218	1191	1197	1183	1198	1193	1193	1188	1154	1200	1201	25
ND/MT	241	Fairview Area	1200	1197	1203	1197	1189	1198	1202	1203	1205	1205	1203	1203	1195	241
ND	261	Williston - Tioga - Minot Line	1169	1185	1189	1193	1166	1175	1180	1165	1172	1156	1159	1163	1123	261
ND	262	Minot Area	1189	1200	1201	1201	1192	1197	1196	1185	1191	1181	1177	1172	1170	262
ND	263	Tioga - Portal	1106	1051	1063	1061	1096	1125	1130	1130	1130	1127	1123	1117	1116	263
ND	264	Williston - Ray	1200	1177	1201	1201	1207	1204	1199	1196	1198	1196	1197	1216	1204	264
ND	271	Bismarck - Cleveland	1168	1127	1144	1145	1164	1184	1199	1187	1191	1183	1175	1167	1145	271
ND	272	Cleveland - Mapleton	1168	1127	1144	1145	1164	1184	1199	1187	1192	1183	1178	1169	1147	272
ND	273	Cleveland - Grafton	1168	1127	1144	1145	1164	1184	1199	1188	1192	1184	1177	1169	1146	273
ND	28	Bismarck - Cabin Creek	1137	1072	1081	1092	1105	1147	1199	1187	1191	1182	1173	1117	1102	28
ND	31	Dickinson Area	1107	1073	1082	1092	1107	1126	1079	1098	1112	1130	1163	1117	1103	31
ND	311	Taylor Take-Off - Glen Ullin Comp	1124	1197	1092	1092	1104	1108	1094	1135	1188	1097	1163	1117	1103	311
ND/MT	32	Cabin Creek - Dickinson	1097	1058	1070	1082	1096	1095	1115	1135	1142	1094	1100	1088	1089	32
ND	33	Killdeer	1180	1181	1182	1180	1180	1182	1183	1182	1183	1180	1179	1177	1176	33
ND	34	Bowman Area	1116	1047	1073	1082	1118	1118	1145	1127	1140	1121	1136	1146	1144	34
ND	802	Linton	1034	1039	1042	1033	1037	1037	1032	1032	1032	1036	1031	1027	1027	802

**THERMAL ZONE VARIANCE
DOCUMENTATION**

February 2014

<i>ZONE</i>	<i>BTU VARIANCE</i>	<i>REASON</i>
28	-52	Mix of gas in the area
31	47	Mix of gas in the area
32	-20	Mix of gas in the area
34	-27	Mix of gas in the area