

# Gas Quality Reports

LS117-Blackwell to Grabham at Grabham  
11/25/2019 - 2/25/2020

Gas Day	Gross Heating Value (HHV) (Btu/scf)	Net Heating Value (LHV) (Btu/scf)	Specific Gravity	Wobbe Index	Hydrocarbon Dewpoint (HCDP) (deg F)	N2 (mol%)	CO2 (mol%)	Methane (mol%)	Ethane (mol%)	Propane (mol%)	Isobutane (mol%)	N-Butane (mol%)	Isopentane (mol%)	N-Pentane (mol%)	C6 Plus (mol%)
11/25/2019	1,047.6	1,029.4	0.597	1,355.83	-138.48	1.379	0.402	91.706	6.341	0.167	0.002	0.003	0	0	0.002
11/26/2019	1,046.4	1,028.2	0.597	1,354.86	-139.03	1.398	0.406	91.825	6.183	0.179	0.003	0.004	0	0	0.002
11/27/2019	1,046.7	1,028.5	0.597	1,355.05	-138.67	1.387	0.410	91.848	6.126	0.216	0.004	0.006	0	0	0.003
11/28/2019	1,047.1	1,028.9	0.597	1,355.33	-138.67	1.405	0.395	91.736	6.283	0.174	0.002	0.003	0	0	0.002
11/29/2019	1,047.5	1,029.2	0.597	1,355.52	-138.44	1.399	0.401	91.686	6.333	0.175	0.002	0.002	0	0	0.002
11/30/2019	1,046.7	1,028.5	0.597	1,354.81	-138.75	1.413	0.405	91.757	6.242	0.170	0.003	0.005	0.001	0	0.003
12/01/2019	1,046.8	1,028.6	0.597	1,354.93	-138.81	1.415	0.404	91.715	6.301	0.160	0.002	0.003	0	0	0.002
12/02/2019	1,045.7	1,027.5	0.597	1,353.77	-139.21	1.456	0.404	91.780	6.176	0.174	0.003	0.004	0	0	0.003
12/03/2019	1,043.1	1,025.0	0.595	1,352.46	-141.08	1.450	0.398	92.149	5.818	0.173	0.003	0.005	0	0	0.002
12/04/2019	1,040.3	1,022.2	0.593	1,351.19	-142.31	1.400	0.411	92.749	5.167	0.225	0.011	0.022	0.004	0.004	0.007
12/05/2019	1,037.2	1,019.2	0.591	1,349.27	-145.82	1.440	0.395	92.905	5.126	0.125	0.003	0.005	0	0	0.003
12/06/2019	1,035.6	1,017.6	0.590	1,348.31	-147.02	1.436	0.399	93.116	4.915	0.124	0.003	0.005	0	0	0.003
12/07/2019	1,032.8	1,014.8	0.588	1,346.84	-149.37	1.421	0.401	93.485	4.575	0.107	0.002	0.005	0	0	0.003
12/08/2019	1,032.8	1,014.8	0.588	1,346.84	-149.37	1.421	0.401	93.485	4.575	0.107	0.002	0.005	0	0	0.003
12/09/2019	1,033.3	1,015.3	0.588	1,347.07	-148.84	1.437	0.392	93.429	4.610	0.120	0.003	0.006	0	0	0.003
12/10/2019	1,031.7	1,013.8	0.588	1,345.29	-149.07	1.549	0.368	93.481	4.429	0.152	0.005	0.010	0.001	0.001	0.005
12/11/2019	1,032.3	1,014.3	0.588	1,346.28	-149.35	1.458	0.390	93.531	4.478	0.127	0.004	0.007	0	0	0.004
12/12/2019	1,031.6	1,013.6	0.588	1,345.54	-149.82	1.490	0.387	93.546	4.440	0.122	0.003	0.007	0	0	0.004
12/13/2019	1,031.3	1,013.4	0.588	1,345.17	-149.95	1.490	0.400	93.536	4.446	0.115	0.003	0.006	0	0	0.004
12/14/2019	1,030.0	1,012.1	0.587	1,344.41	-151.20	1.487	0.401	93.699	4.301	0.102	0.002	0.005	0	0	0.003
12/15/2019	1,030.3	1,012.4	0.587	1,344.50	-150.78	1.500	0.398	93.639	4.345	0.106	0.003	0.006	0	0	0.003
12/16/2019	1,032.4	1,014.4	0.588	1,345.95	-149.00	1.495	0.386	93.457	4.509	0.135	0.004	0.008	0	0.001	0.005
12/17/2019	1,031.9	1,013.9	0.588	1,345.45	-149.35	1.510	0.388	93.471	4.488	0.127	0.004	0.008	0	0	0.005
12/18/2019	1,032.1	1,014.1	0.588	1,346.09	-149.57	1.457	0.395	93.533	4.483	0.118	0.003	0.007	0	0	0.004
12/19/2019	1,033.0	1,015.0	0.588	1,346.61	-148.68	1.456	0.396	93.431	4.571	0.129	0.004	0.008	0	0	0.005
12/20/2019	1,033.4	1,015.5	0.589	1,346.67	-148.08	1.468	0.399	93.364	4.612	0.135	0.005	0.009	0.001	0.001	0.006
12/21/2019	1,032.0	1,014.0	0.588	1,345.93	-149.43	1.469	0.392	93.542	4.457	0.121	0.004	0.008	0	0.001	0.005
12/22/2019	1,032.4	1,014.5	0.588	1,346.10	-148.92	1.475	0.393	93.483	4.499	0.130	0.004	0.009	0	0.001	0.006
12/23/2019	1,028.6	1,010.7	0.586	1,343.99	-152.51	1.461	0.397	93.949	4.090	0.091	0.003	0.005	0.001	0.001	0.004
12/24/2019	1,028.1	1,010.2	0.585	1,343.92	-153.33	1.457	0.388	94.002	4.076	0.072	0.001	0.002	0	0	0.002
12/25/2019	1,028.7	1,010.8	0.585	1,344.40	-152.82	1.445	0.389	93.963	4.116	0.081	0.001	0.002	0	0	0.002
12/26/2019	1,028.6	1,010.7	0.585	1,344.60	-152.83	1.421	0.390	94.062	4.018	0.098	0.003	0.005	0	0	0.004
12/27/2019	1,030.3	1,012.3	0.586	1,345.31	-151.10	1.445	0.388	93.813	4.228	0.110	0.003	0.007	0	0	0.005
12/28/2019	1,030.6	1,012.6	0.587	1,345.06	-150.63	1.472	0.394	93.700	4.303	0.115	0.004	0.007	0	0	0.004
12/29/2019	1,032.5	1,014.5	0.588	1,346.25	-148.79	1.471	0.389	93.516	4.466	0.134	0.005	0.010	0.001	0.002	0.007
12/30/2019	1,030.8	1,012.9	0.587	1,345.05	-149.96	1.486	0.392	93.689	4.276	0.131	0.005	0.011	0.001	0.002	0.007
12/31/2019	1,028.0	1,010.1	0.585	1,343.75	-152.54	1.468	0.386	94.095	3.909	0.115	0.005	0.011	0.002	0.002	0.006
01/01/2020	1,018.6	1,000.9	0.579	1,338.25	-161.76	1.528	0.352	95.161	2.883	0.065	0.002	0.004	0	0	0.004
01/02/2020	1,019.3	1,001.5	0.580	1,338.34	-160.94	1.551	0.352	95.033	2.984	0.070	0.002	0.005	0	0	0.004
01/03/2020	1,022.7	1,004.9	0.583	1,339.99	-156.95	1.558	0.365	94.616	3.319	0.116	0.005	0.010	0.001	0.001	0.007
01/04/2020	1,021.1	1,003.4	0.581	1,339.20	-158.68	1.561	0.357	94.795	3.176	0.092	0.004	0.008	0	0.001	0.006
01/05/2020	1,018.3	1,000.6	0.579	1,337.67	-161.70	1.563	0.350	95.145	2.858	0.072	0.003	0.006	0	0	0.004
01/06/2020	1,018.5	1,000.8	0.580	1,337.85	-161.49	1.564	0.345	95.130	2.874	0.073	0.003	0.006	0	0	0.005

## Gas Quality Reports

LS117-Blackwell to Grabham at Grabham

Page 2 of 3

11/25/2019 - 2/25/2020

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01/07/2020	1,020.4	1,002.6	0.581	1,338.93	-159.47	1.560	0.348	94.914	3.070	0.089	0.003	0.008	0	0.001	0.006
01/08/2020	1,020.9	1,003.1	0.581	1,338.88	-158.57	1.577	0.357	94.811	3.132	0.099	0.005	0.010	0.001	0.002	0.007
01/09/2020	1,018.3	1,000.6	0.580	1,337.38	-161.42	1.592	0.346	95.097	2.870	0.080	0.003	0.007	0	0	0.005
01/10/2020	1,019.8	1,002.0	0.580	1,339.29	-160.72	1.499	0.350	95.105	2.955	0.077	0.003	0.006	0	0	0.005
01/11/2020	1,021.5	1,003.7	0.582	1,339.47	-158.21	1.556	0.357	94.785	3.179	0.101	0.004	0.009	0.001	0.001	0.007
01/12/2020	1,025.5	1,007.7	0.584	1,341.76	-152.64	1.566	0.352	94.479	3.320	0.203	0.017	0.038	0.007	0.008	0.010
01/13/2020	1,019.0	1,001.2	0.580	1,337.65	-160.52	1.607	0.343	94.996	2.951	0.085	0.004	0.008	0	0.001	0.006
01/14/2020	1,019.9	1,002.2	0.581	1,337.83	-159.24	1.632	0.347	94.823	3.082	0.095	0.004	0.009	0.001	0.002	0.006
01/15/2020	1,017.9	1,000.2	0.580	1,336.40	-161.26	1.658	0.344	94.997	2.907	0.079	0.003	0.007	0	0.001	0.005
01/16/2020	1,024.4	1,006.6	0.584	1,341.01	-154.91	1.558	0.364	94.451	3.454	0.133	0.007	0.015	0.003	0.003	0.010
01/17/2020	1,023.2	1,005.4	0.583	1,340.21	-156.30	1.569	0.362	94.552	3.374	0.114	0.005	0.011	0.002	0.002	0.008
01/18/2020	1,027.5	1,009.6	0.586	1,342.54	-150.74	1.582	0.360	94.175	3.596	0.205	0.016	0.037	0.008	0.009	0.012
01/19/2020	1,022.6	1,004.8	0.583	1,339.49	-156.52	1.596	0.365	94.564	3.329	0.114	0.006	0.013	0.003	0.003	0.008
01/20/2020	1,023.3	1,005.5	0.583	1,340.11	-156.06	1.575	0.367	94.513	3.399	0.115	0.006	0.012	0.002	0.003	0.008
01/21/2020	1,022.9	1,005.1	0.583	1,339.89	-156.54	1.576	0.364	94.560	3.363	0.108	0.005	0.011	0.002	0.002	0.008
01/22/2020	1,021.1	1,003.3	0.582	1,339.03	-158.57	1.570	0.359	94.775	3.185	0.090	0.004	0.008	0.001	0.001	0.006
01/23/2020	1,020.8	1,003.1	0.581	1,338.77	-158.70	1.582	0.357	94.796	3.151	0.093	0.004	0.009	0.001	0.001	0.007
01/24/2020	1,022.0	1,004.2	0.582	1,339.17	-157.28	1.595	0.364	94.624	3.285	0.104	0.005	0.011	0.002	0.002	0.007
01/25/2020	1,021.6	1,003.8	0.582	1,339.03	-157.85	1.588	0.362	94.684	3.243	0.098	0.005	0.010	0.001	0.002	0.007
01/26/2020	1,022.4	1,004.6	0.583	1,339.35	-156.78	1.602	0.360	94.587	3.307	0.112	0.006	0.012	0.002	0.003	0.008
01/27/2020	1,019.4	1,001.7	0.581	1,337.52	-159.83	1.620	0.355	94.882	3.036	0.086	0.004	0.008	0.001	0.001	0.006
01/28/2020	1,024.9	1,007.1	0.584	1,340.84	-154.12	1.589	0.368	94.328	3.527	0.142	0.009	0.019	0.004	0.004	0.010
01/29/2020	1,025.7	1,007.9	0.585	1,340.68	-152.72	1.628	0.376	94.126	3.676	0.151	0.008	0.017	0.004	0.004	0.010
01/30/2020	1,024.8	1,006.9	0.584	1,341.01	-154.46	1.575	0.363	94.375	3.512	0.134	0.007	0.016	0.003	0.004	0.010
01/31/2020	1,025.3	1,007.5	0.585	1,341.07	-153.38	1.586	0.371	94.273	3.589	0.139	0.008	0.017	0.004	0.004	0.011
02/01/2020	1,020.4	1,002.7	0.581	1,338.53	-158.91	1.577	0.361	94.866	3.073	0.098	0.005	0.010	0.001	0.002	0.007
02/02/2020	1,020.9	1,003.2	0.582	1,338.80	-158.52	1.569	0.367	94.800	3.142	0.097	0.005	0.010	0.001	0.002	0.007
02/03/2020	1,019.9	1,002.2	0.581	1,338.14	-159.38	1.594	0.355	94.897	3.037	0.092	0.004	0.010	0.001	0.002	0.007
02/04/2020	1,024.0	1,006.2	0.584	1,340.04	-154.80	1.610	0.368	94.392	3.456	0.132	0.007	0.016	0.003	0.004	0.011
02/05/2020	1,025.4	1,007.6	0.585	1,340.53	-152.56	1.637	0.370	94.183	3.603	0.155	0.009	0.020	0.004	0.005	0.013
02/06/2020	1,027.6	1,009.7	0.586	1,341.86	-150.53	1.621	0.374	93.978	3.788	0.177	0.011	0.024	0.005	0.006	0.015
02/07/2020	1,026.2	1,008.3	0.585	1,341.70	-152.24	1.566	0.376	94.252	3.588	0.163	0.010	0.022	0.005	0.005	0.014
02/08/2020	1,024.3	1,006.5	0.584	1,340.27	-154.41	1.598	0.373	94.387	3.451	0.145	0.008	0.018	0.004	0.004	0.012
02/09/2020	1,024.4	1,006.6	0.584	1,340.32	-154.65	1.594	0.377	94.333	3.524	0.136	0.007	0.016	0.001	0.001	0.010
02/10/2020	1,024.0	1,006.2	0.584	1,340.31	-154.97	1.582	0.373	94.436	3.433	0.136	0.008	0.018	0.001	0.001	0.011
02/11/2020	1,024.3	1,006.5	0.584	1,340.54	-154.35	1.584	0.369	94.432	3.418	0.144	0.011	0.023	0.002	0.004	0.012
02/12/2020	1,022.6	1,004.8	0.583	1,339.61	-155.64	1.567	0.376	94.723	3.115	0.159	0.013	0.025	0.004	0.005	0.014
02/13/2020	1,017.1	999.4	0.579	1,336.15	-160.15	1.586	0.377	95.439	2.347	0.184	0.013	0.027	0.005	0.006	0.015
02/14/2020	1,001.5	984.1	0.569	1,327.24	-181.36	1.573	0.376	97.419	0.435	0.149	0.008	0.019	0.004	0.004	0.013
02/15/2020	997.8	980.4	0.567	1,324.72	-199.97	1.603	0.375	97.832	0	0.143	0.008	0.018	0.004	0.004	0.013
02/16/2020	997.2	979.9	0.567	1,324.51	-199.97	1.607	0.368	97.865	0	0.123	0.006	0.015	0.003	0.003	0.011
02/17/2020	996.6	979.3	0.566	1,324.42	-199.97	1.595	0.361	97.921	0	0.099	0.004	0.010	0.001	0.002	0.007
02/18/2020	998.1	980.7	0.567	1,326.01	-199.97	1.514	0.375	97.948	0	0.129	0.006	0.014	0.003	0.002	0.009

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LS117-Blackwell to Grabham at Grabham  
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Gas Day	Gross Heating Value (HHV) (Btu/scf)	Net Heating Value (LHV) (Btu/scf)	Specific Gravity	Wobbe Index	Hydrocarbon Dewpoint (HCDP) (deg F)	N2 (mol%)	CO2 (mol%)	Methane (mol%)	Ethane (mol%)	Propane (mol%)	Isobutane (mol%)	N-Butane (mol%)	Isopentane (mol%)	N-Pentane (mol%)	C6 Plus (mol%)
02/19/2020	1,000.3	982.9	0.567	1,328.94	-199.97	1.533	0.276	97.947	0	0.188	0.011	0.026	0.002	0.001	0.016
02/20/2020	1,005.1	987.6	0.565	1,337.67	-68.56	1.440	0.023	98.229	0	0.232	0.018	0.031	0.003	0.001	0.022
02/21/2020	1,005.1	987.6	0.565	1,337.67	-68.56	1.440	0.023	98.229	0	0.232	0.018	0.031	0.003	0.001	0.022
02/22/2020	1,028.1	1,010.2	0.586	1,343.36	-150.92	1.529	0.370	94.098	3.791	0.157	0.009	0.020	0.005	0.005	0.015
02/23/2020	1,028.0	1,010.1	0.586	1,343.29	-151.08	1.523	0.374	94.109	3.786	0.154	0.009	0.020	0.005	0.005	0.015

**NOTES:**

**Wobbe Index:** Interchangeability constant calculated using the Gross (or Higher) Heating Value (HHV) divided by the square root of the Specific Gravity

**Hydrocarbon Dewpoint (HCDP):** Theoretically determined value using the Redlich-Kwong equation of state (EOS)

Selection: Business Unit ID = 70; Analysis\_Key = 66331