



Measurement Error Report

Air Liquide UK Ltd

MER/CAD/211/21 EM010 Hemswell BNEF

Document Reference: NK3247A-001

Client Reference: PO 4500162994

Document Author: Ben Kirkman

Contact: ben.kirkman@kelton.co.uk

Kelton Engineering Ltd

The Mackenzie Building, 168 Skene Street
Aberdeen, AB10 1PE, Scotland, UK

t: +44 (0) 1224 630000 | f: +44 (0) 1224 630004
e: info@kelton.co.uk | w: www.kelton.co.uk

Contents

1	Revision Control	2
2	Executive Summary.....	3
3	Error Description.....	3
4	Methodology.....	4
5	Error Quantification	5
6	Learning.....	5
7	References	6
8	Appendix A – Daily Correction Factors	6

1 Revision Control

Rev	Issue date	Description	Prep.	App.
1	23/09/2021	Issued for comment	LJ	BK
2	21/10/2021	Final	LJ	BK

2 Executive Summary

Site Name	Hemswell BNEF
DNO	Cadent Gas Limited
LDZ	East Midlands
Error Start Date	20 th September 2019
(Or) Last Good Date	
Error Corrected Date	11 th May 2021
Size of Error (over or under read)	275,430 Sm ³ under-registration (approximately 3.00 GWh)
Error Description	Drift of ultrasonic meter flow readings
Methodology	Comparison of inlet meter and fiscal meter flow readings
Meter Type	Ultrasonic meter
MER Unique Reference Number	EM010
Cadent Internal Reference	MER/CAD/211/21

3 Error Description

Hemswell BNEF has a single 2" Sick Flowsic500 ultrasonic meter stream (Serial No. 17470013) for measurement of gas exiting the grid entry unit (GEU) and entering the distribution network (referred to in this report as 'Fiscal USM'). A turbine meter (Serial No. 1170368) is located on the inlet to the GEU for process control (referred to in this report as 'Inlet Meter'). Propane injection is used to control the gas properties (e.g. calorific value, Wobbe number, etc.) to meet the requirements of the Gas Safety (Management) Regulations (GS(M)R). Gas that is not within specification is rejected by a diverter valve.

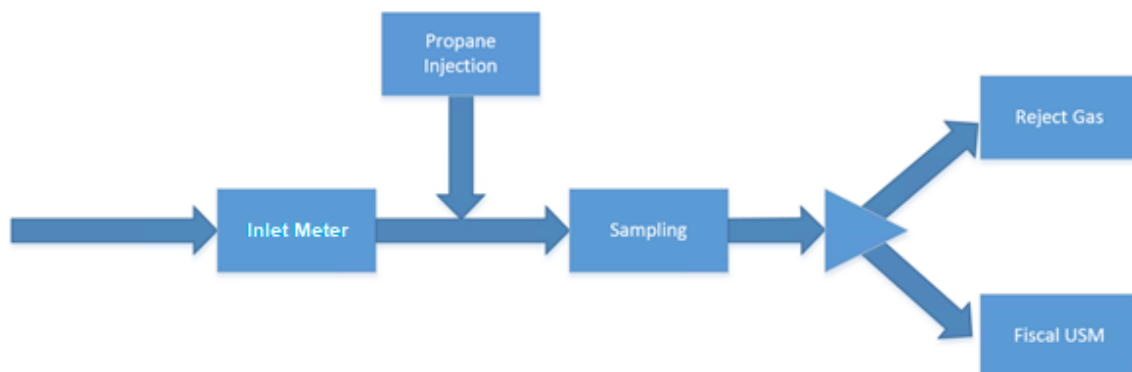


Figure 1 - Grid Entry Unit Flow Diagram

During normal operation the Fiscal USM will read slightly higher (~3.3%) than the Inlet Meter due to the addition of propane. From 20th September 2019, the Fiscal USM gradually started reading increasingly lower than the Inlet Meter. The error was resolved when the Fiscal USM was replaced on 11th May 2021. Refer to Figure 2.

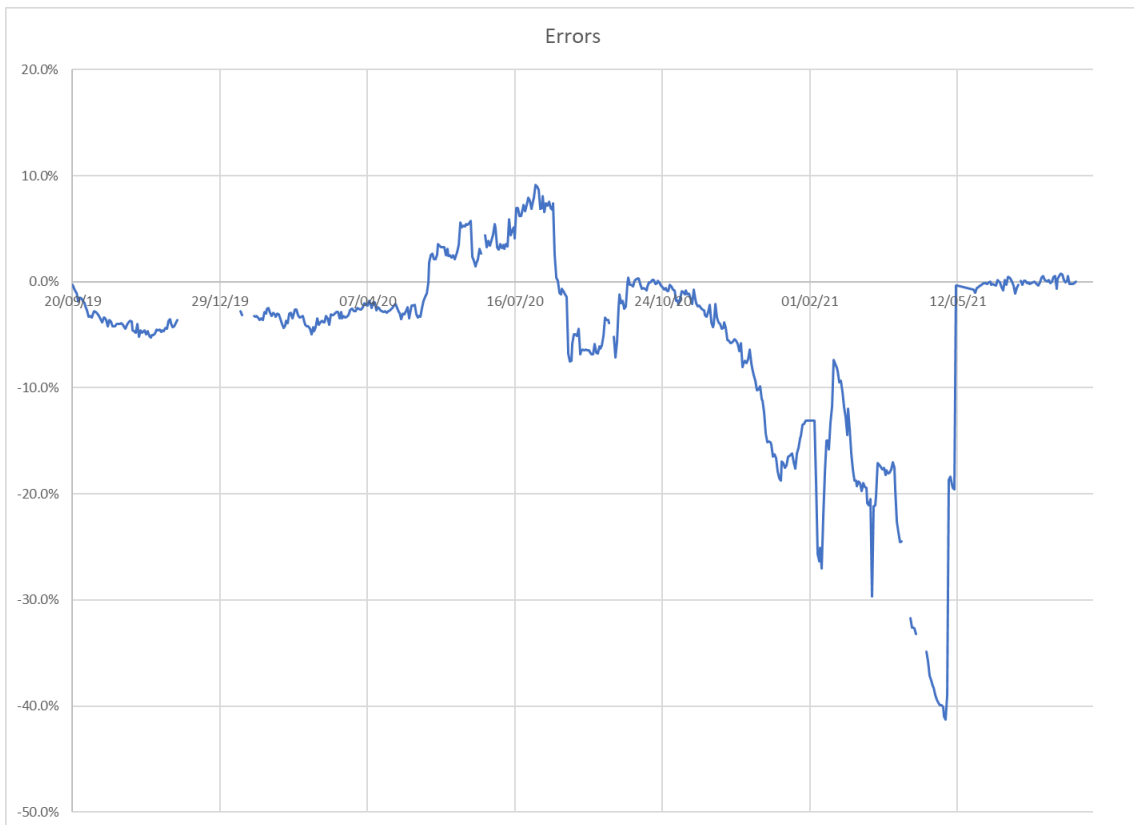


Figure 2 – Fiscal USM Errors

4 Methodology

The percentage offset between the Fiscal USM and Inlet meter is expected to be stable, however in September 2019 the offset began to change (refer to Figure 3 - Left). The start of the drift (error) was determined using the change in standard deviation of the offset values (refer to Figure 3 - Left).

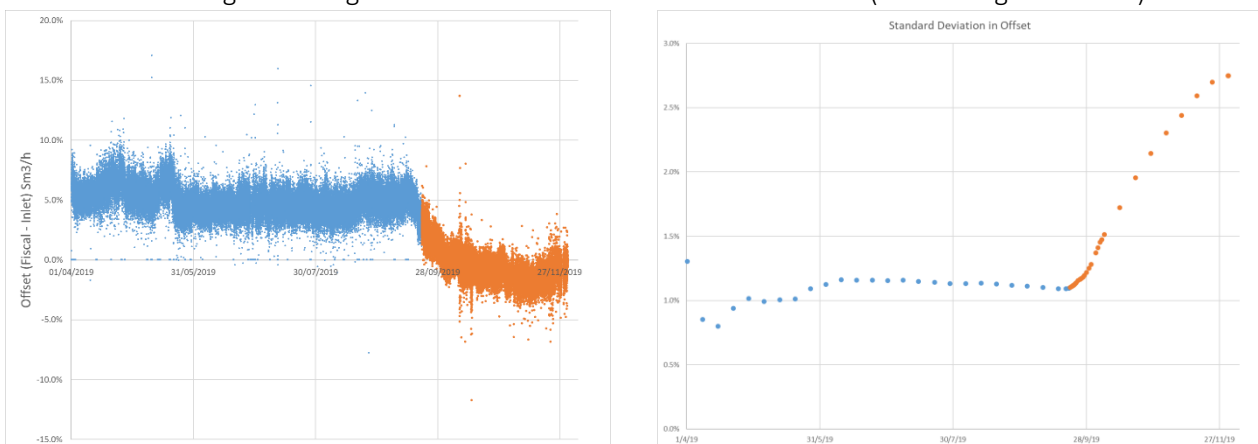


Figure 3 - Left: Offset, Right: Standard Deviation in Offset

The healthy offset between the Fiscal USM and Inlet Meter during normal operation was calculated to be +3.264% from an average of the period following the correction of the error (refer to Figure 4).



Figure 4 - Healthy Offset following Error Period

The Fiscal USM volume flow was then corrected (on a 2-minutely basis) using the Inlet meter volume flow plus the offset. Two sets of volume totals were calculated; one using the measured Fiscal USM flow and another using the corrected Fiscal USM flow, the error being the difference between the two.

5 Error Quantification

The error varied over the error period with some positive and negative values (refer to Figure 2). Where the calculated daily error is below the reconciliation threshold (0.1% of daily volume), no reconciliation is required, and the daily correction factor is set to 1.

The total error is estimated to be an overall under-registration of 275,430 Sm³. The error should be corrected using the daily correction factors in Appendix A.

6 Learning

The exact cause of the intermittent erroneous readings is not known although contamination of the transducers is one potential source. It may be prudent to introduce logic into the system to detect large consistent discrepancies between the Inlet Meter and Fiscal USM when gas is flowing into the network. Further investigation into the root causes of the equipment error is recommended, including through the equipment manufacturer. If contamination is found, measures should be introduced to prevent it reaching the measurement systems.

7 References

Hemswell GEU Data Files

Gemini Daily Volumes

MER_CAD_211_21_Hemswell_Data1.xlsx - Calculation Data spreadsheet

MER_CAD_211_21_Hemswell_Data2.xlsx - Calculation Data spreadsheet

MER_CAD_211_21_Hemswell_Data3.xlsx - Calculation Data spreadsheet

MER_CAD_211_21_Hemswell_Summary.xlsx - Summary spreadsheet

8 Appendix A – Daily Correction Factors

The error should be corrected using the Daily Correction Factors applied to the Gemini Daily Volumes (DVOL) as detailed below.

There were a small number of days where the data was missing or erroneous, and so a default correction factor was used. The default correction factor was determined as an average of, or linear interpolation between, the correction factors immediately before and after the days of bad data. Linear interpolation was used where the period of bad data was more than 7 days. Days when default correction factors have been used are identified in the table by *.

Gas Day	Gemini DVOL	Daily Correction Factor
20-Sep-19	0.01461	1.002927
21-Sep-19	0.01639	1.006919
22-Sep-19	0.01669	1.009869
23-Sep-19	0.01382	1.010312
24-Sep-19	0.00567	1.019157
25-Sep-19	0.00756	1.015105
26-Sep-19	0.01070	1.015594
27-Sep-19	0.01066	1.018561
28-Sep-19	0.01126	1.020888
29-Sep-19	0.01142	1.023979
30-Sep-19	0.01137	1.028054
01-Oct-19	0.01108	1.034009
02-Oct-19	0.01086	1.033212
03-Oct-19	0.01094	1.034953
04-Oct-19	0.01092	1.030147
05-Oct-19	0.01125	1.028323
06-Oct-19	0.01119	1.029022
07-Oct-19	0.01135	1.031059
08-Oct-19	0.00951	1.033260
09-Oct-19	0.01113	1.036191
10-Oct-19	0.01284	1.039832

Gas Day	Gemini DVOL	Daily Correction Factor
11-Oct-19	0.01186	1.035022
12-Oct-19	0.01217	1.034727
13-Oct-19	0.01209	1.037686
14-Oct-19	0.01188	1.043791
15-Oct-19	0.01085	1.037596
16-Oct-19	0.01060	1.038959
17-Oct-19	0.01044	1.043487
18-Oct-19	0.01044	1.043661
19-Oct-19	0.01068	1.044138
20-Oct-19	0.01093	1.041009
21-Oct-19	0.01078	1.041502
22-Oct-19	0.01079	1.041673
23-Oct-19	0.01108	1.040641
24-Oct-19	0.01121	1.042012
25-Oct-19	0.01140	1.044227
26-Oct-19	0.01299	1.046593
27-Oct-19	0.01288	1.042335
28-Oct-19	0.01246	1.039899
29-Oct-19	0.01134	1.038039
30-Oct-19	0.01105	1.038869
31-Oct-19	0.01061	1.047672

Gas Day	Gemini DVol	Daily Correction Factor
01-Nov-19	0.01037	1.048521
02-Nov-19	0.00673	1.050893
03-Nov-19	0.00723	1.041398
04-Nov-19	0.00774	1.054553
05-Nov-19	0.01009	1.048402
06-Nov-19	0.00990	1.050191
07-Nov-19	0.01060	1.049410
08-Nov-19	0.01059	1.048193
09-Nov-19	0.01019	1.051889
10-Nov-19	0.01052	1.049210
11-Nov-19	0.01042	1.053684
12-Nov-19	0.01044	1.055228
13-Nov-19	0.01029	1.052986
14-Nov-19	0.01003	1.052831
15-Nov-19	0.00995	1.051116
16-Nov-19	0.00967	1.047087
17-Nov-19	0.01004	1.047612
18-Nov-19	0.01038	1.047342
19-Nov-19	0.01026	1.049805
20-Nov-19	0.01000	1.047876
21-Nov-19	0.01108	1.049081
22-Nov-19	0.01125	1.045814
23-Nov-19	0.01175	1.046086
24-Nov-19	0.01098	1.038423
25-Nov-19	0.01173	1.036367
26-Nov-19	0.01079	1.040877
27-Nov-19	0.01121	1.040697*
28-Nov-19	0.00806	1.040697*
29-Nov-19	0.01086	1.040516
30-Nov-19	0.00731	1.040364*
01-Dec-19	0.01158	1.040213*
02-Dec-19	0.01142	1.040062*
03-Dec-19	0.01049	1.039911*
04-Dec-19	0.01097	1.039760*
05-Dec-19	0.01036	1.039609*
06-Dec-19	0.01059	1.039458*
07-Dec-19	0.01098	1.039307*
08-Dec-19	0.01139	1.039155*
09-Dec-19	0.01184	1.039004*
10-Dec-19	0.01036	1.038853*
11-Dec-19	0.01117	1.038702*
12-Dec-19	0.01091	1.038551*
13-Dec-19	0.01083	1.038400*

Gas Day	Gemini DVol	Daily Correction Factor
14-Dec-19	0.01068	1.038249*
15-Dec-19	0.01126	1.038098*
16-Dec-19	0.00983	1.037947*
17-Dec-19	0.00907	1.037795*
18-Dec-19	0.00785	1.037644*
19-Dec-19	0.01123	1.037493*
20-Dec-19	0.00976	1.037342*
21-Dec-19	0.01019	1.037191*
22-Dec-19	0.00243	1.037040*
23-Dec-19	0	
24-Dec-19	0	
25-Dec-19	0	
26-Dec-19	0	
27-Dec-19	0	
28-Dec-19	0	
29-Dec-19	0	
30-Dec-19	0	
31-Dec-19	0	
01-Jan-20	0	
02-Jan-20	0	
03-Jan-20	0	
04-Jan-20	0	
05-Jan-20	0	
06-Jan-20	0	
07-Jan-20	0	
08-Jan-20	0	
09-Jan-20	0	
10-Jan-20	0.00107	1.034169
11-Jan-20	0	
12-Jan-20	0.00210	1.028740
13-Jan-20	0.00316	1.032733
14-Jan-20	0	
15-Jan-20	0	
16-Jan-20	0	
17-Jan-20	0	
18-Jan-20	0	
19-Jan-20	0	
20-Jan-20	0	
21-Jan-20	0.00272	1.033378
22-Jan-20	0.00606	1.033759
23-Jan-20	0.00997	1.033538
24-Jan-20	0.00850	1.034976
25-Jan-20	0.01135	1.037325

Gas Day	Gemini DVol	Daily Correction Factor
26-Jan-20	0.01134	1.035939
27-Jan-20	0.00905	1.037280
28-Jan-20	0.00865	1.029067
29-Jan-20	0.01020	1.031190
30-Jan-20	0.01018	1.026294
31-Jan-20	0.01030	1.025566
01-Feb-20	0.01015	1.030038
02-Feb-20	0.00994	1.033062
03-Feb-20	0.01038	1.030304
04-Feb-20	0.01045	1.031868
05-Feb-20	0.01020	1.034206
06-Feb-20	0.01063	1.030545
07-Feb-20	0.00995	1.031539
08-Feb-20	0.00973	1.036167
09-Feb-20	0.00904	1.041147
10-Feb-20	0.00985	1.045301
11-Feb-20	0.00792	1.042949
12-Feb-20	0.00852	1.038446
13-Feb-20	0.00962	1.040963
14-Feb-20	0.00893	1.030878
15-Feb-20	0.01019	1.029846
16-Feb-20	0.01046	1.035323
17-Feb-20	0.01039	1.030027
18-Feb-20	0.01041	1.027256
19-Feb-20	0.01037	1.026518
20-Feb-20	0.01030	1.032386
21-Feb-20	0.01006	1.035006
22-Feb-20	0.00977	1.034045
23-Feb-20	0.00969	1.033620
24-Feb-20	0.01053	1.039939
25-Feb-20	0.01049	1.042577
26-Feb-20	0.01037	1.044038
27-Feb-20	0.01033	1.043987
28-Feb-20	0.00975	1.046335
29-Feb-20	0.00620	1.052018
01-Mar-20	0.01052	1.044806
02-Mar-20	0.01035	1.048657
03-Mar-20	0.01039	1.044836
04-Mar-20	0.01030	1.035897
05-Mar-20	0.00988	1.041856
06-Mar-20	0.01019	1.039641
07-Mar-20	0.01029	1.038073
08-Mar-20	0.01020	1.040096

Gas Day	Gemini DVol	Daily Correction Factor
09-Mar-20	0.01022	1.040002
10-Mar-20	0.01003	1.033647
11-Mar-20	0.01034	1.035698
12-Mar-20	0.01007	1.041887
13-Mar-20	0.01062	1.031666
14-Mar-20	0.01002	1.032420
15-Mar-20	0.00976	1.032246
16-Mar-20	0.00858	1.030940
17-Mar-20	0.01056	1.029181
18-Mar-20	0.01075	1.029301
19-Mar-20	0.01052	1.035914
20-Mar-20	0.01102	1.029663
21-Mar-20	0.01112	1.035442
22-Mar-20	0.01151	1.033068
23-Mar-20	0.01147	1.034755
24-Mar-20	0.01135	1.034442
25-Mar-20	0.01132	1.032456
26-Mar-20	0.01133	1.027572
27-Mar-20	0.01150	1.025867
28-Mar-20	0.01091	1.026047
29-Mar-20	0.01143	1.028463
30-Mar-20	0.00811	1.028269
31-Mar-20	0.01137	1.025276
01-Apr-20	0.01136	1.025913
02-Apr-20	0.01110	1.026998
03-Apr-20	0.01075	1.026838
04-Apr-20	0.01049	1.024741
05-Apr-20	0.01035	1.020774
06-Apr-20	0.01082	1.022048
07-Apr-20	0.01071	1.023145
08-Apr-20	0.01072	1.018036
09-Apr-20	0.01060	1.021952
10-Apr-20	0.00889	1.025120
11-Apr-20	0.01006	1.019837
12-Apr-20	0.01084	1.020062
13-Apr-20	0.01074	1.027309
14-Apr-20	0.01133	1.024464
15-Apr-20	0.01071	1.025780
16-Apr-20	0.01006	1.028020
17-Apr-20	0.00986	1.028886
18-Apr-20	0.01093	1.029678
19-Apr-20	0.01115	1.028179
20-Apr-20	0.00976	1.030431

Gas Day	Gemini DVol	Daily Correction Factor
21-Apr-20	0.00995	1.028153
22-Apr-20	0.00722	1.027468
23-Apr-20	0.00756	1.026949
24-Apr-20	0.01003	1.024961
25-Apr-20	0.01005	1.022910
26-Apr-20	0.01061	1.021284
27-Apr-20	0.01063	1.025126
28-Apr-20	0.00744	1.029623
29-Apr-20	0.00868	1.030481
30-Apr-20	0.00927	1.036650
01-May-20	0.01026	1.031160
02-May-20	0.01004	1.031405
03-May-20	0.01047	1.028524
04-May-20	0.01071	1.024716
05-May-20	0.00831	1.036048
06-May-20	0.00709	1.031287
07-May-20	0.01021	1.023257
08-May-20	0.01032	1.022609
09-May-20	0.01039	1.022416
10-May-20	0.00954	1.031679
11-May-20	0.01046	1.034965
12-May-20	0.01033	1.032960
13-May-20	0.00897	1.033992
14-May-20	0.00949	1.025565
15-May-20	0.01047	1.018550
16-May-20	0.01049	1.014690
17-May-20	0.01028	1.010993
18-May-20	0.00953	1.000751
19-May-20	0.00165	0.981825
20-May-20	0.00456	0.975263
21-May-20	0.00922	0.974323
22-May-20	0.00892	0.978956
23-May-20	0.00961	0.979396
24-May-20	0.00939	0.974698
25-May-20	0.00994	0.965386
26-May-20	0.00940	0.966997
27-May-20	0.00932	0.968613
28-May-20	0.00910	0.968242
29-May-20	0.00938	0.968163
30-May-20	0.00845	0.975276
31-May-20	0.00941	0.970148
01-Jun-20	0.00912	0.976471
02-Jun-20	0.00892	0.975894

Gas Day	Gemini DVol	Daily Correction Factor
03-Jun-20	0.00915	0.977923
04-Jun-20	0.00845	0.975251
05-Jun-20	0.00891	0.979070
06-Jun-20	0.00912	0.974531
07-Jun-20	0.00934	0.972647
08-Jun-20	0.00936	0.966212
09-Jun-20	0.00907	0.947306
10-Jun-20	0.00952	0.951003
11-Jun-20	0.00944	0.949594
12-Jun-20	0.00951	0.950537
13-Jun-20	0.00931	0.948136
14-Jun-20	0.00867	0.949178
15-Jun-20	0.00863	0.947894
16-Jun-20	0.00748	0.945757
17-Jun-20	0.00903	0.976779
18-Jun-20	0.00841	0.980942
19-Jun-20	0.00839	0.985568
20-Jun-20	0.00957	0.982637
21-Jun-20	0.00782	0.979517
22-Jun-20	0.00741	0.969573
23-Jun-20	0.00128	0.974407
24-Jun-20	0	
25-Jun-20	0	
26-Jun-20	0.00609	0.958306
27-Jun-20	0.00715	0.968556
28-Jun-20	0.00819	0.962962
29-Jun-20	0.00881	0.967386
30-Jun-20	0.00820	0.962313
01-Jul-20	0.00968	0.957610
02-Jul-20	0.00874	0.948574
03-Jul-20	0.00985	0.951550
04-Jul-20	0.00990	0.968760
05-Jul-20	0.01050	0.970319
06-Jul-20	0.00976	0.965699
07-Jul-20	0.00955	0.969159
08-Jul-20	0.00990	0.966258
09-Jul-20	0.00937	0.969717
10-Jul-20	0.00693	0.965784
11-Jul-20	0.00589	0.967477
12-Jul-20	0.00002	0.962606*
13-Jul-20	0.00678	0.957734
14-Jul-20	0.00979	0.953570
15-Jul-20	0.00963	0.951441

Gas Day	Gemini DVol	Daily Correction Factor
16-Jul-20	0.00930	0.960731
17-Jul-20	0.00966	0.934990
18-Jul-20	0.00985	0.935311
19-Jul-20	0.00991	0.941718
20-Jul-20	0.00771	0.941363
21-Jul-20	0.00893	0.935920
22-Jul-20	0.00976	0.932637
23-Jul-20	0.00936	0.937671
24-Jul-20	0.00955	0.932607
25-Jul-20	0.00612	0.926570
26-Jul-20	0.00792	0.929018
27-Jul-20	0.00933	0.935896
28-Jul-20	0.00958	0.928892
29-Jul-20	0.01048	0.926349
30-Jul-20	0.00979	0.916234
31-Jul-20	0.00819	0.917519
01-Aug-20	0.00985	0.920348
02-Aug-20	0.00965	0.935845
03-Aug-20	0.00955	0.934728
04-Aug-20	0.01043	0.924971
05-Aug-20	0.00965	0.938196
06-Aug-20	0.00911	0.930955
07-Aug-20	0.00982	0.933170
08-Aug-20	0.00861	0.929907
09-Aug-20	0.00588	0.935004
10-Aug-20	0.00761	0.936206
11-Aug-20	0.00997	0.931005
12-Aug-20	0.00898	0.975063
13-Aug-20	0.00844	0.995993
14-Aug-20	0.00972	0.999033
15-Aug-20	0.00699	1.010594
16-Aug-20	0.00080	1.012023
17-Aug-20	0.00617	1.006999
18-Aug-20	0.00879	1.008790
19-Aug-20	0.00997	1.012302
20-Aug-20	0.01010	1.014699
21-Aug-20	0.00924	1.072627
22-Aug-20	0.00905	1.081721
23-Aug-20	0.00980	1.080200
24-Aug-20	0.00949	1.062201
25-Aug-20	0.00692	1.052135
26-Aug-20	0.00986	1.052252
27-Aug-20	0.01016	1.053783

Gas Day	Gemini DVol	Daily Correction Factor
28-Aug-20	0.00780	1.046490
29-Aug-20	0.00942	1.073022
30-Aug-20	0.00898	1.069598
31-Aug-20	0.00673	1.068196
01-Sep-20	0.00902	1.068832
02-Sep-20	0.00897	1.067837
03-Sep-20	0.00864	1.069096
04-Sep-20	0.00895	1.069108
05-Sep-20	0.00783	1.071142
06-Sep-20	0.00797	1.073438
07-Sep-20	0.00545	1.073259
08-Sep-20	0.00959	1.062403
09-Sep-20	0.00910	1.071604
10-Sep-20	0.00798	1.072919
11-Sep-20	0.00936	1.065175
12-Sep-20	0.00907	1.067795
13-Sep-20	0.00926	1.064238
14-Sep-20	0.00938	1.053683
15-Sep-20	0.00956	1.034695
16-Sep-20	0.00975	1.036979
17-Sep-20	0.00955	1.037040
18-Sep-20	0.00207	1.040644
19-Sep-20	0	
20-Sep-20	0	
21-Sep-20	0.00441	1.054417
22-Sep-20	0.00566	1.076999
23-Sep-20	0.00569	1.059395
24-Sep-20	0.00654	1.024703
25-Sep-20	0.00544	1.011962
26-Sep-20	0.00848	1.020831
27-Sep-20	0.00950	1.018588
28-Sep-20	0.01195	1.025885
29-Sep-20	0.01334	1.023505
30-Sep-20	0.01298	1.001700
01-Oct-20	0.01235	0.996161
02-Oct-20	0.00952	1.002852
03-Oct-20	0.01025	1.002893
04-Oct-20	0.01066	1.004631
05-Oct-20	0.00957	0.999138
06-Oct-20	0.00928	0.997502
07-Oct-20	0.00914	0.996756
08-Oct-20	0.00968	0.996790
09-Oct-20	0.00936	1.002333

Gas Day	Gemini DVol	Daily Correction Factor
10-Oct-20	0.01049	1.006634
11-Oct-20	0.01135	1.005658
12-Oct-20	0.01083	1.006407
13-Oct-20	0.01140	1.008111
14-Oct-20	0.01052	1.004212
15-Oct-20	0.00956	1.000532
16-Oct-20	0.01054	1.000422
17-Oct-20	0.01062	0.998699
18-Oct-20	0.01062	0.998112
19-Oct-20	0.01080	1.001928
20-Oct-20	0.00917	1.001264
21-Oct-20	0.00897	0.998984
22-Oct-20	0.01020	1.000634
23-Oct-20	0.01078	1.003568
24-Oct-20	0.01127	1.004947
25-Oct-20	0.00770	1.007751
26-Oct-20	0.00879	1.005781
27-Oct-20	0.00997	1.008262
28-Oct-20	0.00993	1.008767
29-Oct-20	0.01007	1.003102
30-Oct-20	0.00986	1.004550
31-Oct-20	0.00979	1.007559
01-Nov-20	0.00960	1.007865
02-Nov-20	0.01030	1.018198
03-Nov-20	0.00982	1.017412
04-Nov-20	0.00953	1.021762
05-Nov-20	0.00916	1.015970
06-Nov-20	0.00920	1.008713
07-Nov-20	0.00939	1.009872
08-Nov-20	0.00840	1.012211
09-Nov-20	0.00921	1.007891
10-Nov-20	0.00696	1.011990
11-Nov-20	0.00956	1.011325
12-Nov-20	0.00966	1.015807
13-Nov-20	0.00724	1.021414
14-Nov-20	0.00717	1.007485
15-Nov-20	0.00550	1.016648
16-Nov-20	0.00883	1.020952
17-Nov-20	0.00932	1.023883
18-Nov-20	0.00816	1.023134
19-Nov-20	0.01021	1.025019
20-Nov-20	0.01021	1.027184
21-Nov-20	0.00973	1.027553

Gas Day	Gemini DVol	Daily Correction Factor
22-Nov-20	0.01027	1.032104
23-Nov-20	0.00984	1.034203
24-Nov-20	0.00924	1.029414
25-Nov-20	0.00962	1.022394
26-Nov-20	0.00935	1.039969
27-Nov-20	0.00993	1.044934
28-Nov-20	0.00777	1.041131
29-Nov-20	0.00987	1.021556
30-Nov-20	0.00750	1.034651
01-Dec-20	0.01029	1.039791
02-Dec-20	0.00996	1.041431
03-Dec-20	0.00729	1.046616
04-Dec-20	0.00900	1.045275
05-Dec-20	0.00265	1.040176
06-Dec-20	0.00659	1.045365
07-Dec-20	0.00168	1.057908
08-Dec-20	0.00277	1.059008
09-Dec-20	0.00580	1.061067
10-Dec-20	0.00847	1.060833
11-Dec-20	0.00806	1.059353
12-Dec-20	0.00948	1.057109
13-Dec-20	0.00968	1.059189
14-Dec-20	0.00965	1.062017
15-Dec-20	0.00612	1.069878
16-Dec-20	0.00947	1.061688
17-Dec-20	0.00926	1.087287
18-Dec-20	0.00927	1.083763
19-Dec-20	0.00926	1.080513
20-Dec-20	0.00958	1.082763
21-Dec-20	0.00913	1.078533
22-Dec-20	0.00915	1.067903
23-Dec-20	0.00940	1.083331
24-Dec-20	0.00835	1.088794
25-Dec-20	0.00993	1.096248
26-Dec-20	0.00938	1.102448
27-Dec-20	0.00908	1.114395
28-Dec-20	0.00922	1.112954
29-Dec-20	0.00938	1.109375
30-Dec-20	0.00937	1.124137
31-Dec-20	0.00882	1.126302
01-Jan-21	0.00932	1.141163
02-Jan-21	0.00922	1.166512
03-Jan-21	0.00917	1.178678

Gas Day	Gemini DVol	Daily Correction Factor
04-Jan-21	0.00922	1.177717
05-Jan-21	0.00916	1.177859
06-Jan-21	0.00914	1.181185
07-Jan-21	0.00885	1.197276
08-Jan-21	0.00905	1.193899
09-Jan-21	0.00904	1.200037
10-Jan-21	0.00654	1.217759
11-Jan-21	0.00896	1.227211
12-Jan-21	0.00907	1.230518
13-Jan-21	0.00918	1.203765
14-Jan-21	0.00693	1.206338
15-Jan-21	0.00696	1.212354
16-Jan-21	0.00900	1.209242
17-Jan-21	0.00923	1.197488
18-Jan-21	0.00913	1.195910
19-Jan-21	0.00870	1.194735
20-Jan-21	0.00852	1.193520
21-Jan-21	0.00646	1.204628
22-Jan-21	0.00639	1.213728
23-Jan-21	0.00653	1.192983
24-Jan-21	0.00445	1.185203
25-Jan-21	0.00656	1.172968
26-Jan-21	0.00922	1.169953
27-Jan-21	0.00795	1.155525
28-Jan-21	0.00882	1.154995
29-Jan-21	0.00902	1.151081
30-Jan-21	0.00903	1.192068*
31-Jan-21	0.00909	1.192068*
01-Feb-21	0.00954	1.192068*
02-Feb-21	0.01049	1.192068*
03-Feb-21	0.00885	1.192068*
04-Feb-21	0.00689	1.192068*
05-Feb-21	0.00638	1.233055
06-Feb-21	0.00522	1.345430
07-Feb-21	0.00068	1.357419
08-Feb-21	0.00379	1.335022
09-Feb-21	0.00451	1.370669
10-Feb-21	0.00581	1.284115
11-Feb-21	0.00537	1.220840
12-Feb-21	0.00742	1.176358
13-Feb-21	0.00458	1.175725
14-Feb-21	0.00452	1.187262
15-Feb-21	0.00733	1.152394

Gas Day	Gemini DVol	Daily Correction Factor
16-Feb-21	0.00526	1.132952
17-Feb-21	0.00755	1.079613
18-Feb-21	0.00954	1.083613
19-Feb-21	0.00945	1.088367
20-Feb-21	0.00776	1.091920
21-Feb-21	0.01022	1.104954
22-Feb-21	0.01041	1.102773
23-Feb-21	0.01038	1.115849
24-Feb-21	0.01008	1.133724
25-Feb-21	0.00993	1.147060
26-Feb-21	0.00804	1.169236
27-Feb-21	0.01115	1.135741
28-Feb-21	0.00840	1.160433
01-Mar-21	0.01047	1.193466
02-Mar-21	0.00766	1.214600
03-Mar-21	0.00787	1.230300
04-Mar-21	0.00942	1.230695
05-Mar-21	0.00978	1.238821
06-Mar-21	0.00999	1.232391
07-Mar-21	0.00957	1.234073
08-Mar-21	0.00961	1.245945
09-Mar-21	0.00786	1.234008
10-Mar-21	0.00792	1.239901
11-Mar-21	0.00660	1.241313
12-Mar-21	0.00813	1.263774
13-Mar-21	0.00803	1.267075
14-Mar-21	0.00594	1.257372
15-Mar-21	0.00709	1.422117
16-Mar-21	0.00371	1.268256
17-Mar-21	0.00179	1.267058
18-Mar-21	0.00732	1.253264
19-Mar-21	0.00701	1.205908
20-Mar-21	0.00869	1.208748
21-Mar-21	0.00648	1.211578
22-Mar-21	0.00797	1.214774
23-Mar-21	0.00882	1.212750
24-Mar-21	0.00770	1.222688
25-Mar-21	0.00636	1.215972
26-Mar-21	0.00078	1.220345
27-Mar-21	0.00046	1.217526
28-Mar-21	0.00418	1.215395
29-Mar-21	0.00338	1.204944
30-Mar-21	0.00395	1.210707

Gas Day	Gemini DVol	Daily Correction Factor
31-Mar-21	0.00635	1.242894
01-Apr-21	0.00712	1.291266
02-Apr-21	0.00593	1.308885
03-Apr-21	0.00619	1.323719
04-Apr-21	0.00488	1.326809
05-Apr-21	0.00034	
06-Apr-21	0	
07-Apr-21	0	
08-Apr-21	0	
09-Apr-21	0	
10-Apr-21	0.00431	1.464216
11-Apr-21	0.00649	1.483763
12-Apr-21	0.00634	1.483839
13-Apr-21	0.00623	1.486140
14-Apr-21	0.00397	1.497226
15-Apr-21	0	
16-Apr-21	0	
17-Apr-21	0	
18-Apr-21	0	
19-Apr-21	0	
20-Apr-21	0	
21-Apr-21	0.00077	1.535280
22-Apr-21	0.00115	1.557713
23-Apr-21	0.00020	1.591047
24-Apr-21	0.00272	1.602218
25-Apr-21	0.00520	1.616082
26-Apr-21	0.00466	1.619131
27-Apr-21	0.00528	1.638046
28-Apr-21	0.00331	1.650612
29-Apr-21	0.00477	1.657893
30-Apr-21	0.00345	1.664666
01-May-21	0.00434	1.665256
02-May-21	0.00422	1.669496
03-May-21	0.00592	1.693456
04-May-21	0.00570	1.703802
05-May-21	0.00575	1.638254
06-May-21	0.00864	1.229610
07-May-21	0.00783	1.224954
08-May-21	0.00751	1.236561
09-May-21	0.00810	1.240786
10-May-21	0.00229	1.242954