

## Gravity and Sulfur Banks Handbook

# NuStar Logistics, L.P.

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### Issued and Compiled by:

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## Gravity and Sulfur Banks Handbook

### EXHIBIT A EXPLANATION OF GRAVITY BANKS AND SULFUR BANKS

Shippers will be required, as a condition of nominating into the NuStar West Leg South Texas Crude System, to participate in the NuStar Logistics, L.P. ("NuStar") a Gravity and Sulfur Banks. A fee of [U] \$0.00563 per barrel will be assessed to cover costs for administration of the Gravity and Sulfur Banks.

The tables of gravity and sulfur differential values per barrel as attached hereto as Exhibits B and C are incorporated herein and made a part of these uses.

The weighted average gravity differential value per barrel (for two or more gravities of crude petroleum), as hereinafter referred to, shall be obtained in the following manner: Multiply the gravity differential values per barrel by the number of barrels to which such gravity differential values are applicable and then divide the total of the resultant gravity differential values in dollars and cents by the total of the applicable barrels.

Applicable barrels and gravities shall be the net barrels at 60° Fahrenheit (with no deduction for loss allowance) and the gravities recorded by NuStar at the applicable receipt (Lease Automated Custody Transfer unit ("LACT")).

The weighted average sulfur differential value per barrel (for two or more sulfur contents of crude petroleum), as hereinafter referred to, shall be obtained in the following manner: Multiply the sulfur differential values per barrel by the number of barrels to which such sulfur differential values are applicable and then divide the total of the resultant sulfur differential values in dollars and cents by the total of the applicable barrels.

Applicable barrels and sulfur content shall be the [N] total system-wide composite net barrels at 60° Fahrenheit (with no deduction for loss allowance) and the sulfur content recorded by a competent laboratory for samples obtained by NuStar at the applicable receipt LACT.

Sulfur content as furnished by the laboratory at the true gravity shall be adjusted to reflect its comparison to the reference crude at 35.5° gravity. The adjustment to the test sulfur content shall be made by establishing a ratio of weight per gallon for the gravity of the sample to weight per gallon for the gravity of the reference crude of 35.5° gravity. The Table of Ratio Factors for Sulfur Adjustments is attached hereto as Exhibit D and made a part of these rules.

The ratio thus obtained will be applied against the tested sulfur content of the sample to obtain the adjusted sulfur content (gravity ratio x tested sulfur content = adjusted sulfur content). The adjusted sulfur content will then be used to obtain the sulfur differential value per barrel from the table of sulfur differential values per barrel (Exhibit C).

Adjustment between Shippers shall be computed as follows:

- I. Compute the weighted average gravity differential value per barrel of the barrels received from each Shipper. Compute the weighted average sulfur differential value per barrel of the barrels received from each Shipper.
- II. Compute the weighted average gravity differential value per barrel of the composite common stream receipts.
  - A. If the weighted average gravity differential value per barrel of a Shipper as so determined under Paragraph I above shall be greater than the weighted average gravity differential value per barrel of the aforementioned common stream crude petroleum as determined under Paragraph II, the difference in cents per barrel shall be calculated and Shipper shall be credited an amount calculated by multiplying said difference in gravity differential value per barrel by the applicable barrels.
  - B. If the weighted average gravity differential value per barrel of a Shipper is less than

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the weighted average gravity differential value per barrel of the aforementioned common stream crude petroleum, the difference shall be calculated as above outlined and Shipper debited for such difference.

- III. Compute the weighted average sulfur differential value per barrel of the composite common stream receipts.
  - A. If the weighted average sulfur differential value per barrel of a Shipper as so determined under Paragraph I above shall be greater than the weighted average sulfur differential value per barrel of the aforementioned common stream crude petroleum as determined under Paragraph II, the difference In cents per barrel shall be calculated and Shipper shall be debited an amount calculated by multiplying said difference in sulfur differential value per barrel by the applicable barrels.
  - B. If the weighted average sulfur differential value per barrel of a shipper is less than the weighted average sulfur differential value per barrel of the aforementioned common stream crude petroleum, the difference shall be calculated as above outlined and Shipper shall be credited for such difference.

A sample calculation is attached as Exhibit A-1.

These calculations shall be made for each calendar month and the algebraic sum of the adjustments for the System shall be zero  $\pm$  One Dollar. If a Shipper shall have a net debit balance in combining the two adjustments made above, the balance shall be remitted to the clearinghouse within twenty (20) days from receipt of statement of such debit. If Shipper shall have a credit, the clearinghouse shall remit the amount thereof after receipt by the clearinghouse of the sums from those Shippers having debits as calculated above.

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EXHIBIT A GRAVITY BANKS AND SULFUR BANKS EXAMPLE CALCULATION[N] Exhibit A is being cancelled. It is being replaced by Exhibit A October 1, 2023.

<u>LOCATION</u>	<u>SHIPPER</u>	<u>BBLs REC'D</u>	<u>TESTED % SULFUR</u>	<u>API GRAV</u>	<u>EXHIBIT D</u>	<u>EXHIBIT C</u>	<u>EXHIBIT B</u>	<u>BBLs REC'D x SULFUR DIFF</u>	<u>BBLs REC'D x GRAV DIFF</u>
					<u>RATIO TO 35.5 WT.</u>	<u>ADJUSTED % SULFUR</u>	<u>SULFUR DIFF</u>	<u>GRAVITY DIFF</u>	
<u>LACT 1</u>	<u>A</u>	<u>100.00</u>	<u>0.92</u>	<u>29.8</u>	<u>1.03544</u>	<u>0.95</u>	<u>1.95</u>	<u>4.22</u>	<u>195.00</u>
<u>LACT 2</u>	<u>B</u>	<u>150.00</u>	<u>0.36</u>	<u>38.6</u>	<u>0.98172</u>	<u>0.35</u>	<u>1.35</u>	<u>5.06</u>	<u>759.00</u>
<u>LACT 3</u>	<u>C</u>	<u>100.00</u>	<u>0.42</u>	<u>36.4</u>	<u>0.99461</u>	<u>0.42</u>	<u>1.42</u>	<u>5.02</u>	<u>502.00</u>
<u>LACT 4</u>	<u>C</u>	<u>200.00</u>	<u>0.78</u>	<u>46.2</u>	<u>0.93976</u>	<u>0.73</u>	<u>1.73</u>	<u>4.92</u>	<u>984.00</u>
		<u>550.0</u>							<u>2667.00</u>

COMMON STREAM WEIGHTED AVERAGE GRAVITY VALUE:  $2667.00/550.00 = 4.84909$   
COMMON STREAM WEIGHTED AVERAGE SULFUR VALUE:  $885.50/550.00 = 1.61000$

SHIPPER A  
WEIGHTED AVERAGE GRAVITY VALUE:  $422.00/100 = 4.22000$   
CALCULATION:  $(4.84909 - 4.22000) \times 100 = \$62.91$   
WEIGHTED AVERAGE SULFUR VALUE:  $195.00/100 = 1.95000$   
CALCULATION:  $(1.95000 - 1.61000) \times 100 = \$34.00$   
CURRENT MONTH CLEARINGHOUSE AMOUNT (paid by Shipper): \$96.91

SHIPPER B  
WEIGHTED AVERAGE GRAVITY VALUE:  $759.00/150 = 5.06000$   
CALCULATION:  $(4.84909 - 5.06000) \times 150 = ($31.64)$   
WEIGHTED AVERAGE SULFUR VALUE:  $202.50/150 = 1.35000$   
CALCULATION:  $(1.35000 - 1.61000) \times 150 = ($39.00)$   
CURRENT MONTH CLEARINGHOUSE AMOUNT (received by Shipper): (\$70.64)

SHIPPER C  
WEIGHTED AVERAGE GRAVITY VALUE:  $502.00/100 = 5.02000$   
CALCULATION:  $(4.84909 - 5.02000) \times 100 = ($17.09)$   
WEIGHTED AVERAGE SULFUR VALUE:  $142.00/100 = 1.42000$   
CALCULATION:  $(1.42000 - 1.61000) \times 100 = ($19.00)$   
CURRENT MONTH CLEARINGHOUSE AMOUNT (received by Shipper): (\$36.09)

WEIGHTED AVERAGE GRAVITY VALUE:  $984.00/200 = 4.92000$   
CALCULATION:  $(4.84909 - 4.92000) \times 200 = ($14.18)$   
WEIGHTED AVERAGE SULFUR VALUE:  $346.00/200 = 1.73000$   
CALCULATION:  $(1.73000 - 1.61000) \times 200 = $24.00$   
CURRENT MONTH CLEARINGHOUSE AMOUNT (paid by Shipper): \$9.82

Shipper C total amount received (\$26.27)

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## [N] EXHIBIT A October 1, 2023 GRAVITY BANKS AND SULFUR BANKS EXAMPLE CALCULATION

SHIPPER	BBLs REC'D	TESTED % SULFUR	API GRAV	EXHIBIT D		EXHIBIT C		EXHIBIT B	
				RATIO TO 35.5 WT.	ADJUSTED % SULFUR	SULFUR DIFF	GRAVITY DIFF	BBLs REC'D x SULFUR DIFF	BBLs REC'D x GRAV DIFF
A	100.00	0.92	29.8	1.03544	0.95	1.95	4.22	195.00	422.00
B	150.00	0.36	38.6	0.98172	0.35	1.35	5.06	202.50	759.00
C	100.00	0.42	36.4	0.99461	0.42	1.42	5.02	142.00	502.00
D	200.00	0.78	46.2	0.93976	0.73	1.73	4.92	346.00	984.00
	<u>550.0</u>							<u>885.50</u>	<u>2667.00</u>

COMMON STREAM WEIGHTED AVERAGE GRAVITY VALUE:  $2667.00/550.00 =$   
COMMON STREAM WEIGHTED AVERAGE SULFUR VALUE:  $885.50/550.00 =$

4.84909  
1.61000

SHIPPER A	WEIGHTED AVERAGE GRAVITY VALUE: $422.00/100 = 4.22000$ CALCULATION: $(4.84909 - 4.22000) \times 100 =$ WEIGHTED AVERAGE SULFUR VALUE: $195.00/100 = 1.95000$ CALCULATION: $(1.95000 - 1.61000) \times 100 =$ CURRENT MONTH CLEARINGHOUSE AMOUNT (paid by Shipper):	\$62.91 \$34.00	\$96.91
SHIPPER B	WEIGHTED AVERAGE GRAVITY VALUE: $759.00/150 = 5.06000$ CALCULATION: $(4.84909 - 5.06000) \times 150 =$ WEIGHTED AVERAGE SULFUR VALUE: $202.50/150 = 1.35000$ CALCULATION: $(1.35000 - 1.61000) \times 150 =$ CURRENT MONTH CLEARINGHOUSE AMOUNT (received by Shipper):	(\$31.64) (\$39.00)	(\$70.64)
SHIPPER C	WEIGHTED AVERAGE GRAVITY VALUE: $502.00/100 = 5.02000$ CALCULATION: $(4.84909 - 5.02000) \times 100 =$ WEIGHTED AVERAGE SULFUR VALUE: $142.00/100 = 1.42000$ CALCULATION: $(1.42000 - 1.61000) \times 100 =$ CURRENT MONTH CLEARINGHOUSE AMOUNT (received by Shipper):	(\$17.09) (\$19.00)	(\$36.09)
SHIPPER D	WEIGHTED AVERAGE GRAVITY VALUE: $984.00/200 = 4.92000$ CALCULATION: $(4.84909 - 4.92000) \times 200 =$ WEIGHTED AVERAGE SULFUR VALUE: $346.00/200 = 1.73000$ CALCULATION: $(1.73000 - 1.61000) \times 200 =$ CURRENT MONTH CLEARINGHOUSE AMOUNT (paid by Shipper):	(\$14.18) \$24.00	\$9.82

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## EXHIBIT B

ADJUSTMENT AUTHORIZATION TABLES OF DIFFERENTIALS FOR USE IN DETERMINING ADJUSTMENTS  
FOR DIFFERENCE IN GRAVITY OF CRUDE PETROLEUM

API GRAVITY	DIFF. PER BBL	API GRAVITY	DIFF. PER BBL	API GRAVITY	DIFF. PER BBL	API GRAVITY	DIFF. PER BBL
10.0	1.250	16.0	2.150	22.0	3.050	28.0	3.950
10.1	1.265	16.1	2.165	22.1	3.065	28.1	3.965
10.2	1.280	16.2	2.180	22.2	3.080	28.2	3.980
10.3	1.295	16.3	2.195	22.3	3.095	28.3	3.995
10.4	1.310	16.4	2.210	22.4	3.110	28.4	4.010
10.5	1.325	16.5	2.225	22.5	3.125	28.5	4.025
10.6	1.340	16.6	2.240	22.6	3.140	28.6	4.040
10.7	1.355	16.7	2.255	22.7	3.155	28.7	4.055
10.8	1.370	16.8	2.270	22.8	3.170	28.8	4.070
10.9	1.385	16.9	2.285	22.9	3.185	28.9	4.085
11.0	1.400	17.0	2.300	23.0	3.200	29.0	4.100
11.1	1.415	17.1	2.315	23.1	3.215	29.1	4.115
11.2	1.430	17.2	2.330	23.2	3.230	29.2	4.130
11.3	1.445	17.3	2.345	23.3	3.245	29.3	4.145
11.4	1.460	17.4	2.360	23.4	3.260	29.4	4.160
11.5	1.475	17.5	2.375	23.5	3.275	29.5	4.175
11.6	1.490	17.6	2.390	23.6	3.290	29.6	4.190
11.7	1.505	17.7	2.405	23.7	3.305	29.7	4.205
11.8	1.520	17.8	2.420	23.8	3.320	29.8	4.220
11.9	1.535	17.9	2.435	23.9	3.335	29.9	4.235
12.0	1.550	18.0	2.450	24.0	3.350	30.0	4.250
12.1	1.565	18.1	2.465	24.1	3.365	30.1	4.265
12.2	1.580	18.2	2.480	24.2	3.380	30.2	4.280
12.3	1.595	18.3	2.495	24.3	3.395	30.3	4.295
12.4	1.610	18.4	2.510	24.4	3.410	30.4	4.310
12.5	1.625	18.5	2.525	24.5	3.425	30.5	4.325
12.6	1.640	18.6	2.540	24.6	3.440	30.6	4.340
12.7	1.655	18.7	2.555	24.7	3.455	30.7	4.355
12.8	1.670	18.8	2.570	24.8	3.470	30.8	4.370
12.9	1.685	18.9	2.585	24.9	3.485	30.9	4.385
13.0	1.700	19.0	2.600	25.0	3.500	31.0	4.400
13.1	1.715	19.1	2.615	25.1	3.515	31.1	4.415
13.2	1.730	19.2	2.630	25.2	3.530	31.2	4.430
13.3	1.745	19.3	2.645	25.3	3.545	31.3	4.445
13.4	1.760	19.4	2.660	25.4	3.560	31.4	4.460
13.5	1.775	19.5	2.675	25.5	3.575	31.5	4.475
13.6	1.790	19.6	2.690	25.6	3.590	31.6	4.490
13.7	1.805	19.7	2.705	25.7	3.605	31.7	4.505
13.8	1.820	19.8	2.720	25.8	3.620	31.8	4.520
13.9	1.835	19.9	2.735	25.9	3.635	31.9	4.535
14.0	1.850	20.0	2.750	26.0	3.650	32.0	4.550
14.1	1.865	20.1	2.765	26.1	3.665	32.1	4.565
14.2	1.880	20.2	2.780	26.2	3.680	32.2	4.580
14.3	1.895	20.3	2.795	26.3	3.695	32.3	4.595
14.4	1.910	20.4	2.810	26.4	3.710	32.4	4.610
14.5	1.925	20.5	2.825	26.5	3.725	32.5	4.625
14.6	1.940	20.6	2.840	26.6	3.740	32.6	4.640
14.7	1.955	20.7	2.855	26.7	3.755	32.7	4.655
14.8	1.970	20.8	2.870	26.8	3.770	32.8	4.670
14.9	1.985	20.9	2.885	26.9	3.785	32.9	4.685
15.0	2.000	21.0	2.900	27.0	3.800	33.0	4.700
15.1	2.015	21.1	2.915	27.1	3.815	33.1	4.715
15.2	2.030	21.2	2.930	27.2	3.830	33.2	4.730
15.3	2.045	21.3	2.945	27.3	3.845	33.3	4.745
15.4	2.060	21.4	2.960	27.4	3.860	33.4	4.760
15.5	2.075	21.5	2.975	27.5	3.875	33.5	4.775
15.6	2.090	21.6	2.990	27.6	3.890	33.6	4.790
15.7	2.105	21.7	3.005	27.7	3.905	33.7	4.805
15.8	2.120	21.8	3.020	27.8	3.920	33.8	4.820
15.9	2.135	21.9	3.035	27.9	3.935	33.9	4.835

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## EXHIBIT B (CONTINUED)

## ADJUSTMENT AUTHORIZATION TABLES OF DIFFERENTIALS FOR USE IN DETERMINING ADJUSTMENTS

## FOR DIFFERENCE IN GRAVITY OF CRUDE PETROLEUM

API GRAVITY	DIFF. PER BBL	API GRAVITY	DIFF. PER BBL	API GRAVITY	DIFF. PER BBL	API GRAVITY	DIFF. PER BBL
34.0	4.850	40.0	5.100	46.0	4.950	52.0	4.050
34.1	4.865	40.1	5.100	46.1	4.935	52.1	4.035
34.2	4.880	40.2	5.100	46.2	4.920	52.2	4.020
34.3	4.895	40.3	5.100	46.3	4.905	52.3	4.005
34.4	4.910	40.4	5.100	46.4	4.890	52.4	3.990
34.5	4.925	40.5	5.100	46.5	4.875	52.5	3.975
34.6	4.940	40.6	5.100	46.6	4.860	52.6	3.960
34.7	4.955	40.7	5.100	46.7	4.845	52.7	3.945
34.8	4.970	40.8	5.100	46.8	4.830	52.8	3.930
34.9	4.985	40.9	5.100	46.9	4.815	52.9	3.915
35.0	5.000	41.0	5.100	47.0	4.800	53.0	3.900
35.1	5.000	41.1	5.100	47.1	4.785	53.1	3.885
35.2	5.000	41.2	5.100	47.2	4.770	53.2	3.870
35.3	5.000	41.3	5.100	47.3	4.755	53.3	3.855
35.4	5.000	41.4	5.100	47.4	4.740	53.4	3.840
35.5	5.000	41.5	5.100	47.5	4.725	53.5	3.825
35.6	5.000	41.6	5.100	47.6	4.710	53.6	3.810
35.7	5.000	41.7	5.100	47.7	4.695	53.7	3.795
35.8	5.000	41.8	5.100	47.8	4.680	53.8	3.780
35.9	5.000	41.9	5.100	47.9	4.665	53.9	3.765
36.0	5.020	42.0	5.100	48.0	4.650	54.0	3.750
36.1	5.020	42.1	5.100	48.1	4.635	54.1	3.735
36.2	5.020	42.2	5.100	48.2	4.620	54.2	3.720
36.3	5.020	42.3	5.100	48.3	4.605	54.3	3.705
36.4	5.020	42.4	5.100	48.4	4.590	54.4	3.690
36.5	5.020	42.5	5.100	48.5	4.575	54.5	3.675
36.6	5.020	42.6	5.100	48.6	4.560	54.6	3.660
36.7	5.020	42.7	5.100	48.7	4.545	54.7	3.645
36.8	5.020	42.8	5.100	48.8	4.530	54.8	3.630
36.9	5.020	42.9	5.100	48.9	4.515	54.9	3.615
37.0	5.040	43.0	5.100	49.0	4.500	55.0	3.600
37.1	5.040	43.1	5.100	49.1	4.485	For API GRAVITY values above 55.0° API the differential continues to decline 0.015/bbl. per 0.1° API GRAVITY.	
37.2	5.040	43.2	5.100	49.2	4.470		
37.3	5.040	43.3	5.100	49.3	4.455		
37.4	5.040	43.4	5.100	49.4	4.440		
37.5	5.040	43.5	5.100	49.5	4.425		
37.6	5.040	43.6	5.100	49.6	4.410		
37.7	5.040	43.7	5.100	49.7	4.395		
37.8	5.040	43.8	5.100	49.8	4.380		
37.9	5.040	43.9	5.100	49.9	4.365		
38.0	5.060	44.0	5.100	50.0	4.350		
38.1	5.060	44.1	5.100	50.1	4.335		
38.2	5.060	44.2	5.100	50.2	4.320		
38.3	5.060	44.3	5.100	50.3	4.305		
38.4	5.060	44.4	5.100	50.4	4.290		
38.5	5.060	44.5	5.100	50.5	4.275		
38.6	5.060	44.6	5.100	50.6	4.260		
38.7	5.060	44.7	5.100	50.7	4.245		
38.8	5.060	44.8	5.100	50.8	4.230		
38.9	5.060	44.9	5.100	50.9	4.215		
39.0	5.080	45.0	5.100	51.0	4.200		
39.1	5.080	45.1	5.085	51.1	4.185		
39.2	5.080	45.2	5.070	51.2	4.170		
39.3	5.080	45.3	5.055	51.3	4.155		
39.4	5.080	45.4	5.040	51.4	4.140		
39.5	5.080	45.5	5.025	51.5	4.125		
39.6	5.080	45.6	5.010	51.6	4.110		
39.7	5.080	45.7	4.995	51.7	4.095		
39.8	5.080	45.8	4.980	51.8	4.080		
39.9	5.080	45.9	4.965	51.9	4.065		

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## EXHIBIT C

ADJUSTMENT AUTHORIZATION TABLES OF DIFFERENTIALS FOR USE IN DETERMINING ADJUSTMENTS  
FOR DIFFERENCE IN SULFUR CONTENT OF CRUDE PETROLEUM

PERCENT SULFUR	DIFF. PER BBL	PERCENT SULFUR	DIFF. PER BBL	PERCENT SULFUR	DIFF. PER BBL	PERCENT SULFUR	DIFF. PER BBL	PERCENT SULFUR	DIFF. PER BBL
0.00	1.000	0.60	1.600	1.20	2.200	1.80	2.800	2.40	3.400
0.01	1.010	0.61	1.610	1.21	2.210	1.81	2.810	2.41	3.410
0.02	1.020	0.62	1.620	1.22	2.220	1.82	2.820	2.42	3.420
0.03	1.030	0.63	1.630	1.23	2.230	1.83	2.830	2.43	3.430
0.04	1.040	0.64	1.640	1.24	2.240	1.84	2.840	2.44	3.440
0.05	1.050	0.65	1.650	1.25	2.250	1.85	2.850	2.45	3.450
0.06	1.060	0.66	1.660	1.26	2.260	1.86	2.860	2.46	3.460
0.07	1.070	0.67	1.670	1.27	2.270	1.87	2.870	2.47	3.470
0.08	1.080	0.68	1.680	1.28	2.280	1.88	2.880	2.48	3.480
0.09	1.090	0.69	1.690	1.29	2.290	1.89	2.890	2.49	3.490
0.10	1.100	0.70	1.700	1.30	2.300	1.90	2.900	2.50	3.500
0.11	1.110	0.71	1.710	1.31	2.310	1.91	2.910	2.51	3.510
0.12	1.120	0.72	1.720	1.32	2.320	1.92	2.920	2.52	3.520
0.13	1.130	0.73	1.730	1.33	2.330	1.93	2.930	2.53	3.530
0.14	1.140	0.74	1.740	1.34	2.340	1.94	2.940	2.54	3.540
0.15	1.150	0.75	1.750	1.35	2.350	1.95	2.950	2.55	3.550
0.16	1.160	0.76	1.760	1.36	2.360	1.96	2.960	2.56	3.560
0.17	1.170	0.77	1.770	1.37	2.370	1.97	2.970	2.57	3.570
0.18	1.180	0.78	1.780	1.38	2.380	1.98	2.980	2.58	3.580
0.19	1.190	0.79	1.790	1.39	2.390	1.99	2.990	2.59	3.590
0.20	1.200	0.80	1.800	1.40	2.400	2.00	3.000	2.60	3.600
0.21	1.210	0.81	1.810	1.41	2.410	2.01	3.010	2.61	3.610
0.22	1.220	0.82	1.820	1.42	2.420	2.02	3.020	2.62	3.620
0.23	1.230	0.83	1.830	1.43	2.430	2.03	3.030	2.63	3.630
0.24	1.240	0.84	1.840	1.44	2.440	2.04	3.040	2.64	3.640
0.25	1.250	0.85	1.850	1.45	2.450	2.05	3.050	2.65	3.650
0.26	1.260	0.86	1.860	1.46	2.460	2.06	3.060	2.66	3.660
0.27	1.270	0.87	1.870	1.47	2.470	2.07	3.070	2.67	3.670
0.28	1.280	0.88	1.880	1.48	2.480	2.08	3.080	2.68	3.680
0.29	1.290	0.89	1.890	1.49	2.490	2.09	3.090	2.69	3.690
0.30	1.300	0.90	1.900	1.50	2.500	2.10	3.100	2.70	3.700
0.31	1.310	0.91	1.910	1.51	2.510	2.11	3.110	2.71	3.710
0.32	1.320	0.92	1.920	1.52	2.520	2.12	3.120	2.72	3.720
0.33	1.330	0.93	1.930	1.53	2.530	2.13	3.130	2.73	3.730
0.34	1.340	0.94	1.940	1.54	2.540	2.14	3.140	2.74	3.740
0.35	1.350	0.95	1.950	1.55	2.550	2.15	3.150	2.75	3.750
0.36	1.360	0.96	1.960	1.56	2.560	2.16	3.160	2.76	3.760
0.37	1.370	0.97	1.970	1.57	2.570	2.17	3.170	2.77	3.770
0.38	1.380	0.98	1.980	1.58	2.580	2.18	3.180	2.78	3.780
0.39	1.390	0.99	1.990	1.59	2.590	2.19	3.190	2.79	3.790
0.40	1.400	1.00	2.000	1.60	2.600	2.20	3.200	2.80	3.800
0.41	1.410	1.01	2.010	1.61	2.610	2.21	3.210	2.81	3.810
0.42	1.420	1.02	2.020	1.62	2.620	2.22	3.220	2.82	3.820
0.43	1.430	1.03	2.030	1.63	2.630	2.23	3.230	2.83	3.830
0.44	1.440	1.04	2.040	1.64	2.640	2.24	3.240	2.84	3.840
0.45	1.450	1.05	2.050	1.65	2.650	2.25	3.250	2.85	3.850
0.46	1.460	1.06	2.060	1.66	2.660	2.26	3.260	2.86	3.860
0.47	1.470	1.07	2.070	1.67	2.670	2.27	3.270	2.87	3.870
0.48	1.480	1.08	2.080	1.68	2.680	2.28	3.280	2.88	3.880
0.49	1.490	1.09	2.090	1.69	2.690	2.29	3.290	2.89	3.890
0.50	1.500	1.10	2.100	1.70	2.700	2.30	3.300	2.90	3.900
0.51	1.510	1.11	2.110	1.71	2.710	2.31	3.310	2.91	3.910
0.52	1.520	1.12	2.120	1.72	2.720	2.32	3.320	2.92	3.920
0.53	1.530	1.13	2.130	1.73	2.730	2.33	3.330	2.93	3.930
0.54	1.540	1.14	2.140	1.74	2.740	2.34	3.340	2.94	3.940
0.55	1.550	1.15	2.150	1.75	2.750	2.35	3.350	2.95	3.950
0.56	1.560	1.16	2.160	1.76	2.760	2.36	3.360	2.96	3.960
0.57	1.570	1.17	2.170	1.77	2.770	2.37	3.370	2.97	3.970
0.58	1.580	1.18	2.180	1.78	2.780	2.38	3.380	2.98	3.980
0.59	1.590	1.19	2.190	1.79	2.790	2.39	3.390	2.99	3.990



## Gravity and Sulfur Banks Handbook

## EXHIBT C (CONTINUED)

ADJUSTMENT AUTHORIZATION TABLES OF DIFFERENTIALS FOR USE IN DETERMINING ADJUSTMENTS  
FOR DIFFERENCE IN SULFUR CONTENT OF CRUDE PETROLEUM

PERCENT SULFUR	DIFF. PER BBL	PERCENT SULFUR	DIFF. PER BBL
3.00	4.000	3.60	4.600
3.01	4.010	3.61	4.610
3.02	4.020	3.62	4.620
3.03	4.030	3.63	4.630
3.04	4.040	3.64	4.640
3.05	4.050	3.65	4.650
3.06	4.060	3.66	4.660
3.07	4.070	3.67	4.670
3.08	4.080	3.68	4.680
3.09	4.090	3.69	4.690
3.10	4.100	3.70	4.700
3.11	4.110	3.71	4.710
3.12	4.120	3.72	4.720
3.13	4.130	3.73	4.730
3.14	4.140	3.74	4.740
3.15	4.150	3.75	4.750
3.16	4.160	3.76	4.760
3.17	4.170	3.77	4.770
3.18	4.180	3.78	4.780
3.19	4.190	3.79	4.790
3.20	4.200	3.80	4.800
3.21	4.210	3.81	4.810
3.22	4.220	3.82	4.820
3.23	4.230	3.83	4.830
3.24	4.240	3.84	4.840
3.25	4.250	3.85	4.850
3.26	4.260	3.86	4.860
3.27	4.270	3.87	4.870
3.28	4.280	3.88	4.880
3.29	4.290	3.89	4.890
3.30	4.300	3.90	4.900
3.31	4.310	3.91	4.910
3.32	4.320	3.92	4.920
3.33	4.330	3.93	4.930
3.34	4.340	3.94	4.940
3.35	4.350	3.95	4.950
3.36	4.360	3.96	4.960
3.37	4.370	3.97	4.970
3.38	4.380	3.98	4.980
3.39	4.390	3.99	4.990
3.40	4.400	4.00	5.000
3.41	4.410		
3.42	4.420		
3.43	4.430		
3.44	4.440		
3.45	4.450		
3.46	4.460		
3.47	4.470		
3.48	4.480		
3.49	4.490		
3.50	4.500		
3.51	4.510		
3.52	4.520		
3.53	4.530		
3.54	4.540		
3.55	4.550		
3.56	4.560		
3.57	4.570		
3.58	4.580		
3.59	4.590		

For Sulfur Values  
above 4.00%, the  
differential continues  
to increase 0.01/BBL  
per 0.01 Percent  
Sulfur

# Gravity and Sulfur Banks Handbook

## EXHIBIT D

### RATIO FACTORS FOR SULFUR ADJUSTMENT WEIGHT OF CRUDE BY GRAVITY TO REFERENCE BASE OF 35.5° API GRAVITY ADJUSTMENT AUTHORIZATION

API GRAVITY	RATIO TO 35.5° WT.	API GRAVITY	RATIO TO 35.5° WT.	API GRAVITY	RATIO TO 35.5° WT.	API GRAVITY	RATIO TO 35.5° WT.	API GRAVITY	RATIO TO 35.5° WT.	API GRAVITY	RATIO TO 35.5° WT.
10.0	1.18044	16.0	1.13239	22.0	1.08802	28.0	1.04706	34.0	1.00907	40.0	0.97378
10.1	1.17959	16.1	1.13168	22.1	1.08731	28.1	1.04649	34.1	1.00850	40.1	0.97321
10.2	1.17888	16.2	1.13083	22.2	1.08661	28.2	1.04578	34.2	1.00780	40.2	0.97264
10.3	1.17803	16.3	1.13012	22.3	1.08590	28.3	1.04507	34.3	1.00723	40.3	0.97208
10.4	1.17718	16.4	1.12927	22.4	1.08519	28.4	1.04451	34.4	1.00666	40.4	0.97151
10.5	1.17633	16.5	1.12856	22.5	1.08448	28.5	1.04380	34.5	1.00609	40.5	0.97094
10.6	1.17548	16.6	1.12785	22.6	1.08377	28.6	1.04323	34.6	1.00539	40.6	0.97038
10.7	1.17463	16.7	1.12700	22.7	1.08320	28.7	1.04252	34.7	1.00482	40.7	0.96981
10.8	1.17378	16.8	1.12629	22.8	1.08249	28.8	1.04181	34.8	1.00425	40.8	0.96924
10.9	1.17307	16.9	1.12558	22.9	1.08179	28.9	1.04125	34.9	1.00369	40.9	0.96867
11.0	1.17222	17.0	1.12473	23.0	1.08108	29.0	1.04054	35.0	1.00298	41.0	0.96811
11.1	1.17137	17.1	1.12403	23.1	1.08037	29.1	1.03997	35.1	1.00241	41.1	0.96754
11.2	1.17052	17.2	1.12332	23.2	1.07966	29.2	1.03926	35.2	1.00184	41.2	0.96697
11.3	1.16967	17.3	1.12247	23.3	1.07895	29.3	1.03855	35.3	1.00128	41.3	0.96641
11.4	1.16896	17.4	1.12176	23.4	1.07824	29.4	1.03799	35.4	1.00057	41.4	0.96584
11.5	1.16811	17.5	1.12105	23.5	1.07753	29.5	1.03728	35.5	1.00000	41.5	0.96527
11.6	1.16726	17.6	1.12020	23.6	1.07682	29.6	1.03671	35.6	0.99943	41.6	0.96471
11.7	1.16641	17.7	1.11949	23.7	1.07612	29.7	1.03600	35.7	0.99887	41.7	0.96414
11.8	1.16570	17.8	1.11878	23.8	1.07541	29.8	1.03544	35.8	0.99816	41.8	0.96357
11.9	1.16485	17.9	1.11793	23.9	1.07470	29.9	1.03473	35.9	0.99759	41.9	0.96300
12.0	1.16400	18.0	1.11722	24.0	1.07413	30.0	1.03416	36.0	0.99702	42.0	0.96244
12.1	1.16315	18.1	1.11651	24.1	1.07342	30.1	1.03345	36.1	0.99646	42.1	0.96187
12.2	1.16244	18.2	1.11580	24.2	1.07271	30.2	1.03288	36.2	0.99589	42.2	0.96145
12.3	1.16159	18.3	1.11495	24.3	1.07201	30.3	1.03218	36.3	0.99518	42.3	0.96088
12.4	1.16074	18.4	1.11425	24.4	1.07130	30.4	1.03161	36.4	0.99461	42.4	0.96031
12.5	1.16003	18.5	1.11354	24.5	1.07059	30.5	1.03090	36.5	0.99405	42.5	0.95974
12.6	1.15918	18.6	1.11283	24.6	1.06988	30.6	1.03033	36.6	0.99348	42.6	0.95918
12.7	1.15833	18.7	1.11198	24.7	1.06931	30.7	1.02962	36.7	0.99291	42.7	0.95861
12.8	1.15748	18.8	1.11127	24.8	1.06860	30.8	1.02906	36.8	0.99220	42.8	0.95804
12.9	1.15677	18.9	1.11056	24.9	1.06790	30.9	1.02835	36.9	0.99164	42.9	0.95748
13.0	1.15592	19.0	1.10985	25.0	1.06719	31.0	1.02778	37.0	0.99107	43.0	0.95691
13.1	1.15521	19.1	1.10900	25.1	1.06648	31.1	1.02707	37.1	0.99050	43.1	0.95648
13.2	1.15436	19.2	1.10829	25.2	1.06577	31.2	1.02651	37.2	0.98994	43.2	0.95592
13.3	1.15351	19.3	1.10758	25.3	1.06520	31.3	1.02580	37.3	0.98937	43.3	0.95535
13.4	1.15280	19.4	1.10687	25.4	1.06449	31.4	1.02523	37.4	0.98880	43.4	0.95478
13.5	1.15195	19.5	1.10617	25.5	1.06378	31.5	1.02452	37.5	0.98809	43.5	0.95422
13.6	1.15110	19.6	1.10532	25.6	1.06308	31.6	1.02395	37.6	0.98753	43.6	0.95365
13.7	1.15039	19.7	1.10461	25.7	1.06251	31.7	1.02339	37.7	0.98696	43.7	0.95308
13.8	1.14954	19.8	1.10390	25.8	1.06180	31.8	1.02268	37.8	0.98639	43.8	0.95266
13.9	1.14883	19.9	1.10319	25.9	1.06109	31.9	1.02211	37.9	0.98583	43.9	0.95209
14.0	1.14798	20.0	1.10248	26.0	1.06038	32.0	1.02140	38.0	0.98526	44.0	0.95152
14.1	1.14713	20.1	1.10177	26.1	1.05967	32.1	1.02084	38.1	0.98469	44.1	0.95096
14.2	1.14642	20.2	1.10106	26.2	1.05911	32.2	1.02013	38.2	0.98412	44.2	0.95039
14.3	1.14557	20.3	1.10021	26.3	1.05840	32.3	1.01956	38.3	0.98356	44.3	0.94982
14.4	1.14486	20.4	1.09950	26.4	1.05769	32.4	1.01899	38.4	0.98285	44.4	0.94940
14.5	1.14401	20.5	1.09880	26.5	1.05698	32.5	1.01828	38.5	0.98228	44.5	0.94883
14.6	1.14330	20.6	1.09809	26.6	1.05641	32.6	1.01772	38.6	0.98172	44.6	0.94826
14.7	1.14245	20.7	1.09738	26.7	1.05571	32.7	1.01715	38.7	0.98115	44.7	0.94770
14.8	1.14174	20.8	1.09667	26.8	1.05500	32.8	1.01644	38.8	0.98058	44.8	0.94713
14.9	1.14089	20.9	1.09596	26.9	1.05443	32.9	1.01588	38.9	0.98001	44.9	0.94670
15.0	1.14018	21.0	1.09525	27.0	1.05372	33.0	1.01517	39.0	0.97945	45.0	0.94614
15.1	1.13933	21.1	1.09454	27.1	1.05301	33.1	1.01460	39.1	0.97888	45.1	0.94557
15.2	1.13863	21.2	1.09383	27.2	1.05245	33.2	1.01403	39.2	0.97831	45.2	0.94500
15.3	1.13777	21.3	1.09313	27.3	1.05174	33.3	1.01332	39.3	0.97775	45.3	0.94444
15.4	1.13707	21.4	1.09242	27.4	1.05103	33.4	1.01276	39.4	0.97718	45.4	0.94401
15.5	1.13622	21.5	1.09171	27.5	1.05046	33.5	1.01219	39.5	0.97661	45.5	0.94344
15.6	1.13551	21.6	1.09086	27.6	1.04975	33.6	1.01148	39.6	0.97605	45.6	0.94288
15.7	1.13466	21.7	1.09015	27.7	1.04904	33.7	1.01091	39.7	0.97548	45.7	0.94231
15.8	1.13395	21.8	1.08944	27.8	1.04848	33.8	1.01035	39.8	0.97491	45.8	0.94189
15.9	1.13324	21.9	1.08873	27.9	1.04777	33.9	1.00964	39.9	0.97434	45.9	0.94132

## Gravity and Sulfur Banks Handbook

## EXHIBIT D (CONTINUED)

 RATIO FACTORS FOR SULFUR ADJUSTMENT WEIGHT OF CRUDE BY GRAVITY TO  
 REFERENCE BASE OF 35.5<sup>0</sup> API GRAVITY ADJUSTMENT AUTHORIZATION

API GRAVITY	RATIO TO 35.5° WT.	API GRAVITY	RATIO TO 35.5° WT.	API GRAVITY	RATIO TO 35.5° WT.	API GRAVITY	RATIO TO 35.5° WT.	API GRAVITY	RATIO TO 35.5° WT.
46.0	0.94075	52.0	0.90999	58.0	0.88108	64.0	0.85400	70.0	0.82849
46.1	0.94018	52.1	0.90943	58.1	0.88085	64.1	0.85358	70.1	0.82807
46.2	0.93976	52.2	0.90900	58.2	0.88009	64.2	0.85315	70.2	0.82764
46.3	0.93919	52.3	0.90843	58.3	0.87966	64.3	0.85273	70.3	0.82721
46.4	0.93863	52.4	0.90801	58.4	0.87923	64.4	0.85230	70.4	0.82679
46.5	0.93806	52.5	0.90744	58.5	0.87867	64.5	0.85188	70.5	0.82651
46.6	0.93763	52.6	0.90702	58.6	0.87824	64.6	0.85145	70.6	0.82608
46.7	0.93707	52.7	0.90645	58.7	0.87782	64.7	0.85103	70.7	0.82566
46.8	0.93650	52.8	0.90602	58.8	0.87739	64.8	0.85046	70.8	0.82537
46.9	0.93607	52.9	0.90546	58.9	0.87697	64.9	0.85004	70.9	0.82495
47.0	0.93551	53.0	0.90503	59.0	0.87654	65.0	0.84961	71.0	0.82452
47.1	0.93494	53.1	0.90446	59.1	0.87597	65.1	0.84918	71.1	0.82410
47.2	0.93437	53.2	0.90404	59.2	0.87555	65.2	0.84876	71.2	0.82367
47.3	0.93395	53.3	0.90361	59.3	0.87512	65.3	0.84833	71.3	0.82325
47.4	0.93338	53.4	0.90305	59.4	0.87456	65.4	0.84791	71.4	0.82282
47.5	0.93281	53.5	0.90262	59.5	0.87413	65.5	0.84746	71.5	0.82240
47.6	0.93239	53.6	0.90206	59.6	0.87371	65.6	0.84706	71.6	0.82197
47.7	0.93182	53.7	0.90163	59.7	0.87328	65.7	0.84663	71.7	0.82155
47.8	0.93125	53.8	0.90106	59.8	0.87286	65.8	0.84621	71.8	0.82112
47.9	0.93083	53.9	0.90064	59.9	0.87229	65.9	0.84578	71.9	0.82084
48.0	0.93026	54.0	0.90007	60.0	0.87186	66.0	0.84536	72.0	0.82041
48.1	0.92970	54.1	0.89965	60.1	0.87144	66.1	0.84493	72.1	0.81999
48.2	0.92927	54.2	0.89922	60.2	0.87087	66.2	0.84451	72.2	0.81956
48.3	0.92870	54.3	0.89865	60.3	0.87045	66.3	0.84408	72.3	0.81914
48.4	0.92814	54.4	0.89823	60.4	0.87002	66.4	0.84366	72.4	0.81871
48.5	0.92771	54.5	0.89766	60.5	0.86960	66.5	0.84323	72.5	0.81828
48.6	0.92714	54.6	0.89724	60.6	0.86917	66.6	0.84281	72.6	0.81800
48.7	0.92672	54.7	0.89681	60.7	0.86875	66.7	0.84238	72.7	0.81758
48.8	0.92615	54.8	0.89624	60.8	0.86818	66.8	0.84196	72.8	0.81715
48.9	0.92558	54.9	0.89582	60.9	0.86775	66.9	0.84153	72.9	0.81673
49.0	0.92516	55.0	0.89525	61.0	0.86733	67.0	0.84111	73.0	0.81630
49.1	0.92459	55.1	0.89483	61.1	0.86690	67.1	0.84068	73.1	0.81602
49.2	0.92403	55.2	0.89440	61.2	0.86648	67.2	0.84026	73.2	0.81559
49.3	0.92360	55.3	0.89383	61.3	0.86591	67.3	0.83983	73.3	0.81517
49.4	0.92303	55.4	0.89341	61.4	0.86549	67.4	0.83940	73.4	0.81474
49.5	0.92261	55.5	0.89525	61.5	0.86506	67.5	0.83898	73.5	0.81432
49.6	0.92204	55.6	0.89242	61.6	0.86464	67.6	0.83855	73.6	0.81403
49.7	0.92147	55.7	0.89199	61.7	0.86421	67.7	0.83813	73.7	0.81361
49.8	0.92105	55.8	0.89157	61.8	0.86378	67.8	0.83770	73.8	0.81318
49.9	0.92048	55.9	0.89114	61.9	0.86322	67.9	0.83728	73.9	0.81276
50.0	0.92006	56.0	0.89057	62.0	0.86279	68.0	0.83685	74.0	0.81233
50.1	0.91949	56.1	0.89015	62.1	0.86237	68.1	0.83643	74.1	0.81191
50.2	0.91892	56.2	0.88958	62.2	0.86194	68.2	0.83600	74.2	0.81162
50.3	0.91850	56.3	0.88916	62.3	0.86152	68.3	0.83558	74.3	0.81120
50.4	0.91793	56.4	0.88873	62.4	0.86109	68.4	0.83515	74.4	0.81077
50.5	0.91751	56.5	0.88816	62.5	0.86067	68.5	0.83473	74.5	0.81049
50.6	0.91694	56.6	0.88774	62.6	0.86010	68.6	0.83430	74.6	0.81006
50.7	0.91651	56.7	0.88717	62.7	0.85967	68.7	0.83388	74.7	0.80964
50.8	0.91595	56.8	0.88675	62.8	0.85925	68.8	0.83345	74.8	0.80921
50.9	0.91552	56.9	0.88632	62.9	0.85882	68.9	0.83303	74.9	0.80879
51.0	0.91495	57.0	0.88575	63.0	0.85840	69.0	0.83260		
51.1	0.91439	57.1	0.88533	63.1	0.85797	69.1	0.83218		
51.2	0.91396	57.2	0.88490	63.2	0.85755	69.2	0.83175		
51.3	0.91339	57.3	0.88448	63.3	0.85712	69.3	0.83147		
51.4	0.91297	57.4	0.88391	63.4	0.85670	69.4	0.83104		
51.5	0.91240	57.5	0.88349	63.5	0.85613	69.5	0.83062		
51.6	0.91198	57.6	0.88292	63.6	0.85571	69.6	0.83019		
51.7	0.91141	57.7	0.88249	63.7	0.85528	69.7	0.82977		
51.8	0.91099	57.8	0.88207	63.8	0.85485	69.8	0.82934		
51.9	0.91042	57.9	0.88150	63.9	0.85443	69.9	0.82892		