



# Test Monitoring Center

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MEMORANDUM: 01-176  
DATE: November 29, 2001  
TO: Sequence VIII Surveillance Panel  
FROM: Michael T. Kasimirsky  
SUBJECT: Test Target Updates

The TMC has received 32 data points on reference oil 1006 and 35 data points on reference oil 704-1 and as such has sufficient data to update and freeze the test targets for both of these reference oils. The current targets for these two reference oils are listed below for comparison purposes:

UPDATED REFERENCE OIL 1006 TEST TARGETS		
PARAMETER	MEAN	STANDARD DEVIATION
BWL	15.6	4.66
SVIS	8.98	0.19

UPDATED REFERENCE OIL 704-1 TEST TARGETS		
PARAMETER	MEAN	STANDARD DEVIATION
BWL	8.3	2.44
SVIS	10.29	0.11

The original targets for these two reference oils are shown below for comparison purposes:

ORIGINAL REFERENCE OIL 1006 TEST TARGETS		
PARAMETER	MEAN	STANDARD DEVIATION
BWL	17.1	5.28
SVIS	9.00	0.22

ORIGINAL REFERENCE OIL 704-1 TEST TARGETS		
PARAMETER	MEAN	STANDARD DEVIATION
BWL	8.0	3.40
SVIS	10.25	0.15

The data obtained to date on these reference oils were adjusted using the severity adjustments, if any, generated as a result of the previous reference oil test. Since stripped viscosity is not a severity-adjusted parameter, only bearing weight loss results were severity adjusted. The new test targets, based upon this methodology, are shown below:

FINAL REFERENCE OIL 1006 TEST TARGETS		
PARAMETER	MEAN	STANDARD DEVIATION
BWL	15.9	4.85
SVIS	9.00	0.17

FINAL REFERENCE OIL 704-1 TEST TARGETS		
PARAMETER	MEAN	STANDARD DEVIATION
BWL	8.3	2.32
SVIS	10.27	0.11

These targets; along with the previous original & updated test targets, targets based upon the unadjusted raw data, and the individual data points; are displayed graphically in the four attached plots. The first two plots show reference oil 1006 data and the second two plots show reference oil 704-1 data. On the last four pages are tables showing the individual reference oil test results used in generation of these targets. Table 1 shows the unadjusted values for reference oil 1006 and Table 2 shows the reference oil 1006 test results with severity adjustments applied. Results in Table 2 that have been severity adjusted are shown with the adjusted parameter underlined. Tables 3 and 4 show similar data for reference oil 704-1 as Tables 1 and 2. These new test targets are effective for all reference oil tests completed on or after December 17, 2001.

MTK/mtk

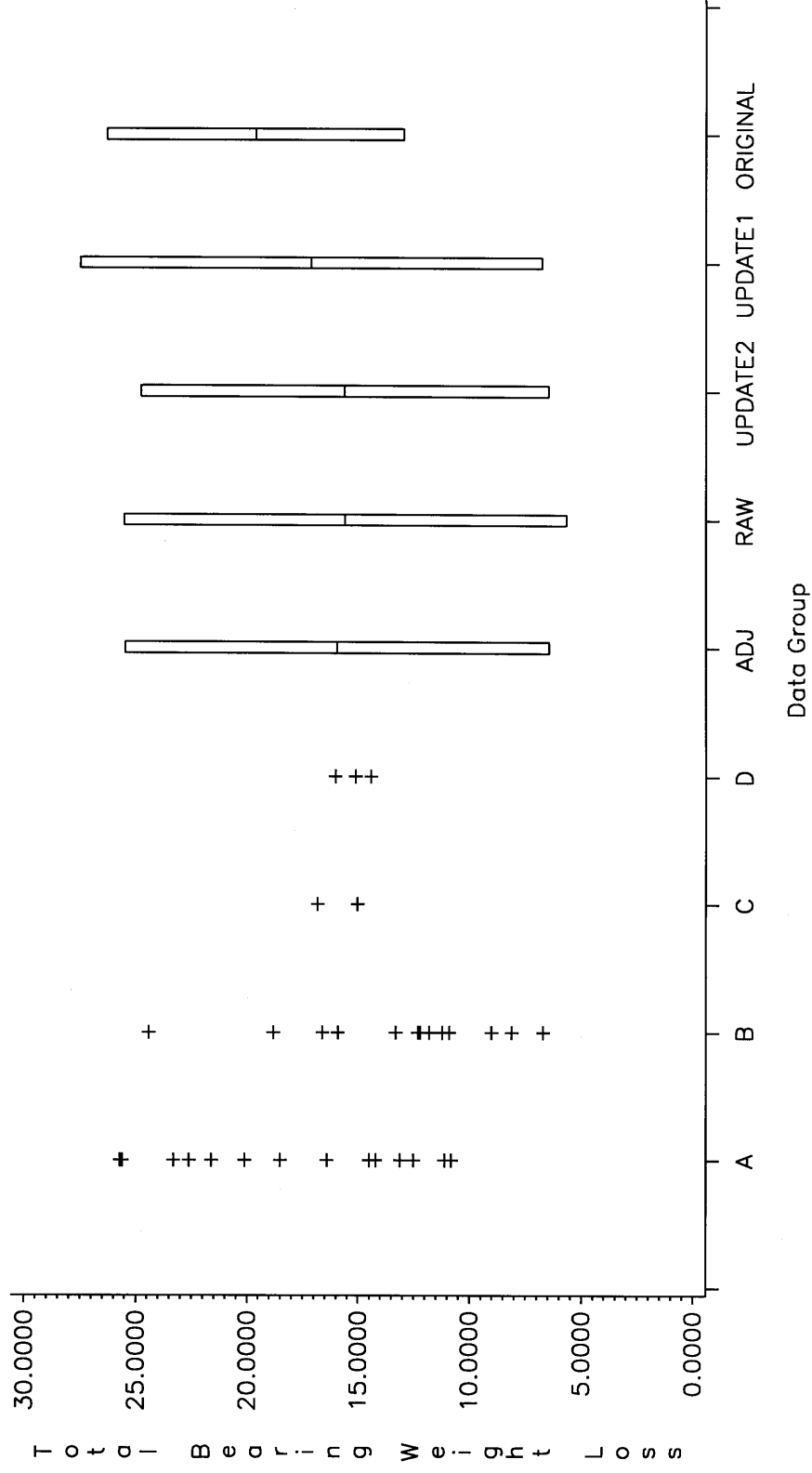
Attachments

c: John L. Zalar, TMC

<ftp://www.tmc.astm.cmri.cmu.edu/docs/gas/sequenceviii/memos/mem01-176.pdf>

# Sequence VIII Reference Oil 1006 Test Target Data Set and Shewhart Bands

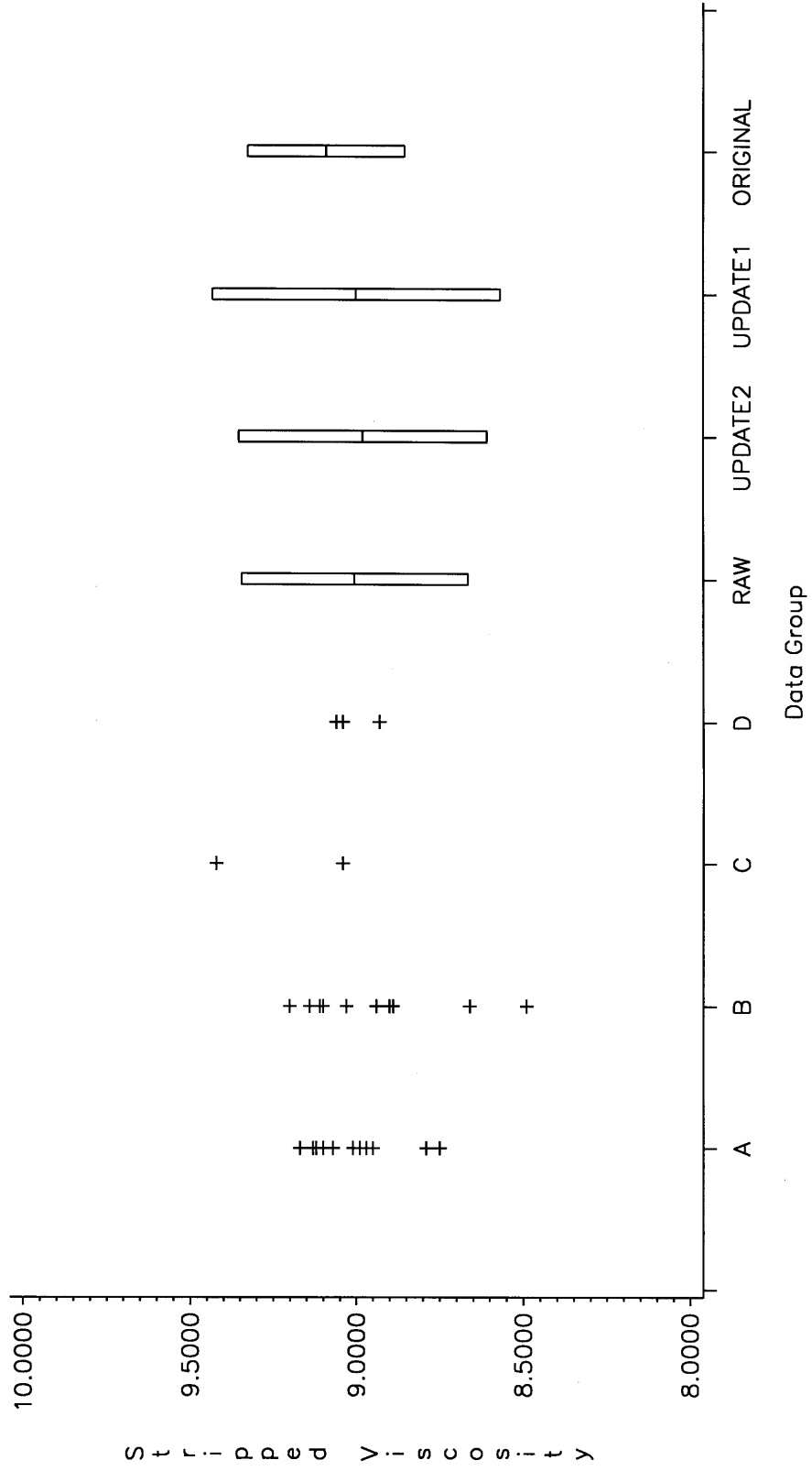
Bearing Weight Loss, in mg



# Sequence VIII Reference Oil 1006

## Test Target Data Set and Shewhart Bands

Stripped Viscosity, in cSt





# Sequence VIII Reference Oil 704-1

## Test Target Data Set and Shewhart Bands

Stripped Viscosity, in cSt

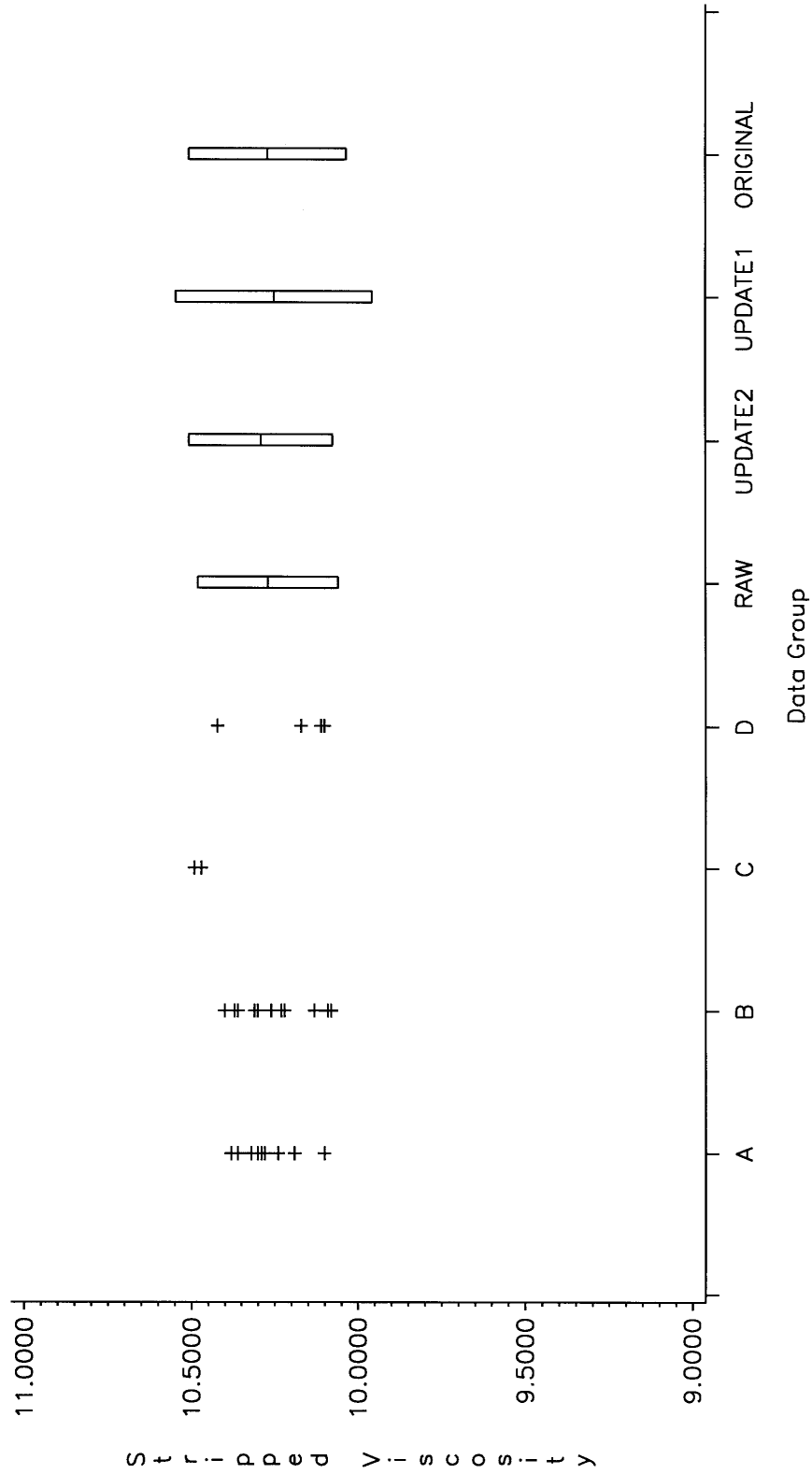


Table 1 – Raw Reference Oil 1006 Data

OILCODE	LTMSLAB	LTMSAPP	IND	VAL	LTMSDATE	LTMSTIME	BWL	SVIS
33543	C	1	1006	AO	11/12/1998	16:05	15	9.04
33544	C	1	1006	AO	11/17/1998	20:40	16.8	9.42
36209	D	1	1006	AC	2/14/2000	9:30	14.4	8.93
36210	D	1	1006	AC	9/21/2000	9:20	16	9.04
38052	D	1	1006	AC	4/4/2001	11:05	15.1	9.06
31089	B	1	1006	AO	9/3/1998	19:35	18.8	8.94
35310	B	1	1006	OC	8/25/1999	23:00	12.2	8.89
34702	B	1	1006	OC	9/3/1999	20:05	12.3	8.66
34704	B	1	1006	AC	9/9/1999	20:25	16.6	8.9
35478	B	1	1006	OC	11/26/1999	20:05	13.3	8.49
35919	B	1	1006	AC	12/10/1999	12:55	11.8	9.03
35921	B	3	1006	AC	6/14/2000	8:15	10.9	8.89
38040	B	1	1006	OC	1/28/2001	10:35	6.7	9.14
38041	B	1	1006	AC	2/3/2001	17:55	8.1	9.11
38042	B	3	1006	AC	4/27/2001	20:35	11.2	9.2
38043	B	1	1006	AC	8/12/2001	15:35	15.9	9.11
40332	B	4	1006	AC	8/23/2001	20:40	9	8.9
42219	B	1	1006	AC	11/18/2001	16:55	24.4	9.1
31096	A	1	1006	AO	9/27/1998	14:35	25.6	9.12
34067	A	1	1006	AC	2/21/1999	9:55	25.7	9.1
34149	A	1	1006	OC	8/23/1999	8:25	10.8	8.75
34150	A	1	1006	OC	8/27/1999	12:10	14.5	9.17
35359	A	1	1006	AC	12/20/1999	16:55	12.5	8.97
35360	A	2	1006	AC	3/6/2000	12:41	20.1	8.79
36201	A	3	1006	AC	6/29/2000	14:22	11.1	8.99
36202	A	2	1006	AC	10/9/2000	13:51	14.2	9.1
38032	A	3	1006	AC	1/17/2001	12:12	18.5	9.01
39064	A	2	1006	AC	1/20/2001	15:47	21.6	9.13
40335	A	2	1006	AC	5/12/2001	12:38	13.1	9.07
40337	A	4	1006	AC	6/25/2001	13:05	16.4	9.17
41614	A	3	1006	AC	9/3/2001	11:39	23.3	8.95
41615	A	3	1006	AC	9/15/2001	9:13	22.6	8.97

Table 2 – Severity Adjusted Reference Oil 1006 Data

OILCODE	LTMSLAB	LTMSAPP	IND	VAL	LTMSDATE	LTMSTIME	BWL	SVIS
33543	C	1	1006	AO	11/12/1998	16:05	15	9.04
33544	C	1	1006	AO	11/17/1998	20:40	16.8	9.42
36209	D	1	1006	AC	2/14/2000	9:30	14.4	8.93
36210	D	1	1006	AC	9/21/2000	9:20	16	9.04
38052	D	1	1006	AC	4/4/2001	11:05	15.1	9.06
31089	B	1	1006	AO	9/3/1998	19:35	18.8	8.94
35310	B	1	1006	OC	8/25/1999	23:00	12.2	8.89
34702	B	1	1006	OC	9/3/1999	20:05	12.3	8.66
34704	B	1	1006	AC	9/9/1999	20:25	<u>18.9</u>	8.9
35478	B	1	1006	OC	11/26/1999	20:05	13.3	8.49
35919	B	1	1006	AC	12/10/1999	12:55	11.8	9.03
35921	B	3	1006	AC	6/14/2000	8:15	10.9	8.89
38040	B	1	1006	OC	1/28/2001	10:35	6.7	9.14
38041	B	1	1006	AC	2/3/2001	17:55	8.1	9.11
38042	B	3	1006	AC	4/27/2001	20:35	11.2	9.2
38043	B	1	1006	AC	8/12/2001	15:35	15.9	9.11
40332	B	4	1006	AC	8/23/2001	20:40	9	8.9
42219	B	1	1006	AC	11/18/2001	16:55	<u>29</u>	9.1
31096	A	1	1006	AO	9/27/1998	14:35	25.6	9.12
34067	A	1	1006	AC	2/21/1999	9:55	25.7	9.1
34149	A	1	1006	OC	8/23/1999	8:25	10.8	8.75
34150	A	1	1006	OC	8/27/1999	12:10	14.5	9.17
35359	A	1	1006	AC	12/20/1999	16:55	12.5	8.97
35360	A	2	1006	AC	3/6/2000	12:41	20.1	8.79
36201	A	3	1006	AC	6/29/2000	14:22	11.1	8.99
36202	A	2	1006	AC	10/9/2000	13:51	14.2	9.1
38032	A	3	1006	AC	1/17/2001	12:12	18.5	9.01
39064	A	2	1006	AC	1/20/2001	15:47	21.6	9.13
40335	A	2	1006	AC	5/12/2001	12:38	13.1	9.07
40337	A	4	1006	AC	6/25/2001	13:05	16.4	9.17
41614	A	3	1006	AC	9/3/2001	11:39	23.3	8.95
41615	A	3	1006	AC	9/15/2001	9:13	22.6	8.97



Table 3 – Raw Reference Oil 704-1 Data

OILCODE	LTMSLAB	LTMSAPP	IND	VAL	LTMSDATE	LTMSTIME	BWL	SVIS
21886	C	1	704-1	AO	10/17/1998	13:00	9	10.49
24744	C	1	704-1	AO	11/6/1998	22:35	4.9	10.47
21888	D	1	704-1	AC	3/24/1999	10:30	5.4	10.1
24996	D	1	704-1	AC	4/29/1999	10:40	6.6	10.11
25000	D	1	704-1	AC	12/10/1999	11:15	7.8	10.42
38050	D	1	704-1	AC	11/16/2001	12:30	5.1	10.17
31522	B	1	704-1	AO	8/29/1998	8:30	5.8	10.08
32810	B	1	704-1	AO	9/16/1998	19:25	12.3	10.09
34701	B	1	704-1	AC	9/12/1999	19:45	11.3	10.23
34703	B	3	704-1	AC	12/5/1999	16:55	8.5	10.31
35920	B	1	704-1	OC	8/18/2000	10:05	13.8	10.3
36204	B	1	704-1	OC	8/24/2000	15:40	7.1	10.37
36205	B	1	704-1	AC	8/30/2000	16:20	3.9	10.4
36206	B	1	704-1	AC	9/14/2000	12:35	8	10.36
38045	B	3	704-1	AC	11/19/2000	18:15	11.6	10.26
39045	B	3	704-1	AC	2/4/2001	13:45	10.1	10.22
39046	B	1	704-1	AC	5/11/2001	17:40	7.9	10.23
42171	B	3	704-1	OC	11/8/2001	18:10	3.4	10.3
42172	B	4	704-1	AC	11/11/2001	16:35	4.1	10.3
42173	B	3	704-1	AC	11/14/2001	18:30	7.9	10.13
42174	B	3	704-1	AC	11/18/2001	18:15	8.7	10.22
31535	A	1	704-1	AO	9/13/1998	11:05	7.5	10.24
31530	A	1	704-1	AO	10/3/1998	10:30	7.6	10.24
34148	A	1	704-1	OC	9/4/1999	12:35	7.8	10.36
34151	A	1	704-1	AC	9/11/1999	18:25	7.7	10.38
35923	A	2	704-1	AC	12/13/1999	10:49	7.9	10.28
36199	A	2	704-1	AC	9/11/2000	14:24	11.7	10.29
38030	A	3	704-1	AC	10/2/2000	5:22	6.6	10.19
38031	A	4	704-1	AC	2/19/2001	10:28	7.5	10.19
38033	A	4	704-1	AC	3/1/2001	12:00	6.9	10.38
40336	A	4	704-1	AC	6/30/2001	15:33	10.8	10.3
40338	A	2	704-1	AC	7/10/2001	13:59	6.2	10.32
41613	A	4	704-1	AC	9/9/2001	15:45	6.8	10.29
41616	A	4	704-1	AC	9/13/2001	12:24	8	10.28
42450	A	3	704-1	AC	10/25/2001	16:51	9.4	10.1

Table 4 – Severity Adjusted Reference Oil 704-1 Data

OILCODE	LTMSLAB	LTMSAPP	IND	VAL	LTMSDATE	LTMSTIME	BWL	SVIS
21886	C	1	704-1	AO	10/17/1998	13:00	9	10.49
24744	C	1	704-1	AO	11/6/1998	22:35	4.9	10.47
21888	D	1	704-1	AC	3/24/1999	10:30	5.4	10.1
24996	D	1	704-1	AC	4/29/1999	10:40	6.6	10.11
25000	D	1	704-1	AC	12/10/1999	11:15	7.8	10.42
38050	D	1	704-1	AC	11/16/2001	12:30	5.1	10.17
31522	B	1	704-1	AO	8/29/1998	8:30	5.8	10.08
32810	B	1	704-1	AO	9/16/1998	19:25	12.3	10.09
34701	B	1	704-1	AC	9/12/1999	19:45	<u>13.8</u>	10.23
34703	B	3	704-1	AC	12/5/1999	16:55	8.5	10.31
35920	B	1	704-1	OC	8/18/2000	10:05	<u>17</u>	10.3
36204	B	1	704-1	OC	8/24/2000	15:40	7.1	10.37
36205	B	1	704-1	AC	8/30/2000	16:20	3.9	10.4
36206	B	1	704-1	AC	9/14/2000	12:35	8	10.36
38045	B	3	704-1	AC	11/19/2000	18:15	11.6	10.26
39045	B	3	704-1	AC	2/4/2001	13:45	<u>13.7</u>	10.22
39046	B	1	704-1	AC	5/11/2001	17:40	7.9	10.23
42171	B	3	704-1	OC	11/8/2001	18:10	3.4	10.3
42172	B	4	704-1	AC	11/11/2001	16:35	<u>8.6</u>	10.3
42173	B	3	704-1	AC	11/14/2001	18:30	<u>13.4</u>	10.13
42174	B	3	704-1	AC	11/18/2001	18:15	8.7	10.22
31535	A	1	704-1	AO	9/13/1998	11:05	7.5	10.24
31530	A	1	704-1	AO	10/3/1998	10:30	7.6	10.24
34148	A	1	704-1	OC	9/4/1999	12:35	7.8	10.36
34151	A	1	704-1	AC	9/11/1999	18:25	7.7	10.38
35923	A	2	704-1	AC	12/13/1999	10:49	7.9	10.28
36199	A	2	704-1	AC	9/11/2000	14:24	11.7	10.29
38030	A	3	704-1	AC	10/2/2000	5:22	6.6	10.19
38031	A	4	704-1	AC	2/19/2001	10:28	7.5	10.19
38033	A	4	704-1	AC	3/1/2001	12:00	6.9	10.38
40336	A	4	704-1	AC	6/30/2001	15:33	10.8	10.3
40338	A	2	704-1	AC	7/10/2001	13:59	6.2	10.32
41613	A	4	704-1	AC	9/9/2001	15:45	6.8	10.29
41616	A	4	704-1	AC	9/13/2001	12:24	8	10.28
42450	A	3	704-1	AC	10/25/2001	16:51	9.4	10.1