

# CAPLINE SYSTEM

## CRUDE OIL PROPERTIES AND QUALITY INDICATORS

Approved Crude List - 1st Quarter, 2003

Updated  
04/10/03

Section I. Crudes Approved, Moved and Capline Assay Reported																						
Mnwm	See Foot- notes	Crude Name	Product Code	Country	Assay Date	Density	RVP	Sulfur	a)Pour Point	Carbon Residue	Viscosity (SSU)			b) H2S	Metals (ppm)				TAN E	SALT	Organic Chlorides (ppm)	
						(API@60)	(psia)	(%)	(degF)	(%)	@60 F	@80 F	@100 F	(ppm)	Vanadium	Nickel	Whole	Pitch	Whole	Pitch	(mg KOH/g)	(lb/MB)
<b>Sweet - Low Metals Group</b>																						
BNL		BONNY LIGHT	82337	Nigeria	08/12/02	32.9	3.8	0.17	32.0	1.1	60.2	46.0	41.2	<1	1.2	3.8	6.4	39.0	0.26	15	<1	<1
BSR		BRASS RIVER	82325	Nigeria	01/28/03	40.1	6.0	0.11	<-27.4	0.6	37.4	35.1	33.3	<1	<0.5	5.3	1.3	29.0	0.17	10	<1	1.7
BRN		BRENT	82288	U. K.	03/17/03	38.4	6.5	0.43	15.8	2.0	48.2	40.8	37.3	<1	5.9	59.0	1.1	9.7	0.05	30	<1	<1
CAB	☑	CABINDA	82345	Angola	03/03/03	32.4	2.7	0.13	59.0	3.5	-	-	73.5	<1	1.7	6.0	17.0	63.0	0.17	3	<1	<1
COCO		COCODRIE CONDENSATE	82921	USA	07/27/01	48.8	6.5	0.12	<-27.4	0.2	32.5			<1	0.6		0.5		0.16	93	<1	<1
CUS	☑	CUSIANA	82419	Columbia	09/19/02	42.6	8.9	0.15	32.0	0.7	39.7	34.6	32.9	<1	2.6	27.0	0.8	7.0	0.13	73	<1	<1
DJEN	☑	DJENO	82602	Congo	07/05/97	27.0	2.5	0.47	32.0	5.3	695.1	284.3	173.9	<1	6.7	22.0	12.3	62.0	0.82	10	<1	2.4
DRAUG		DRAUGEN	82575	Norway	04/26/02	39.1	7.3	0.16	<-27.4	0.7	42.1	39.2	35.5	<1	1.1	16.0	1.0	13.0	0.18	29	<1	<1
EKO		EKOFISK	82307	Norway	06/06/02	37.3	3.9	0.23	26.6	0.9		46.0	40.8	<1	1.4	9.7	2.2	16.0	0.10	4	<1	<1
ESC		ESCRAVOS	82338	Nigeria	07/21/01	36.4	5.2	0.18	42.8	1.3	68.0	44.1	39.1	<1	1.4	13.0	3.6	33.0	0.16	6	<1	<1
FON	☑	FOINAVEN	82424	U. K.	06/12/00	26.6	0.6	0.40	42.8	2.0	478.5	188.6	110.6	<1	4.6	18.8	2.7	10.3	0.16	8	<1	2.0
FOR		FORCADOS	82331	Nigeria	08/08/02	30.1	2.5	0.24	-0.4	1.3	69.1	57.3	46.1	<1	3.6	14.0	8.7	33.0	0.39	30	<1	<1
GIR		GIRASSOL	82583	Angola	02/13/03	31.1	2.7	0.34	<-27.4	3.2	112.4	79.7	58.1	<1	4.1	19.0	10.0	44.0	0.33	6	<1	<1
GFAX		GULLFAKS	82270	Norway	07/23/01	36.9	4.4	0.30	5.0	1.3	48.8	44.5	38.6	<1	2.8	27.0	1.5	14.0	0.08	10	<1	<1
HLS	☑	HEAVY LA SWEET	82720	USA	02/28/03	36.3	3.5	0.29	-22.0	1.7	50.6	47.0	40.5	<1	1.7	15.0	2.9	26.0	0.51	72	<1	<1
JSB		JAY COND/LT MS SR BLEND (90/10)	82773	USA	02/21/01	49.0	6.2	0.45	<-27.4	0.7	32.2	31.2	30.6	<1	1.2	22.0	0.3	4.1	0.25	39	<1	<1
KIT	☑	KITINA	82580	Congo	09/21/02	36.4	4.2	0.11	59.0	2.3		56.8	48.5	<1	1.0	4.7	9.1	38.0	0.10	4	<1	<1
LMS	☑	LA MISSISSIPPI SWEET	82723	USA	01/30/03	40.2	4.5	0.55	<-27.4	2.0	43.2	39.4	38.5	<1	1.6	15.0	1.3	14.0	0.12	13	<1	<1
LLS		LIGHT LOUISIANA SWEET	82722	USA	03/01/03	40.8	4.0	0.31	<-27.4	0.9	40.1	37.7	35.1	<1	1.6	18.0	1.2	13.0	0.40	89	1.5	4.5
NAK		NAPHTHA - KOCH	82161	USA	08/03/02	57.8	3.1	0.11	<-27.4	0.2	<32.0	<32.0	<32.0	<1	1.2		0.4		0.11	10	<1	<1
NBA		NEMBA	82255	Angola	06/27/00	38.6	6.2	0.19	-11.2	1.4	45.3	42.2	38.7	<1	2.3	18.0	2.0	15.0	0.07	106	<1	<1
NKS	☑	N'KOSSA	82135	Congo	03/23/00	47.5	8.8	0.12	<-27.4	0.2	36.1	34.2	33.7	<1	1.5	21.0	0.7	8.7	0.04	8	<1	<1
NOR	☑	NORNE	82430	Norway	03/17/03	32.6	2.4	0.20	64.4	1.0		56.8	46.5	<1	<0.5	23.5	0.9	8.6	0.07	33	<1	<1
OSB		OSEBERG	82271	Norway	06/08/99	36.8	5.0	0.25	10.4	1.9	49.2	41.5	31.0	<1	1.3	8.6	1.1	6.9	0.14	17	<1	<1
OSO	☑	OSO CONDENSATE	82403	Nigeria	09/16/02	45.7	8.9	0.06	64.4	0.3	38.2	32.6	<32.0	<1	<0.1		0.7		0.11	10	<1	<1
KWI	☑	QUA IBOE	82339	Nigeria	03/05/03	36.4	3.7	0.12	59.0	1.0	70.3	40.4	37.1	<1	0.5	4.8	4.0	42.0	0.33	10	<1	<1
SAH	☑	SAHARAN BLEND	82298	Middle East	03/11/03	46.0	10.7	0.08	<-27.4	1.0	36.2	34.3	32.9	<1	0.3	2.8	0.2	2.0	0.03	14	<1	<1
STB		SANTA BARBARA	82251	Venezuela	03/12/03	39.5	5.4	0.49	-22.0	0.9	38.8	36.0	34.2	<1	4.2	69.0	0.9	15.0	0.02	29	<1	<1
SCH	☑	SCHIEHALLION	82441	Scotland	02/12/01	26.5	0.9	0.48	26.6	2.6	238.7	140.5	88.7	<1	6.3	33.0	3.8	18.0	0.30	3	<1	1.7
SLS		SOUTH LOUISIANA SWEET	82586	USA	02/26/03	36.9	2.9	0.32	-22.0	1.6	49.3	43.5	39.5	<1	2.6	27.0	2.8	29.0	0.36	118	<1	1.2
TROL	☑	TROLL EXPORT	82421	Norway	08/23/02	27.4	1.7	0.27	<-27.4	1.7	123.2	84.8	64.1	<1	1.4	10.0	1.0	7.7	1.20	15	<1	<1
WSB		WILLIAMS SUGARLAND BLEND	82573	USA	07/14/01	40.9	6.4	0.20	37.4	0.7	38.5	36.4	34.3	<1	1.2	22.0	0.8	19.0	0.19	39	<1	1.1
ZUASW		ZUATA SWEET	82576	Venezuela	08/13/02	32.0	3.4	0.26	<-27.4	0.1	53.9	46.5	41.0	<1	0.7	37.0	0.4	21.0	0.10	8	<1	1.9
<b>Intermediate Group</b>																						
BS	☑	BONITO SOUR	82743	USA	03/01/03	37.5	4.5	0.85	-11.2	1.9	50.2	44.0	40.4	<1	7.0	48.0	2.9	20.0	0.49	172	<1	1.3
EIC		EUGENE ISLAND	82725	USA	08/09/02	36.2	5.0	0.88	-22.0	2.0	54.5	46.6	41.1	<1	10.0	47.0	4.2	20.0	0.61	60	<1	<1
OMA		OLMECA	82385	Mexico	02/18/02	37.3	6.2	0.84	10.4	2.4	48.6	43.1	39.5	<1	11.0	66.0	5.0	26.0	0.15	10	<1	1.9
ORI		ORIENTE	82388	Ecuador	09/10/01	25.7	2.8	0.38	-11.0	8.6	436.9	250.0	139.6	<1	116.0	315.0	35.0	82.0	0.31	106	<1	1.2
<b>Sour Group</b>																						
AXL		ARABIAN EXTRA LIGHT	82375	Saudi Arabia	02/15/02	38.1	5.5	1.20	-27.4	2.3	50.0	43.4	40.1	<1	4.9	31.0	1.8	11.0	0.24	17	<1	3.0
ABL	☑	ARABIAN LIGHT	82376	Saudi Arabia	02/12/02	33.2	7.6	1.85	-27.4	4.3	67.1	53.0	46.5	<1	16.0	96.0	6.6	29.0	0.14	19	<1	<1
BASLI		BASRAH LT/MESA 30 BLEND (35/65)	82671	Iraq/USA	02/08/01	30.5	3.5	1.63	<-27.4	5.0	92.8	75.5	54.2	<1	39.0	181.0	9.6	43.0	0.09	4	<1	<1
EMX	☑	EAST MS MIX	82521	USA	02/26/02	32.3	2.8	1.99	5.0	6.6	93.7	65.7	53.3	23	8.4	36.0	5.5	24.0	0.11	56	<1	<1
FUR		FURRIAL	82374	Venezuela	03/19/02	30.0	2.8	1.06	<-27.4	4.3	93.5	69.0	53.6	<1	38.0	179.0	8.2	35.0	0.09	3	<1	<1
MARS		MARS BLEND	82745	USA	02/26/03	30.2	4.1	1.99	-22.0	5.1	116.5	83.0	62.4	<1	45.0	184.0	16.0	69.0	0.70	100	<1	<1
MMB		MARS/MESA BLEND (40/60)	82428	Loop	09/08/00	30.1	3.1	1.65	-22.0	5.1	100.0	70.9	57.6	<1	48.0	156.0	14.0	49.0	0.27	85	<1	<1
MSA		MESA 30	82369	Venezuela	03/17/03	31.0	3.9	1.02	-22.0	4.4	79.4	60.1	49.9	<1	37.0	224.0	6.5	48.0	0.08	12	<1	<1
PSD		POSEIDON	82749	USA	02/28/03	31.6	3.9	1.64	<-27.4	3.9	87.9	67.2	55.5	<1	20.0	102.0	7.8	38.0	0.96	>300	<1	1.3
URA		URALS	82370	C.I.S. Euro	05/23/02	32.6	4.7	1.09	-11.2	3.1	88.2	61.4	52.1	<1	42.0	202.0	13.0	63.0	0.66	7	<1	1.4
VAS	☑	VASCONIA	82237	Colombia	02/09/02	24.5	1.9	1.01	37.4	6.0	440.8	229.5	130.6	<1	144.0	349.0	67.0	171.0	0.78	6	<1	<1

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Mnmn	See Foot- notes	Crude Name	Product Code	Country	Assay Date	Density	RVP	Sulfur	a)Pour Point	Carbon Residue	Viscosity (SSU)			b) H2S	Metals (ppm)				TAN E	SALT	Organic Chlorides (ppm)	
						(API@60)	(psia)	(%)	(degF)	(%)	@60 F	@80 F	@100 F	(ppm)	Whole	Pitch	Whole	Pitch	(mg KOH/g)	(lb/MB)	Whole	Naphtha
<b>High Sulfur Sour Group</b>																						
ABH		ARABIAN HEAVY	82378	Saudi Arabia	05/19/01	27.7	4.3	2.87	<-27.4	7.8	226.2	145.8	99.6	<1	49.0	181.0	15.0	59.0	<0.10	6	<1	<1
ABM	<input checked="" type="checkbox"/>	ARABIAN MEDIUM	82377	Saudi Arabia	03/17/03	30.7	3.4	2.55	-0.4	6.1	112.2	72.1	61.2	<1	36.0	142.0	11.0	39.0	0.23	3	<1	1.2
BAS		BASRAH LIGHT	82383	Iraq	07/13/01	31.8	4.3	2.50	<-27.4	5.6	87.3	67.4	56.5	<1	29.0	150.0	8.9	46.0	0.02	11	<1	3.2
KIR		KIRKUK	82384	IRAQ	03/11/03	33.9	4.6	2.26	-0.4	4.9	62.9	52.3	45.6	<1	31.0	128.0	13.0	53.0	0.12	75	<1	<1
KUW		KUWAIT	82380	Kuwait	04/15/02	30.4	5.1	2.76	-22.0	5.8	138.6	77.9	61.6	<1	31.0	141.0	10.0	44.0	0.14	91	<1	<1
MOB		MAYA/OLMECA BLEND	82626	Mexico/US	04/14/00	26.5	3.2	2.64	<-27.4	8.9	279.1	175.2	108.3	<1	154.0	495.0	16.0	85.0	0.19	26	<1	3.2
<b>Section II. Crudes Approved, Moved, Pending Capline Assay</b>																						
<b>Sweet - Low Metals Group</b>																						
LLC		CUSIANA/LLS BLEND	82756	Colombia	05/15/00	39.9	5.8	0.23	23.9	0.8	42.2	38.2	35.8	<1	1.0	17.2	0.4	5.2	0.17	44	<1	<1
FOT		FORTIES	82308	U.K.	12/01/01	43.4	5.5	0.20	5.0	1.0	37.4	35.1	32.8		<2	15.0	<2	10.0	0.10	46		
MARB		MARIB LIGHT (ALIF)	82352	North Yem	05/12/98	48.9	8.6	0.07	-22.0	0.6	32.1	31.4	30.4	<1	1.0	<1	1.0	<1	0.16	<1	<1	<1
ODU		ODUDU	82110	Nigeria	11/27/98	30.5	3.3	0.15	<-27.4		60.8	51.1	44.0	<1	1.2	8.9	6.7	59.0	0.77	65	8.0	<1
PSOYO		PALANCA/SOYO	82460	Angola	01/01/99	37.8	7.8	0.16	45.0	1.5	48.7	42.7	40.5	<1	1.7	15.4	1.5	13.1	0.05	27	<1	<1
WHSW		WEST HACKBERRY SWEET	82267	USA	10/10/00	37.0	5.3	0.29	-2.0	1.9	51.6	43.6	38.9	<2	4.0	35.0	2.6	23.0	0.09	45		
<b>Sweet - High Metals Group</b>																						
ZFR		ZAFIRO	82252	Eq. New G	10/15/97	29.9	4.9	0.28	-22.0	2.9	90.3	66.6	53.7	<1	1.6	25.0	9.6	84.4	1.00	40	<1	<1
<b>Sour Group</b>																						
BCSR	<input checked="" type="checkbox"/>	BAYOU CHOCTAW - SOUR	82174	USA	05/01/98	32.2	3.6	1.43	11.0	4.0	76.8	57.0	47.3	100	40.3	240.0	11.1	66.0	0.13	<50	<0.1	
ITM		ISTHMUS	82387	Mexico	07/01/97	33.8	3.7	1.30	-33.0	4.0	71.6	56.1	48.2	<1	37.0	129.0	7.7	27.0	0.33	2	<1	<1
SEG11		LOOP SEGREGATION NO.11	82209	Loop	08/07/96	24.0	3.2	1.80	-22.0	7.5	686.3	253.6	147.6	<1	108.0	457.0	28.0	126.0	0.66	15	<1	<1
SEG17		LOOP SEGREGATION NO.17	82226	Loop	06/04/97	31.0	4.6	2.50	-22.0	6.0	110.2	78.8	60.6	<1	34.0	148.0	9.3	38.2	0.27	2	<1	<1
<b>Section III. Crudes Approved, Not Moved</b>																						
<b>Sweet - Low Metals Group</b>																						
ASGD		AASGARD CRUDE	82790	Norway	03/28/01	41.9	7.7	0.18	16.0	0.6	41.0	37.3	34.0	<1	0.1	2.2	0.1	0.6	<0.02	4	-	-
LION	<input checked="" type="checkbox"/>	LION CRUDE	82604	Ivory Coast	09/25/02	44.9	3.4	0.15	10.4	0.6	10.9	7.4	5.3	<2	0.1	1.1	0.8	14.3	0.05	8	-	-
OKON	<input checked="" type="checkbox"/>	OKONO	82584	Nigeria	02/09/02	41.9	7.7	0.06	64.4	0.4	39.0	35.0	33.0	-	<2	4.0	2.0	57.0	0.34	13	-	-

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## CRUDE OIL PROPERTIES AND QUALITY INDICATORS

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### HYDROCARBON

### FOOTNOTES

ARABIAN LIGHT	!! Due to HIGH Hydrogen Sulfide reported via LOOP - TAKE SAFETY PRECAUTIONS !! The RVP for this batch is higher than expected. Will monitor.
ARABIUM MEDIUM	Will monitor Organic Chlorides on next batches.
BAYOU CHOCTAW - SOUR	!! Due to Hydrogen Sulfide results- Take safety precautions !!
BONITO SOUR	Salt very high for Bonito Sour. Retest confirms.
CABINDA	Must be pour point depressed ! Viscosity at 60 and 80F not accurately measured - too close to pour point.
CUSIANA	Must be pour point depressed . Salt higher than usual.
DJENO	Must be pour point depressed.
EAST MS MIX	!! Due to Hydrogen Sulfide results- Take safety precautions !!
FOINAVEN	Must be pour point depressed.
Heavy LA Sweet	Gravity higher than usual. Gravity for HLS has been trending upward.
KITINA	Must be pour point depressed.
LION CRUDE	NOTE: Older assay indicates POUR POINT is 40F. Check Pour Point in winter. Older assay indicates Viscosity is 37.8 SSU at 60F, 35.9 SSU at 80F and 34.6 SSU at 100F.
LOUISIANA MISSISSIPPI SWEET	Several parameters are not consistent with LMS. Carriers have been notified and stream should change soon.
NORNE	Must be pour point depressed.
NKOSSA	Due to RVP - ONLY move in winter months
OKONO	Must be pour point depressed.
OSO CONDENSATE	Due to RVP, must be shipped on a case by case basis and approved prior to each nomination.
QUA IBOE	Must be pour point depressed.
SAHARAN BLEND	Due to RVP, must be shipped on a case by case basis and approved prior to each nomination.
SCHIEHALLION	Must be pour point depressed.
TROLL EXPORT	The acid number on Troll Export continues to be higher than usual. Will continue to move with Sweet Low Metals group and will monitor acid number on future batches.
VASCONIA	Must be pour point depressed.

**a) POUR POINT may have been depressed in the sample taken for this assay.**

**b) Due to loss of H2S in sampling and shipping, H2S is likely higher than stated in this assay. TAKE precautions with all crude oils - sour or sweet.**

### NOTES

#### CRITERIA FOR GROUPING CRUDES ON CAPLINE

Group	Criteria			
	Sulfur %w	Ni + V ppm	TAN mg KOH/g	Salt lb/1000 bbl
Sweet - Low Metals	< 0.5	<= 100	<= 1.0	<= 75
Sweet - High Metals	< 0.5	<= 250	<= 1.0	<= 75
Intermediate	0.5 - 1.0	<= 550	<= 1.0	<= 75
Sour	>1.0 - 2.0	<= 1200	<= 1.5	<= 75
High Sulfur Sour	> 2.0	<= 1200	<= 2.0	<= 75

#### POUR POINT REQUIREMENTS

<b>Summer</b>	Start on or after April 1 and Clear of system by September 30 <= +55I
<b>Winter</b>	Start October 1 - March 31 <= +35F

#### RVP LIMITATIONS

<b>Year-Round</b>	RVP of <= 8.6 psi accepted year-round
<b>Winter</b>	Start on or after October 1 and Clear of system by April 30 <= 9.6
	NOTE: Winter RVP > 9.6 Subject to Management Approval

#### CRUDES REMOVED AS OF THIS LISTING:

Crude	Assay or Approval Date
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**Crudes not moved within three (3) years will be removed from the list.**

**Newly approved crudes that have not moved within six (6) months will be removed from the list.**