

	Data	Notes	Reference ID
Origin: Angola			
Data from OGJ 99 were originally published in 1983 as part of a series entitled "Guide to Export Crudes for the '80s".			
API Gravity	31.7		OGJ 99
Sulphur (weight %)	0.17		OGJ 99
Reid Vapour Pressure (kPa)	26		OGJ 99
Pour Point (°C)	18		OGJ 99
Saybolt Viscosity (SUS)			
	<u>Temperature (°C)</u>		
	38	94	OGJ 99
Yield on Crude (volume %)			
	<u>Boiling Range (°C)</u>		
	C1-C4	2	OGJ 99
	Light naphtha (C5-60)	2	OGJ 99
	Light naphtha (60-77)	2	OGJ 99
	Heavy naphtha (77-154)	10	OGJ 99
	Kerosene (154-271)	16	OGJ 99
	Light gas oil (271-360)	16	OGJ 99
	Heavy gas oil (360-538)	29	OGJ 99
Metals (ppm)			
	Nickel	16	OGJ 99
	Vanadium	2	OGJ 99

California (API 11)

	Data	Notes	Reference ID
Origin: California, USA			
API Gravity	10.3		EETD 88
Equation(s) for Predicting Evaporation			
%Ev = $(-0.13 + 0.013T)\sqrt{t}$ Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)			ESD 99
Sulphur (weight %)	3.30		EETD 88
Water Content (weight %)	8.6		ESD 98
Flash Point (°C)	28		EETD 88
Density (g/mL)	<u>Temperature (°C)</u> 0 0.9968 EETD 88 5 0.9942 EETD 88 10 0.9915 EETD 88 15 0.9882 EETD 88 20 0.9852 EETD 88 25 0.9824 EETD 88 30 0.9796 EETD 88		
Pour Point (°C)	0		EETD 88
Dynamic Viscosity (mPa·s or cP)	<u>Temperature (°C)</u> 0 220,000 EETD 88 15 34,000 EETD 88		
Emulsion Formation	Visual stability	entrained	ESD 98
	Water content (wt %)	35	ESD 98
Chemical Dispersibility (volume %)			
	Corexit 9500	0 (a)	ESD 98
	Corexit 9527	0	EETD 89
	Dasic LTS	0	EETD 89
	Enersperse 700	0	EETD 89
(a) visual			
Hydrocarbon Groups (weight %)			
	Asphaltenes	16	ESD 91
	Waxes	1	ESD 91

	Data	Notes	Reference ID
Volatile Organic Compounds (ppm)			
Benzene	100		ESD 94
Toluene	100		ESD 94
Ethylbenzene	350		ESD 94
Xylenes	650		ESD 94
C3-benzenes	1,650		ESD 94
Total BTEX	1,200		ESD 94
Total VOCs	2,850		ESD 94
Surface Tension (mN/m or dynes/cm)			
<u>Temperature (°C)</u>			
0	NM		EETD 88
15	37.0		EETD 88
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)			
<u>Temperature (°C)</u>			
0	NM		EETD 88
15	NM		EETD 88
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)			
<u>Temperature (°C)</u>			
0	NM		EETD 88
15	NM		EETD 88
Boiling Point Distribution (weight %)			
<u>Boiling Point (°C)</u>			
100	1		ESD 94
120	1		ESD 94
140	3		ESD 94
160	4		ESD 94
180	5		ESD 94
200	7		ESD 94
250	12		ESD 94
300	17		ESD 94
350	23		ESD 94
400	28		ESD 94
450	35		ESD 94
500	41		ESD 94
550	49		ESD 94
600	56		ESD 94
650	64		ESD 94
700	71		ESD 94

California (API 11)

		Data	Notes	Reference ID
Metals (ppm)				
	Aluminum	5		Cao 92
	Barium	1		Cao 92
	Cadmium	< 0.5		Cao 92
	Calcium	64		Cao 92
	Chromium	2		Cao 92
	Cobalt	< 1		Cao 92
	Copper	< 0.6		Cao 92
	Iron	22		Cao 92
	Lead	3		Cao 92
	Magnesium	237		Cao 92
	Manganese	0.5		Cao 92
	Mercury	< 15		Cao 92
	Molybdenum	4		Cao 92
	Nickel	106		Cao 92
	Selenium	23		Cao 92
	Strontium	1		Cao 92
	Tin	< 15		Cao 92
	Titanium	2		Cao 92
	Vanadium	245		Cao 92
	Zinc	< 0.6		Cao 92

		Data	Notes	Reference ID
Origin: California, USA				
API Gravity		13.2		EETD 88
Equation(s) for Predicting Evaporation				
%Ev = $(-0.14 + 0.013T)\sqrt{t}$ Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)				ESD 99
Sulphur (weight %)		5.50		EETD 88
Water Content (weight %)		0.1		ESD 98
Flash Point (°C)		12		EETD 88
Density (g/mL)				
	<u>Temperature (°C)</u>			
	0	0.9907		EETD 88
	5	0.9832		EETD 88
	10	0.9802		EETD 88
	15	0.9770		EETD 88
	20	0.9735		EETD 88
	25	0.9702		EETD 88
	30	0.9672		EETD 88
Pour Point (°C)		-9		EETD 88
Dynamic Viscosity (mPa·s or cP)				
	<u>Temperature (°C)</u>			
	0	31,000		EETD 88
	15	6,400		EETD 88
Emulsion Formation				
	Visual stability	entrained		ESD 98
	Water content (wt %)	39		ESD 98
Chemical Dispersibility (volume %)				
	Corexit 9500	0	(a)	ESD 98
	Corexit 9527	0		EETD 89
	Dasic LTS	0		EETD 89
	Enersperse 700	0		EETD 89

(a) visual

California (API 15)

	Data	Notes	Reference ID
Hydrocarbon Groups (weight %)			
Saturates	19		ESD 95
Aromatics	35		ESD 95
Resins	23		ESD 95
Asphaltenes	22		ESD 95
Waxes	1		ESD 98
Volatile Organic Compounds (ppm)			
Benzene	360		ESD 94
Toluene	1,040		ESD 94
Ethylbenzene	520		ESD 94
Xylenes	1,190		ESD 94
C3-benzenes	2,180		ESD 94
Total BTEX	3,110		ESD 94
Total VOCs	5,280		ESD 94
Surface Tension (mN/m or dynes/cm)			
<u>Temperature (°C)</u>			
0	NM		EETD 88
15	33.6		EETD 88
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)			
<u>Temperature (°C)</u>			
0	NM		EETD 88
15	NM		EETD 88
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)			
<u>Temperature (°C)</u>			
0	NM		EETD 88
15	NM		EETD 88

	Data	Notes	Reference ID
Boiling Point Distribution (weight %)			
Boiling Point (°C)			
140	3		ESD 94
160	5		ESD 94
180	7		ESD 94
200	8		ESD 94
250	12		ESD 94
300	17		ESD 94
350	22		ESD 94
400	27		ESD 94
450	33		ESD 94
500	39		ESD 94
550	46		ESD 94
600	54		ESD 94
650	62		ESD 94
700	69		ESD 94
Metals (ppm)			
Barium	1		Cao 92
Chromium	2		Cao 92
Copper	< 0.6		Cao 92
Iron	9		Cao 92
Lead	3		Cao 92
Magnesium	8		Cao 92
Molybdenum	5		Cao 92
Nickel	111		Cao 92
Titanium	2		Cao 92
Vanadium	266		Cao 92
Zinc	< 0.6		Cao 92

Canadon Seco

	Data	Notes	Reference ID
Origin: Argentina			
Data from OGJ 99 were originally published in 1995.			
API Gravity	26.3		OGJ 99
Sulphur (weight %)	0.20		OGJ 99
Reid Vapour Pressure (kPa)	10		OGJ 99
Pour Point (°C)	-3		OGJ 99
Kinematic Viscosity (mm²/s or cSt)			
<u>Temperature (°C)</u>			
20	279		OGJ 99
40	99		OGJ 99
Hydrocarbon Groups (weight %)			
Asphaltenes	2		OGJ 99
Yield on Crude (volume %)			
<u>Boiling Range (°C)</u>			
Light ends (<C5)	0		OGJ 99
Naphtha (C5-145)	10		OGJ 99
Kerosene (145-250)	14		OGJ 99
Gas oil (250-370)	17		OGJ 99
Vacuum distillate (370-400)	3		OGJ 99
Cracking feed (400-550)	21		OGJ 99
Residue (>550)	34		OGJ 99

		Data	Notes	Reference ID
Origin: Colombia				
Data from OGJ 99 were originally published in 1986 as part of a series entitled "Guide to Export Crudes for the '80s".				
API Gravity				
		28.8		ESD 98
		30.8		OGJ 99
Equation(s) for Predicting Evaporation				
%Ev = $(1.71 + 0.045T)\ln(t)$				ESD 98
Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)				
Sulphur (weight %)				
<u>Evaporation (weight %)</u>				
0		0.47		OGJ 99
		0.38		ESD 99
7		0.45		ESD 99
14		0.46		ESD 99
21		0.51		ESD 99
Flash Point (°C)				
<u>Evaporation (weight %)</u>				
0		13		ESD 98
7		58		ESD 98
14		88		ESD 98
21		> 100		ESD 98
Reid Vapour Pressure (kPa)				
		5		OGJ 99
Density (g/mL)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	0.8945		ESD 98
	15	0.8817		ESD 98
	25	0.8738		ESD 98
7	0	0.9085		ESD 98
	15	0.8961		ESD 98
	25	0.8879		ESD 98
14	0	0.9200		ESD 98
	15	0.9077		ESD 98
	25	0.8995		ESD 98
21	0	0.9317		ESD 98
	15	0.9200		ESD 98
	25	0.9122		ESD 98

Cano Limon

		Data	Notes	Reference ID
Pour Point (°C)				
<u>Evaporation (weight %)</u>				
0		16		OGJ 99
		8		ESD 98
7		11		ESD 98
14		10		ESD 98
21		13		ESD 98
Dynamic Viscosity (mPa s or cP)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	119		ESD 98
	15	46		ESD 98
	25	26		ESD 98
7	0	453		ESD 98
	15	103		ESD 98
	25	51		ESD 98
14	0	1,444	(a)	ESD 98
		5,107	(b)	ESD 98
		51,630	(c)	ESD 98
	15	254		ESD 98
	25	101		ESD 98
21	0	NM		ESD 98
	15	1,350	(d)	ESD 98
	25	258		ESD 98
Shear rate = (a) 100/s; (b) 10/s; (c) 1/s (d) slightly non-newtonian				
Kinematic Viscosity (mm²/s or cSt)				
	<u>Temperature (°C)</u>			
	38	13		OGJ 99
	50	8		OGJ 99

		Data	Notes	Reference ID
Hydrocarbon Groups (weight %)				
<u>Evaporation (weight %)</u>				
0	Saturates	60		ESD 98
	Aromatics	24		ESD 98
	Resins	8		ESD 98
	Asphaltenes	8		ESD 98
7	Saturates	57		ESD 99
	Aromatics	25		ESD 99
	Resins	8		ESD 99
	Asphaltenes	9		ESD 99
14	Saturates	56		ESD 99
	Aromatics	25		ESD 99
	Resins	8		ESD 99
	Asphaltenes	10		ESD 99
21	Saturates	51		ESD 99
	Aromatics	28		ESD 99
	Resins	10		ESD 99
	Asphaltenes	11		ESD 99
Adhesion (g/m²)				
<u>Evaporation (weight %)</u>				
0		34	<i>SD = 4</i>	ESD 98
7		37	<i>SD = 2</i>	ESD 98
14		47	<i>SD = 5</i>	ESD 98
22		112	<i>SD = 10</i>	ESD 98

Cano Limon

		Data	Notes	Reference ID
Volatile Organic Compounds (ppm)				
<u>Evaporation (weight %)</u>				
0	Benzene	55		ESD 98
	Toluene	174		ESD 98
	Ethylbenzene	63		ESD 98
	Xylenes	359		ESD 98
	C3-benzenes	1,193		ESD 98
	Total BTEX	652		ESD 98
	Total VOCs	1,846		ESD 98
7	Benzene	0		ESD 98
	Toluene	5		ESD 98
	Ethylbenzene	37		ESD 98
	Xylenes	256		ESD 98
	C3-benzenes	1,180		ESD 98
	Total BTEX	298		ESD 98
	Total VOCs	1,478		ESD 98
14	Benzene	0		ESD 98
	Toluene	1		ESD 98
	Ethylbenzene	2		ESD 98
	Xylenes	21		ESD 98
	C3-benzenes	501		ESD 98
	Total BTEX	24		ESD 98
	Total VOCs	525		ESD 98
21	Benzene	0		ESD 98
	Toluene	0		ESD 98
	Ethylbenzene	1		ESD 98
	Xylenes	2		ESD 98
	C3-benzenes	2		ESD 98
	Total BTEX	6		ESD 98
	Total VOCs	8		ESD 98
Surface Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	15	28.0		ESD 98
	25	27.1		ESD 00
7	15	29.1		ESD 98
	25	28.3		ESD 00
14	15	29.5		ESD 98
	25	29.7		ESD 00
21	15	DNF		ESD 98
	25	29.7		ESD 00

		Data	Notes	Reference ID
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	15	28.9		ESD 98
	25	20.1		ESD 98
7	15	23.5		ESD 98
	25	21.1		ESD 00
14	15	NM		ESD 98
	25	17.5		ESD 00
21	15	DNF		ESD 98
	25	NM		ESD 00
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	15	28.7		ESD 98
	25	21.3		ESD 00
7	15	25.6		ESD 98
	25	22.4		ESD 00
14	15	NM		ESD 98
	25	20.3		ESD 00
21	15	DNF		ESD 98
	25	NM		ESD 00
Yield on Crude (volume %)				
	<u>Boiling Range (°C)</u>			
	Light naphtha (IBP-104)	4		OGJ 99
	Naphtha (104-149)	7		OGJ 99
	Heavy naphtha (149-182)	6		OGJ 99
	Kerosene (182-260)	21		OGJ 99
	Light gas oil (260-371)	22		OGJ 99
	Residue (>371)	40		OGJ 99

Carpinteria

		Data	Notes	Reference ID
Origin: California, USA				
API Gravity		22.9		ESD 91
Equation(s) for Predicting Evaporation				
%Ev = (1.68 + 0.045T)ln(t) Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)				ESD 96
Sulphur (weight %)				
<u>Evaporation (volume %)</u>				
0		1.88		ESD 93
10		2.01		ESD 93
15		2.04		ESD 93
Water Content (weight %)				
<u>Evaporation (volume %)</u>				
0		0.1		ESD 98
10		0.1		ESD 98
15		< 0.1		ESD 98
Flash Point (°C)				
<u>Evaporation (volume %)</u>				
0		-15		ESD 91
10		54		ESD 92
15		> 90		ESD 92
Density (g/mL)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	0.9263		ESD 91
	15	0.9155		ESD 91
10	0	0.9397		ESD 91
	15	0.9299		ESD 91
15	0	0.9589		ESD 91
	15	0.9482		ESD 91
Pour Point (°C)				
<u>Evaporation (volume %)</u>				
0		-21		ESD 91
10		6		ESD 91
15		12		ESD 91

		Data	Notes	Reference ID
Dynamic Viscosity (mPa·s or cP)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	790		ESD 91
	15	164		ESD 91
10	0	13,750	(a)	ESD 91
		63,270	(b)	ESD 91
	15	755		ESD 91
15	0	56,280	(a)	ESD 91
		61,580	(b)	ESD 91
	15	3,426		ESD 91
<i>Shear rate = (a) 10/s; (b) 1/s</i>				
Emulsion Formation				
<u>Evaporation (volume %)</u>				
0	Visual stability	none		ESD 98
	Water content (wt %)	9		ESD 98
10	Visual stability	meso		ESD 98
	Viscosity (mPa·s)	21,000		ESD 98
	Complex modulus (mPa)	73,000		ESD 98
	Water content (wt %)	72		ESD 98
15	Visual stability	meso		ESD 98
	Viscosity (mPa·s)	29,000		ESD 98
	Complex modulus (mPa)	130,000		ESD 98
	Water content (wt %)	54		ESD 98
Chemical Dispersibility (volume %)				
<u>Evaporation (volume %)</u>				
0	Corexit 9500	16		ESD 98
	Corexit 9527	0		ESD 91
	Dasic LTS	0		ESD 91
	Enersperse 700	11		ESD 96
9	Corexit 9500	7		ESD 96
	Corexit 9527	0	(a)	ESD 96
	Dasic LTS	0	(a)	ESD 96
	Enersperse 700	0	(a)	ESD 96
15	Corexit 9500	7		ESD 98
	Corexit 9527	0	(a)	ESD 96
	Dasic LTS	0	(a)	ESD 96
	Enersperse 700	0	(a)	ESD 96

(a) UV/VIS quantitation

Carpinteria

		Data	Notes	Reference ID
Hydrocarbon Groups (weight %)				
<u>Evaporation (volume %)</u>				
0	Saturates	44		ESD 96
	Aromatics	30		ESD 96
	Resins	17		ESD 96
	Asphaltenes	9		ESD 96
	Waxes	7		ESD 91
10	Saturates	40		ESD 96
	Aromatics	30		ESD 96
	Resins	19		ESD 96
	Asphaltenes	11		ESD 96
	Waxes	5		ESD 98
15	Saturates	31		ESD 96
	Aromatics	36		ESD 96
	Resins	22		ESD 96
	Asphaltenes	11		ESD 96
	Waxes	4		ESD 98
Adhesion (g/m²)				
<u>Evaporation (volume %)</u>				
0		57	<i>SD = 8</i>	ESD 96
10		61	<i>SD = 9</i>	ESD 96
15		76	<i>SD = 8</i>	ESD 96

		Data	Notes	Reference ID
Volatile Organic Compounds (ppm)				
<u>Evaporation (volume %)</u>				
0	Benzene	190		ESD 94
	Toluene	1,080		ESD 94
	Ethylbenzene	520		ESD 94
	Xylenes	1,690		ESD 94
	C3-benzenes	3,100		ESD 94
	Total BTEX	3,470		ESD 94
	Total VOCs	6,570		ESD 94
10	Benzene	100		ESD 94
	Toluene	560		ESD 94
	Ethylbenzene	410		ESD 94
	Xylenes	1,380		ESD 94
	C3-benzenes	3,330		ESD 94
	Total BTEX	2,460		ESD 94
	Total VOCs	5,790		ESD 94
15	Benzene	0		ESD 94
	Toluene	30		ESD 94
	Ethylbenzene	0		ESD 94
	Xylenes	30		ESD 94
	C3-benzenes	1,010		ESD 94
	Total BTEX	60		ESD 94
	Total VOCs	1,070		ESD 94
Surface Tension (mN/m or dynes/cm)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	30.8		ESD 91
	15	27.8		ESD 91
10	0	NM		ESD 91
	15	28.6		ESD 91
15	0	NM		ESD 91
	15	33.3		ESD 91
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	27.5		ESD 91
	15	23.7		ESD 91
10	0	NM		ESD 91
	15	21.3		ESD 91
15	0	NM		ESD 91
	15	30.0		ESD 91

Carpinteria

		Data	Notes	Reference ID
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	31.0		ESD 91
	15	26.0		ESD 91
10	0	NM		ESD 91
	15	24.7		ESD 91
15	0	NM		ESD 91
	15	35.5		ESD 91

		Data	Notes	Reference ID
Boiling Point Distribution (weight %)				
<u>Evaporation (volume %)</u>	<u>Boiling Point (°C)</u>			
0	40	2		ESD 94
	60	2		ESD 94
	80	3		ESD 94
	100	6		ESD 94
	120	8		ESD 94
	140	11		ESD 94
	160	13		ESD 94
	180	15		ESD 94
	200	18		ESD 94
	250	24		ESD 94
	300	32		ESD 94
	350	40		ESD 94
	400	47		ESD 94
	450	56		ESD 94
	500	64		ESD 94
	550	71		ESD 94
	600	78		ESD 94
	650	84		ESD 94
	700	89		ESD 94
10	100	1		ESD 96
	120	1		ESD 96
	140	3		ESD 96
	160	5		ESD 96
	180	7		ESD 96
	200	9		ESD 96
	250	17		ESD 96
	300	25		ESD 96
	350	35		ESD 96
	400	44		ESD 96
	450	54		ESD 96
	500	63		ESD 96
	550	71		ESD 96
	600	78		ESD 96
	650	84		ESD 96
15	700	89		ESD 96
	180	1		ESD 96
	200	3		ESD 96
	250	10		ESD 96
	300	19		ESD 96
	350	29		ESD 96
	400	38		ESD 96

Carpinteria

		Data	Notes	Reference ID
Boiling Point Distribution (weight %)				
<u>Evaporation (volume %)</u>	<u>Boiling Point (°C)</u>			
15	450	49		ESD 96
	500	59		ESD 96
	550	67		ESD 96
	600	75		ESD 96
	650	81		ESD 96
	700	86		ESD 96

		Data	Notes	Reference ID
Metals (ppm)				
<u>Evaporation (volume %)</u>				
0	Aluminum	< 5		Cao 92
	Barium	< 0.3		Cao 92
	Cadmium	< 0.5		Cao 92
	Calcium	170		Cao 92
	Chromium	< 2		Cao 92
	Cobalt	< 1		Cao 92
	Copper	< 0.6		Cao 92
	Iron	30		Cao 92
	Lead	< 3		Cao 92
	Magnesium	< 1		Cao 92
	Manganese	< 0.3		Cao 92
	Mercury	< 15		Cao 92
	Molybdenum	< 0.6		Cao 92
	Nickel	49		Cao 92
	Selenium	39		Cao 92
	Strontium	< 0.2		Cao 92
	Tin	< 15		Cao 92
	Titanium	< 0.6		Cao 92
	Vanadium	112		Cao 92
	Zinc	< 0.6		Cao 92
10	Barium	< 0.3		Cao 92
	Chromium	< 2		Cao 92
	Copper	< 0.6		Cao 92
	Iron	32		Cao 92
	Lead	< 4		Cao 92
	Magnesium	4		Cao 92
	Molybdenum	1		Cao 92
	Nickel	58		Cao 92
	Titanium	0.9		Cao 92
	Vanadium	112		Cao 92
15	Zinc	0.9		Cao 92
	Barium	< 0.3		Cao 92
	Chromium	< 2		Cao 92
	Copper	< 0.6		Cao 92
	Iron	36		Cao 92
	Lead	< 3		Cao 92
	Magnesium	1		Cao 92
	Molybdenum	< 0.6		Cao 92
	Nickel	66		Cao 92
	Titanium	< 0.6		Cao 92
	Vanadium	148		Cao 92

Carpinteria

		Data	Notes	Reference ID
Metals (ppm)				
<u>Evaporation (volume %)</u>				
15	Zinc	< 0.6		Cao 92
Aqueous Solubility (mg/L)				
	Room temperature	11	(a)	ESD 91
<i>(a) fresh water</i>				
Acute Toxicity of Water Soluble Fraction (mg/L)				
	<u>Test Organism</u>			
48h LC50	Daphnia magna	6	(a)	Harris 94
<i>(a) results based on GC purge-and-trap analysis</i>				

	Data	Notes	Reference ID
Two samples of oil, one containing dye, were provided by CEDRE. The samples were received in November, 1998.			
API Gravity			
	15.2		ESD 98
With dye	15.5		ESD 98
Sulphur (weight %)			
	0.00		ESD 99
With dye	0.00		ESD 99
Flash Point (°C)			
	> 100		ESD 98
With dye	> 100		ESD 98
Density (g/mL)			
	<u>Temperature (°C)</u>		
0	0.9737		ESD 98
	0.9718	(a)	ESD 98
15	0.9635		ESD 98
	0.9620	(a)	ESD 98
25	0.9565		ESD 98
	0.9550	(a)	ESD 98
(a) with dye			
Pour Point (°C)			
	-22		ESD 98
With dye	-22		ESD 98
Dynamic Viscosity (mPa s or cP)			
	<u>Temperature (°C)</u>		
0	5,359		ESD 98
	4,819	(a)	ESD 98
15	1,430		ESD 98
	1,301	(a)	ESD 98
25	608		ESD 98
	556	(a)	ESD 98
(a) with dye			
Chemical Dispersibility (volume %)			
Corexit 9500	28		ESD 00

Castor Oil

	Data	Notes	Reference ID
Hydrocarbon Groups (weight %)			
Saturates	23		ESD 99
	24	(a)	ESD 99
Aromatics	0		ESD 99
	0	(a)	ESD 99
Resins	76		ESD 99
	75	(a)	ESD 99
Asphaltenes	1		ESD 99
	1	(a)	ESD 99
(a) with dye			
Adhesion (g/m²)			
With dye	55	SD = 0	ESD 98
	40	SD = 6	ESD 98
Volatile Organic Compounds (ppm)			
Benzene	16		ESD 99
	21	(a)	ESD 99
Toluene	2		ESD 99
	3	(a)	ESD 99
Ethylbenzene	0		ESD 99
	1	(a)	ESD 99
Xylenes	1		ESD 99
	2	(a)	ESD 99
C3-benzenes	2		ESD 99
	1	(a)	ESD 99
Total BTEX	20		ESD 99
	25	(a)	ESD 99
Total VOCs	22		ESD 99
	26	(a)	ESD 99
(a) with dye			
Surface Tension (mN/m or dynes/cm)			
<u>Temperature (°C)</u>			
0	35.4		ESD 00
	35.6	(a)	ESD 00
15	34.7		ESD 98
	34.7	(a)	ESD 98
25	34.1		ESD 00
	34.1	(a)	ESD 00
(a) with dye			

	Data	Notes	Reference ID
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)			
These measurements were very difficult to make with the Kruss automatic tensiometer. The instrument had difficulty determining the endpoint. The data shown were taken when the ring broke through the interface , as would have been done with a manual instrument.			
<u>Temperature (°C)</u>			
0	37.9		ESD 00
	NM	(a)	ESD 00
15	18.0		ESD 98
	18.4	(a)	ESD 98
25	21.6		ESD 00
	25.9	(a)	ESD 00
(a) with dye			

Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)

These measurements were very difficult to make with the Kruss automatic tensiometer. The instrument had difficulty determining the endpoint. The data shown were taken when the ring broke through the interface , as would have been done with a manual instrument.			
<u>Temperature (°C)</u>			
0	NM		ESD 00
	NM	(a)	ESD 00
15	22.1		ESD 98
	21.3	(a)	ESD 98
25	29.2		ESD 00
	31.9	(a)	ESD 00

(a) with dye

Catalytic Cracking Feed

	Data	Notes	Reference ID
Synonyms: Cat Cracking Feed			
API Gravity	23.2		ESD 92
Equation(s) for Predicting Evaporation			
$\%Ev = (-0.18 + 0.013T)\sqrt{t}$ Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)			ESD 98
Sulphur (weight %)			
Evaporation (volume %)			
0	0.29		ESD 93
2	0.28		ESD 93
Flash Point (°C)			
Evaporation (volume %)			
0	> 90		ESD 92
2	> 90		ESD 92
Density (g/mL)			
Evaporation (volume %)	Temperature (°C)		
0	0	0.9260	ESD 92
	15	0.9139	ESD 92
2	0	0.9271	ESD 92
	15	0.9144	ESD 92
Pour Point (°C)			
Evaporation (volume %)			
0	25		ESD 92
2	23		ESD 92
Dynamic Viscosity (mPa·s or cP)			
Evaporation (volume %)	Temperature (°C)		
0	0	9,602	(a) ESD 92
		49,310	(b) ESD 92
	15	780	ESD 92
2	0	11,290	(a) ESD 92
		55,390	(b) ESD 92
	15	938	(a) ESD 92
		1,151	(b) ESD 92
<i>Shear rate = (a) 10/s; (b) 1/s</i>			
Chemical Dispersibility (volume %)			
	Corexit 9500	10	ESD 94
	Corexit 9527	5	ESD 91
	Dasic LTS	5	ESD 91
	Enersperse 700	5	ESD 91

Catalytic Cracking Feed

		Data	Notes	Reference ID
Hydrocarbon Groups (weight %)				
<u>Evaporation (volume %)</u>				
0	Saturates	53		ESD 96
	Aromatics	38		ESD 96
	Resins	7		ESD 96
	Asphaltenes	2		ESD 96
	Waxes	12		ESD 92
2	Saturates	53		ESD 96
	Aromatics	38		ESD 96
	Resins	8		ESD 96
	Asphaltenes	1		ESD 96
	Waxes	4		ESD 98
Adhesion (g/m²)				
<u>Evaporation (volume %)</u>				
0		116	<i>SD = 7</i>	ESD 96
2		124	<i>SD = 23</i>	ESD 96
Volatile Organic Compounds (ppm)				
<u>Evaporation (volume %)</u>				
0	Benzene	100		ESD 94
	Toluene	100		ESD 94
	Ethylbenzene	0		ESD 94
	Xylenes	150		ESD 94
	C3-benzenes	250		ESD 94
	Total BTEX	350		ESD 94
	Total VOCs	590		ESD 94
2	Benzene	110		ESD 94
	Toluene	0		ESD 94
	Ethylbenzene	0		ESD 94
	Xylenes	50		ESD 94
	C3-benzenes	220		ESD 94
	Total BTEX	160		ESD 94
	Total VOCs	380		ESD 94
Surface Tension (mN/m or dynes/cm)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	NM		ESD 92
	15	32.3		ESD 92
2	0	NM		ESD 92
	15	31.9		ESD 92

Catalytic Cracking Feed

		Data	Notes	Reference ID
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	NM		ESD 92
	15	27.7		ESD 92
2	0	NM		ESD 92
	15	26.3		ESD 92
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	NM		ESD 92
	15	31.5		ESD 92
2	0	NM		ESD 92
	15	30.5		ESD 92
Boiling Point Distribution (weight %)				
<u>Evaporation (volume %)</u>	<u>Boiling Point (°C)</u>			
0	200	1		ESD 94
	250	3		ESD 94
	300	8		ESD 94
	350	17		ESD 94
	400	31		ESD 94
	450	49		ESD 94
	500	66		ESD 94
	550	80		ESD 94
	600	90		ESD 94
	650	95		ESD 94
	700	98		ESD 94
2	250	3		ESD 96
	300	8		ESD 96
	350	17		ESD 96
	400	31		ESD 96
	450	50		ESD 96
	500	67		ESD 96
	550	81		ESD 96
	600	90		ESD 96
	650	96		ESD 96
	700	98		ESD 96

Catalytic Cracking Feed

		Data	Notes	Reference ID
Metals (ppm)				
<u>Evaporation (volume %)</u>				
0	Barium	< 0.3		Cao 92
	Chromium	< 2		Cao 92
	Copper	< 0.6		Cao 92
	Iron	< 3		Cao 92
	Lead	< 3		Cao 92
	Magnesium	4		Cao 92
	Molybdenum	< 0.6		Cao 92
	Nickel	2		Cao 92
	Titanium	< 0.6		Cao 92
	Vanadium	< 0.6		Cao 92
	Zinc	0.9		Cao 92
2	Barium	0.4		Cao 92
	Chromium	< 2		Cao 92
	Copper	< 0.6		Cao 92
	Iron	5		Cao 92
	Lead	< 3		Cao 92
	Magnesium	9		Cao 92
	Molybdenum	< 0.6		Cao 92
	Nickel	5		Cao 92
	Titanium	< 0.6		Cao 92
	Vanadium	0.6		Cao 92
	Zinc	0.6		Cao 92
Aqueous Solubility (mg/L)				
	Room temperature	0.9	(a)	ESD 92
<i>(a) fresh water</i>				
Acute Toxicity of Water Soluble Fraction (mg/L)				
	<u>Test Organism</u>			
48h LC50	Daphnia magna	> 0.4	(a)	Harris 94
<i>(a) results based on GC headspace analysis</i>				

Ceuta

	Data	Notes	Reference ID
Origin: Venezuela			
Data from OGJ 99 were originally published in 1983 as part of a series entitled "Guide to Export Crudes for the '80s".			
API Gravity	31.8		OGJ 99
Sulphur (weight %)	1.20		OGJ 99
Reid Vapour Pressure (kPa)	19		OGJ 99
Pour Point (°C)	-37		OGJ 99
Saybolt Viscosity (SUS)			
	<u>Temperature (°C)</u>		
	38	62	OGJ 99
Yield on Crude (volume %)			
	<u>Boiling Range (°C)</u>		
	C1-C4	2	OGJ 99
	Light naphtha (28-93)	8	OGJ 99
	Heavy naphtha (93-149)	10	OGJ 99
	Naphtha (149-177)	5	OGJ 99
	Kerosene (177-204)	5	OGJ 99
	Gas oil (204-260)	10	OGJ 99
	Gas oil (260-287)	5	OGJ 99
	Gas oil (287-343)	9	OGJ 99
	Residue (>343)	46	OGJ 99

		Data	Notes	Reference ID
Origin: Brunei				
Data from OGJ 99 were originally published in 1983 as part of a series entitled "Guide to Export Crudes for the '80s".				
API Gravity		23.9		OGJ 99
Sulphur (weight %)		0.12		OGJ 99
Pour Point (°C)		< -36		OGJ 99
Kinematic Viscosity (mm²/s or cSt)				
	<u>Temperature (°C)</u>			
	10	21		OGJ 99
Hydrocarbon Groups (weight %)				
	Waxes	0		OGJ 99
Yield on Crude				
	<u>Boiling Range (°C)</u>			
Weight %	Light hydrocarbons	1		OGJ 99
Volume %	Gasoline (C5-65)	0		OGJ 99
	Naphtha (65-100)	2		OGJ 99
	Naphtha (100-150)	5		OGJ 99
	Naphtha (150-200)	8		OGJ 99
	Kerosene (200-250)	16		OGJ 99
	Gas oil (250-300)	23		OGJ 99
	Gas oil (300-350)	15		OGJ 99
	Heavy gas oil (350-370)	4		OGJ 99
	Residue (>370)	26		OGJ 99

Cinta

	Data	Notes	Reference ID
Origin: Indonesia			
Data from OGJ 99 were originally published in 1983 as part of a series entitled "Guide to Export Crudes for the '80s".			
API Gravity	33.4		OGJ 99
Sulphur (weight %)	0.08		OGJ 99
Reid Vapour Pressure (kPa)	10		OGJ 99
Pour Point (°C)	41		OGJ 99
Kinematic Viscosity (mm²/s or cSt)			
	<u>Temperature (°C)</u>		
	38	64	OGJ 99
Hydrocarbon Groups (weight %)			
	Waxes	30	OGJ 99
Yield on Crude (volume %)			
	<u>Boiling Range (°C)</u>		
	C1-C5	3	OGJ 99
	Light naphtha (C5-82)	2	OGJ 99
	Naphtha (82-149)	5	OGJ 99
	Heavy naphtha (149-193)	4	OGJ 99
	Kerosene (193-232)	2	OGJ 99
	Gas oil (232-343)	12	OGJ 99
	Heavy gas oil (343-566)	40	OGJ 99
	Residue (>343)	74	OGJ 99
Metals (ppm)			
	Nickel	10	OGJ 99
	Vanadium	0.1	OGJ 99

Coal Oil Point Seep Oil

	Data	Notes	Reference ID
Origin: California, USA			
The sample, provided by the United States Minerals Management Service, was obtained from a natural seep near Coal Oil Point.			
API Gravity	11.7		ESD 97
Sulphur (weight %)	2.51		ESD 97
Water Content	33.3		ESD 97
Flash Point (°C)	> 95		ESD 97
Density (g/mL)	<u>Temperature (°C)</u>		
	0	0.9953	ESD 97
	15	0.9872	ESD 97
	25	0.9861	ESD 98
Pour Point (°C)	8		ESD 97
Dynamic Viscosity (mPa s or cP)	<u>Temperature (°C)</u>		
	0	1,585,000	ESD 97
	15	165,750	ESD 97
	25	93,350	ESD 98
Emulsion Formation	Visual stability	same	ESD 98
	Viscosity (mPa·s)	280,000	ESD 98
	Complex modulus (mPa)	1,200,000	ESD 98
	Water content (wt %)	32	ESD 98
Hydrocarbon Groups (weight %)	Corrected for initial water content of oil.		
	Saturates	21	ESD 98
	Aromatics	35	ESD 98
	Resins	24	ESD 98
	Asphaltenes	21	ESD 98
Adhesion (g/m²)	396	SD = 39	ESD 97

Coal Oil Point Seep Oil

	Data	Notes	Reference ID
Volatile Organic Compounds (ppm)			
Benzene	22		ESD 97
Toluene	20		ESD 97
Ethylbenzene	8		ESD 97
Xylenes	98		ESD 97
C3-benzenes	300		ESD 97
Total BTEX	148		ESD 97
Total VOCs	448		ESD 97
Surface Tension (mN/m or dynes/cm)			
<u>Temperature (°C)</u>			
0	NM		ESD 97
15	NM		ESD 97
25	NM		ESD 98
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)			
<u>Temperature (°C)</u>			
0	NM		ESD 97
15	NM		ESD 97
25	NM		ESD 98
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)			
<u>Temperature (°C)</u>			
0	NM		ESD 97
15	NM		ESD 97
25	NM		ESD 98

		Data	Notes	Reference ID
Origin: Nova Scotia, Canada				
Data for equilibrium liquid of separator flash test.				
API Gravity				
		47.5		EETD 89
Flash Point (°C)				
<u>Evaporation (volume %)</u>				
0		32		EETD 89
11		40		EETD 89
26		82		EETD 89
Density (g/mL)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	0.8002		EETD 89
	15	0.7900		EETD 89
11	0	0.8149		EETD 89
	15	0.8046		EETD 89
26	0	0.8469		EETD 89
	15	0.8367		EETD 89
Pour Point (°C)				
<u>Evaporation (volume %)</u>				
0		-30		EETD 89
11		-18		EETD 89
26		-12		EETD 89
Kinematic Viscosity (mm²/s or cSt)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	3		EETD 89
	15	2		EETD 89
11	0	4		EETD 89
	15	3		EETD 89
26	0	7		EETD 89
	15	5		EETD 89
Chemical Dispersibility (volume %)				
	Dasic LTS	5		ESD 91
	Enersperse 700	35		ESD 91
Hydrocarbon Groups (weight %)				
<u>Evaporation (volume %)</u>				
0	Asphaltenes	0		EETD 89
11		0		EETD 89
26		0		EETD 89
28		0		EETD 89

Cohasset

		Data	Notes	Reference ID
Surface Tension (mN/m or dynes/cm)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	25.7		EETD 89
	15	25.6		EETD 89
11	0	25.4		EETD 89
	15	25.2		EETD 89
26	0	27.4		EETD 89
	15	26.8		EETD 89
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	15.3		EETD 89
	15	16.5		EETD 89
11	0	13.1		EETD 89
	15	12.5		EETD 89
26	0	12.1		EETD 89
	15	13.0		EETD 89
Metals (ppm)				
	Barium	1		Cao 92
	Chromium	4		Cao 92
	Copper	9		Cao 92
	Iron	24		Cao 92
	Lead	9		Cao 92
	Magnesium	27		Cao 92
	Molybdenum	0.9		Cao 92
	Nickel	< 1		Cao 92
	Titanium	2		Cao 92
	Vanadium	2		Cao 92
	Zinc	3		Cao 92

Cold Lake Bitumen

	Data	Notes	Reference ID
Origin: Alberta, Canada			
Synonyms: Cold Lake Crude			
Data from OGJ 99 were originally published in 1983 as part of a series entitled "Export Crudes for the '80s".			
API Gravity	9.8		EETD 88
	13.2		OGJ 99
Sulphur (weight %)	6.90		EETD 88
	4.11		OGJ 99
Flash Point (°C)	81		EETD 88
Density (g/mL)			
	<u>Temperature (°C)</u>		
	0	1.0075	EETD 88
	5	1.0049	EETD 88
	10	1.0023	EETD 88
	15	1.0002	EETD 88
		0.9770	OGJ 99
	20	0.9968	EETD 88
	25	0.9943	EETD 88
	30	0.9916	EETD 88
Pour Point (°C)	9		EETD 88
	-4		OGJ 99
Dynamic Viscosity (mPa·s or cP)			
	<u>Temperature (°C)</u>		
	0	> 3,000,000	EETD 88
	15	235,000	EETD 88
Kinematic Viscosity (mm²/s or cSt)			
	<u>Temperature (°C)</u>		
	40	1,057	OGJ 99
	80	98	OGJ 99
Chemical Dispersibility (volume %)			
	Corexit 9527	0	EETD 89
	Dasic LTS	0	EETD 89
	Enersperse 700	0	EETD 89
Hydrocarbon Groups (weight %)			
	Asphaltenes	13	ESD 91
	Waxes	2	ESD 91

Cold Lake Bitumen

	Data	Notes	Reference ID
Boiling Point Distribution (weight %)			
<u>Boiling Point (°C)</u>			
200	1		ESD 94
250	3		ESD 94
300	8		ESD 94
350	15		ESD 94
400	22		ESD 94
450	29		ESD 94
500	37		ESD 94
550	45		ESD 94
600	54		ESD 94
650	62		ESD 94
700	69		ESD 94
Metals (ppm)			
Aluminum	6		Cao 92
Barium	< 0.3		Cao 92
Cadmium	< 0.5		Cao 92
Calcium	111		Cao 92
Chromium	< 2		Cao 92
Cobalt	< 1		Cao 92
Copper	< 0.6		Cao 92
Iron	15		Cao 92
Lead	< 3		Cao 92
Magnesium	9		Cao 92
Manganese	0.5		Cao 92
Mercury	< 15		Cao 92
Molybdenum	4		Cao 92
Nickel	69		Cao 92
Selenium	< 15		Cao 92
Strontium	< 0.2		Cao 92
Tin	< 15		Cao 92
Titanium	< 0.6		Cao 92
Vanadium	190		Cao 92
Zinc	4		Cao 92
Other Elements (weight %)			
Nitrogen	0.42		OGJ 99

Cold Lake Blend

	Data	Notes	Reference ID
Origin: Alberta, Canada			
Synonyms: Cold Lake Dilbit			
Cold Lake Blend consists of approximately 70% Cold Lake Bitumen and 30% condensate (see Cold Lake Diluent).			
Data from OGJ 99 were originally published in 1992 as part of a series entitled "Export Crudes for the '90s".			
API Gravity	22.6		EETD 88
	22.6		OGJ 92
Sulphur (weight %)	4.72		EETD 88
	3.60		OGJ 92
Flash Point (°C)	< -35		EETD 88
Density (g/mL)			
	<u>Temperature (°C)</u>		
	0	0.9273	EETD 88
	15	0.9172	EETD 88
		0.9177	OGJ 92
Pour Point (°C)	-45		EETD 88
	-46		OGJ 92
Dynamic Viscosity (mPa·s or cP)			
	<u>Temperature (°C)</u>		
	0	425	EETD 88
	15	150	EETD 88
Kinematic Viscosity (mm²/s or cSt)			
	<u>Temperature (°C)</u>		
	16	206	OGJ 92
Volatile Organic Compounds (ppm)			
Benzene	1,510		ESD 94
Toluene	3,700		ESD 94
Ethylbenzene	290		ESD 94
Xylenes	3,190		ESD 94
C3-benzenes	1,810		ESD 94
Total BTEX	8,700		ESD 94
Total VOCs	10,500		ESD 94

Cold Lake Blend

		Data	Notes	Reference ID
Surface Tension (mN/m or dynes/cm)				
<u>Temperature (°C)</u>				
	0	29.2		EETD 88
	15	27.1		EETD 88
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)				
<u>Temperature (°C)</u>				
	0	28.1		EETD 88
	15	16.3		EETD 88
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)				
<u>Temperature (°C)</u>				
	0	28.3		EETD 88
	15	21.7		EETD 88
Boiling Point Distribution (weight %)				
<u>Boiling Point (°C)</u>				
	40	7		ESD 94
	60	7		ESD 94
	80	11		ESD 94
	100	13		ESD 94
	120	15		ESD 94
	140	17		ESD 94
	160	18		ESD 94
	180	19		ESD 94
	200	20		ESD 94
	250	23		ESD 94
	300	28		ESD 94
	350	34		ESD 94
	400	41		ESD 94
	450	48		ESD 94
	500	54		ESD 94
	550	62		ESD 94
	600	69		ESD 94
	650	76		ESD 94
	700	82		ESD 94
Yield on Crude				
<u>Boiling Range (°C)</u>				
Weight %	C1-C5	5		OGJ 92
Volume %	20-175	25		OGJ 92
	175-295	10		OGJ 92
	295-343	6		OGJ 92
	343-565	27		OGJ 92
	565-816	31		OGJ 92

Cold Lake Blend

		Data	Notes	Reference ID
Other Elements (weight %)				
	Nitrogen	0.38		OGJ 92
Aqueous Solubility (mg/L)				
	<u>Temperature (°C)</u>			
	25	28	(a)	EETD 88
(a) distilled water				

Cold Lake Diluent

	Data	Notes	Reference ID
Origin: Alberta, Canada			
Diluent used in Cold Lake Blend, obtained from Esso Resources Canada.			
API Gravity	69.3		EETD 88
Sulphur (weight %)	0.25		EETD 88
Flash Point (°C)	< -35		EETD 88
Density (g/mL)			
	<u>Temperature (°C)</u>		
	0	0.7162	EETD 88
	15	0.7040	EETD 88
Pour Point (°C)	< -75		EETD 88
Dynamic Viscosity (mPa·s or cP)			
	<u>Temperature (°C)</u>		
	0	1	EETD 88
	15	1	EETD 88
Volatile Organic Compounds			
	Benzene	11,600	ESD 94
	Toluene	24,790	ESD 94
	Ethylbenzene	1,760	ESD 94
	Xylenes	19,060	ESD 94
	C3-benzenes	10,880	ESD 94
	Total BTEX	57,200	ESD 94
	Total VOCs	68,080	ESD 94
Surface Tension (mN/m or dynes/cm)			
	<u>Temperature (°C)</u>		
	0	20.0	EETD 88
	15	19.9	EETD 88
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)			
	<u>Temperature (°C)</u>		
	0	7.5	EETD 88
	15	6.8	EETD 88
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)			
	<u>Temperature (°C)</u>		
	0	8.3	EETD 88
	15	8.3	EETD 88

		Data	Notes	Reference ID
Distillation (°C)				
	<u>Total Distillate (volume %)</u>			
	IBP	23		EETD 88
	5	42		EETD 88
	10	45		EETD 88
	15	48		EETD 88
	20	49		EETD 88
	25	49		EETD 88
	30	49		EETD 88
	35	52		EETD 88
	40	56		EETD 88
	45	68		EETD 88
	50	73		EETD 88
	55	77		EETD 88
	60	89		EETD 88
	65	97		EETD 88
	70	101		EETD 88
Metals				
	Barium	< 0.3		Cao 92
	Chromium	< 2		Cao 92
	Copper	< 0.6		Cao 92
	Iron	3		Cao 92
	Lead	< 3		Cao 92
	Magnesium	1		Cao 92
	Molybdenum	1		Cao 92
	Nickel	< 1		Cao 92
	Titanium	< 0.6		Cao 92
	Vanadium	< 0.6		Cao 92
	Zinc	< 0.6		Cao 92
Aqueous Solubility (mg/L)				
	<u>Temperature (°C)</u>			
	25	58	(a)	EETD 88
(a) distilled water				

Cook Inlet

		Data	Notes	Reference ID
Origin: Cook Inlet, Alaska, USA				
Acute Toxicity of Water Soluble Fraction (mg/L)				
	<u>Test Organism</u>			
96h LC50 (aromatics)	Clupea pallasii	1		Rice 79
	Salvelinus malma	2		Rice 79
	Oncorhynchus gorbuscha	2		Rice 79
	Theragra chalcogrammus	2		Rice 79
	Aulorhynchus flavidus	3		Rice 79
	Myoxocephalus polyacanthcephalus	4		Rice 79
	Platichthys stellatus	> 5		Rice 79
	Pholis laeta	> 12		Rice 79
	Anoplarchus purpurescens	> 12		Rice 79
	Crangon alaskensis	0.9		Rice 79
	Pandalus goniurus	2		Rice 79
	Eualus suckleyi	2		Rice 79
	Pandalus borealis	5		Rice 79
	Paralithodes camtschatica	4		Rice 79
	Hemigrapsis nudus	8		Rice 79
	Pagurus hirsuticulus	> 11		Rice 79
	Oechomene pinguis	> 8		Rice 79
	Acanthomysis pseudomacropsis	> 9		Rice 79
	Cucumaria vega	> 7		Rice 79
	Strongylocentrotus drobachiensis	> 11		Rice 79
	Leptasterias hexactis	> 11		Rice 79
	Eupentacta quinquesimita	> 12		Rice 79
	Chlamys hericus	4		Rice 79
	Mytilus edulis	> 9		Rice 79
	Protothaca staminea	> 7		Rice 79
	Collisella scutum	8		Rice 79
	Notoacmaeca pelta	> 8		Rice 79
	Katharina tunicata	> 8		Rice 79
	Tonicella lineata	> 8		Rice 79
	Mopalia ciliata	> 8		Rice 79
	Margarites pupillus	> 8		Rice 79
	Littorina sitkana	> 8		Rice 79
	Thais lima	> 8		Rice 79
	Colus palli	> 9		Rice 79
	Neptunea lyrata	> 11		Rice 79
	Nereis vexillosa	> 11		Rice 79
	Harmothoe imbricata	> 11		Rice 79
	Paranemertes peregrina	> 11		Rice 79
	Lineus nevetus	> 11		Rice 79

	Data	Notes	Reference ID
Origin: Australia			
Data from OGJ 99 were originally published sometime between 1984 and 1992.			OGJ 94
API Gravity	45.2		OGJ 94
Sulphur (weight %)	0.02		OGJ 94
Water Content (volume %)	0.0		OGJ 94
Reid Vapour Pressure (kPa)	37		OGJ 94
Pour Point (°C)	12		OGJ 94
Kinematic Viscosity (mm²/s or cSt)			
<u>Temperature (°C)</u>			
50	2		OGJ 94
Hydrocarbon Groups (weight %)			
Asphaltenes	1		OGJ 94
Waxes	12		OGJ 94
Yield on Crude (volume %)			
<u>Boiling Range (°C)</u>			
Naphtha (C5-190)	23		OGJ 94
Kerosene (190-230)	13		OGJ 94
Atmospheric gas oil (230-360)	37		OGJ 94
Vacuum gas oil (360-540)	22		OGJ 94
Short residue (>540)	3		OGJ 94
Metals (ppm)			
Copper	0.1		OGJ 94
Iron	0.1		OGJ 94
Nickel	0.2		OGJ 94
Sodium	2		OGJ 94
Vanadium	0.1		OGJ 94
Other Elements (weight %)			
Nitrogen	0.02		OGJ 94

Cormorant North

	Data	Notes	Reference ID
Origin: North Sea, UK			
Data from OGJ 99 were originally published in 1983 as part of a series entitled "Guide to Export Crudes for the '80s".			
API Gravity	34.9		OGJ 99
Sulphur (weight %)	0.71		OGJ 99
Density (g/mL)			
	<u>Temperature (°C)</u>		
	15	0.8500	OGJ 99
Pour Point (°C)	12		OGJ 99
Kinematic Viscosity (mm²/s or cSt)			
	<u>Temperature (°C)</u>		
	40	6	OGJ 99
Yield on Crude (volume %)			
	<u>Boiling Range (°C)</u>		
	C1-C4	3	OGJ 99
	Gasoline (C5-85)	7	OGJ 99
	Naphtha (85-165)	15	OGJ 99
	Kerosene (165-235)	12	OGJ 99
	Gas oil (235-300)	13	OGJ 99
	Gas oil (300-350)	9	OGJ 99
	Residue (>350)	43	OGJ 99

	Data	Notes	Reference ID
Origin: North Sea, UK			
Synonyms: Cormorant "A"			
Data from OGJ 99 were originally published in 1983 as part of a series entitled "Guide to Export Crudes for the '80s".			
API Gravity	35.7		OGJ 99
Sulphur (weight %)	0.56		OGJ 99
Density (g/mL)			
	<u>Temperature (°C)</u>		
	15	0.8460	OGJ 99
Pour Point (°C)	-6		OGJ 99
Kinematic Viscosity (mm²/s or cSt)			
	<u>Temperature (°C)</u>		
	40	5	OGJ 99
Yield on Crude (volume %)			
	<u>Boiling Range (°C)</u>		
	C1-C4	3	OGJ 99
	Gasoline (C5-85)	8	OGJ 99
	Naphtha (85-165)	15	OGJ 99
	Kerosene (165-235)	13	OGJ 99
	Gas oil (235-300)	13	OGJ 99
	Gas oil (300-350)	8	OGJ 99
	Residue (>350)	41	OGJ 99

Corrosion Inhibitor Solvent (Destin Dome)

		Data	Notes	Reference ID
API Gravity		32.3		ESD 98
Equation(s) for Predicting Evaporation				
%Ev = $(-0.02 + 0.013T)\sqrt{t}$				ESD 98
Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)				
Sulphur (weight %)				
<u>Evaporation (weight %)</u>				
0		0.38		ESD 99
8		0.47		ESD 99
15		0.45		ESD 99
Water Content				
<u>Evaporation (weight %)</u>				
0		< 0.1		ESD 98
8		< 0.1		ESD 98
15		< 0.1		ESD 98
Flash Point (°C)				
<u>Evaporation (weight %)</u>				
0		69		ESD 98
8		93		ESD 98
15		> 95		ESD 98
Density (g/mL)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	0.8737		ESD 98
	15	0.8631		ESD 98
	25	0.8560		ESD 98
8	0	0.8785		ESD 98
	15	0.8680		ESD 98
	25	0.8609		ESD 98
15	0	0.8822		ESD 98
	15	0.8719		ESD 98
	25	0.8647		ESD 98
Pour Point (°C)				
<u>Evaporation (weight %)</u>				
0		-23		ESD 98
8		-23		ESD 98
15		-17		ESD 98

Corrosion Inhibitor Solvent (Destin Dome)

		Data	Notes	Reference ID
Dynamic Viscosity (mPa s or cP)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	7		ESD 98
	15	5		ESD 98
	25	4		ESD 98
8	0	9		ESD 98
	15	6		ESD 98
	25	4		ESD 98
15	0	10		ESD 98
	15	6		ESD 98
	25	5		ESD 98
Hydrocarbon Groups (weight %)				
<u>Evaporation (weight %)</u>				
0	Saturates	61		ESD 98
	Aromatics	37		ESD 98
	Resins	2		ESD 98
	Asphaltenes	0		ESD 98
8	Saturates	57		ESD 98
	Aromatics	41		ESD 98
	Resins	2		ESD 98
	Asphaltenes	0		ESD 98
15	Saturates	54		ESD 98
	Aromatics	40		ESD 98
	Resins	5		ESD 98
	Asphaltenes	0		ESD 98
Adhesion (g/m²)				
<u>Evaporation (weight %)</u>				
0		6	<i>SD = 1</i>	ESD 98
8		6	<i>SD = 2</i>	ESD 98
15		8	<i>SD = 1</i>	ESD 98

Corrosion Inhibitor Solvent (Destin Dome)

		Data	Notes	Reference ID
Volatile Organic Compounds (ppm)				
	<u>Evaporation (weight %)</u>			
0	Benzene	106		ESD 98
	Toluene	391		ESD 98
	Ethylbenzene	403		ESD 98
	Xylenes	1,666		ESD 98
	C3-benzenes	5,151		ESD 98
	Total BTEX	2,566		ESD 98
	Total VOCs	7,717		ESD 98
8	Benzene	0		ESD 98
	Toluene	0		ESD 98
	Ethylbenzene	8		ESD 98
	Xylenes	67		ESD 98
	C3-benzenes	2,085		ESD 98
	Total BTEX	74		ESD 98
	Total VOCs	2,160		ESD 98
15	Benzene	0		ESD 98
	Toluene	0		ESD 98
	Ethylbenzene	0		ESD 98
	Xylenes	0		ESD 98
	C3-benzenes	133		ESD 98
	Total BTEX	1		ESD 98
	Total VOCs	134		ESD 98
Surface Tension (mN/m or dynes/cm)				
	<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>		
0		0	29.1	ESD 98
		15	28.3	ESD 98
		25	27.8	ESD 98
8		0	29.3	ESD 98
		15	28.5	ESD 98
		25	28.3	ESD 98
15		0	29.6	ESD 98
		15	28.8	ESD 98
		25	28.3	ESD 98

Corrosion Inhibitor Solvent (Destin Dome)

		Data	Notes	Reference ID
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	NM		ESD 98
	15	4.5		ESD 98
	25	3.3		ESD 98
8	0	10.8		ESD 98
	15	10.9		ESD 98
	25	11.7		ESD 98
15	0	7.0		ESD 98
	15	5.4		ESD 98
	25	6.9		ESD 98
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	NM		ESD 98
	15	5.6		ESD 98
	25	4.5		ESD 98
8	0	NM		ESD 98
	15	10.9		ESD 98
	25	10.8		ESD 98
15	0	6.9		ESD 98
	15	6.2		ESD 98
	25	5.9		ESD 98

Cossack

		Data	Notes	Reference ID
Origin: Australia				
Data from OGJ 99 were originally published in 1997.				
API Gravity		47.3		OGJ 99
Sulphur (weight %)		0.03		OGJ 99
Reid Vapour Pressure (kPa)		44		OGJ 99
Density (g/mL)				
	<u>Temperature (°C)</u>			
	15	0.7908		OGJ 99
Pour Point (°C)		-18		OGJ 99
Kinematic Viscosity (mm²/s or cSt)				
	<u>Temperature (°C)</u>			
	20	2		OGJ 99
	40	1		OGJ 99
Hydrocarbon Groups (weight %)				
	Asphaltenes	0		OGJ 99
	Waxes	2		OGJ 99
Yield on Crude (volume %)				
	<u>Boiling Range (°C)</u>			
	C1-C4	3		OGJ 99
	15.5-70	9		OGJ 99
	70-140	24		OGJ 99
	140-260	32		OGJ 99
	260-360	16		OGJ 99
	360-450	9		OGJ 99
	450-535	5		OGJ 99
	>535	2		OGJ 99
Metals (ppm)				
	Copper	< 1		OGJ 99
	Iron	< 1		OGJ 99
	Nickel	1		OGJ 99
	Sodium	< 1		OGJ 99
	Vanadium	< 1		OGJ 99
Other Elements (weight %)				
	Nitrogen	0.03		OGJ 99

		Data	Notes	Reference ID
Origin: Colombia				
Data from OGJ 99 were originally published in 1995.				
API Gravity				
		38.3		ESD 98
		36.4		OGJ 99
Equation(s) for Predicting Evaporation				
%Ev = (3.39 + 0.045T)ln(t)				ESD 98
Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)				
Sulphur (weight %)				
<u>Evaporation (weight %)</u>				
0		0.25		OGJ 99
		0.27		ESD 99
13		0.22		ESD 99
24		0.24		ESD 99
38		0.28		ESD 99
Water Content (volume %)				
		< 0.1		OGJ 99
Flash Point (°C)				
<u>Evaporation (weight %)</u>				
		-28		ESD 98
13		24		ESD 98
24		60		ESD 98
38		> 100		ESD 98
Density (g/mL)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	0.8468		ESD 98
	15	0.8328		ESD 98
	25	0.8252		ESD 98
13	0	0.8740		ESD 98
	15	0.8598		ESD 98
	25	0.8517		ESD 98
24	0	0.8913		ESD 98
	15	0.8773		ESD 98
	25	0.8690		ESD 98
38	0	0.9094		ESD 98
	15	0.8965		ESD 98
	25	0.8883		ESD 98

Cusiana

		Data	Notes	Reference ID
Pour Point (°C)				
<u>Evaporation (weight %)</u>				
0		0		OGJ 99
		-19		ESD 98
13		-13		ESD 98
24		2		ESD 98
38		23		ESD 98
Dynamic Viscosity (mPa s or cP)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	18		ESD 98
	15	7		ESD 98
	25	4		ESD 98
13	0	76		ESD 98
	15	10		ESD 98
	25	7		ESD 98
24	0	198		ESD 98
	15	31		ESD 98
	25	13		ESD 98
38	0	2,150	(a)	ESD 98
		56,720	(b)	ESD 98
		116,000	(c)	ESD 98
	15	326		ESD 98
	25	47		ESD 98
<i>Shear rate = (a) 100/s; (b) 10/s; (c) 1/s</i>				
Kinematic Viscosity (mm²/s or cSt)				
	<u>Temperature (°C)</u>			
	20	7		OGJ 99
	30	5		OGJ 99
	40	3		OGJ 99

		Data	Notes	Reference ID
Hydrocarbon Groups (weight %)				
<u>Evaporation (weight %)</u>				
0	Saturates	76		ESD 99
	Aromatics	20		ESD 99
	Resins	3		ESD 99
	Asphaltenes	1		ESD 99
		0		OGJ 99
13	Saturates	71		ESD 99
	Aromatics	23		ESD 99
	Resins	5		ESD 99
	Asphaltenes	1		ESD 99
24	Saturates	70		ESD 99
	Aromatics	23		ESD 99
	Resins	5		ESD 99
	Asphaltenes	2		ESD 99
38	Saturates	71		ESD 99
	Aromatics	22		ESD 99
	Resins	5		ESD 99
	Asphaltenes	2		ESD 99
Adhesion (g/m²)				
<u>Evaporation (weight %)</u>				
0		11	<i>SD = 1</i>	ESD 98
13		12	<i>SD = 2</i>	ESD 98
24		17	<i>SD = 2</i>	ESD 98
38		94	<i>SD = 4</i>	ESD 98

Cusiana

		Data	Notes	Reference ID
Volatile Organic Compounds (ppm)				
<u>Evaporation (weight %)</u>				
0	Benzene	2,036		ESD 98
	Toluene	12,576		ESD 98
	Ethylbenzene	1,479		ESD 98
	Xylenes	14,016		ESD 98
	C3-benzenes	14,441		ESD 98
	Total BTEX	30,106		ESD 98
	Total VOCs	44,548		ESD 98
13	Benzene	659		ESD 98
	Toluene	8,855		ESD 98
	Ethylbenzene	1,471		ESD 98
	Xylenes	14,675		ESD 98
	C3-benzenes	15,973		ESD 98
	Total BTEX	25,659		ESD 98
	Total VOCs	41,632		ESD 98
24	Benzene	0		ESD 98
	Toluene	38		ESD 98
	Ethylbenzene	405		ESD 98
	Xylenes	5,678		ESD 98
	C3-benzenes	14,544		ESD 98
	Total BTEX	6,121		ESD 98
	Total VOCs	20,665		ESD 98
38	Benzene	0		ESD 98
	Toluene	0		ESD 98
	Ethylbenzene	1		ESD 98
	Xylenes	5		ESD 98
	C3-benzenes	44		ESD 98
	Total BTEX	6		ESD 98
	Total VOCs	50		ESD 98

Surface Tension (mN/m or dynes/cm)

<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>		
0	15	25.9	ESD 98
	25	25.4	ESD 00
13	15	27.7	ESD 98
	25	26.9	ESD 00
24	15	28.9	ESD 98
	25	28.3	ESD 00
38	15	34.7	ESD 98
	25	27.7	ESD 00

		Data	Notes	Reference ID
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	15	21.2		ESD 98
	25	11.5		ESD 00
13	15	21.8		ESD 98
	25	12.7		ESD 00
24	15	20.1		ESD 98
	25	14.5		ESD 00
38	15	NM		ESD 98
	25	7.8		ESD 00
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	15	22.5		ESD 98
	25	15.2		ESD 00
13	15	22.2		ESD 98
	25	14.9		ESD 00
24	15	21.9		ESD 98
	25	16.3		ESD 00
38	15	NM		ESD 98
	25	9.0		ESD 00
Yield on Crude (weight %)				
	<u>Boiling Range (°C)</u>			
	C1-C4	2		OGJ 99
	C5-149	18		OGJ 99
	149-232	15		OGJ 99
	232-342	25		OGJ 99
	342-369	6		OGJ 99
	369-509	23		OGJ 99
	509-550	3		OGJ 99
	>550	8		OGJ 99
Metals (ppm)				
	Nickel	< 2		OGJ 99
	Vanadium	< 2		OGJ 99