

	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	32.8		OGJ 99
Sulphur (weight %)	0.08		OGJ 99
Reid Vapour Pressure (kPa)	11		OGJ 99
Pour Point (°C)	29		OGJ 99
Kinematic Viscosity (mm²/s or cSt)			
	<u>Temperature (°C)</u>		
	38	4	OGJ 99
Yield on Crude (weight %)			
	<u>Boiling Range (°C)</u>		
	C1-C4	0	OGJ 99
	Gasoline (C5-75)	2	OGJ 99
	Naphtha (75-145)	11	OGJ 99
	Kerosene (145-250)	19	OGJ 99
	Gas oil (145-350)	46	OGJ 99
	Residue (>350)	40	OGJ 99
Metals (ppm)			
	Nickel	< 1	OGJ 99
	Vanadium	< 0.5	OGJ 99

Heavy Reformate

	Data	Notes	Reference ID
API Gravity	10.1		ESD 92
Equation(s) for Predicting Evaporation			
%Ev = $(-0.17 + 0.013T)\sqrt{t}$ Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)			ESD 98
Sulphur (weight %)	1.24		ESD 93
Flash Point (°C)	> 90		ESD 92
Density (g/mL)			
	<u>Temperature (°C)</u>		
	0	0.9347	ESD 92
	15	0.9226	ESD 92
Pour Point (°C)	28		ESD 92
Dynamic Viscosity (mPa·s or cP)			
	<u>Temperature (°C)</u>		
	0	5,293	(a) ESD 92
		13,470	(b) ESD 92
	15	1,321	(a) ESD 92
		3,498	(b) ESD 92
<i>Shear rate = (a) 10/s; (b) 1/s</i>			
Chemical Dispersibility (volume %)			
	Corexit 9500	20	ESD 94
Hydrocarbon Groups (weight %)			
	Saturates	43	ESD 97
	Aromatics	50	ESD 97
	Resins	7	ESD 97
	Asphaltenes	0	ESD 92
	Waxes	12	ESD 92
Adhesion (g/m²)	80	SD = 9	ESD 96
Volatile Organic Compounds (ppm)			
	Benzene	90	ESD 94
	Toluene	220	ESD 94
	Ethylbenzene	180	ESD 94
	Xylenes	270	ESD 94
	C3-benzenes	760	ESD 94
	Total BTEX	760	ESD 94
	Total VOCs	1,520	ESD 94

Heavy Reformate

		Data	Notes	Reference ID
Surface Tension (mN/m or dynes/cm)				
	<u>Temperature (°C)</u>			
	0	NM		ESD 92
	15	NM		ESD 92
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)				
	<u>Temperature (°C)</u>			
	0	NM		ESD 92
	15	NM		ESD 92
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)				
	<u>Temperature (°C)</u>			
	0	NM		ESD 92
	15	NM		ESD 92
Boiling Point Distribution (weight %)				
	<u>Boiling Point (°C)</u>			
	160	1		ESD 94
	180	1		ESD 94
	200	1		ESD 94
	250	5		ESD 94
	300	11		ESD 94
	350	24		ESD 94
	400	47		ESD 94
	450	71		ESD 94
	500	88		ESD 94
	550	97		ESD 94
Metals (ppm)				
	Barium	< 0.3		Cao 92
	Chromium	< 2		Cao 92
	Copper	< 0.6		Cao 92
	Iron	< 4		Cao 92
	Lead	< 4		Cao 92
	Magnesium	11		Cao 92
	Molybdenum	< 0.6		Cao 92
	Nickel	< 1		Cao 92
	Titanium	1		Cao 92
	Vanadium	< 0.6		Cao 92
	Zinc	< 0.6		Cao 92
Acute Toxicity of Water Soluble Fraction (mg/L)				
	<u>Test Organism</u>			
48h LC50	Daphnia magna	> 1	(a)	Harris 94
(a) results based on GC headspace analysis				

Hebron

		Data	Notes	Reference ID
Origin: Newfoundland, Canada				
The sample analyzed by SL Ross Environmental Research Ltd. was collected in May 1999 and was identified as 'Hebron D-94'.				
API Gravity		20.1		Mobil 99
Flash Point (°C)				
<u>Evaporation (volume %)</u>				
0		61		Mobil 99
3		89		SL Ross 99b
7		112		SL Ross 99b
Density (g/mL)				
<u>Evaporation (volume %)</u>				
<u>Temperature (°C)</u>				
0	15	0.9310		SL Ross 99b
	30	0.9200		SL Ross 99b
3	15	0.9350		SL Ross 99b
	30	0.9240		SL Ross 99b
7	15	0.9380		SL Ross 99b
	30	0.9290		SL Ross 99b
Pour Point (°C)				
<u>Evaporation (volume %)</u>				
0		-4		Mobil 99
		< -16		SL Ross 99b
3		-15		SL Ross 99b
7		-9		SL Ross 99b
Dynamic Viscosity (mPa·s or cP)				
<u>Evaporation (volume %)</u>				
<u>Temperature (°C)</u>				
0	15	680		SL Ross 99b
	30	185		SL Ross 99b
3	15	1,065		SL Ross 99b
	30	277		SL Ross 99b
7	15	1,338		SL Ross 99b
	30	462		SL Ross 99b
Kinematic Viscosity (mm²/s or cSt)				
<u>Temperature (°C)</u>				
	15	628		Mobil 99
	40	105		Mobil 99
	50	60		Mobil 99

		Data	Notes	Reference ID
Surface Tension (mN/m or dynes/cm)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	15	33.7		SL Ross 99b
3		35.0		SL Ross 99b
7		35.3		SL Ross 99b
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	15	16.9		SL Ross 99b
3		16.6		SL Ross 99b
7		16.0		SL Ross 99b
Distillation (°C)				
	<u>Total Distillate (volume %)</u>			
	IBP	86		SL Ross 99b
	5	92		Mobil 99
		108		SL Ross 99b
	10	258		Mobil 99
		134		SL Ross 99b
	15	158		SL Ross 99b
	20	306		Mobil 99
		182		SL Ross 99b
	25	238		SL Ross 99b
	30	350		Mobil 99
		289		SL Ross 99b
	33	350		SL Ross 99b
	40	392		Mobil 99
	50	436		Mobil 99
	60	483		Mobil 99
Metals (ppm)				
	Nickel	6		Mobil 99
	Vanadium	1		Mobil 99
Other Elements (weight %)				
	Nitrogen	0.23		Mobil 99

Hebron M-04

		Data	Notes	Reference ID
Origin: Newfoundland				
Flash Point (°C)				
<u>Evaporation (weight %)</u>				
0		9		ESD 00
9		55		ESD 00
16		82		ESD 00
23		> 100		ESD 00
Density (g/mL)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	0.9307		ESD 00
	15	0.9189		ESD 00
	25	0.9113		ESD 00
9	0	0.9468		ESD 00
	15	0.9344		ESD 00
	25	0.9257		ESD 00
16	0	0.9538		ESD 00
	15	0.9423		ESD 00
	25	0.9336		ESD 00
23	0	0.9693		ESD 00
	15	0.9564		ESD 00
	25	0.9474		ESD 00
Pour Point (°C)				
<u>Evaporation (weight %)</u>				
0		-2		ESD 00
9		9		ESD 00
16		12		ESD 00
23		20		ESD 00

		Data	Notes	Reference ID
Dynamic Viscosity (mPa·s or cP)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	612		ESD 00
	15	154		ESD 00
	25	85		ESD 00
9	0	2,272		ESD 00
	15	676		ESD 00
	25	228		ESD 00
16	0	6,298	(a)	ESD 00
		12,740	(b)	ESD 00
		22,860	(c)	ESD 00
	15	1,442		ESD 00
	25	574		ESD 00
23	0	113,100	(b)	ESD 00
		344,100	(c)	ESD 00
		7,369		ESD 00
		2,443		ESD 00
<i>shear rate = (a) 100/s; (b) 10/s; (c) 1/s</i>				
Chemical Dispersibility (volume %)				
<u>Evaporation (weight %)</u>				
0	Corexit 9500	< 10		ESD 00
9		< 10		ESD 00
16		< 10		ESD 00
23		< 10		ESD 00
Adhesion (g/m²)				
<u>Evaporation (weight %)</u>				
0		41	SD = 5	ESD 00
9		64	SD = 2	ESD 00
16		74	SD = 4	ESD 00
23		222	SD = 30	ESD 00

Hebron M-04

		Data	Notes	Reference ID
Surface Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	28.6		ESD 00
	15	28.3		ESD 00
	25	27.9		ESD 00
9	0	48.0		ESD 00
	15	28.8		ESD 00
	25	29.1		ESD 00
16	0	DNF		ESD 00
	15	34.6		ESD 00
	25	29.8		ESD 00
23	0	DNF		ESD 00
	15	NM		ESD 00
	25	38.0		ESD 00
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	27.5		ESD 00
	15	24.9		ESD 00
	25	32.5		ESD 00
9	0	NM		ESD 00
	15	NM		ESD 00
	25	32.1		ESD 00
16	0	DNF		ESD 00
	15	NM		ESD 00
	25	21.9		ESD 00
23	0	DNF		ESD 00
	15	NM		ESD 00
	25	NM		ESD 00
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	27.1		ESD 00
	15	26.0		ESD 00
	25	34.2		ESD 00
9	0	NM		ESD 00
	15	NM		ESD 00
	25	34.4		ESD 00
16		DNF		ESD 00
		NM		ESD 00
		NM		ESD 00
23	0	DNF		ESD 00
	15	NM		ESD 00
	25	NM		ESD 00

		Data	Notes	Reference ID
Origin: Norwegian Sea, Norway				
Statoil data for Heidrun, November 1995				Statoil 97
API Gravity				
		28.6		Statoil 97
		28.6		ESD 97
Equation(s) for Predicting Evaporation				
%Ev = (1.95 + 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		0.46		Statoil 97
		0.53		ESD 97
8		0.49		ESD 97
15		0.55		ESD 97
23		0.61		ESD 97
Water Content (weight %)				
		0.1		Statoil 97
Flash Point (°C)				
<u>Evaporation (weight %)</u>				
0		< 10		Statoil 97
		-19		ESD 97
8		49		ESD 97
15		91		ESD 97
23		> 95		ESD 97
Reid Vapour Pressure (kPa)				
		40		Statoil 97
Density (g/mL)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	0.8942		ESD 97
	15	0.8833		Statoil 97
		0.8835		ESD 97
	25	0.8777		ESD 98
8	0	0.9122		ESD 97
	15	0.9013		ESD 97
	25	0.8952		ESD 98
15	0	0.9235		ESD 97
	15	0.9128		ESD 97
	25	0.9065		ESD 98
23	0	0.9328		ESD 97
	15	0.9222		ESD 97
	25	0.9159		ESD 98

Heidrun

		Data	Notes	Reference ID
Pour Point (°C)				
<u>Evaporation (weight %)</u>				
0		-48		Statoil 97
		-45		ESD 97
8		-30		ESD 97
15		-27		ESD 97
23		-25		ESD 97
Dynamic Viscosity (mPa s or cP)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	35		ESD 97
	15	18		ESD 97
	25	12		ESD 98
8	0	88		ESD 97
	15	38		ESD 97
	25	24		ESD 98
15	0	251		ESD 97
	15	76		ESD 97
	25	44		ESD 98
23	0	743		ESD 97
	15	152		ESD 97
	25	88		ESD 98
Kinematic Viscosity (mm²/s or cSt)				
	<u>Temperature (°C)</u>			
	20	16		Statoil 97
	50	6		Statoil 97

		Data	Notes	Reference ID
Hydrocarbon Groups (weight %)				
<u>Evaporation (weight %)</u>				
0	Saturates	55		ESD 98
	Aromatics	35		ESD 98
	Resins	9		ESD 98
	Asphaltenes	1		ESD 98
	Waxes	4		Statoil 97
8	Saturates	57		ESD 98
	Aromatics	33		ESD 98
	Resins	9		ESD 98
	Asphaltenes	1		ESD 98
15	Saturates	52		ESD 98
	Aromatics	38		ESD 98
	Resins	9		ESD 98
	Asphaltenes	1		ESD 98
23	Saturates	52		ESD 98
	Aromatics	36		ESD 98
	Resins	10		ESD 98
	Asphaltenes	1		ESD 98
Adhesion (g/m²)				
<u>Evaporation (weight %)</u>				
0		9	<i>SD = 3</i>	ESD 97
8		19	<i>SD = 5</i>	ESD 97
15		34	<i>SD = 5</i>	ESD 97
23		26		ESD 97

Heidrun

		Data	Notes	Reference ID
Volatile Organic Compounds (ppm)				
<u>Evaporation (weight %)</u>				
0	Benzene	1,429		ESD 97
	Toluene	6,047		ESD 97
	Ethylbenzene	878		ESD 97
	Xylenes	3,780		ESD 97
	C3-benzenes	5,838		ESD 97
	Total BTEX	12,134		ESD 97
	Total VOCs	17,972		ESD 97
8	Benzene	265		ESD 97
	Toluene	3,207		ESD 97
	Ethylbenzene	693		ESD 97
	Xylenes	3,176		ESD 97
	C3-benzenes	5,248		ESD 97
	Total BTEX	7,341		ESD 97
	Total VOCs	12,589		ESD 97
15	Benzene	29		ESD 97
	Toluene	21		ESD 97
	Ethylbenzene	66		ESD 97
	Xylenes	464		ESD 97
	C3-benzenes	2,781		ESD 97
	Total BTEX	580		ESD 97
	Total VOCs	3,361		ESD 97
23	Benzene	0		ESD 97
	Toluene	2		ESD 97
	Ethylbenzene	1		ESD 97
	Xylenes	3		ESD 97
	C3-benzenes	21		ESD 97
	Total BTEX	6		ESD 97
	Total VOCs	26		ESD 97

		Data	Notes	Reference ID
Surface Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	29.0		ESD 97
	15	28.1		ESD 97
	25	27.1		ESD 98
8	0	30.3		ESD 97
	15	29.6		ESD 97
	25	28.4		ESD 98
15	0	31.3		ESD 97
	15	30.5		ESD 97
	25	29.4		ESD 98
23	0	31.8		ESD 97
	15	30.6		ESD 97
	25	30.0		ESD 98
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	18.4		ESD 97
	15	18.6		ESD 97
	25	16.2		ESD 98
8	0	19.0		ESD 97
	15	18.1		ESD 97
	25	15.9		ESD 98
15	0	17.3		ESD 97
	15	17.4		ESD 97
	25	15.3		ESD 98
23	0	17.2		ESD 97
	15	14.5		ESD 97
	25	14.5		ESD 98
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	23.0		ESD 97
	15	23.7		ESD 97
	25	19.8		ESD 98
8	0	24.0		ESD 97
	15	24.0		ESD 97
	25	19.7		ESD 98
15	0	23.3		ESD 97
	15	22.8		ESD 97
	25	19.5		ESD 98
23	0	21.9		ESD 97
	15	20.7		ESD 97
	25	17.3		ESD 98

Heidrun

		Data	Notes	Reference ID
Boiling Point Distribution (weight %)				
<u>Evaporation (weight %)</u>	<u>Boiling Point (°C)</u>			
0	40	3		ESD 97
	60	4		ESD 97
	80	6		ESD 97
	100	8		ESD 97
	120	8		ESD 97
	140	10		ESD 97
	160	13		ESD 97
	180	16		ESD 97
	200	19		ESD 97
	250	30		ESD 97
	300	43		ESD 97
	350	55		ESD 97
	400	65		ESD 97
	450	76		ESD 97
	500	83		ESD 97
	550	89		ESD 97
	600	93		ESD 97
	650	97		ESD 97
	700	99		ESD 97
8	80	1		ESD 97
	100	2		ESD 97
	120	2		ESD 97
	140	4		ESD 97
	160	6		ESD 97
	180	9		ESD 97
	200	12		ESD 97
	250	24		ESD 97
	300	38		ESD 97
	350	51		ESD 97
	400	62		ESD 97
	450	73		ESD 97
	500	82		ESD 97
	550	88		ESD 97
	600	93		ESD 97
15	650	96		ESD 97
	700	99		ESD 97
	160	1		ESD 97
	180	3		ESD 97
	200	5		ESD 97
	250	18		ESD 97
	300	32		ESD 97

		Data	Notes	Reference ID
Boiling Point Distribution (weight %)				
<u>Evaporation (weight %)</u>	<u>Boiling Point (°C)</u>			
15	350	47		ESD 97
	400	59		ESD 97
	450	71		ESD 97
	500	80		ESD 97
	550	87		ESD 97
	600	92		ESD 97
	650	96		ESD 97
	700	99		ESD 97
23	200	1		ESD 97
	250	10		ESD 97
	300	25		ESD 97
	350	41		ESD 97
	400	55		ESD 97
	450	68		ESD 97
	500	78		ESD 97
	550	85		ESD 97
	600	91		ESD 97
	650	95		ESD 97
	700	98		ESD 97
Metals (ppm)				
	Nickel	2		Statoil 97
	Sodium	31		Statoil 97
	Vanadium	9		Statoil 97

Hibernia

	Data	Notes	Reference ID
Origin: Newfoundland, Canada			
The Hibernia oil field is located 315 km east southeast of St. John's, Newfoundland.			
Data from OGJ 99 were originally published in 1998 and were based on four assays from four producing wells, sampled in July 1998. The assays were done by Mobil Technology Co..			
The data from SL Ross Environmental Research Ltd. are for a sample that was collected in April 1999.			
API Gravity			
	37.1		Mackay 82a
	35.0		OGJ 99
Sulphur (weight %)			
	0.37		OGJ 99
Flash Point (°C)			
<u>Evaporation (volume %)</u>			
11	19		SL Ross 99a
22	26		SL Ross 99a
Reid Vapour Pressure (kPa)			
	36	(a)	OGJ 99
<i>(a) value may have been influenced by manner of sampling or sample handling</i>			
Hydrogen Sulphide (ppm)			
	0	(a)	OGJ 99
<i>(a) value may have been influenced by manner of sampling or sample handling</i>			

		Data	Notes	Reference ID
Density (g/mL)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	0.8430		Mackay 82a
	5	0.8410		Mackay 82a
	10	0.8400		Mackay 82a
		0.8780	(a)	Buist 89
		0.8440	(b)	Buist 89
	15	0.8390		Mackay 82a
		0.8500		SL Ross 99a
	20	0.8370		Mackay 82a
		0.8700	(a)	Buist 89
		0.8370	(b)	Buist 89
	25	0.8360		Mackay 82a
	30	0.8620	(a)	Buist 89
		0.8300	(b)	Buist 89
		0.8390		SL Ross 99a
	11	0.8630		SL Ross 99a
	30	0.8510		SL Ross 99a
22	15	0.8790		SL Ross 99a
	30	0.8650		SL Ross 99a

(a) sample B-27; (b) sample C-96

Pour Point (°C)

<u>Evaporation (volume %)</u>				
0		6		Mackay 82a
		9	(a)	Buist 89
		18	(b)	Buist 89
		2		OGJ 99
		-6		SL Ross 99a
11		3		SL Ross 99a
22		12		SL Ross 99a

(a) Hibernia B-27, (b) Hibernia C-96

Hibernia

		Data	Notes	Reference ID
Dynamic Viscosity (mPa·s or cP)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	5	148		Mackay 82a
	10	73		Mackay 82a
	15	49		Mackay 82a
		240	(a)(c)	Buist 89
		30		SL Ross 99a
	20	33		Mackay 82a
		80	(a)(c)	Buist 89
		90	(b)(c)	Buist 89
	25	26		Mackay 82a
	30	25	(a)(c)	Buist 89
		30	(b)(c)	Buist 89
		9		SL Ross 99a
	11	141		SL Ross 99a
	30	13		SL Ross 99a
	22	150		SL Ross 99a
	30	25		SL Ross 99a
(a) sample B-27; (b) sample C-96; (c) shear rate = 10/s				
Kinematic Viscosity (mm²/s or cSt)				
	<u>Temperature (°C)</u>			
	15	18		OGJ 99
	40	6		OGJ 99
	50	4		OGJ 99
Hydrocarbon Groups (weight %)				
	Saturates	79		Mackay 82a
	Aromatics	15		Mackay 82a
	Resins	4		Mackay 82a
	Asphaltenes	3		Mackay 82a
		1	(a)	Buist 89
		3	(b)	Buist 89
	Waxes	8		Mackay 82a
		10	(a)	Buist 89
		7	(b)	Buist 89
(a) sample B-27; (b) sample C-96				
Surface Tension (mN/m or dynes/cm)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	15	28.8		SL Ross 99a
11		30.5		SL Ross 99a
22		31.7		SL Ross 99a

		Data	Notes	Reference ID
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	15	9.2		SL Ross 99a
	20	35.9		Mackay 82a
11	15	10.0		SL Ross 99a
22		17.1		SL Ross 99a
Distillation (°C)				
	<u>Total Distillate (volume %)</u>			
	IBP	55		SL Ross 99a
	5	108		SL Ross 99a
	10	134		SL Ross 99a
	15	158		SL Ross 99a
	20	182		SL Ross 99a
	30	238		SL Ross 99a
	40	289		SL Ross 99a
	50	334		SL Ross 99a
Yield on Crude (weight %)				
	<u>Boiling Range (°C)</u>			
	Light naphtha (49-74)	2		OGJ 99
	Heavy naphtha (74-160)	14		OGJ 99
	Kerosene (160-260)	17		OGJ 99
	Diesel oil (260-343)	15		OGJ 99
	Vacuum gas oil (343-538)	30		OGJ 99
	Vacuum residue (>538)	20		OGJ 99
Metals (ppm)				
	Nickel	1		OGJ 99
	Vanadium	1		OGJ 99
Other Elements (weight %)				
	Carbon	86.10		OGJ 99
	Hydrogen	13.40		OGJ 99
	Nitrogen	0.11		OGJ 99

Hibernia (1999)

		Data	Notes	Reference ID
Origin: Newfoundland				
Flash Point (°C)				
<u>Evaporation (weight %)</u>				
0		-17		ESD 00
10		30		ESD 00
21		71		ESD 00
33		> 100		ESD 00
Density				
<u>Evaporation (weight %)</u>				
0	0	0.8637		ESD 00
	15	0.8504		ESD 00
	25	0.8427		ESD 00
10	0	0.8887		ESD 00
	15	0.8753		ESD 00
	25	0.8675		ESD 00
21	0	0.9015		ESD 00
	15	0.8893		ESD 00
	25	0.8803		ESD 00
33	0	0.9191		ESD 00
	15	0.9075		ESD 00
	25	0.8979		ESD 00
Pour Point (°C)				
<u>Evaporation (weight %)</u>				
0		10		ESD 00
10		15		ESD 00
21		18		ESD 00
33		28		ESD 00

		Data	Notes	Reference ID
Dynamic Viscosity (mPa·s or cP)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	109	(a)	ESD 00
		848	(b)	ESD 00
		12,640	(c)	ESD 00
	15	13		ESD 00
	25	8		ESD 00
10	0	299	(a)	ESD 00
		1,433	(b)	ESD 00
		16,150	(c)	ESD 00
	15	35		ESD 00
	25	20		ESD 00
21	0	547	(a)	ESD 00
		3,065	(b)	ESD 00
		21,550	(c)	ESD 00
	15	99		ESD 00
	25	44		ESD 00
33	0	3,576	(a)	ESD 00
		13,960	(b)	ESD 00
		137,500	(c)	ESD 00
	15	773	(a)	ESD 00
		2,172	(b)	ESD 00
		23,730	(c)	ESD 00
	25	238		ESD 00
<i>shear rate = (a) 100/s; (b) 10/s; (c) 1/s</i>				
Chemical Dispersibility (volume %)				
<u>Evaporation (weight %)</u>	Corexit 9500			
0		21		ESD 00
10		17		ESD 00
20		15		ESD 00
32		11		ESD 00
Adhesion (g/m²)				
<u>Evaporation (weight %)</u>				
0		12	SD = 1	ESD 00
10		27	SD = 4	ESD 00
21		51	SD = 8	ESD 00
33		160	SD = 8	ESD 00

Hibernia (1999)

		Data	Notes	Reference ID
Surface Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	DNF		ESD 00
	15	26.5		ESD 00
	25	25.9		ESD 00
10	0	DNF		ESD 00
	15	28.1		ESD 00
	25	27.6		ESD 00
21	0	DNF		ESD 00
	15	28.9		ESD 00
	25	28.8		ESD 00
33	0	DNF		ESD 00
	15	50.0		ESD 00
	25	29.4		ESD 00
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	DNF		ESD 00
	15	21.6		ESD 00
	25	25.6		ESD 00
10	0	DNF		ESD 00
	15	26.3		ESD 00
	25	27.5		ESD 00
21	0	DNF		ESD 00
	15	24.9		ESD 00
	25	21.6		ESD 00
33	0	DNF		ESD 00
	15	NM		ESD 00
	25	NM		ESD 00
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	DNF		ESD 00
	15	23.9		ESD 00
	25	26.1		ESD 00
10	0	DNF		ESD 00
	15	27.2		ESD 00
	25	28.1		ESD 00
21	0	DNF		ESD 00
	15	NM		ESD 00
	25	22.2		ESD 00
33	0	DNF		ESD 00
	15	NM		ESD 00
	25	NM		ESD 00

		Data	Notes	Reference ID
Origin: Newfoundland, Canada				
Oil sample received from EPA, Ohmsett, 1986.				
API Gravity		28.3		EETD 86
Sulphur (weight %)				
<u>Evaporation (weight %)</u>				
0		0.65		EETD 86
9		0.64		EETD 86
Flash Point (°C)		-14		EETD 86
Density (g/mL)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	0.8970		EETD 86
	15	0.8849		EETD 86
9	0	0.9131		EETD 86
	15	0.9011		EETD 86
18	0	0.9246		EETD 86
	15	0.9138		EETD 86
Pour Point (°C)				
<u>Evaporation (weight %)</u>				
0		15		EETD 86
9		18		EETD 86
18		21		EETD 86
Dynamic Viscosity (mPa·s or cP)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	10,190		EETD 86
	15	44		EETD 86
9	0	110,500		EETD 86
	15	207		EETD 86
18	0	NM		EETD 86
	15	1,471		EETD 86
Chemical Dispersibility (volume %)				
	Corexit 9527	10		EETD 89
	Dasic LTS	5		EETD 89
	Enersperse 700	5		EETD 89
Hydrocarbon Groups (weight %)				
	Saturates	82		EETD 86
	Aromatics	14		EETD 86
	Resins	2		EETD 86
	Asphaltenes	4		EETD 89

Hibernia (EPA 86)

		Data	Notes	Reference ID
Surface Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	NM		EETD 86
	15	26.2		EETD 86
9	0	NM		EETD 86
	15	26.5		EETD 86
18	0	NM		EETD 86
	15	27.0		EETD 86
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	NM		EETD 86
	15	13.5		EETD 86
9	0	NM		EETD 86
	15	16.7		EETD 86
18	0	NM		EETD 86
	15	19.1		EETD 86
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	NM		EETD 86
	15	16.2		EETD 86
9	0	NM		EETD 86
	15	16.8		EETD 86
18	0	NM		EETD 86
	15	20.9		EETD 86
Distillation (°C)				
	<u>Total Distillate (volume %)</u>			
	IBP	35		EETD 86
	5	85		EETD 86
	10	115		EETD 86
	15	139		EETD 86
	20	160		EETD 86
	25	185		EETD 86
	30	210		EETD 86
	35	234		EETD 86
	40	253		EETD 86
	45	267		EETD 86
	50	284		EETD 86
	55	325		EETD 86

		Data	Notes	Reference ID
Aqueous Solubility (mg/L)				
	<u>Temperature (°C)</u>			
	20 (approx.)	8	(a)	MacLean 89
		11	(b)	MacLean 89
	22	23	(a)	Suntio 86
		19	(b)	Suntio 86

(a) fresh water; (b) salt water

Acute Toxicity of Water Soluble Fraction (mg/L)				
	<u>Test Organism</u>			
48h EC50	Daphnia magna	1	(a)	MacLean 89
		3	(b)	EETD 89
	Artemia spp	6	(a)	MacLean 89
		11	(b)	EETD 89
48h LC50	Daphnia magna	5	(a)	MacLean 89
		15	(b)	MacLean 89
	Artemia spp	8	(a)	MacLean 89
		14	(b)	EETD 89

(a) results based on fluorescence spectroscopy; (b) results based on GC purge-and-trap analysis

High Viscosity Fuel Oil

	Data	Notes	Reference ID
API Gravity	8.0		ESD 93
Equation(s) for Predicting Evaporation			
%Ev = $(-0.12 + 0.013T)\sqrt{t}$ Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)			ESD 99
Sulphur (weight %)	1.91		ESD 93
Water Content (weight %)	0.2		ESD 98
Flash Point (°C)	> 95		ESD 93
Density (g/mL)	<u>Temperature (°C)</u>		
	0	1.0241	ESD 93
	15	1.0140	ESD 93
Pour Point (°C)	2		ESD 93
Dynamic Viscosity (mPa·s or cP)	<u>Temperature (°C)</u>		
	0	104,100	ESD 93
	15	13,460	ESD 93
Emulsion Formation			
Visual stability	entrained		ESD 98
Viscosity (mPa·s)	74,000		ESD 98
Complex modulus (mPa)	310,000		ESD 98
Water content (wt %)	48		ESD 98
Chemical Dispersibility (volume %)			
Corexit 9500	0		ESD 99
Hydrocarbon Groups (weight %)			
Saturates	18		ESD 95
Aromatics	43		ESD 95
Resins	13		ESD 95
Asphaltenes	26		ESD 95
Waxes	2		ESD 97
Adhesion (g/m²)	129	SD = 12	ESD 95

High Viscosity Fuel Oil

	Data	Notes	Reference ID
Volatile Organic Compounds (ppm)			
Benzene	90		ESD 94
Toluene	240		ESD 94
Ethylbenzene	90		ESD 94
Xylenes	570		ESD 94
C3-benzenes	1,560		ESD 94
Total BTEX	990		ESD 94
Total VOCs	2,550		ESD 94
Surface Tension (mN/m or dynes/cm)			
<u>Temperature (°C)</u>			
0	DNF		ESD 94
15	32.9		ESD 93
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)			
<u>Temperature (°C)</u>			
0	DNF		ESD 94
15	43.3		ESD 93
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)			
<u>Temperature (°C)</u>			
0	DNF		ESD 94
15	NM		ESD 93
Boiling Point Distribution (weight %)			
<u>Boiling Point (°C)</u>			
180	1		ESD 94
200	2		ESD 94
250	14		ESD 94
300	25		ESD 94
350	34		ESD 94
400	40		ESD 94
450	45		ESD 94
500	50		ESD 94
550	56		ESD 94
600	64		ESD 94
650	72		ESD 94
700	79		ESD 94

Hondo

		Data	Notes	Reference ID
Origin: California, USA				
The sample analyzed by ESD was identified as 'Hondo', but is more similar to Hondo Monterey than to Hondo Blend.				
API Gravity		19.6		ESD 91
Equation(s) for Predicting Evaporation				
%Ev = (1.49 + 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		4.30		ESD 93
17		4.60		ESD 93
32		4.80		ESD 93
Water Content (weight %)				
<u>Evaporation (volume %)</u>				
0		1.5		ESD 98
17		0.1		ESD 98
32		< 0.1		ESD 98
Flash Point (°C)				
<u>Evaporation (volume %)</u>				
0		-5		ESD 91
17		71		ESD 92
32		> 90		ESD 92
Density (g/mL)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	0.9461		ESD 91
	15	0.9356		ESD 91
17	0	0.9780		ESD 91
	15	0.9674		ESD 91
32	0	0.9976		ESD 91
	15	0.9881		ESD 91
Pour Point (°C)				
<u>Evaporation (volume %)</u>				
0		-15		ESD 91
17		3		ESD 91
32		21		ESD 91

		Data	Notes	Reference ID
Dynamic Viscosity (mPa·s or cP)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	3,507		ESD 91
	15	735		ESD 91
17	0	110,500	(a)	ESD 91
		172,600	(b)	ESD 91
	15	9,583		ESD 91
32	0	83,080,000	(c)	ESD 91
	15	449,700		ESD 91
<i>Shear rate = (a) 10/s; (b) 1/s; (c) 0.001/s</i>				
Emulsion Formation				
<u>Evaporation (volume %)</u>				
0	Visual stability	stable		ESD 98
	Viscosity (mPa·s)	110,000		ESD 98
	Complex modulus (mPa)	920,000		ESD 98
	Water content (wt %)	81		ESD 98
17	Visual stability	stable		ESD 98
	Viscosity (mPa·s)	190,000		ESD 98
	Complex modulus (mPa)	1,300,000		ESD 98
	Water content (wt %)	66		ESD 98
32	Visual stability	none		ESD 98
Chemical Dispersibility (volume %)				
<u>Evaporation (volume %)</u>				
0	Corexit 9500	8		ESD 97
	Corexit 9527	5		ESD 91
	Dasic LTS	0		ESD 91
	Enersperse 700	4		ESD 96
17	Corexit 9500	6		ESD 98
	Corexit 9527	0		ESD 96
	Dasic LTS	0		ESD 96
	Enersperse 700	0		ESD 96
32	Corexit 9500	4		ESD 98
	Corexit 9527	0		ESD 96
	Dasic LTS	0		ESD 96
	Enersperse 700	0		ESD 96

Hondo

		Data	Notes	Reference ID
Hydrocarbon Groups (weight %)				
<u>Evaporation (volume %)</u>				
0	Saturates	33		ESD 94
	Aromatics	31		ESD 94
	Resins	24		ESD 94
	Asphaltenes	12		ESD 94
	Waxes	4		ESD 98
17	Saturates	27		ESD 96
	Aromatics	33		ESD 96
	Resins	29		ESD 96
	Asphaltenes	12		ESD 96
	Waxes	4		ESD 98
32	Saturates	27		ESD 96
	Aromatics	28		ESD 96
	Resins	32		ESD 96
	Asphaltenes	13		ESD 96
	Waxes	4		ESD 98
Adhesion (g/m²)				
<u>Evaporation (volume %)</u>				
0		79	<i>SD = 6</i>	ESD 96
17		124	<i>SD = 12</i>	ESD 96
32		437	<i>SD = 40</i>	ESD 96

		Data	Notes	Reference ID
Volatile Organic Compounds (ppm)				
<u>Evaporation (volume %)</u>				
0	Benzene	870		ESD 94
	Toluene	2,200		ESD 94
	Ethylbenzene	1,190		ESD 94
	Xylenes	2,570		ESD 94
	C3-benzenes	4,130		ESD 94
	Total BTEX	6,830		ESD 94
	Total VOCs	10,960		ESD 94
17	Benzene	40		ESD 94
	Toluene	110		ESD 94
	Ethylbenzene	340		ESD 94
	Xylenes	850		ESD 94
	C3-benzenes	2,500		ESD 94
	Total BTEX	1,340		ESD 94
	Total VOCs	3,840		ESD 94
32	Benzene	0		ESD 94
	Toluene	0		ESD 94
	Ethylbenzene	0		ESD 94
	Xylenes	0		ESD 94
	C3-benzenes	0		ESD 94
	Total BTEX	0		ESD 94
	Total VOCs	0		ESD 94
Surface Tension (mN/m or dynes/cm)				
<u>Evaporation (volume %)</u>		<u>Temperature (°C)</u>		
0		0	30.6	ESD 91
		15	29.2	ESD 91
17		0	NM	ESD 91
		15	30.3	ESD 91
32		0	NM	ESD 91
		15	NM	ESD 91
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (volume %)</u>		<u>Temperature (°C)</u>		
0		0	26.6	ESD 91
		15	15.8	ESD 91
17		0	NM	ESD 91
		15	22.8	ESD 91
32		0	NM	ESD 91
		15	NM	ESD 91

Hondo

		Data	Notes	Reference ID
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	28.3		ESD 91
	15	22.5		ESD 91
17	0	NM		ESD 91
	15	29.8		ESD 91
32	0	NM		ESD 91
	15	NM		ESD 91

		Data	Notes	Reference ID
Boiling Point Distribution (weight %)				
<u>Evaporation (volume %)</u>	<u>Boiling Point (°C)</u>			
0	40	2		ESD 96
	60	3		ESD 96
	80	5		ESD 96
	100	6		ESD 96
	120	6		ESD 96
	140	8		ESD 96
	160	10		ESD 96
	180	12		ESD 96
	200	14		ESD 96
	250	20		ESD 96
	300	26		ESD 96
	350	33		ESD 96
	400	41		ESD 96
	450	48		ESD 96
	500	56		ESD 96
	550	63		ESD 96
	600	70		ESD 96
	650	77		ESD 96
	700	83		ESD 96
17	140	1		ESD 96
	160	2		ESD 96
	180	3		ESD 96
	200	5		ESD 96
	250	11		ESD 96
	300	18		ESD 96
	350	27		ESD 96
	400	35		ESD 96
	450	44		ESD 96
	500	52		ESD 96
	550	61		ESD 96
	600	68		ESD 96
32	650	76		ESD 96
	700	83		ESD 96
	250	2		ESD 96
	300	9		ESD 96
	350	19		ESD 96
	400	28		ESD 96
	450	38		ESD 96
	500	48		ESD 96
	550	57		ESD 96
	600	65		ESD 96

Hondo

		Data	Notes	Reference ID
Boiling Point Distribution (weight %)				
<u>Evaporation (volume %)</u>	<u>Boiling Point (°C)</u>			
32	650	74		ESD 96
	700	81		ESD 96

		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	31		Cao 92
	Lead	< 4		Cao 92
	Magnesium	5		Cao 92
	Molybdenum	2		Cao 92
	Nickel	75		Cao 92
	Titanium	2		Cao 92
	Vanadium	196		Cao 92
	Zinc	0.5		Cao 92
17	Barium	0.3		Cao 92
	Chromium	2		Cao 92
	Copper	0.7		Cao 92
	Iron	3		Cao 92
	Lead	< 3		Cao 92
	Magnesium	6		Cao 92
	Molybdenum	< 0.6		Cao 92
	Nickel	80		Cao 92
	Titanium	2		Cao 92
	Vanadium	218		Cao 92
	Zinc	< 0.6		Cao 92
32	Aluminum	8		Cao 92
	Barium	0.3		Cao 92
	Cadmium	< 0.5		Cao 92
	Calcium	100		Cao 92
	Chromium	< 2		Cao 92
	Cobalt	< 1		Cao 92
	Copper	2		Cao 92
	Iron	3		Cao 92
	Lead	< 3		Cao 92
	Magnesium	9		Cao 92
	Manganese	< 0.3		Cao 92
	Mercury	< 15		Cao 92
	Molybdenum	0.6		Cao 92
	Nickel	88		Cao 92
	Selenium	< 15		Cao 92
	Strontium	0.9		Cao 92
	Tin	< 15		Cao 92
	Titanium	2		Cao 92
	Vanadium	228		Cao 92

Hondo

		Data	Notes	Reference ID
Metals (ppm)				
<u>Evaporation (volume %)</u>				
32	Zinc	< 0.6		Cao 92
Aqueous Solubility (mg/L)				
	Room temperature	21	(a)	ESD 91
<i>(a) fresh water</i>				
Acute Toxicity of Water Soluble Fraction (mg/L)				
	<u>Test Organism</u>			
48h LC50	Daphnia magna	12	(a)	Harris 94
<i>(a) results based on GC purge-and-trap analysis</i>				

Hondo Blend				
		Data	Notes	Reference ID
Origin: California, USA				
Data from OGJ 99 were originally published in 1992.				
API Gravity				
		20.8		OGJ 99
Sulphur (weight %)				
		4.29		OGJ 99
Density (g/mL)				
		<u>Temperature (°C)</u>		
15		0.9288		OGJ 99
Pour Point (°C)				
		-21		OGJ 99
Kinematic Viscosity (mm²/s or cSt)				
		<u>Temperature (°C)</u>		
16		511		OGJ 99
Yield on Crude				
		<u>Boiling Range (°C)</u>		
Weight %	C1-C5	1		OGJ 99
Volume %	20-175	16		OGJ 99
	175-295	16		OGJ 99
	295-343	6		OGJ 99
	343-565	25		OGJ 99
	565-816	36		OGJ 99
Other Elements (weight %)				
Nitrogen		0.61		OGJ 99

Hondo Monterey

		Data	Notes	Reference ID
Origin: California, USA				
Data from OGJ 99 were originally published in 1992.				
API Gravity				
		18.3		ESD 98
		19.4		OGJ 99
Sulphur (weight %)				
<u>Evaporation (weight %)</u>				
0		4.70		OGJ 99
		4.34		ESD 99
9		4.41		ESD 99
18		4.70		ESD 99
Flash Point (°C)				
<u>Evaporation (weight %)</u>				
0		-12		ESD 98
9		59		ESD 98
18		< 100		ESD 98
Density (g/mL)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	0.9556		ESD 98
	15	0.9377		OGJ 99
		0.9435		ESD 98
	25	0.9375		ESD 98
9	0	0.9826		ESD 98
	15	0.9705		ESD 98
	25	0.9640		ESD 98
18	0	1.0034		ESD 98
	15	0.9917		ESD 98
	25	0.9876		ESD 98
Pour Point (°C)				
<u>Evaporation (weight %)</u>				
0		-23		OGJ 99
		-9		ESD 98
9		4		ESD 98
18		25		ESD 98

		Data	Notes	Reference ID
Dynamic Viscosity (mPa s or cP)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	8,064		ESD 98
	15	1,599		ESD 98
	25	696		ESD 98
9	0	200,000		ESD 98
	15	17,880		ESD 98
	25	6,527		ESD 98
18	0	NM		ESD 98
	15	1,867,000		ESD 98
	25	354,600		ESD 98
Kinematic Viscosity (mm²/s or cSt)				
	<u>Temperature (°C)</u>			
	16	1,034		OGJ 99
Hydrocarbon Groups (weight %)				
<u>Evaporation (weight %)</u>				
0	Saturates	34		ESD 99
	Aromatics	31		ESD 99
	Resins	20		ESD 99
	Asphaltenes	15		ESD 99
9	Saturates	25		ESD 99
	Aromatics	35		ESD 99
	Resins	22		ESD 99
	Asphaltenes	17		ESD 99
18	Saturates	21		ESD 99
	Aromatics	33		ESD 99
	Resins	23		ESD 99
	Asphaltenes	23		ESD 99
Adhesion (g/m²)				
<u>Evaporation (weight %)</u>				
0		86	<i>SD = 13</i>	ESD 98
9		139	<i>SD = 15</i>	ESD 98
18		1,187	<i>SD = 238</i>	ESD 98

Hondo Monterey

		Data	Notes	Reference ID
Volatile Organic Compounds (ppm)				
<u>Evaporation (weight %)</u>				
0	Benzene	934		ESD 99
	Toluene	2,080		ESD 99
	Ethylbenzene	1,231		ESD 99
	Xylenes	2,323		ESD 99
	C3-benzenes	3,437		ESD 99
	Total BTEX	6,568		ESD 99
	Total VOCs	10,005		ESD 99
9	Benzene	69		ESD 99
	Toluene	808		ESD 99
	Ethylbenzene	746		ESD 99
	Xylenes	1,563		ESD 99
	C3-benzenes	2,932		ESD 99
	Total BTEX	3,186		ESD 99
	Total VOCs	6,118		ESD 99
18	Benzene	29		ESD 99
	Toluene	4		ESD 99
	Ethylbenzene	0		ESD 99
	Xylenes	1		ESD 99
	C3-benzenes	6		ESD 99
	Total BTEX	35		ESD 99
	Total VOCs	42		ESD 99
Surface Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	33.4		ESD 00
	15	29.3		ESD 98
	25	28.2		ESD 00
9	0	NM		ESD 00
	15	45.5		ESD 98
	25	29.7		ESD 00
18	0	NM		ESD 00
	15	NM		ESD 98
	25	NM		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	0	NM		ESD 00
	15	24.1		ESD 98
	25	12.0		ESD 00
9	0	NM		ESD 00
	15	NM		ESD 98
	25	NM		ESD 00
18	0	NM		ESD 00
	15	NM		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	0	NM		ESD 00
	15	24.6		ESD 98
	25	NM		ESD 00
9	0	NM		ESD 00
	15	NM		ESD 98
	25	NM		ESD 00
18	0	NM		ESD 00
	15	NM		ESD 98
	25	NM		ESD 00
Yield on Crude				
	<u>Boiling Range (°C)</u>			
Weight %	C1-C5	1		OGJ 99
Volume %	20-175	15		OGJ 99
	175-295	15		OGJ 99
	295-343	6		OGJ 99
	343-565	25		OGJ 99
	565-816	39		OGJ 99
Other Elements (weight %)				
	Nitrogen	0.65		OGJ 99

Hondo Sandstone

		Data	Notes	Reference ID
Origin: California, USA				
Data from OGJ 99 were originally published in 1992.				
API Gravity		35.2		OGJ 99
Sulphur (weight %)		0.21		OGJ 99
Density (g/mL)				
	<u>Temperature (°C)</u>			
	15	0.8488		OGJ 99
Pour Point (°C)		-4		OGJ 99
Kinematic Viscosity (mm²/s or cSt)				
	<u>Temperature (°C)</u>			
	16	8		OGJ 99
Yield on Crude				
	<u>Boiling Range (°C)</u>			
Weight %	C1-C5	2		OGJ 99
Volume %	20-175	26		OGJ 99
	175-295	24		OGJ 99
	295-343	9		OGJ 99
	343-565	29		OGJ 99
	565-816	10		OGJ 99
Other Elements (weight %)				
	Nitrogen	0.26		OGJ 99

		Data	Notes	Reference ID
Origin: Kuwait/Iraq Divided Zone				
Sample analyzed by ESD was obtained from the collection of Don Mackay in 1995. The actual age of the sample is unknown.				
Data from OGJ 99 were originally published in 1983 as part of a series entitled "Guide to Export Crudes for the '80s".				
API Gravity				
		32.8		OGJ 99
		32.4		ESD 95
Equation(s) for Predicting Evaporation				
%Ev = (2.29 + 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		1.88		ESD 97
		1.91		OGJ 99
9		1.92		ESD 97
22		2.20		ESD 97
30		2.43		ESD 97
Flash Point (°C)				
<u>Evaporation (weight %)</u>				
0		-18		ESD 95
9		34		ESD 95
22		88		ESD 95
30		> 95		ESD 95
Reid Vapour Pressure (kPa)				
		32		OGJ 99
Density (g/mL)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	0.8743		ESD 95
	15	0.8628		ESD 95
9	0	0.8997		ESD 95
	15	0.8881		ESD 95
22	0	0.9234		ESD 95
	15	0.9117		ESD 95
30	0	0.9403		ESD 95
	15	0.9277		ESD 95

Hout

		Data	Notes	Reference ID
Pour Point (°C)				
<u>Evaporation (weight %)</u>				
0		-25		OGJ 99
		-14		ESD 95
9		-14		ESD 95
22		-5		ESD 95
30		8		ESD 95
Dynamic Viscosity (mPa·s or cP)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	36		ESD 95
	15	15		ESD 95
9	0	90		ESD 95
	15	37		ESD 95
22	0	703		ESD 95
	15	146		ESD 95
30	0	10,470	(a)	ESD 95
		63,870	(b)	ESD 95
	15	726		ESD 95
<i>Shear rate = (a) 10/s; (b) 1/s</i>				
Kinematic Viscosity (mm²/s or cSt)				
	<u>Temperature (°C)</u>			
	30	10		OGJ 99
Chemical Dispersibility (volume %)				
	Corexit 9500	18		ESD 95
	Corexit 9527	2		ESD 95
	Dasic LTS	10		ESD 95
	Enersperse 700	5		ESD 95

		Data	Notes	Reference ID
Hydrocarbon Groups (weight %)				
<u>Evaporation (weight %)</u>				
0	Saturates	56		ESD 96
	Aromatics	32		ESD 96
	Resins	8		ESD 96
	Asphaltenes	2		OGJ 99
		5		ESD 96
	Waxes	3		OGJ 99
		5		ESD 98
9	Saturates	50		ESD 96
	Aromatics	35		ESD 96
	Resins	8		ESD 96
	Asphaltenes	6		ESD 96
	Waxes	4		ESD 98
22	Saturates	46		ESD 96
	Aromatics	37		ESD 96
	Resins	10		ESD 96
	Asphaltenes	7		ESD 96
	Waxes	6		ESD 98
30	Saturates	44		ESD 96
	Aromatics	38		ESD 96
	Resins	11		ESD 96
	Asphaltenes	7		ESD 96
	Waxes	6		ESD 98
Adhesion (g/m²)				
<u>Evaporation (weight %)</u>				
0		23	<i>SD = 3</i>	ESD 96
9		24	<i>SD = 0</i>	ESD 96
22		33	<i>SD = 1</i>	ESD 96
30		38	<i>SD = 6</i>	ESD 96

Hout

		Data	Notes	Reference ID
Volatile Organic Compounds (ppm)				
<u>Evaporation (weight %)</u>				
0	Benzene	280		ESD 96
	Toluene	3,550		ESD 96
	Ethylbenzene	1,780		ESD 96
	Xylenes	5,430		ESD 96
	C3-benzenes	9,400		ESD 96
	Total BTEX	11,030		ESD 96
	Total VOCs	20,440		ESD 96
9	Benzene	60		ESD 96
	Toluene	2,460		ESD 96
	Ethylbenzene	1,590		ESD 96
	Xylenes	4,960		ESD 96
	C3-benzenes	9,520		ESD 96
	Total BTEX	9,060		ESD 96
	Total VOCs	18,580		ESD 96
22	Benzene	0		ESD 96
	Toluene	10		ESD 96
	Ethylbenzene	50		ESD 96
	Xylenes	330		ESD 96
	C3-benzenes	3,210		ESD 96
	Total BTEX	400		ESD 96
	Total VOCs	3,600		ESD 96
30	Benzene	0		ESD 96
	Toluene	0		ESD 96
	Ethylbenzene	0		ESD 96
	Xylenes	0		ESD 96
	C3-benzenes	0		ESD 96
	Total BTEX	0		ESD 96
	Total VOCs	0		ESD 96

Surface Tension (mN/m or dynes/cm)

<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>		
0	0	27.4	ESD 95
	15	26.7	ESD 95
9	0	29.2	ESD 95
	15	28.3	ESD 95
22	0	31.3	ESD 95
	15	30.0	ESD 95
30	0	DNF	ESD 95
	15	31.0	ESD 95

		Data	Notes	Reference ID
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	20.5		ESD 95
	15	15.2		ESD 95
9	0	18.7		ESD 95
	15	15.7		ESD 95
22	0	NM		ESD 95
	15	18.7		ESD 95
30	0	DNF		ESD 95
	15	15.2		ESD 95
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	21.3		ESD 95
	15	17.2		ESD 95
9	0	20.8		ESD 95
	15	17.3		ESD 95
22	0	NM		ESD 95
	15	20.1		ESD 95
30	0	DNF		ESD 95
	15	19.3		ESD 95

Hout

		Data	Notes	Reference ID
Boiling Point Distribution (weight %)				
<u>Evaporation (weight %)</u>	<u>Boiling Point (°C)</u>			
0	40	4		ESD 95
	60	5		ESD 95
	80	7		ESD 95
	100	9		ESD 95
	120	11		ESD 95
	140	14		ESD 95
	160	17		ESD 95
	180	20		ESD 95
	200	23		ESD 95
	250	31		ESD 95
	300	39		ESD 95
	350	47		ESD 95
	400	55		ESD 95
	450	62		ESD 95
	500	69		ESD 95
	550	75		ESD 95
	600	80		ESD 95
	650	84		ESD 95
	700	88		ESD 95
9	80	1		ESD 95
	100	2		ESD 95
	120	3		ESD 95
	140	5		ESD 95
	160	8		ESD 95
	180	12		ESD 95
	200	15		ESD 95
	250	24		ESD 95
	300	33		ESD 95
	350	42		ESD 95
	400	50		ESD 95
	450	58		ESD 95
	500	65		ESD 95
	550	72		ESD 95
	600	78		ESD 95
22	650	83		ESD 95
	700	86		ESD 95
	180	2		ESD 95
	200	5		ESD 95
	250	14		ESD 95
	300	24		ESD 95
	350	35		ESD 95

		Data	Notes	Reference ID
Boiling Point Distribution (weight %)				
<u>Evaporation (weight %)</u>	<u>Boiling Point (°C)</u>			
22	400	44		ESD 95
	450	54		ESD 95
	500	63		ESD 95
	550	71		ESD 95
	600	77		ESD 95
	650	83		ESD 95
	700	87		ESD 95
30	250	4		ESD 95
	300	15		ESD 95
	350	27		ESD 95
	400	38		ESD 95
	450	49		ESD 95
	500	59		ESD 95
	550	68		ESD 95
	600	75		ESD 95
	650	82		ESD 95
	700	86		ESD 95
Yield on Crude (volume %)				
	<u>Boiling Range (°C)</u>			
	C1-C4	2		OGJ 99
	Light naphtha (C5-80)	6		OGJ 99
	Full range naphtha (C5-190)	25		OGJ 99
	Kerosene (190-250)	11		OGJ 99
	Gas oil (250-340)	15		OGJ 99
	Residue (>340)	47		OGJ 99
Metals (ppm)				
	Nickel	6		OGJ 99
	Vanadium	28		OGJ 99

Hydra

		Data	Notes	Reference ID
Origin: Australia/Indonesia Zone of Cooperation				
Data from OGJ 99 were originally published in 1994.				
API Gravity		37.5		OGJ 99
Sulphur (weight %)		0.08		OGJ 99
Water Content (volume %)		0.1	(a)	OGJ 99
(a) water and sediment				
Reid Vapour Pressure (kPa)		21		OGJ 99
Density (g/mL)				
	<u>Temperature (°C)</u>			
	15	0.8372		OGJ 99
Pour Point (°C)		10		OGJ 99
Kinematic Viscosity (mm²/s or cSt)				
	<u>Temperature (°C)</u>			
	38	5		OGJ 99
Yield on Crude (volume %)				
	<u>Boiling Range (°C)</u>			
	Light ends (C1-C6)	4		OGJ 99
	IBP-160	18		OGJ 99
	160-193	7		OGJ 99
	193-246	13		OGJ 99
	246-349	24		OGJ 99
	349-454	17		OGJ 99
	454-566	12		OGJ 99
	>566	9		OGJ 99
Metals (ppm)				
	Nickel	1		OGJ 99