

		Data	Notes	Reference ID
Origin: Nova Scotia, Canada				
Data for separator oil sample 87/08/07, Petro-Canada				
API Gravity		50.8		EETD 89
Equation(s) for Predicting Evaporation				
%Ev = $(7.12 + 0.045T)\ln(t)$ Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)				ESD 96
Sulphur (weight %)				
<u>Evaporation (volume %)</u>				
0		0.04		EETD 89
32		0.02		EETD 89
47		0.04		EETD 89
53		0.02		EETD 89
Flash Point (°C)				
<u>Evaporation (volume %)</u>				
0		-30		EETD 89
32		32		EETD 89
47		64		EETD 89
Density (g/mL)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	0.7865		EETD 89
	15	0.7757		EETD 89
32	0	0.8130		EETD 89
	15	0.8021		EETD 89
47	0	0.8277		EETD 89
	15	0.8168		EETD 89
Pour Point (°C)				
<u>Evaporation (volume %)</u>				
0		-36		EETD 89
32		-21		EETD 89
47		-18		EETD 89
Kinematic Viscosity (mm²/s or cSt)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	1	2		EETD 89
	15	1		EETD 89
32	1	3		EETD 89
	15	2		EETD 89
47	1	5		EETD 89
	15	3		EETD 89

Panuke

		Data	Notes	Reference ID
Chemical Dispersibility (volume %)				
	Dasic LTS	40		EETD 89
	Enersperse 700	85		ESD 91
Hydrocarbon Groups (weight %)				
<u>Evaporation (volume %)</u>				
0	Asphaltenes	0		ESD 90
	Waxes	2		ESD 91
32	Asphaltenes	0		EETD 89
47		1		EETD 89
53		0		EETD 89
Volatile Organic Compounds (ppm)				
	Benzene	40		ESD 94
	Toluene	150		ESD 94
	Ethylbenzene	150		ESD 94
	Xylenes	1,250		ESD 94
	C3-benzenes	4,790		ESD 94
	Total BTEX	1,580		ESD 94
	Total VOCs	6,380		ESD 94
Boiling Point Distribution (weight %)				
<u>Boiling Point (°C)</u>				
	40	1		ESD 94
	60	3		ESD 94
	80	9		ESD 94
	100	18		ESD 94
	120	29		ESD 94
	140	36		ESD 94
	160	44		ESD 94
	180	51		ESD 94
	200	57		ESD 94
	250	71		ESD 94
	300	85		ESD 94
	350	94		ESD 94
	400	98		ESD 94
	450	99		ESD 94

		Data	Notes	Reference ID
Metals (ppm)				
	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	< 0.6		Cao 92
	Nickel	< 1		Cao 92
	Titanium	< 0.6		Cao 92
	Vanadium	< 0.6		Cao 92
	Zinc	< 0.6		Cao 92

Pennington

	Data	Notes	Reference ID
Origin: Nigeria			
Data from OGJ 99 were originally published in 1983 as part of a series entitled "Guide to Export Crudes for the '80s".			
API Gravity	36.6		OGJ 99
Sulphur (weight %)	0.07		OGJ 99
Reid Vapour Pressure (kPa)	35		OGJ 99
Pour Point (°C)	6		OGJ 99
Kinematic Viscosity (mm²/s or cSt)			
	<u>Temperature (°C)</u>		
	40	3	OGJ 99
Yield on Crude (volume %)			
	<u>Boiling Range (°C)</u>		
	C1-C4	2	OGJ 99
	Light naphtha (C5-93)	7	OGJ 99
	Heavy naphtha (93-171)	15	OGJ 99
	Kerosene (171-243)	18	OGJ 99
	Gas oil (243-343)	32	OGJ 99
	Vacuum gas oil (343-538)	23	OGJ 99
	Residue (>343)	27	OGJ 99
Metals (ppm)			
	Nickel	1	OGJ 99
	Vanadium	2	OGJ 99

		Data	Notes	Reference ID
Synonyms: Ligroin				
Density (g/mL)				
	<u>Temperature (°C)</u>			
	0	0.6547		EETD 86
	15	0.6404		EETD 86
Dynamic Viscosity (mPa·s or cP)				
	<u>Temperature (°C)</u>			
	0	0		EETD 86
	15	0		EETD 86
Surface Tension (mN/m or dynes/cm)				
	<u>Temperature (°C)</u>			
	0	18.2		EETD 86
	15	17.5		EETD 86
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)				
	<u>Temperature (°C)</u>			
	0	44.8		EETD 86
	15	43.8		EETD 86
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)				
	<u>Temperature (°C)</u>			
	0	45.5		EETD 86
	15	44.4		EETD 86

Pitas Point

		Data	Notes	Reference ID
Origin: California, USA				
API Gravity		38.0		ESD 91
Equation(s) for Predicting Evaporation				
%Ev = (7.04 + 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		0.61		ESD 93
24		0.76		ESD 93
Water Content (weight %)				
<u>Evaporation (volume %)</u>				
0		< 0.1		ESD 98
24		< 0.1		ESD 98
Flash Point (°C)				
<u>Evaporation (volume %)</u>				
0		17		ESD 91
24		46		ESD 92
Reid Vapour Pressure (kPa)				
		7		ESD 91
Density (g/mL)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	0.8443		ESD 91
	15	0.8341		ESD 91
24	0	0.8646		ESD 91
	15	0.8537		ESD 91
47	0	0.8791		ESD 91
	15	0.8688		ESD 91
Pour Point (°C)				
<u>Evaporation (volume %)</u>				
0		< -60		ESD 91
24		< -65		ESD 91
47		< -51		ESD 91
Dynamic Viscosity (mPa·s or cP)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	3		ESD 91
	15	2		ESD 91
24	0	3		ESD 91
	15	2		ESD 91
47	0	6		ESD 91
	15	4		ESD 91

		Data	Notes	Reference ID
Emulsion Formation				
<u>Evaporation (volume %)</u>				
0	Visual stability	none		ESD 98
24		none		ESD 98
Chemical Dispersibility (volume %)				
<u>Evaporation (volume %)</u>				
0	Corexit 9500	65		ESD 95
	Corexit 9527	42		ESD 96
	Dasic LTS	55		ESD 96
	Enersperse 700	66		ESD 96
24	Corexit 9500	66		ESD 96
	Corexit 9527	38		ESD 96
	Dasic LTS	50		ESD 96
	Enersperse 700	59		ESD 96
Hydrocarbon Groups (weight %)				
<u>Evaporation (volume %)</u>				
0	Saturates	80		ESD 96
	Aromatics	18		ESD 96
	Resins	3		ESD 96
	Asphaltenes	0		ESD 91
	Waxes	0		ESD 91
24	Saturates	62		ESD 96
	Aromatics	35		ESD 96
	Resins	2		ESD 96
	Asphaltenes	0		ESD 96
	Waxes	7		ESD 98
Adhesion (g/m²)				
<u>Evaporation (volume %)</u>				
0		2	<i>SD = 3</i>	ESD 96
24		4	<i>SD = 0</i>	ESD 96

Pitas Point

		Data	Notes	Reference ID
Volatile Organic Compounds (ppm)				
<u>Evaporation (volume %)</u>				
0	Benzene	210		ESD 94
	Toluene	1,090		ESD 94
	Ethylbenzene	2,970		ESD 94
	Xylenes	6,230		ESD 94
	C3-benzenes	15,400		ESD 94
	Total BTEX	10,500		ESD 94
	Total VOCs	25,900		ESD 94
24	Benzene	90		ESD 94
	Toluene	330		ESD 94
	Ethylbenzene	1,090		ESD 94
	Xylenes	3,030		ESD 94
	C3-benzenes	12,090		ESD 94
	Total BTEX	4,550		ESD 94
	Total VOCs	16,640		ESD 94
Surface Tension (mN/m or dynes/cm)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	25.9		ESD 91
	15	26.3		ESD 91
24	0	27.5		ESD 91
	15	27.1		ESD 91
47	0	24.5		ESD 91
	15	26.4		ESD 91
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	2.0		ESD 91
	15	7.3		ESD 91
24	0	3.4		ESD 91
	15	8.9		ESD 91
47	0	4.2		ESD 91
	15	3.7		ESD 91
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	7.6		ESD 91
	15	10.5		ESD 91
24	0	7.4		ESD 91
	15	10.4		ESD 91
47	0	7.5		ESD 91
	15	8.3		ESD 91

		Data	Notes	Reference ID
Boiling Point Distribution (weight %)				
<u>Evaporation (volume %)</u>	<u>Boiling Point (°C)</u>			
0	40	1		ESD 94
	60	1		ESD 94
	80	2		ESD 94
	100	3		ESD 94
	120	7		ESD 94
	140	20		ESD 94
	160	31		ESD 94
	180	44		ESD 94
	200	54		ESD 94
	250	76		ESD 94
	300	88		ESD 94
	350	95		ESD 94
	400	98		ESD 94
	450	99		ESD 94
24	100	1		ESD 96
	120	1		ESD 96
	140	7		ESD 96
	160	15		ESD 96
	180	28		ESD 96
	200	40		ESD 96
	250	68		ESD 96
	300	84		ESD 96
	350	94		ESD 96
	400	97		ESD 96
	450	99		ESD 96

Pitas Point

		Data	Notes	Reference ID
Metals (ppm)				
<u>Evaporation (volume %)</u>				
0	Barium	0.6		Cao 92
	Chromium	< 2		Cao 92
	Copper	< 0.6		Cao 92
	Iron	10		Cao 92
	Lead	< 3		Cao 92
	Magnesium	< 1		Cao 92
	Molybdenum	< 0.6		Cao 92
	Nickel	< 1		Cao 92
	Titanium	0.6		Cao 92
	Vanadium	< 0.6		Cao 92
	Zinc	3		Cao 92
24	Barium	0.8		Cao 92
	Chromium	< 2		Cao 92
	Copper	< 0.6		Cao 92
	Iron	13		Cao 92
	Lead	< 3		Cao 92
	Magnesium	< 1		Cao 92
	Molybdenum	< 0.6		Cao 92
	Nickel	< 1		Cao 92
	Titanium	1		Cao 92
	Vanadium	< 0.6		Cao 92
	Zinc	4		Cao 92
Aqueous Solubility (mg/L)				
	Room temperature	27	(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
Origin: California, USA				
API Gravity		20.6		ESD 99
Equation(s) for Predicting Evaporation				
%Ev = (1.68 + 0.045T)ln(t)				ESD 99
Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)				
Sulphur (weight %)				
<u>Evaporation (weight %)</u>				
0		4.08		ESD 99
7		4.27		ESD 99
13		4.42		ESD 99
21		4.56		ESD 99
Water Content (weight %)				
<u>Evaporation (weight %)</u>				
0		1.3		ESD 99
7		0.3		ESD 99
13		0.1		ESD 99
21		< 0.1		ESD 99
Flash Point (°C)				
<u>Evaporation (weight %)</u>				
0		-25		ESD 99
7		32		ESD 99
13		73		ESD 99
21		> 100		ESD 99
Density (g/mL)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	0.9404		ESD 99
	15	0.9297		ESD 99
	25	0.9224		ESD 99
7	0	0.9600		ESD 99
	15	0.9489		ESD 99
	25	0.9422		ESD 99
13	0	0.9760		ESD 99
	15	0.9645		ESD 99
	25	0.9585		ESD 99
21	0	0.9920		ESD 99
	15	0.9810		ESD 99
	25	0.9752		ESD 99

Platform Gail

		Data	Notes	Reference ID
Pour Point (°C)				
<u>Evaporation (weight %)</u>				
0		-20		ESD 99
7		-12		ESD 99
13		-1		ESD 99
21		13		ESD 99
Dynamic Viscosity (mPa s or cP)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	1,393		ESD 99
	15	406		ESD 99
	25	196		ESD 99
7	0	6,622		ESD 99
	15	1,450		ESD 99
	25	604		ESD 99
13	0	53,015		ESD 99
	15	7,092		ESD 99
	25	2,723		ESD 99
21	0	NM		ESD 99
	15	161,500		ESD 99
	25	36,340		ESD 99
Emulsion Formation				
<u>Evaporation (weight%)</u>				
0	Visual stability	stable		ESD 99
	Viscosity (mPa·s)	35,820		ESD 99
	Complex modulus (mPa)	120,000		ESD 99
	Water content (wt %)	76		ESD 99
7	Visual stability	stable		ESD 99
	Viscosity (mPa·s)	69,520		ESD 99
	Complex modulus (mPa)	202,500		ESD 99
	Water content (wt %)	75		ESD 99
13	Visual stability	stable		ESD 99
	Viscosity (mPa·s)	112,800		ESD 99
	Complex modulus (mPa)	337,500		ESD 99
	Water content (wt %)	67		ESD 99
21	Visual stability	entrained		ESD 99
	Viscosity (mPa·s)	398,200		ESD 99
	Complex modulus (mPa)	1,210,000		ESD 99
	Water content (wt %)	44		ESD 99

		Data	Notes	Reference ID
Chemical Dispersibility (volume %)				
<u>Evaporation (weight %)</u>				
0	Corexit 9500	22		ESD 99
7		4		ESD 99
13		0		ESD 99
21		0		ESD 99
Hydrocarbon Groups (weight %)				
<u>Evaporation (weight %)</u>				
0	Saturates	39		ESD 00
	Aromatics	28		ESD 00
	Resins	21		ESD 00
	Asphaltenes	12		ESD 00
7	Saturates	35		ESD 00
	Aromatics	31		ESD 00
	Resins	21		ESD 00
	Asphaltenes	13		ESD 00
13	Saturates	32		ESD 00
	Aromatics	28		ESD 00
	Resins	25		ESD 00
	Asphaltenes	15		ESD 00
21	Saturates	27		ESD 00
	Aromatics	29		ESD 00
	Resins	25		ESD 00
	Asphaltenes	19		ESD 00
Adhesion (g/m²)				
<u>Evaporation (weight %)</u>				
0		65	<i>SD = 4</i>	ESD 00
7		69	<i>SD = 2</i>	ESD 00
13		82	<i>SD = 11</i>	ESD 00
21		280	<i>SD = 24</i>	ESD 00

Platform Gail

		Data	Notes	Reference ID
Volatile Organic Compounds (ppm)				
<u>Evaporation (weight %)</u>				
0	Benzene	685		ESD 99
	Toluene	1,364		ESD 99
	Ethylbenzene	957		ESD 99
	Xylenes	3,546		ESD 99
	C3-benzenes	4,883		ESD 99
	Total BTEX	6,552		ESD 99
	Total VOCs	11,435		ESD 99
7	Benzene	316		ESD 99
	Toluene	1,074		ESD 99
	Ethylbenzene	1,052		ESD 99
	Xylenes	4,177		ESD 99
	C3-benzenes	6,051		ESD 99
	Total BTEX	6,619		ESD 99
	Total VOCs	12,670		ESD 99
13	Benzene	7		ESD 99
	Toluene	83		ESD 99
	Ethylbenzene	320		ESD 99
	Xylenes	1,614		ESD 99
	C3-benzenes	4,367		ESD 99
	Total BTEX	2,024		ESD 99
	Total VOCs	6,391		ESD 99
21	Benzene	6		ESD 99
	Toluene	1		ESD 99
	Ethylbenzene	0		ESD 99
	Xylenes	1		ESD 99
	C3-benzenes	48		ESD 99
	Total BTEX	8		ESD 99
	Total VOCs	57		ESD 99

		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	27.8		ESD 00
	25	27.7		ESD 00
7	0	30.0		ESD 00
	15	29.0		ESD 00
	25	28.9		ESD 00
13	0	NM		ESD 00
	15	30.5		ESD 00
	25	29.4		ESD 00
21	0	NM		ESD 00
	15	NM		ESD 00
	25	NM		ESD 00
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	NM		ESD 00
	15	NM		ESD 00
	25	7.5		ESD 00
7	0	NM		ESD 00
	15	NM		ESD 00
	25	NM		ESD 00
13	0	NM		ESD 00
	15	NM		ESD 00
	25	NM		ESD 00
21	0	NM		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	NM		ESD 00
	15	NM		ESD 00
	25	9.3		ESD 00
7	0	NM		ESD 00
	15	NM		ESD 00
	25	NM		ESD 00
13	0	NM		ESD 00
	15	NM		ESD 00
	25	NM		ESD 00
21	0	NM		ESD 00
	15	NM		ESD 00
	25	NM		ESD 00

Platform Holly

		Data	Notes	Reference ID
Origin: California, USA				
The sample received contained over 75% water. This led to inconsistent rates of evaporation using the standard rotary evaporation method.				
API Gravity				
<u>Evaporation (weight %)</u>				
		11.0		ESD 97
Equation(s) for Predicting Evaporation				
%Ev = (1.09 + 0.045T)ln(t)				ESD 97
Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)				
Sulphur (weight %)				
<u>Evaporation (weight %)</u>				
0		1.43		ESD 97
24		1.87		ESD 97
54		1.98		ESD 97
78		2.23		ESD 97
Water Content				
<u>Evaporation (weight %)</u>				
0		76.0		ESD 97
24		62.0		ESD 97
54		50.0		ESD 97
78		26.0		ESD 97
Flash Point (°C)				
<u>Evaporation (weight %)</u>				
0		11		ESD 97
24		> 95		ESD 97
54		> 95		ESD 97
78		> 95		ESD 97
Density (g/mL)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	0.9994		ESD 97
	15	0.9928		ESD 97
	25	0.9976	(a)	ESD 98
24	0	1.0039		ESD 97
	15	1.0003		ESD 97
	25	0.9974	(a)	ESD 98
54	0	1.0111		ESD 97
	15	1.0066		ESD 97
	25	1.0030	(a)	ESD 98
78	0	1.0809		ESD 97
	15	1.0705		ESD 97
	25	1.0607	(a)	ESD 98

(a) water in sample; unstable density reading

		Data	Notes	Reference ID
Pour Point (°C)				
<u>Evaporation (weight %)</u>				
0		-9		ESD 97
24		12		ESD 97
54		23		ESD 97
Dynamic Viscosity (mPa s or cP)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	18,610		ESD 97
	15	3,314		ESD 97
	25	61	(c)	ESD 98
24	0	5,979	(a)	ESD 97
		601,200	(b)	ESD 97
	15	4,068	(a)	ESD 97
		150,200	(b)	ESD 97
	25	483	(c)	ESD 98
54	0	NM		ESD 97
	15	399,700	(b)	ESD 97
	25	68,870		ESD 98
78	0	NM		ESD 97
	15	304,550	(b)	ESD 97
	25	224,900	(b)	ESD 98
<i>Shear rate = (a) 10/s; (b) 1/s</i>				
<i>(c) water visible in sample; extremely non-newtonian</i>				
Emulsion Formation				
<u>Evaporation (weight%)</u>				
0	Visual stability	same		ESD 98
	Viscosity (mPa·s)	150,000		ESD 98
	Complex modulus (mPa)	440,000		ESD 98
	Water content (wt %)	77		ESD 98
24	Visual stability	same		ESD 98
	Viscosity (mPa·s)	360,000		ESD 98
	Complex modulus (mPa)	1,600,000		ESD 98
	Water content (wt %)	60		ESD 98
54	Visual stability	same		ESD 98
	Viscosity (mPa·s)	670,000		ESD 98
	Complex modulus (mPa)	3,300,000		ESD 98
	Water content (wt %)	49		ESD 98
78	Visual stability	same		ESD 98
	Viscosity (mPa·s)	800,000		ESD 98
	Complex modulus (mPa)	3,300,000		ESD 98
	Water content (wt %)	34		ESD 98

Platform Holly

		Data	Notes	Reference ID
Hydrocarbon Groups (weight %)				
<u>Evaporation (weight %)</u>				
0	Saturates	54	(a)	ESD 98
	Aromatics	14	(a)	ESD 98
	Resins	15	(a)	ESD 98
	Asphaltenes	17	(a)	ESD 98
24	Saturates	29	(b)	ESD 98
	Aromatics	30	(b)	ESD 98
	Resins	19	(b)	ESD 98
	Asphaltenes	24	(b)	ESD 98
54	Saturates	36	(c)	ESD 98
	Aromatics	25	(c)	ESD 98
	Resins	17	(c)	ESD 98
	Asphaltenes	22	(c)	ESD 98
78	Saturates	19	(d)	ESD 98
	Aromatics	26	(d)	ESD 98
	Resins	19	(d)	ESD 98
	Asphaltenes	36	(d)	ESD 98
<i>Corrected for water content of (a) 75.73%; (b) 61.66%; (c) 50.09%; (d) 25.50%</i>				
Adhesion (g/m²)				
<u>Evaporation (weight %)</u>				
0		61	<i>SD = 6</i>	ESD 97
24		564	<i>SD = 85</i>	ESD 97
54		889	<i>SD = 73</i>	ESD 97
78		938	<i>SD = 83</i>	ESD 97

		Data	Notes	Reference ID
Volatile Organic Compounds (ppm)				
<u>Evaporation (weight %)</u>				
0	Benzene	346		ESD 97
	Toluene	1,158		ESD 97
	Ethylbenzene	272		ESD 97
	Xylenes	948		ESD 97
	C3-benzenes	1,308		ESD 97
	Total BTEX	2,724		ESD 97
	Total VOCs	4,031		ESD 97
24	Benzene	0		ESD 97
	Toluene	2		ESD 97
	Ethylbenzene	1		ESD 97
	Xylenes	3		ESD 97
	C3-benzenes	27		ESD 97
	Total BTEX	5		ESD 97
	Total VOCs	32		ESD 97
54	Benzene	0		ESD 97
	Toluene	0		ESD 97
	Ethylbenzene	0		ESD 97
	Xylenes	3		ESD 97
	C3-benzenes	3		ESD 97
	Total BTEX	4		ESD 97
	Total VOCs	7		ESD 97
78	Benzene	0		ESD 97
	Toluene	0		ESD 97
	Ethylbenzene	1		ESD 97
	Xylenes	3		ESD 97
	C3-benzenes	1		ESD 97
	Total BTEX	4		ESD 97
	Total VOCs	5		ESD 97

Platform Holly

		Data	Notes	Reference ID
Surface Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	42.8		ESD 97
	15	29.1		ESD 97
24	0	NM		ESD 97
	15	NM		ESD 97
	25	NM		ESD 98
54	0	NM		ESD 97
	15	NM		ESD 97
	25	NM		ESD 98
78	0	NM		ESD 97
	15	NM		ESD 97
	25	NM		ESD 98
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	NM		ESD 97
	15	32.0		ESD 97
24	0	NM		ESD 97
	15	NM		ESD 97
	25	NM		ESD 98
54	0	NM		ESD 97
	15	NM		ESD 97
	25	NM		ESD 98
78	0	NM		ESD 97
	15	NM		ESD 97
	25	NM		ESD 98
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	NM		ESD 97
	15	NM		ESD 97
24	0	NM		ESD 97
	15	NM		ESD 97
	25	NM		ESD 98
54	0	NM		ESD 97
	15	NM		ESD 97
	25	NM		ESD 98
78	0	NM		ESD 97
	15	NM		ESD 97
	25	NM		ESD 98

		Data	Notes	Reference ID
Origin: California, USA				
API Gravity		11.2		ESD 91
Equation(s) for Predicting Evaporation				
Short term (<5 days): %Ev = $(-0.05 + 0.013T)\sqrt{t}$				ESD 97
Long term: %Ev = $(0.74 + 0.045T)\ln(t)$				
Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)				
Sulphur (weight %)		1.40		ESD 93
Water Content		57.3		ESD 98
Flash Point (°C)		-2		ESD 91
Density (g/mL)				
	Temperature (°C)			
	0	0.9968		ESD 91
	15	0.9907		ESD 91
Pour Point (°C)		12		ESD 91
Dynamic Viscosity (mPa·s or cP)				
	Temperature (°C)			
	0	63,180	(a)	ESD 91
	15	76,000		ESD 91
(a) shear rate = 10/s				
Emulsion Formation				
	Visual stability	entrained		ESD 98
	Viscosity (mPa·s)	390,000		ESD 98
	Complex modulus (mPa)	1,400,000		ESD 98
	Water content (wt %)	62		ESD 98
Hydrocarbon Groups (weight %)				
Corrected for initial water content of oil.				
	Saturates	26		ESD 96
	Aromatics	29		ESD 96
	Resins	22		ESD 96
	Asphaltenes	22		ESD 96
	Waxes	2		ESD 91
Adhesion (g/m²)		1,342	SD = 196	ESD 96

Platform Irene

	Data	Notes	Reference ID
Volatile Organic Compounds (ppm)			
Benzene	130		ESD 94
Toluene	560		ESD 94
Ethylbenzene	350		ESD 94
Xylenes	870		ESD 94
C3-benzenes	1,600		ESD 94
Total BTEX	1,900		ESD 94
Total VOCs	3,510		ESD 94
Surface Tension (mN/m or dynes/cm)			
<u>Temperature (°C)</u>			
0	NM		ESD 91
15	37.2		ESD 91
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)			
<u>Temperature (°C)</u>			
0	NM		ESD 91
15	NM		ESD 91
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)			
<u>Temperature (°C)</u>			
0	NM		ESD 91
15	NM		ESD 91
Metals (ppm)			
Aluminum	14		Cao 92
Barium	54		Cao 92
Cadmium	< 0.5		Cao 92
Calcium	291		Cao 92
Chromium	2		Cao 92
Cobalt	< 1		Cao 92
Copper	0.8		Cao 92
Iron	44		Cao 92
Lead	< 3		Cao 92
Magnesium	237		Cao 92
Manganese	0.6		Cao 92
Mercury	< 15		Cao 92
Molybdenum	< 0.6		Cao 92
Nickel	61		Cao 92
Selenium	< 15		Cao 92
Strontium	10		Cao 92
Tin	< 15		Cao 92
Titanium	1		Cao 92
Vanadium	238		Cao 92
Zinc	5		Cao 92

		Data	Notes	Reference ID
Aqueous Solubility (mg/L)				
	Room temperature	11	(a)	ESD 91
(a) fresh water				

Point Arguello Comingled

		Data	Notes	Reference ID
Origin: California, USA				
API Gravity		21.4		ESD 93
Equation(s) for Predicting Evaporation				
%Ev = (1.43 + 0.045T)ln(t)				ESD 96
Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)				
Sulphur (weight %)				
Evaporation (weight %)				
0		3.64		ESD 97
9		3.64		ESD 97
16		3.81		ESD 97
22		4.09		ESD 97
Water Content (weight %)				
Evaporation (weight %)				
0		1.2		ESD 98
9		< 0.1		ESD 98
15		< 0.1		ESD 98
22		< 0.1		ESD 98
Flash Point (°C)				
Evaporation (weight %)				
0		-5		ESD 93
9		44		ESD 95
15		83		ESD 95
22		> 95		ESD 95
Density (g/mL)				
Evaporation (weight %)	Temperature (°C)			
0	0	0.9363		ESD 93
	15	0.9248		ESD 93
9	0	0.9635		ESD 95
	15	0.9528		ESD 95
15	0	0.9783		ESD 95
	15	0.9688		ESD 95
22	0	0.9958	(a)	ESD 94
	15	0.9853	(a)	ESD 94

(a) The oil solidifies in the density meter tube. Cracks form in the solidified oil allowing air pockets. This produces a less accurate measurement.

		Data	Notes	Reference ID
Pour Point (°C)				
<u>Evaporation (weight %)</u>				
0		-12		ESD 93
9		-7		ESD 95
15		7		ESD 95
22		28		ESD 95
Dynamic Viscosity (mPa·s or cP)				
<u>Evaporation (weight %)</u>		<u>Temperature (°C)</u>		
0	0	2,510		ESD 93
	15	533		ESD 93
9	0	31,420		ESD 95
	15	4,988		ESD 95
15	0	487,200		ESD 95
	15	41,860		ESD 95
22	0	NM		ESD 94
	15	2,266,000		ESD 94
Emulsion Formation				
<u>Evaporation (weight%)</u>				
0	Visual stability	stable		ESD 98
	Viscosity (mPa·s)	180,000		ESD 98
	Complex modulus (mPa)	780,000		ESD 98
	Water content (wt %)	82		ESD 98
9	Visual stability	stable		ESD 98
	Viscosity (mPa·s)	150,000		ESD 98
	Complex modulus (mPa)	850,000		ESD 98
	Water content (wt %)	68		ESD 98
15	Visual stability	entrained		ESD 98
	Viscosity (mPa·s)	140,000		ESD 98
	Complex modulus (mPa)	610,000		ESD 98
	Water content (wt %)	30		ESD 98
22	Visual stability	none		ESD 98
	Water content (wt %)	5		ESD 98

Point Arguello Comingled

		Data	Notes	Reference ID
Chemical Dispersibility (volume %)				
<u>Evaporation (weight %)</u>				
0	Corexit 9500	3		ESD 96
	Corexit 9527	0		ESD 96
	Dasic LTS	0		ESD 99
	Enersperse 700	0		ESD 96
9	Corexit 9500	0	(a)	ESD 98
	Corexit 9527	0	(a)	ESD 98
	Dasic LTS	0	(a)	ESD 98
	Enersperse 700	0	(a)	ESD 98
15	Corexit 9500	0	(a)	ESD 98
	Corexit 9527	0	(a)	ESD 98
	Dasic LTS	0	(a)	ESD 98
	Enersperse 700	0	(a)	ESD 98
22	Corexit 9500	0	(a)	ESD 98
	Corexit 9527	0	(a)	ESD 98
	Dasic LTS	0	(a)	ESD 98
	Enersperse 700	0	(a)	ESD 98

(a) visual

Hydrocarbon Groups (weight %)

Evaporation (weight %)

0	Saturates	36		ESD 96
	Aromatics	25		ESD 96
	Resins	23		ESD 96
	Asphaltenes	16		ESD 94
	Waxes	8		ESD 94
9	Saturates	31		ESD 96
	Aromatics	33		ESD 96
	Resins	19		ESD 96
	Asphaltenes	17		ESD 96
	Waxes	4		ESD 98
15	Saturates	27		ESD 96
	Aromatics	33		ESD 96
	Resins	21		ESD 96
	Asphaltenes	19		ESD 96
	Waxes	4		ESD 98
22	Saturates	24		ESD 96
	Aromatics	33		ESD 96
	Resins	21		ESD 96
	Asphaltenes	22		ESD 96
	Waxes	5		ESD 98

		Data	Notes	Reference ID
Adhesion (g/m²)				
<u>Evaporation (weight %)</u>				
0		81	<i>SD = 20</i>	ESD 95
9		104	<i>SD = 12</i>	ESD 95
15		187	<i>SD = 26</i>	ESD 95
22		1,137	<i>SD = 2</i>	ESD 95
Volatile Organic Compounds (ppm)				
<u>Evaporation (weight %)</u>				
0	Benzene	250		ESD 94
	Toluene	850		ESD 94
	Ethylbenzene	950		ESD 94
	Xylenes	2,610		ESD 94
	C3-benzenes	4,770		ESD 94
	Total BTEX	4,670		ESD 94
	Total VOCs	9,450		ESD 94
9	Benzene	0		ESD 96
	Toluene	960		ESD 96
	Ethylbenzene	740		ESD 96
	Xylenes	2,080		ESD 96
	C3-benzenes	3,880		ESD 96
	Total BTEX	3,790		ESD 96
	Total VOCs	7,670		ESD 96
15	Benzene	0		ESD 96
	Toluene	30		ESD 96
	Ethylbenzene	130		ESD 96
	Xylenes	490		ESD 96
	C3-benzenes	2,090		ESD 96
	Total BTEX	660		ESD 96
	Total VOCs	2,750		ESD 96
22	Benzene	0		ESD 96
	Toluene	10		ESD 96
	Ethylbenzene	0		ESD 96
	Xylenes	0		ESD 96
	C3-benzenes	0		ESD 96
	Total BTEX	10		ESD 96
	Total VOCs	10		ESD 96

Point Arguello Comingled

		Data	Notes	Reference ID
Surface Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	29.8		ESD 94
	15	27.5		ESD 94
9	0	NM		ESD 95
	15	30.2		ESD 95
15	0	NM		ESD 95
	15	NM		ESD 95
22	0	DNF		ESD 95
	15	DNF		ESD 95
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	NM		ESD 94
	15	28.2		ESD 94
9	0	NM		ESD 95
	15	NM		ESD 95
15	0	NM		ESD 95
	15	NM		ESD 95
22	0	DNF		ESD 95
	15	DNF		ESD 95
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	NM		ESD 94
	15	26.3		ESD 94
9	0	NM		ESD 95
	15	NM		ESD 95
15	0	NM		ESD 95
	15	NM		ESD 95
22	0	DNF		ESD 95
	15	DNF		ESD 95

		Data	Notes	Reference ID
Boiling Point Distribution (weight %)				
<u>Evaporation (weight %)</u>	<u>Boiling Point (°C)</u>			
0	80	2		ESD 94
	100	5		ESD 94
	120	6		ESD 94
	140	8		ESD 94
	160	10		ESD 94
	180	12		ESD 94
	200	14		ESD 94
	250	20		ESD 94
	300	25		ESD 94
	350	32		ESD 94
	400	37		ESD 94
	450	44		ESD 94
	500	50		ESD 94
	550	57		ESD 94
	600	64		ESD 94
	650	70		ESD 94
	700	76		ESD 94
9	100	1		ESD 95
	120	2		ESD 95
	140	3		ESD 95
	160	5		ESD 95
	180	7		ESD 95
	200	10		ESD 95
	250	16		ESD 95
	300	23		ESD 95
	350	30		ESD 95
	400	37		ESD 95
	450	45		ESD 95
	500	52		ESD 95
	550	60		ESD 95
	600	68		ESD 95
15	650	75		ESD 95
	700	81		ESD 95
	160	1		ESD 95
	180	2		ESD 95
	200	4		ESD 95
	250	11		ESD 95
	300	18		ESD 95
	350	26		ESD 95
	400	34		ESD 95
	450	42		ESD 95

Point Arguello Comingled

		Data	Notes	Reference ID
Boiling Point Distribution (weight %)				
<u>Evaporation (weight %)</u>	<u>Boiling Point (°C)</u>			
15	500	51		ESD 95
	550	59		ESD 95
	600	68		ESD 95
	650	75		ESD 95
	700	82		ESD 95
22	250	4		ESD 95
	300	11		ESD 95
	350	20		ESD 95
	400	28		ESD 95
	450	37		ESD 95
	500	46		ESD 95
	550	55		ESD 95
	600	64		ESD 95
	650	72		ESD 95
	700	80		ESD 95

		Data	Notes	Reference ID
Origin: California, USA				
API Gravity		18.2		ESD 93
Equation(s) for Predicting Evaporation				
%Ev = (0.94 + 0.045T)ln(t)				ESD 97
Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)				
Sulphur (weight %)				
<u>Evaporation (weight %)</u>				
0		3.44		ESD 97
9		3.93		ESD 97
18		4.22		ESD 97
Water Content (weight %)				
<u>Evaporation (weight %)</u>				
0		0.1		ESD 98
9		< 0.1		ESD 98
18		< 0.1		ESD 98
Flash Point (°C)				
<u>Evaporation (weight %)</u>				
0		0		ESD 94
9		72		ESD 95
18		> 95		ESD 95
Density (g/mL)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	0.9558		ESD 93
	15	0.9447		ESD 93
9	0	0.9815		ESD 95
	15	0.9706		ESD 95
18	0	1.0020		ESD 94
	15	0.9914		ESD 94
Pour Point (°C)				
<u>Evaporation (weight %)</u>				
0		-4		ESD 93
9		6		ESD 95
18		30		ESD 95

Point Arguello Heavy

		Data	Notes	Reference ID
Dynamic Viscosity (mPa·s or cP)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	19,400		ESD 93
	15	3,250		ESD 93
9	0	850,400		ESD 95
	15	59,390		ESD 95
18	0	NM		ESD 94
	15	4,953,000		ESD 94
Emulsion Formation				
<u>Evaporation (weight%)</u>				
0	Visual stability	stable		ESD 98
	Viscosity (mPa·s)	150,000		ESD 98
	Complex modulus (mPa)	490,000		ESD 98
	Water content (wt %)	73		ESD 98
9	Visual stability	entrained		ESD 98
	Water content (wt %)	28		ESD 98
18	Visual stability	none		ESD 98
Chemical Dispersibility (volume %)				
<u>Evaporation (weight %)</u>				
0	Corexit 9500	0		ESD 98
	Corexit 9527	0		ESD 93
	Dasic LTS	0		ESD 93
	Enersperse 700	0		ESD 93
9	Corexit 9500	0	(a)	ESD 98
	Corexit 9527	0	(a)	ESD 98
	Dasic LTS	0	(a)	ESD 98
	Enersperse 700	0	(a)	ESD 98
18	Corexit 9500	0	(a)	ESD 98
	Corexit 9527	0	(a)	ESD 98
	Dasic LTS	0	(a)	ESD 98
	Enersperse 700	0	(a)	ESD 98

(a) visual

		Data	Notes	Reference ID
Hydrocarbon Groups (weight %)				
<u>Evaporation (weight %)</u>				
0	Saturates	32		ESD 96
	Aromatics	32		ESD 96
	Resins	17		ESD 96
	Asphaltenes	19		ESD 96
	Waxes	6		ESD 94
9	Saturates	26		ESD 96
	Aromatics	35		ESD 96
	Resins	18		ESD 96
	Asphaltenes	20		ESD 96
	Waxes	4		ESD 98
18	Saturates	25		ESD 96
	Aromatics	34		ESD 96
	Resins	21		ESD 96
	Asphaltenes	22		ESD 96
	Waxes	4		ESD 98
Adhesion (g/m²)				
<u>Evaporation (weight %)</u>				
0		155	<i>SD = 12</i>	ESD 95
9		276	<i>SD = 26</i>	ESD 95
18		1,231	<i>SD = 119</i>	ESD 95

Point Arguello Heavy

		Data	Notes	Reference ID
Volatile Organic Compounds (ppm)				
Evaporation (weight %)				
0	Benzene	250		ESD 94
	Toluene	960		ESD 94
	Ethylbenzene	810		ESD 94
	Xylenes	2,340		ESD 94
	C3-benzenes	4,260		ESD 94
	Total BTEX	4,370		ESD 94
	Total VOCs	8,630		ESD 94
9	Benzene	0		ESD 96
	Toluene	180		ESD 96
	Ethylbenzene	320		ESD 96
	Xylenes	930		ESD 96
	C3-benzenes	2,710		ESD 96
	Total BTEX	1,430		ESD 96
	Total VOCs	4,140		ESD 96
18	Benzene	0		ESD 96
	Toluene	10		ESD 96
	Ethylbenzene	0		ESD 96
	Xylenes	0		ESD 96
	C3-benzenes	0		ESD 96
	Total BTEX	10		ESD 96
	Total VOCs	10		ESD 96
Surface Tension (mN/m or dynes/cm)				
Evaporation (weight %)		Temperature (°C)		
0	0	NM		ESD 94
	15	23.8		ESD 94
9	0	DNF		ESD 95
	15	NM		ESD 95
18	0	DNF		ESD 95
	15	DNF		ESD 95
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)				
Evaporation (weight %)		Temperature (°C)		
0	0	NM		ESD 94
	15	28.4		ESD 94
9	0	DNF		ESD 95
	15	NM		ESD 95
18	0	DNF		ESD 95
	15	DNF		ESD 95

		Data	Notes	Reference ID
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	NM		ESD 94
	15	30.5		ESD 94
9	0	DNF		ESD 95
	15	NM		ESD 95
18	0	DNF		ESD 95
	15	DNF		ESD 95

Point Arguello Heavy

		Data	Notes	Reference ID
Boiling Point Distribution (weight %)				
<u>Evaporation (weight %)</u>	<u>Boiling Point (°C)</u>			
0	100	2		ESD 94
	120	4		ESD 94
	140	6		ESD 94
	160	8		ESD 94
	180	9		ESD 94
	200	11		ESD 94
	250	17		ESD 94
	300	23		ESD 94
	350	29		ESD 94
	400	35		ESD 94
	450	41		ESD 94
	500	48		ESD 94
	550	55		ESD 94
	600	62		ESD 94
	650	69		ESD 94
	700	75		ESD 94
9	140	1		ESD 96
	160	2		ESD 96
	180	3		ESD 96
	200	5		ESD 96
	250	12		ESD 96
	300	19		ESD 96
	350	27		ESD 96
	400	35		ESD 96
	450	44		ESD 96
	500	52		ESD 96
	550	59		ESD 96
	600	67		ESD 96
	650	74		ESD 96
18	700	81		ESD 96
	250	3		ESD 96
	300	10		ESD 96
	350	19		ESD 96
	400	28		ESD 96
	450	37		ESD 96
	500	46		ESD 96
	550	55		ESD 96
	600	63		ESD 96
	650	71		ESD 96
	700	78		ESD 96

		Data	Notes	Reference ID
Origin: California, USA				
API Gravity		30.3		ESD 93
Equation(s) for Predicting Evaporation				
%Ev = (2.37 + 0.045T)ln(t)				ESD 97
Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)				
Sulphur (weight %)				
Evaporation (weight %)				
0		1.10		ESD 97
10		1.18		ESD 97
19		1.26		ESD 97
28		1.44		ESD 97
Water Content (weight %)				
Evaporation (weight %)				
0		< 0.1		ESD 98
10		< 0.1		ESD 98
19		< 0.1		ESD 98
28		< 0.1		ESD 98
Flash Point (°C)				
Evaporation (weight %)				
0		-6		ESD 94
10		49		ESD 95
19		87		ESD 95
28		> 95		ESD 95
Density (g/mL)				
Evaporation (weight %)	Temperature (°C)			
0	0	0.8860		ESD 93
	15	0.8739		ESD 93
10	0	0.9095		ESD 95
	15	0.8979		ESD 95
19	0	0.9249		ESD 95
	15	0.9132		ESD 95
28	0	0.9410		ESD 94
	15	0.9289		ESD 94
Pour Point (°C)				
Evaporation (weight %)				
0		-22		ESD 93
10		-12		ESD 95
19		-12		ESD 95
28		8		ESD 95

Point Arguello Light

		Data	Notes	Reference ID
Dynamic Viscosity (mPa·s or cP)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	70		ESD 93
	15	22		ESD 93
10	0	149		ESD 95
	15	76		ESD 95
19	0	543		ESD 95
	15	183		ESD 95
28	0	4,804	(a)	ESD 94
		14,170	(b)	ESD 94
		116,700	(c)	ESD 94
	15	671		ESD 94

Shear rate = (a) 100/s; (b) 10/s; (c) 1/s

Emulsion Formation

<u>Evaporation (weight%)</u>			
0	Visual stability	stable	ESD 98
	Viscosity (mPa·s)	67,000	ESD 98
	Complex modulus (mPa)	650,000	ESD 98
	Water content (wt %)	93	ESD 98
10	Visual stability	stable	ESD 98
	Viscosity (mPa·s)	280,000	ESD 98
	Complex modulus (mPa)	3,300,000	ESD 98
	Water content (wt %)	89	ESD 98
19	Visual stability	stable	ESD 98
	Viscosity (mPa·s)	270,000	ESD 98
	Complex modulus (mPa)	3,400,000	ESD 98
	Water content (wt %)	86	ESD 98
28	Visual stability	stable	ESD 98
	Viscosity (mPa·s)	140,000	ESD 98
	Complex modulus (mPa)	980,000	ESD 98
	Water content (wt %)	80	ESD 98

Chemical Dispersibility (volume %)

<u>Evaporation (weight %)</u>			
0	Corexit 9500	13	ESD 98
	Corexit 9527	10	ESD 97
	Dasic LTS	3	ESD 97
	Enersperse 700	6	ESD 97
10	Corexit 9500	20	ESD 98
19		13	ESD 98
28		4	ESD 98

		Data	Notes	Reference ID
Hydrocarbon Groups (weight %)				
<u>Evaporation (weight %)</u>				
0	Saturates	57		ESD 95
	Aromatics	27		ESD 95
	Resins	9		ESD 95
	Asphaltenes	7		ESD 97
	Waxes	6		ESD 98
10	Saturates	54		ESD 96
	Aromatics	30		ESD 96
	Resins	9		ESD 96
	Asphaltenes	8		ESD 96
	Waxes	6		ESD 98
19	Saturates	48		ESD 96
	Aromatics	31		ESD 96
	Resins	12		ESD 96
	Asphaltenes	9		ESD 96
	Waxes	7		ESD 98
28	Saturates	45		ESD 96
	Aromatics	32		ESD 96
	Resins	12		ESD 96
	Asphaltenes	11		ESD 96
	Waxes	8		ESD 98
Adhesion (g/m²)				
<u>Evaporation (weight %)</u>				
0		29	<i>SD = 2</i>	ESD 95
10		40	<i>SD = 2</i>	ESD 95
19		46	<i>SD = 1</i>	ESD 95
28		47	<i>SD = 5</i>	ESD 95

Point Arguello Light

		Data	Notes	Reference ID
Volatile Organic Compounds (ppm)				
<u>Evaporation (weight %)</u>				
0	Benzene	220		ESD 94
	Toluene	1,120		ESD 94
	Ethylbenzene	1,030		ESD 94
	Xylenes	2,990		ESD 94
	C3-benzenes	6,430		ESD 94
	Total BTEX	5,360		ESD 94
	Total VOCs	11,790		ESD 94
10	Benzene	0		ESD 96
	Toluene	910		ESD 96
	Ethylbenzene	930		ESD 96
	Xylenes	2,600		ESD 96
	C3-benzenes	6,340		ESD 96
	Total BTEX	4,450		ESD 96
	Total VOCs	10,790		ESD 96
19	Benzene	0		ESD 96
	Toluene	10		ESD 96
	Ethylbenzene	50		ESD 96
	Xylenes	230		ESD 96
	C3-benzenes	2,480		ESD 96
	Total BTEX	290		ESD 96
	Total VOCs	2,770		ESD 96
28	Benzene	0		ESD 96
	Toluene	10		ESD 96
	Ethylbenzene	0		ESD 96
	Xylenes	0		ESD 96
	C3-benzenes	0		ESD 96
	Total BTEX	10		ESD 96
	Total VOCs	10		ESD 96
Surface Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	28.0		ESD 94
	15	27.1		ESD 94
10	0	29.8		ESD 95
	15	28.9		ESD 95
19	0	45.7		ESD 95
	15	29.9		ESD 95
28	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	24.9		ESD 94
	15	24.0		ESD 94
10	0	21.1		ESD 95
	15	25.8		ESD 95
19	0	NM		ESD 95
	15	25.5		ESD 95
28	0	DNF		ESD 95
	15	NM		ESD 95
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	24.6		ESD 94
	15	27.0		ESD 94
10	0	23.9		ESD 95
	15	25.4		ESD 95
19	0	NM		ESD 95
	15	24.6		ESD 95
28	0	DNF		ESD 95
	15	NM		ESD 95

Point Arguello Light

		Data	Notes	Reference ID
Boiling Point Distribution (weight %)				
<u>Evaporation (weight %)</u>	<u>Boiling Point (°C)</u>			
0	40	1		ESD 94
	60	2		ESD 94
	80	3		ESD 94
	100	6		ESD 94
	120	9		ESD 94
	140	12		ESD 94
	160	15		ESD 94
	180	19		ESD 94
	200	22		ESD 94
	250	31		ESD 94
	300	40		ESD 94
	350	49		ESD 94
	400	58		ESD 94
	450	67		ESD 94
	500	74		ESD 94
	550	81		ESD 94
	600	87		ESD 94
	650	91		ESD 94
	700	94		ESD 94
10	120	2		ESD 95
	140	4		ESD 95
	160	7		ESD 95
	180	11		ESD 95
	200	14		ESD 95
	250	25		ESD 95
	300	35		ESD 95
	350	47		ESD 95
	400	57		ESD 95
	450	67		ESD 95
	500	76		ESD 95
	550	84		ESD 95
19	600	90		ESD 95
	650	94		ESD 95
	700	98		ESD 95
	160	1		ESD 95
	180	3		ESD 95
	200	6		ESD 95
	250	17		ESD 95
	300	28		ESD 95
	350	41		ESD 95
	400	52		ESD 95

		Data	Notes	Reference ID
Boiling Point Distribution (weight %)				
<u>Evaporation (weight %)</u>	<u>Boiling Point (°C)</u>			
19	450	63		ESD 95
	500	73		ESD 95
	550	82		ESD 95
	600	88		ESD 95
	650	93		ESD 95
	700	97		ESD 95
28	250	6		ESD 95
	300	17		ESD 95
	350	31		ESD 95
	400	43		ESD 95
	450	55		ESD 95
	500	66		ESD 95
	550	75		ESD 95
	600	82		ESD 95
	650	88		ESD 95
	700	92		ESD 95

Port Hueneme

		Data	Notes	Reference ID
Origin: California, USA				
API Gravity		14.8		ESD 91
Equation(s) for Predicting Evaporation				
%Ev = (0.30 + 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		3.73		ESD 93
4		3.69		ESD 93
8		3.63		ESD 93
Water Content (weight %)				
<u>Evaporation (volume %)</u>				
0		0.9		ESD 98
4		0.1		ESD 98
8		< 0.1		ESD 98
Flash Point (°C)				
<u>Evaporation (volume %)</u>				
0		-11		ESD 91
4		> 90		ESD 92
8		> 90		ESD 92
Reid Vapour Pressure (kPa)				
		9		ESD 91
Density (g/mL)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	0.9756		ESD 91
	15	0.9662		ESD 91
4	0	0.9843		ESD 91
	15	0.9745		ESD 91
8	0	0.9888		ESD 91
	15	0.9787		ESD 91
Pour Point (°C)				
<u>Evaporation (volume %)</u>				
0		-9		ESD 91
4		-9		ESD 91
8		0		ESD 91

		Data	Notes	Reference ID
Dynamic Viscosity (mPa·s or cP)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	22,510		ESD 91
	15	4,131		ESD 91
4	0	54,160		ESD 91
	15	7,833		ESD 91
8	0	157,800		ESD 91
	15	20,990		ESD 91
Emulsion Formation				
<u>Evaporation (volume %)</u>				
0	Visual stability	entrained		ESD 98
	Viscosity (mPa·s)	16,000		ESD 98
	Complex modulus (mPa)	64,000		ESD 98
	Water content (wt %)	38		ESD 98
4	Visual stability	entrained		ESD 98
	Viscosity (mPa·s)	46,000		ESD 98
	Complex modulus (mPa)	170,000		ESD 98
	Water content (wt %)	45		ESD 98
8	Visual stability	entrained		ESD 98
	Viscosity (mPa·s)	71,000		ESD 98
	Complex modulus (mPa)	270,000		ESD 98
	Water content (wt %)	43		ESD 98
Chemical Dispersibility (volume %)				
<u>Evaporation (volume %)</u>				
0	Corexit 9500	12		ESD 98
	Corexit 9527	0		ESD 91
	Dasic LTS	0		ESD 91
	Enersperse 700	0		ESD 91
4	Corexit 9500	5		ESD 98
	Corexit 9527	0		ESD 97
	Dasic LTS	0		ESD 97
	Enersperse 700	0		ESD 97
8	Corexit 9500	0		ESD 97
	Corexit 9527	0		ESD 97
	Dasic LTS	0		ESD 97
	Enersperse 700	7		ESD 97

Port Hueneme

		Data	Notes	Reference ID
Hydrocarbon Groups (weight %)				
<u>Evaporation (volume %)</u>				
0	Saturates	24		ESD 96
	Aromatics	43		ESD 96
	Resins	20		ESD 96
	Asphaltenes	12		ESD 91
	Waxes	5		ESD 91
4	Saturates	23		ESD 96
	Aromatics	41		ESD 96
	Resins	21		ESD 96
	Asphaltenes	14		ESD 96
	Waxes	3		ESD 98
8	Saturates	23		ESD 96
	Aromatics	28		ESD 96
	Resins	37		ESD 96
	Asphaltenes	13		ESD 96
	Waxes	3		ESD 98
Adhesion (g/m²)				
<u>Evaporation (volume %)</u>				
0		67	<i>SD = 10</i>	ESD 96
4		91	<i>SD = 10</i>	ESD 96
8		124	<i>SD = 15</i>	ESD 96

		Data	Notes	Reference ID
Volatile Organic Compounds (ppm)				
<u>Evaporation (volume %)</u>				
0	Benzene	0		ESD 94
	Toluene	50		ESD 94
	Ethylbenzene	140		ESD 94
	Xylenes	90		ESD 94
	C3-benzenes	660		ESD 94
	Total BTEX	280		ESD 94
	Total VOCs	950		ESD 94
4	Benzene	0		ESD 94
	Toluene	0		ESD 94
	Ethylbenzene	50		ESD 94
	Xylenes	50		ESD 94
	C3-benzenes	360		ESD 94
	Total BTEX	100		ESD 94
	Total VOCs	460		ESD 94
8	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	32.6	ESD 91
		15	30.8	ESD 91
4		0	NM	ESD 91
		15	30.0	ESD 91
8		0	NM	ESD 91
		15	31.1	ESD 91
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (volume %)</u>		<u>Temperature (°C)</u>		
0		0	30.8	ESD 91
		15	23.2	ESD 91
4		0	NM	ESD 91
		15	28.4	ESD 91
8		0	NM	ESD 91
		15	28.6	ESD 91

Port Hueneme

		Data	Notes	Reference ID
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	35.6		ESD 91
	15	30.2		ESD 91
4	0	NM		ESD 91
	15	30.1		ESD 91
8	0	NM		ESD 91
	15	32.6		ESD 91

		Data	Notes	Reference ID
Boiling Point Distribution (weight %)				
<u>Evaporation (volume %)</u>	<u>Boiling Point (°C)</u>			
0	40	1		ESD 94
	60	1		ESD 94
	80	1		ESD 94
	100	1		ESD 94
	120	2		ESD 94
	140	2		ESD 94
	160	3		ESD 94
	180	4		ESD 94
	200	5		ESD 94
	250	11		ESD 94
	300	17		ESD 94
	350	25		ESD 94
	400	33		ESD 94
	450	42		ESD 94
	500	51		ESD 94
	550	61		ESD 94
	600	70		ESD 94
	650	78		ESD 94
	700	84		ESD 94
4	160	1		ESD 96
	180	1		ESD 96
	200	3		ESD 96
	250	8		ESD 96
	300	15		ESD 96
	350	23		ESD 96
	400	32		ESD 96
	450	42		ESD 96
	500	51		ESD 96
	550	60		ESD 96
	600	69		ESD 96
	650	76		ESD 96
8	700	82		ESD 96
	200	1		ESD 96
	250	6		ESD 96
	300	12		ESD 96
	350	21		ESD 96
	400	30		ESD 96
	450	40		ESD 96
	500	50		ESD 96
	550	59		ESD 96
	600	68		ESD 96

Port Hueneme

		Data	Notes	Reference ID
Boiling Point Distribution (weight %)				
<u>Evaporation (volume %)</u>	<u>Boiling Point (°C)</u>			
8	650	75		ESD 96
	700	82		ESD 96

		Data	Notes	Reference ID
Metals (ppm)				
<u>Evaporation (volume %)</u>				
0	Aluminum	7		Cao 92
	Barium	< 0.3		Cao 92
	Cadmium	< 0.5		Cao 92
	Calcium	49		Cao 92
	Chromium	< 2		Cao 92
	Cobalt	< 1		Cao 92
	Copper	< 0.6		Cao 92
	Iron	16		Cao 92
	Lead	< 3		Cao 92
	Magnesium	3		Cao 92
	Manganese	< 0.3		Cao 92
	Mercury	< 15		Cao 92
	Molybdenum	0.6		Cao 92
	Nickel	68		Cao 92
	Selenium	< 15		Cao 92
	Strontium	0.6		Cao 92
	Tin	< 15		Cao 92
	Titanium	0.6		Cao 92
	Vanadium	253		Cao 92
	Zinc	0.6		Cao 92
4	Barium	0.7		Cao 92
	Chromium	< 2		Cao 92
	Copper	< 0.6		Cao 92
	Iron	20		Cao 92
	Lead	< 3		Cao 92
	Magnesium	20		Cao 92
	Molybdenum	2		Cao 92
	Nickel	79		Cao 92
	Titanium	1		Cao 92
	Vanadium	288		Cao 92
8	Zinc	0.6		Cao 92
	Barium	< 0.3		Cao 92
	Chromium	< 2		Cao 92
	Copper	< 0.6		Cao 92
	Iron	16		Cao 92
	Lead	< 3		Cao 92
	Magnesium	3		Cao 92
	Molybdenum	0.6		Cao 92
	Nickel	73		Cao 92
	Titanium	0.6		Cao 92
	Vanadium	260		Cao 92

Port Hueneme

		Data	Notes	Reference ID
Metals (ppm)				
<u>Evaporation (volume %)</u>				
8	Zinc	0.4		Cao 92
Aqueous Solubility (mg/L)				
	Room temperature	3	(a)	ESD 91
<i>(a) fresh water</i>				
Acute Toxicity of Water Soluble Fraction (mg/L)				
<u>Test Organism</u>				
48h LC50	Daphnia magna	> 1	(a)	Harris 94
<i>(a) results based on GC purge-and-trap analysis</i>				

Propylene Tetramer

	Data	Notes	Reference ID
Evaporative loss of 83 wt% was produced by 28 hours of rotary evaporation, not the standard 48 hours.			ESD 94

API Gravity

51.1 ESD 93

Equation(s) for Predicting Evaporation

%Ev = (0.25)(t) (at 15 °C)
Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)

ESD 97

Sulphur (weight %)

Evaporation (weight %)

0	0.00	ESD 94
83	0.03	ESD 94

Flash Point (°C)

Evaporation (weight %)

0	54	ESD 93
83	73	ESD 94

Density (g/mL)

Evaporation (weight %)

Temperature (°C)

0	0	0.7858	ESD 93
	15	0.7746	ESD 93
83	0	0.7960	ESD 94
	15	0.7850	ESD 94

Pour Point (°C)

Evaporation (weight %)

0	< -60	ESD 93
83	< -60	ESD 94

Dynamic Viscosity (mPa·s or cP)

Evaporation (weight %)

Temperature (°C)

0	0	2	ESD 93
	15	2	ESD 93
83	0	2	ESD 94
	15	2	ESD 94

Propylene Tetramer

		Data	Notes	Reference ID
Hydrocarbon Groups (weight %)				
<u>Evaporation (weight %)</u>				
0	Saturates	97		ESD 96
	Aromatics	2		ESD 96
	Resins	1		ESD 96
	Asphaltenes	0		ESD 96
	Waxes	0		ESD 96
83	Saturates	98		ESD 96
	Aromatics	1		ESD 96
	Resins	1		ESD 96
	Asphaltenes	0		ESD 96
	Waxes	0		ESD 98
Adhesion (g/m²)				
<u>Evaporation (weight %)</u>				
0		1	<i>SD = 1</i>	ESD 95
83		2	<i>SD = 3</i>	ESD 96
Volatile Organic Compounds (ppm)				
<u>Evaporation (weight %)</u>				
0	Benzene	0		ESD 94
	Toluene	0		ESD 94
	Ethylbenzene	0		ESD 94
	Xylenes	0		ESD 94
	C3-benzenes	50		ESD 94
	Total BTEX	0		ESD 94
	Total VOCs	50		ESD 94
83	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 (weight %)</u>		<u>Temperature (°C)</u>		
0		0	25.2	ESD 94
		15	24.4	ESD 94
83		0	25.9	ESD 94
		15	24.3	ESD 94

Propylene Tetramer

		Data	Notes	Reference ID
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	34.8		ESD 94
	15	32.1		ESD 94
83	0	20.7		ESD 94
	15	22.3		ESD 94
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	37.4		ESD 94
	15	39.0		ESD 94
83	0	22.1		ESD 94
	15	23.6		ESD 94
Boiling Point Distribution (weight %)				
<u>Evaporation (weight %)</u>	<u>Boiling Point (°C)</u>			
0	160	2		ESD 94
	180	12		ESD 94
	200	51		ESD 94
	220	91		ESD 94
	240	98		ESD 94
83	200	22		ESD 95
	250	98		ESD 95
Acute Toxicity of Water Soluble Fraction (mg/L)				
	<u>Test Organism</u>			
48h LC50	Daphnia magna	> 0.9	(a)	Harris 94
<i>(a) results based on GC headspace analysis</i>				

Prudhoe Bay

	Data	Notes	Reference ID
Origin: Alaska, USA			
API Gravity	24.8		Mackay 82a
Equation(s) for Predicting Evaporation			
%Ev = (1.69 + 0.045T)ln(t) Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)			ESD 96
Density (g/mL)			
	<u>Temperature (°C)</u>		
	0	0.9150	Mackay 82a
	5	0.9110	Mackay 82a
	10	0.9100	Mackay 82a
	15	0.9050	Mackay 82a
	20	0.9020	Mackay 82a
	25	0.9000	Mackay 82a
Pour Point (°C)			
	0		Mackay 82a
Dynamic Viscosity (mPa·s or cP)			
	<u>Temperature (°C)</u>		
	0	577	Mackay 82a
	5	196	Mackay 82a
	10	103	Mackay 82a
	15	68	Mackay 82a
	20	46	Mackay 82a
	25	35	Mackay 82a
Chemical Dispersibility (volume %)			
	Corexit 9500	10	ESD 95
Hydrocarbon Groups (weight %)			
	<u>Evaporation (weight %)</u>		
	Saturates	87	Mackay 82a
		78	EETD 86
	Aromatics	10	Mackay 82a
		18	EETD 86
	Resins	2	Mackay 82a
		3	EETD 86
	Asphaltenes	2	Mackay 82a
		2	EETD 86
	Waxes	4	Mackay 82a

	Data	Notes	Reference ID
Volatile Organic Compounds (ppm)			
Benzene	990		ESD 94
Toluene	3,790		ESD 94
Ethylbenzene	910		ESD 94
Xylenes	4,230		ESD 94
C3-benzenes	4,700		ESD 94
Total BTEX	9,920		ESD 94
Total VOCs	14,620		ESD 94
Surface Tension (mN/m or dynes/cm)			
<u>Temperature (°C)</u>			
0	30.4		EETD 85
15	28.3		EETD 85
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)			
<u>Temperature (°C)</u>			
0	15.0		EETD 85
15	9.7		EETD 85
20	14.8		Mackay 82a
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)			
<u>Temperature (°C)</u>			
0	17.6		EETD 85
15	16.9		EETD 85
Boiling Point Distribution (weight %)			
<u>Boiling Point (°C)</u>			
40	1		ESD 94
60	1		ESD 94
80	2		ESD 94
100	4		ESD 94
120	6		ESD 94
140	9		ESD 94
160	11		ESD 94
180	14		ESD 94
200	16		ESD 94
250	24		ESD 94
300	33		ESD 94
350	43		ESD 94
400	52		ESD 94
450	62		ESD 94
500	69		ESD 94
550	76		ESD 94
600	82		ESD 94
650	87		ESD 94
700	90		ESD 94

Prudhoe Bay

		Data	Notes	Reference ID
Aqueous Solubility (mg/L)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
	22	26	(a)	Suntio 86
		21	(b)	Suntio 86
	Room temperature	29	(c)	Bobra 83
10		5	(c)	Bobra 83
18		0.2	(c)	Bobra 83
24		> 0.1	(c)	Bobra 83
<i>(a) fresh water; (b) salt water; (c) distilled water</i>				
Acute Toxicity of Water Soluble Fraction (mg/L)				
	<u>Test Organism</u>			
48h LC50	Daphnia magna	9		Bobra 83
		4	(a)	Bobra 83
		0.2	(b)	Bobra 83
		0.1	(c)	Bobra 83
96h LC50	Arctic char	2	(d)	Moles 79
	Arctic grayling	2	(d)	Moles 79
	Chinook salmon	1	(d)	Moles 79
	Coho salmon	1	(d)	Moles 79
	Dolly varden	1	(d)	Moles 79
	Slimy sculpin	3	(d)	Moles 79
	Sockeye salmon	2	(d)	Moles 79
	3-spine stickleback	7	(d)	Moles 79
<i>Oil evaporated (a) 10 wt %; (b) 18 wt %; (c) 24 wt % (d) fresh water</i>				

		Data	Notes	Reference ID
Origin: Alaska, USA				
Sample received from ARCO, winter 1995.				ESD 95
API Gravity		28.5		ESD 95
Equation(s) for Predicting Evaporation				
%Ev = $(2.37 + 0.045T)\ln(t)$ Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)				ESD 96
Sulphur (weight %)				
Evaporation (weight %)				
0		0.96		ESD 98
9		1.01		ESD 98
18		1.13		ESD 98
27		1.24		ESD 98
Water Content (weight %)				
Evaporation (weight %)				
0		0.3		ESD 98
9		< 0.1		ESD 98
18		< 0.1		ESD 98
27		< 0.1		ESD 98
Flash Point (°C)				
Evaporation (weight %)				
0		-17		ESD 95
9		45		ESD 95
18		87		ESD 95
27		> 95		ESD 95
Density (g/mL)				
Evaporation (weight %)	Temperature (°C)			
0	0	0.8948		ESD 95
	15	0.8837		ESD 95
9	0	0.9163		ESD 95
	15	0.9048		ESD 95
18	0	0.9319		ESD 95
	15	0.9204		ESD 95
27	0	0.9470		ESD 95
	15	0.9352		ESD 95
Pour Point (°C)				
Evaporation (weight %)				
0		-15		ESD 95
9		-9		ESD 95
18		8		ESD 95
27		12		ESD 95

Prudhoe Bay (1995)

		Data	Notes	Reference ID
Dynamic Viscosity (mPa·s or cP)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	46		ESD 95
	15	22		ESD 95
9	0	141		ESD 95
	15	55		ESD 95
18	0	608		ESD 95
	15	148		ESD 95
27	0	4,447	(a)	ESD 95
		6,400	(b)	ESD 95
		27,440	(c)	ESD 95
	15	623		ESD 95

Shear rate = (a) 50/s; (b) 10/s; (c) 1/s

Emulsion Formation

<u>Evaporation (weight%)</u>			
0	Visual stability	meso	ESD 98
	Viscosity (mPa·s)	500	ESD 98
	Complex modulus (mPa)	6,800	ESD 98
	Water content (wt %)	43	ESD 98
9	Visual stability	stable	ESD 98
	Viscosity (mPa·s)	46,000	ESD 98
	Complex modulus (mPa)	640,000	ESD 98
	Water content (wt %)	85	ESD 98
18	Visual stability	none	ESD 98
	Water content (wt %)	5	ESD 98
27	Visual stability	meso	ESD 98
	Viscosity (mPa·s)	1,600	ESD 98
	Complex modulus (mPa)	230,000	ESD 98
	Water content (wt %)	20	ESD 98

Chemical Dispersibility (volume %)

<u>Evaporation (weight %)</u>			
0	Corexit 9500	10	ESD 95
		18	ESD 99
18		0	ESD 99
27		0	ESD 99

Prudhoe Bay (1995)

		Data	Notes	Reference ID
Hydrocarbon Groups (weight %)				
<u>Evaporation (weight %)</u>				
0	Saturates	53		ESD 96
	Aromatics	34		ESD 96
	Resins	10		ESD 96
	Asphaltenes	4		ESD 96
	Waxes	4		ESD 98
9	Saturates	51		ESD 96
	Aromatics	35		ESD 96
	Resins	10		ESD 96
	Asphaltenes	3		ESD 96
	Waxes	5		ESD 98
18	Saturates	52		ESD 96
	Aromatics	32		ESD 96
	Resins	12		ESD 96
	Asphaltenes	4		ESD 96
	Waxes	5		ESD 98
27	Saturates	43		ESD 96
	Aromatics	38		ESD 96
	Resins	15		ESD 96
	Asphaltenes	5		ESD 96
	Waxes	5		ESD 98
Adhesion (g/m²)				
<u>Evaporation (weight %)</u>				
0		28	<i>SD = 2</i>	ESD 96
9		30	<i>SD = 10</i>	ESD 96
18		24	<i>SD = 4</i>	ESD 96
27		29	<i>SD = 4</i>	ESD 96

Prudhoe Bay (1995)

		Data	Notes	Reference ID
Volatile Organic Compounds (ppm)				
<u>Evaporation (weight %)</u>				
0	Benzene	1,836		ESD 96
	Toluene	6,665		ESD 96
	Ethylbenzene	2,672		ESD 96
	Xylenes	9,536		ESD 96
	C3-benzenes	12,121		ESD 96
	Total BTEX	20,710		ESD 96
	Total VOCs	32,831		ESD 96
9	Benzene	229		ESD 96
	Toluene	2,941		ESD 96
	Ethylbenzene	1,817		ESD 96
	Xylenes	7,056		ESD 96
	C3-benzenes	10,691		ESD 96
	Total BTEX	12,043		ESD 96
	Total VOCs	22,735		ESD 96
18	Benzene	0		ESD 96
	Toluene	16		ESD 96
	Ethylbenzene	166		ESD 96
	Xylenes	1,047		ESD 96
	C3-benzenes	5,414		ESD 96
	Total BTEX	1,228		ESD 96
	Total VOCs	6,642		ESD 96
27	Benzene	0		ESD 96
	Toluene	3		ESD 96
	Ethylbenzene	1		ESD 96
	Xylenes	4		ESD 96
	C3-benzenes	8		ESD 96
	Total BTEX	9		ESD 96
	Total VOCs	17		ESD 96

Surface Tension (mN/m or dynes/cm)

<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>		
0	0	28.6	ESD 95
	15	27.6	ESD 95
9	0	29.9	ESD 95
	15	29.5	ESD 95
18	0	31.3	ESD 95
	15	30.2	ESD 95
27	0	51.9	ESD 95
	15	30.9	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	13.5		ESD 95
	15	3.9		ESD 95
9	0	16.9		ESD 95
	15	11.5		ESD 95
18	0	22.4		ESD 95
	15	14.2		ESD 95
27	0	NM		ESD 95
	15	15.5		ESD 95
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	17.6		ESD 95
	15	4.2		ESD 95
9	0	19.5		ESD 95
	15	15.5		ESD 95
18	0	24.2		ESD 95
	15	16.5		ESD 95
27	0	NM		ESD 95
	15	16.5		ESD 95

Prudhoe Bay (1995)

		Data	Notes	Reference ID
Boiling Point Distribution (weight %)				
<u>Evaporation (weight %)</u>	<u>Boiling Point (°C)</u>			
0	40	1		ESD 96
	60	1		ESD 96
	80	3		ESD 96
	100	6		ESD 96
	120	9		ESD 96
	140	12		ESD 96
	160	15		ESD 96
	180	19		ESD 96
	200	22		ESD 96
	250	32		ESD 96
	300	42		ESD 96
	350	53		ESD 96
	400	62		ESD 96
	450	72		ESD 96
	500	79		ESD 96
	550	86		ESD 96
	600	91		ESD 96
	650	96		ESD 96
	700	99		ESD 96
9	100	1		ESD 96
	120	2		ESD 96
	140	5		ESD 96
	160	8		ESD 96
	180	11		ESD 96
	200	15		ESD 96
	250	25		ESD 96
	300	36		ESD 96
	350	48		ESD 96
	400	58		ESD 96
	450	69		ESD 96
	500	77		ESD 96
	550	84		ESD 96
	600	90		ESD 96
	650	95		ESD 96
18	700	99		ESD 96
	160	1		ESD 96
	180	3		ESD 96
	200	6		ESD 96
	250	17		ESD 96
	300	29		ESD 96
	350	42		ESD 96

		Data	Notes	Reference ID
Boiling Point Distribution (weight %)				
<u>Evaporation (weight %)</u>	<u>Boiling Point (°C)</u>			
18	400	54		ESD 96
	450	65		ESD 96
	500	75		ESD 96
	550	82		ESD 96
	600	89		ESD 96
	650	94		ESD 96
	700	98		ESD 96
27	250	7		ESD 96
	300	19		ESD 96
	350	34		ESD 96
	400	47		ESD 96
	450	60		ESD 96
	500	71		ESD 96
	550	80		ESD 96
	600	87		ESD 96
	650	93		ESD 96
	700	98		ESD 96

Pulai

	Data	Notes	Reference ID
Origin: Malaysia			
Data from OGJ 99 were originally published in 1983 as part of a series entitled "Guide to Export Crudes for the '80s".			
API Gravity	42.5		OGJ 99
Sulphur (weight %)	0.02		OGJ 99
Reid Vapour Pressure (kPa)	19		OGJ 99
Pour Point (°C)	-5		OGJ 99
Kinematic Viscosity (mm²/s or cSt)			
	<u>Temperature (°C)</u>		
	21	2	OGJ 99
Hydrocarbon Groups (weight %)			
	Asphaltenes	0	OGJ 99
	Waxes	3	OGJ 99
Yield on Crude (volume %)			
	<u>Boiling Range (°C)</u>		
	C1-C4	1	OGJ 99
	Light naphtha (C5-63)	2	OGJ 99
	Heavy naphtha (63-166)	28	OGJ 99
	Kerosene (166-232)	28	OGJ 99
	Light distillate (232-343)	34	OGJ 99
	Residue (>343)	8	OGJ 99
Metals (ppm)			
	Nickel	0.1	OGJ 99
	Vanadium	1	OGJ 99
Other Elements (weight %)			
	Nitrogen	0.00	OGJ 99