Reference: THUND22B
Crude: Thunder Horse

ExxonMobil

Crude Summary Report

General Information	
Reference:	THUND22B
Name:	Thunder Horse
Origin:	Gulf of Mexico
Assay Date:	4/28/2022
Comments:	

Molecules (%wt on crude)	
methane + ethane	0.02
propane	0.40
isobutane	0.26
n-butane	1.06
isopentane	0.81
n-pentane	1.26
cyclopentane	0.13
C6 paraffins	2.34
C6 naphthenes	0.90
benzene	0.15
C7 paraffins	2.25
C7 naphthenes	1.50
toluene	0.41

Whole Crude Properties	
Density @ 15°C (g/cc)	0.8497
API Gravity	**35.0**
Total Sulfur (% wt)	0.70
Pour Point (°C)	-26
Viscosity @ 20°C (cSt)	9.6
Viscosity @ 40°C (cSt)	5.0
Nickel (ppm)	9.0
Vanadium (ppm)	7.8
Total Nitrogen (ppm)	1220
Total Acid Number (mgKOH/g)	0.07
Mercaptan Sulfur (ppm)	7.3
Hydrogen Sulfide (ppm)	0.0
Reid Vapor Pressure (kPa)	48.7

Cut Data		Atmospheric Cuts									Vacuum Cuts			
Start (°C)	IBP	C5	65	100	150	200	250	300	350	370	370	450	500	550
End (°C)	FBP	65	100	150	200	250	300	350	370	FBP	450	500	550	FBP
Yield (% wt)		4.0	5.2	8.7	8.5	8.4	8.8	8.8	3.5	42.7	13.1	7.3	6.0	16.3
Yield (% vol)		5.3	6.1	9.8	9.2	8.8	8.9	8.6	3.3	37.9	12.3	6.6	5.5	13.5
Cumulative Yield (% wt)		1.4	5.5	10.6	19.3	27.8	36.3	45.1	53.8	57.3	57.3	70.4	77.6	83.7
Volume Average B.P. (°C)	318	41.3	83	125	175	225	275	325	360	523	409	474	524	650
Density @ 15°C (g/cc)	0.8497	0.6456	0.7166	0.7531	0.7868	0.8131	0.8423	0.8617	0.8811	0.9557	0.9032	0.9306	0.9383	1.0227
API Gravity	35.0	87.7	65.9	56.4	48.3	42.5	36.4	32.6	29.0	16.5	25.1	20.5	19.2	6.8
UOPK	12.01			11.88	11.82	11.86	11.81	11.89	11.85	11.79	11.85	11.86	12.02	11.57
Molecular Weight (g/mol)				110	138	172	209	255	289	519	343	437	556	974
Total Sulfur (% wt)	0.7	0.000	0.001	0.005	0.026	0.091	0.305	0.59	0.75	1.37	0.89	1.04	1.23	1.96
Mercaptan Sulfur (ppm)	7.3	0.0	0.0	1.1	8.6	7.5	2.9							
Total Nitrogen (ppm)	1220					14	34	166	440	2777	1046	1553	1938	5015
Basic Nitrogen (ppm)	333					9	27	73	143	746	293	479	555	1297
Total Acid Number (mgKOH/g)	0.07	0.00	0.00	0.01	0.03	0.06	0.10	0.14	0.14	0.07	0.12	0.09	0.09	0.03
Viscosity @ 20°C (cSt)	9.63				1.26									
Viscosity @ 40°C (cSt)	5.01				0.98	1.54	2.81	6.07	11.8					
Viscosity @ 50°C (cSt)	3.85					1.34	2.34	4.74	8.66	758	22.9	96.5	350	
Viscosity @ 60°C (cSt)										377	15.9	58.7	189	
Viscosity @ 100°C (cSt)										50.0	5.48	13.8	31.3	9071
Viscosity @ 130°C (cSt)														1069
Viscosity @ 150°C (cSt)														364
RON (Clear)		75.0	35.6	55.7	34.2									
MON (Clear)		72.8	51.7	56.4	32.5									
Paraffins (% wt)	33.1	96.2	68.7	45.4	51.5									
Naphthenes (%wt)	29.7	3.8	28.3	40.8	32.0									
Aromatics (% wt)	37.2	0.0	3.0	13.8	16.4									
Pour Point (°C)	-26					-45	-22	-2	9	39	23	38	48	73
Cloud Point (°C)						-43	-20	-1						
Freeze Point (°C)					-64	-39	-16							
Smoke Point (mm)					24	20	15							
Cetane Index (D4737A)					40	48	53	60	61					
Naphthalenes (% vol)					0.1	2.5	7.6	9.9						
Aniline Point (°C)				51.1	55.3	62.7	70.2	76.4	79.5		85.7	92.9	95.2	
Hydrogen (% wt)	13.4	16.5	15.4	14.3	14.2	13.8	13.6	13.3	13.0		12.6	12.4	12.5	
Total Wax (% wt)	10.6									8.7	15.3	12.2	8.4	2.0
C7 Asphaltenes (% wt)	1.3									3.0		0.0	0.0	7.9
Micro Carbon Residue (% wt)	3.6									8.4		0.2	1.7	21.3
Vanadium (ppm)	7.8									18.3		0.0	0.0	47.9
Nickel (ppm)	9.0									21.0		0.0	0.0	54.8
Iron (ppm)	0.8									2.0		0.0	0.0	5.1
Sodium (ppm)	3.1													
Mercury (ppb)	4.0													
Arsenic (ppb)	5													

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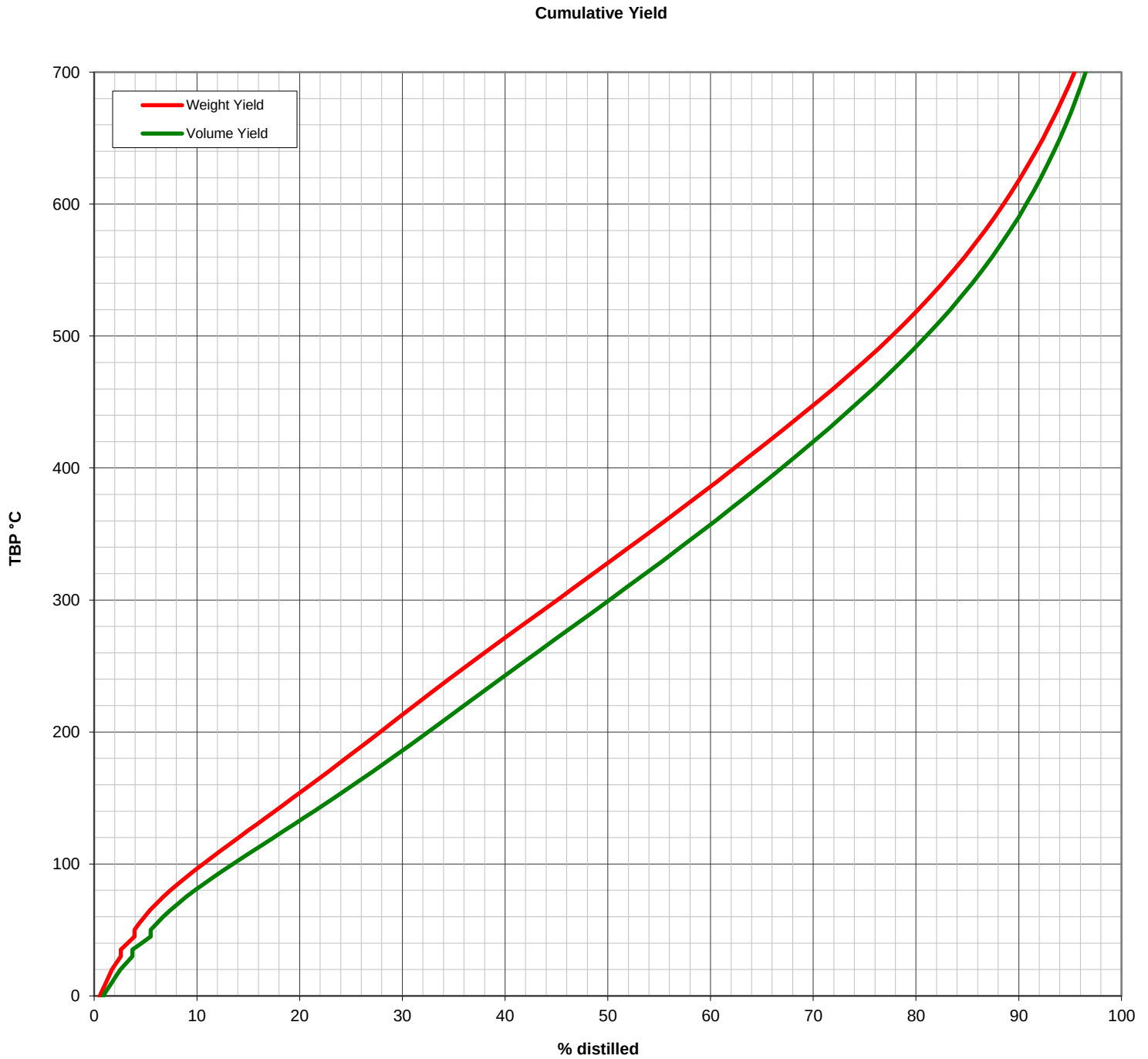
Yield Distribution



Cumulative Volume % Distilled at 10 Degree C (TBP) Intervals

	0	10	20	30	40	50	60	70	80	90
0				3.7	4.6	5.5	6.7	8.2	9.8	11.6
100	13.5	15.5	17.5	19.5	21.4	23.3	25.2	27.1	28.9	30.7
200	32.5	34.3	36.0	37.8	39.5	41.3	43.1	44.8	46.6	48.4
300	50.2	51.9	53.7	55.4	57.1	58.8	60.5	62.1	63.7	65.3
400	66.9	68.5	70.0	71.5	73.0	74.4	75.8	77.2	78.5	79.8
500	81.0	82.2	83.3	84.4	85.5	86.5	87.4	88.3	89.2	90.0