



2024 CRUDE CHARACTERISTICS

The 2024 Crude Characteristics Booklet is a summary of selected chemical and physical properties of crude oils and condensates moved in the Enbridge Pipelines Inc. (Enbridge)/Enbridge Energy Partners, L.P. system. Samples were collected over a limited period of time and may or may not be representative of shipments over the entire year.

Density at 15C, Vapour Pressure, Sulphur by Weight, Pour Point and Viscosity results at 10, 20, 30, 40 and 45C were tabulated.

The pieces of data were accumulated as follows:

- 1- Incoming streams were sampled upon first point of receipt into Enbridge custody, or injection onto Enbridge Mainline, or first comingle point.
- 2- Samples are tested at Edmonton and Superior Enbridge labs, as well as external laboratories.
- 3- All available test results for Density, Vapour Pressure, Sulphur, Pour Point and Viscosity are compiled, analyzed, and averaged to obtain Crude Characteristics results.
 - Heavy Viscosity data is compiled from samples tested during the lowest reference temperature time period.
- 4- Spot commodities are excluded from crude characteristics testing.
- 5- Vapour Pressure (1) All crude oils are reported as the VPCR4 @ 37.8oC, results are an annual average,
(2) All condensates are reported as DVPE

2024 Crude Characteristics

Product Identifier	Crude Type (Long Name)	Total Sulphur (% by wt.)	Pour Point (C)	Vapour Pressure (kPa)	Density (kg/m3)	Viscosity (cSt) at Specified Temperature (degree Celsius)				
						10.00	20.00	30.00	40.00	45.00
AHS	ALBIAN HEAVY SYNTHETIC	2.86	<-30	68	931.5	238	121	68.0	42.0	34.0
AMH	Albian Muskeg River Heavy	4.02	<-30	68.3	922.1	169	93.0	55.0	35.0	29.0
AWB	ACCESS WESTERN BLEND	4.11	<-30	69.8	919.4	292	152	87.0	54.0	43.0
BCH	BP CONVENTIONAL HEAVY BLEND	3.04	<-30	62.8	927.5	283	145	82.1	50.3	40.3
BHB	BOREALIS HEAVY BLEND	3.91	<-30	58	924.0	249	132	77.0	48.0	39.0
BR	BOW RIVER	3.98	<-30	69.4	926.0	189	104	62.0	39.0	32.0
CAL	CENTRAL ALBERTA PIPELINE	1.11	-24	92.2	840.9	10.1	7.44	5.64	4.44	3.98
CAM	AMOCO CONDENSATE	0.05	<-30	76.1	717.0	0.670	0.630	0.570	0.520	0.500
CDB	CHRISTINA LAKE DIL-BIT BLEND	4.05	<-30	66.1	921.9	297	154	88.0	54.0	44.0
CFT	FORT SASKATCHEWAN CONDENSATE	0.02	<-30	95.7	677.1	0.510	0.470	0.440	0.410	0.390
CGB	GIBSON CONDENSATE	0.08	<-30	92.5	689.3	0.660	0.600	0.550	0.500	0.480
CGL	CONDENSATE GIBSONS LIGHT	0.03	<-30	93.4	673.2	0.580	0.520	0.470	0.440	0.420
CHV	CONVENTIONAL HEAVY	3.33	<-30	65.8	925.9	235	123	74.0	46.0	37.0
CL	COLD LAKE	3.92	<-30	65.1	924.3	288	151	87.0	54.0	43.0
CNS	CNRL LIGHT SWEET SYNTHETIC BLEND	0.15	<-30	32	865.7	9.77	7.01	5.24	4.07	3.62
CNX	CANADIAN NATURAL HIGH TAN	2.64	<-30	62.6	922.0	322	167	95.0	58.0	43.0
CPM	PEMBINA CONDENSATE	0.08	<-30	61	756.6	1.35	1.17	1.02	0.910	0.860
CPR	PEACE PIPE CONDENSATE	0.10	<-30	59.5	757.5	1.50	1.30	1.14	1.02	0.960
CRL	RANGELAND CONDENSATE	0.08	<-30	81.8	710.2	0.640	0.560	0.530	0.450	0.430
CRW	CONDENSATE BLEND	0.08	<-30	67.3	743.2	1.25	1.09	0.960	0.850	0.800
CSW	CENTRAL ALBERTA SWEET	0.40	-24	86.1	824.6	5.96	4.65	3.61	2.88	2.62
F	FOSTERTON	3.66	<-30	60.3	918.7	212	114	67.0	42.0	34.0
FD	FEDERATED	0.37	<-30	85.1	816.2	4.48	3.54	2.80	2.32	2.11
FRB	FORT HILLS DILBIT	4.13	<-30	58.5	928.5	292	153	87.0	54.0	43.0
HSB	HUSKY SYNTHETIC BLEND	0.29	<-30	64.1	856.6	12.3	8.61	6.31	4.76	4.28
HSC	HARDISTY SYNTHETIC CRUDE	0.32	<-30	46.9	862.0	11.8	8.30	6.14	4.71	4.17
ISB	IMPERIAL SOUR BLEND	0.84	<-30	70.2	855.2	8.53	6.39	4.93	3.91	3.46
KDB	KEARL LAKE DILBIT	4.07	<-30	63	925.0	248	131	76.0	47.0	38.0
KSW	KINDER MORGAN SWEET	0.36	<-30	66.6	816.8	4.58	3.69	2.95	2.33	2.11
LLB	LLOYDMINSTER BLEND	3.44**	<-30**	64.3	924.2**	283**	148**	85.3**	53.8**	42.5**
LLK	LLOYDMINSTER KERROBERT	3.37	<-30	64.6	921.8	201	110	65.0	41.0	33.0
LSB	LIGHT SOUR BLEND	1.22	<-30	86.9	832.6	6.34	4.80	3.70	2.98	2.70
M	MIDALE BLEND	2.04	-12	85.6	857.8	13.3	8.34	5.85	4.52	4.05

* Results from 2023 Crude Characteristics.

** Results from 2022 Crude Characteristics.

n/a = Test was not done.

2024 Crude Characteristics

Product Identifier	Crude Type (Long Name)	Total Sulphur (% by wt.)	Pour Point (C)	Vapour Pressure (kPa)	Density (kg/m ³)	Viscosity (cSt) at Specified Temperature (degree Celsius)				
						10.00	20.00	30.00	40.00	45.00
MBL	HARDISTY LIGHT	1.94**	<-30**	75.9	846.9**	11.9**	8.67**	6.57**	5.13**	4.57**
MCG	ICG LIGHT SOUR	1.10	<-30	87.1	833.8	5.97	4.66	3.62	2.92	2.66
MGL	GIBSON LIGHT	0.48	<-30	83.5	819.1	4.79	3.81	3.04	2.49	2.28
MGS	GIBSON SOUR	1.43	<-30	85.1	846.9	7.33	5.62	4.39	3.51	3.18
MJT	MOOSE JAW TOPS	1.84	<-30	68.3	839.7	4.34	3.41	2.76	2.26	2.06
MLS	TUNDRA LIGHT SOUR	1.08	<-30	89.2	834.7	5.76	4.51	3.55	2.86	2.61
MM	MANITOBA MEDIUM	2.11	-15	87.9	861.7	11.8	8.33	6.11	4.77	4.28
MML	MANITOBA LIGHT	1.09	<-30	88.6	834.2	5.72	4.49	3.53	2.85	2.60
MPR	PEACE PIPE LIGHT	0.39	<-30	87.9	807.6	4.17	3.24	2.63	2.18	2.01
MSB	MEDIUM SOUR BLEND	1.74	-23	82.1	839.7	6.26	4.79	3.73	3.02	2.74
MSE	SECURE ENERGY LIGHT SWEET	0.29**	-10**	85.6	838.7**	10.1**	6.76**	5.04**	3.99**	3.60**
MSM	WESTSPUR MIDALE	2.10	-12	86.5	861.4	11.5	8.03	5.94	4.62	4.15
MST	MANITOBA SWEET - TUNDRA	0.47	<-30	87.4	817.5	3.65	2.95	2.43	2.04	1.88
MSY	LIGHT SMILEY	0.31**	-5**	85.3	839.1**	10.2**	6.71**	4.96**	3.97**	3.56**
NSA	PREMIUM NEWGRADE SYNTHETIC	0.07	<-30	48.9	842.0	4.80	3.75	3.01	2.48	2.26
OCC	SUNCOR-CRACKED C	3.82	<-30	13.1	929.5	26.8	16.8	11.3	8.00	6.80
OSA	SUNCOR - A	0.15	-18	27.2	862.4	8.03	5.85	4.47	3.53	3.17
OSH	SUNCOR-OSH	3.11	-20	21.7	935.8	158	78.0	43.0	26.0	21.0
OSM	SUNCOR M	0.14	<-30	15.5	856.5	5.67	4.16	3.28	2.66	2.42
OSN	SUNCOR - N	0.01	<-30	58.8	728.0	0.920	0.820	0.730	0.660	0.630
P	PEMBINA	0.34	-21	88	820.1	6.33	4.89	3.74	2.92	2.64
PAS	PREMIUM ALBIAN SYNTHETIC	0.11	<-30	24.4	867.8	9.44	6.79	5.10	3.98	3.56
PBS	PINE BEND SPECIAL	3.34	<-30	34.7	931.2	109	62.0	38.0	25.0	21.0
PCH	PREMIUM CONVENTIONAL HEAVY	3.11	<-30	64.4	927.4	298	156	89.0	55.0	44.0
PDH	LONG LAKE HEAVY DILBIT BLEND	4.33	<-30	68.1	924.6	298*	154*	87.8*	53.9*	43.3*
PSY	PREMIUM SYNTHETIC	0.15	<-30	36.6	866.9	11.4	8.01	5.92	4.55	4.04
PXB	PETROCHINA BLEND	2.61	<-30	29.5	931.5	192	102	60.0	37.0	30.0
RA	RAINBOW LIGHT	0.39	-12	82.5	827.2	5.83	4.50	3.56	2.90	2.64
RSW	RANGELAND SWEET	0.36	<-30	88.3	815.0	4.39	3.51	2.81	2.37	2.17
SC	SMILEY COLEVILLE HEAVY	3.05	<-30	47.1	927.4	243	130	75.5	47.2	38.2
SES	SOUTH EAST SASK	1.22	<-30	87.9	839.7	6.39	4.90	3.82	3.07	2.79
SH	SEAL HEAVY	5.39	<-30	57.9	929.6	241	131	77.0	49.0	40.0
SHD	SURMONT HEAVY DILBIT	4.35	<-30	66.7	923.3	252	133	77.0	48.0	39.0

* Results from 2023 Crude Characteristics.

** Results from 2022 Crude Characteristics.

n/a = Test was not done.

2024 Crude Characteristics

Product Identifier	Crude Type (Long Name)	Total Sulphur (% by wt.)	Pour Point (C)	Vapour Pressure (kPa)	Density (kg/m3)	Viscosity (cSt) at Specified Temperature (degree Celsius)				
						10.00	20.00	30.00	40.00	45.00
SLD	SOUTHERN LIGHTS DILUENT	0.01	<-30	97.7	667.1	0.550	0.500	0.460	0.400	0.390
SPR	PEACE PIPE SOUR	1.26	<-30	89	823.3	4.82	3.82	3.05	2.51	2.29
SSP	SYNCRUDE SWEET PREMIUM	0.19	<-30	42	858.8	8.55	6.23	4.73	3.71	3.31
SSX	SHELL SYNTHETIC LIGHT	0.15	<-30	45.8	857.2	16.4	11.1	7.97	5.97	5.25
SW	MIXED BLEND SWEET	0.40	-23	85.6	831.0	7.08	5.22	4.00	3.18	2.89
SYB	SYNBIT BLEND	2.63	<-30	36.4	933.9	206	109	63.0	42.0	34.0
SYN	SYNTHETIC SWEET BLEND	0.19	<-30	40.2	863.8	9.42	6.80	5.12	4.00	3.57
UHC	U.S. HIGH SWEET - CLEARBROOK	0.22	<-30	85.9	808.4	3.12	2.56	2.15	1.83	1.70
UHL	U.S. HIGH SWEET - LEWISTON	0.42*	-12**	67.3	805.0*	4.28**	3.03**	2.39**	1.95**	1.81**
WCB	WESTERN CANADIAN BLEND	2.98**	<-30**	35.6	923.5**	275**	145**	83.0**	51.4**	41.4**
WCS	WESTERN CANADIAN SELECT	3.75	<-30	69.9	925.7	291	152	87.0	54.0	43.0
WDB	WESTERN CANADA DILBIT	3.45	<-30	72.1	922.6	245	134	78.0	48.0	39.0
WH	WABASCA HVY	4.57	<-30	57	928.2	240	128	76.0	48.0	39.0

* Results from 2023 Crude Characteristics.

** Results from 2022 Crude Characteristics.

n/a = Test was not done.