

PLAINS MIDSTREAM CANADA ULC

These Crude Quality Specifications apply to the use of Plains Midstream Canada ULC's
Petroleum and Condensate Pipeline Systems.

CRUDE QUALITY SPECIFICATIONS FOR PETROLEUM

	Density (kg/m ³ @ 15°C)	Total Sulphur (mass %)	Kinematic Viscosity (mm ² /s)	Receipt Temperature (°C)		Vapour Pressure (kPa @ 37.8°C)		Salt (g/m ³)
Test Procedure ¹	ASTM D5002	ASTM D4294	ASTM D445	API 7.3		ASTM D6377		ASTM D3230
				Minimum	Maximum	May 1 to November 30	December 1 to April 30	
Condensate ²	600 – 775	≤0.5% ¹²	<2	0	40	<103	<103	<285
Light Sweet ³	800 – 876	≤0.5%	<20	0	40	<95	<95	<285
Light Sour ⁴	800 – 871	≤1.2%	<20	0	40	<95	<95	<285
Light Sour Blend ⁵	800 – 871	n/a	<20	0	40	<90	<90	<285
Medium Sour Blend ⁶	871.1 – 904	n/a	<100	0	40	<90	<90	<285
Heavy Crude ⁷	900 - 955	n/a	n/a	5	60/80 ¹⁰	<70	<76	<285
Heavy Raw Crude ⁸	940 – 1000	n/a	n/a	10	60/80 ¹⁰	<35	<35	<285
Heavy Blend Crude ⁹	<940	n/a	>100 - <350	5	60	<70	<76	<285

	Organic Halides/ Organic chlorides (ppmW, naphtha fraction)	Phosphorous (ppm)	Olefins (mass %)	Total Contaminant Content ¹¹ Maximum (vol %)	Moisture Content (vol %)	pH of contained Water	Pour Point
Test Procedure ¹	ASTM D4929	Bureau Veritas CCQTA ICP OES	HNMR	Centrifuge API 10.4 Karl Fisher API 10.9 ASTM D4928	API 10.4	Litmus Test	ASTM D5853
Condensate ²	<1	<1.5	<0.3	0.5	<0.3	>5.0	<-7°C
Light Sweet ³	<1	<1.5	<0.3	0.5	<0.3	>5.0	<-7°C
Light Sour ⁴	<1	<1.5	<0.3	0.5	<0.3	>5.0	<-7°C
Light Sour Blend ⁵	<1	<1.5	<0.3	0.5	<0.3	>5.0	<-7°C
Medium Sour Blend ⁶	<1	<1.5	<0.3	0.5	<0.3	>5.0	<-7°C
Heavy Crude ⁷	<1	<1.5	<0.3	0.5	<0.3	>5.0	<-7°C
Heavy Raw Crude ⁸	<1	n/a	<0.3	0.5	<0.3	>5.0	<-7°C
Heavy Blend Crude ⁹	<1	n/a	<0.3	0.5	<0.3	>5.0	<-7°C

Notes to Quality Specifications

1. Test procedures shall be determined based on the most recent API or ASTM standards or at the Carrier's sole discretion.
2. Applicable Streams: Rangeland/Aurora Condensate, Rainbow Condensate, Manito Condensate.
3. Applicable Streams: Rainbow Sweet, Rangeland/Aurora Sweet, Wascana Sweet.
4. Applicable Streams: Rangeland/Aurora Sour.
5. Applicable Streams: Wapella Light Sour Blend, SSPL Moose Jaw Tops.
6. Applicable Streams: Wapella Medium Sour.
7. Applicable Streams: SSPL Fosterton.
8. Applicable Streams: Rainbow Seal Heavy, Rainbow Wabasca Heavy, Manito and Cactus Lake LLK.
9. Applicable Streams: Rainbow Seal Heavy and Rainbow Wabasca Heavy.
10. The maximum receipt temperature for Heavy Crude is 60°C for LACTs, and 80°C for trucked volumes.
11. Contaminant content means all non-hydrocarbon materials, such as Basic Sediment and Water (BS&W) and other impurities.
12. H₂S in liquid phase cannot exceed 20 ppm weight based upon ASTM D5623 test method, Volatile Mercaptans (cumulative C1, C2, C3 mercaptans) cannot exceed 175 ppm weight sulphur based upon ASTM D5623 test method.