

## Machine Id **18-22 ST THOMAS** Component **Diesel Engine** Fluid **PETRO CANADA XR 4 SAE 15W40 (--- LTR)**

## RECOMMENDATION

Resample at the next service interval to monitor. Please specify the component make and model with your next sample.

WEAR	

All component wear rates are normal.

## CONTAMINATION

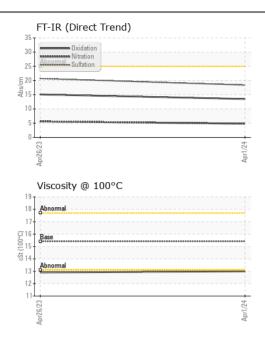
There is no indication of any contamination in the oil.

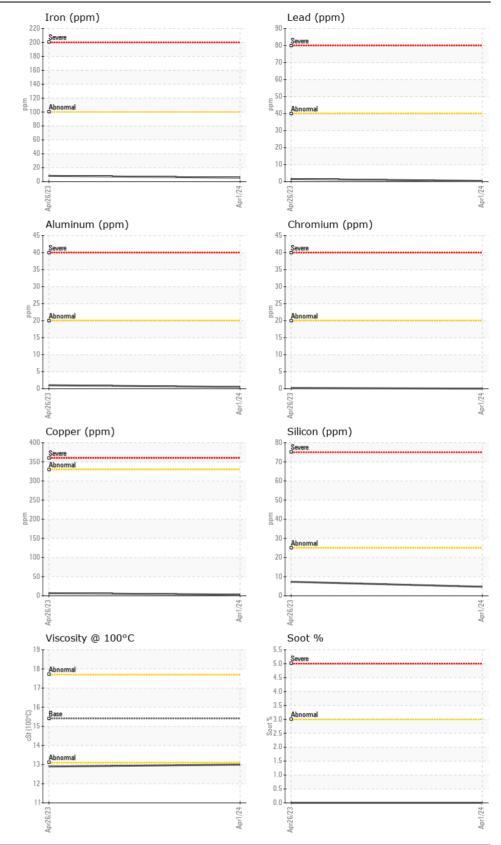
## FLUID CONDITION

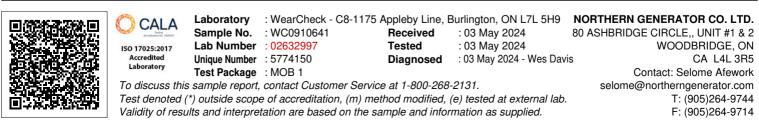
The condition of the oil is acceptable for the time in service.

TestUOMMethodLimit/MCurrentHistory1History2Sample NumberClient InfoMC0910641WC091064126 Apr 2023Machine AgehrsClient Info00Filter AgehrsClient Info00Filter AgehrsClient Info00Filter ChangedClient InfoN/AN/AFilter ChangedClient InfoN/AN/AFilter ChangedClient InfoN/AN/ASample StatusVirtualNORMALMARGINALIronpmASTILD5185m>200NickelpmASTILD5185m>200NickelpmASTILD5185m>200AluminumpmASTILD5185m>300AluminumpmASTILD5185m>337VanadiumpmASTILD5185m>337SilconpmASTILD5185m>2016FuelWC Method>557FuelWC Method>20NEGNEGSilconpmASTILD5185m>2016SilconpmASTILD5185m>2016FuelWC Method>20NEG0.0 <tr< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th></tr<>							
Sample DateClient InfoO0Apr 2023Machine AgehrsClient Info00Oil AgehrsClient Info00Filter AgehrsClient InfoN/AN/ACli ChangedClient InfoN/AN/AFilter ChangedClient InfoN/AN/AFilter ChangedClient InfoN/AN/AFilter ChangedClient InfoN/AN/ASample StatusN/AN/AIronppmASTM D5185(m)>10068ChromiumppmASTM D5185(m)>200NickelppmASTM D5185(m)>300SilverppmASTM D5185(m)>300AluminumppmASTM D5185(m)>337LeadppmASTM D5185(m)>139VanadiumppmASTM D5185(m)>2557PotassiumppmASTM D5185(m)>2016SoliconppmASTM D5185(m)>2016FuelWC Method>5<1.0ASoliconppmASTM D5185(m)>2018.420.7SoliconppmASTM D7445>300 <th>Test</th> <th>UOM</th> <th>Method</th> <th>Limit/Abn</th> <th>Current</th> <th>History1</th> <th>History2</th>	Test	UOM	Method	Limit/Abn	Current	History1	History2
Machine AgehrsClient Info00Oil AgehrsClient Info00Filter AgehrsClient InfoN/AN/AOil ChangedClient InfoN/AN/AFilter ChangedClient InfoN/AN/AFilter ChangedClient InfoN/AN/ASample StatusN/AN/AIronppmASTM D5185(m)>10068ChromiumppmASTM D5185(m)>200<1NickelppmASTM D5185(m)>300SilverppmASTM D5185(m)>300AluminumppmASTM D5185(m)>3037LeadppmASTM D5185(m)>3037VanadiumppmASTM D5185(m)>2016VanadiumppmASTM D5185(m)>2016SiliconppmASTM D5185(m)>2016FuelWC Method>5<1.02.9GycolwC Method>5<1.02.9SulfationAbs/cmASTM D5185(m)2.016SulfationAbs/cmASTM D5185(m)>2.016SulfationAbs/cmASTM D5185(m)300 </th <th>Sample Number</th> <th></th> <th>Client Info</th> <th></th> <th>WC0910641</th> <th>WC0810832</th> <th></th>	Sample Number		Client Info		WC0910641	WC0810832	
Oil Age Filter AgehrsClient Info00Filter AgehrsClient InfoN/AN/AOil ChangedClient InfoN/AN/AFilter ChangedQClient InfoN/AN/ASample StatusNORMALMARGINALIronppmASTM D5185(m)>10068ChromiumppmASTM D5185(m)>200<1NickelppmASTM D5185(m)>2000NickelppmASTM D5185(m)>300AluminumppmASTM D5185(m)>300AluminumppmASTM D5185(m)>33037CopperppmASTM D5185(m)>2016SiliconppmASTM D5185(m)>2016SiliconppmASTM D5185(m)>2016FuelWC Method>00WaterWC Method>016SolitationppmASTM D5185(m)>2016SuifationAbs/tmASTM D5185(m)2016FuelWC Method>0SolitationAbs/tmASTM D5185(m)2NEGSuifationAbs/tmASTM D5185(m) <td< th=""><th>Sample Date</th><th></th><th>Client Info</th><th></th><th>01 Apr 2024</th><th>26 Apr 2023</th><th></th></td<>	Sample Date		Client Info		01 Apr 2024	26 Apr 2023	
Filter Age   hrs   Client Info   0   0      Oil Changed   Client Info   N/A   N/A   N/A      Filter Changed   Client Info   N/A   N/A   N/A      Sample Status   NORMAL   MARGINAL    Norman   Participation      Iron   ppm   ASTM D5185(m)   >20   0   <1      Nickel   ppm   ASTM D5185(m)   >20   0   <1      Nickel   ppm   ASTM D5185(m)   >4   0   0      Silver   ppm   ASTM D5185(m)   >3   0   0      Aluminum   ppm   ASTM D5185(m)   >20   <1   1      Lead   ppm   ASTM D5185(m)   >20   <1   6      Vanadium   ppm   ASTM D5185(m)   >20   1   6      Silicon   ppm   ASTM D5185(m)   >20   1 <td< th=""><th>Machine Age</th><th>hrs</th><th>Client Info</th><th></th><th>0</th><th>0</th><th></th></td<>	Machine Age	hrs	Client Info		0	0	
Oli ChangedClient InfoN/AN/AN/AFilter ChangedClient InfoN/AN/AN/ASample StatusNORMALMARGINALIronppmASTM D5185(m)>10068ChromiumppmASTM D5185(m)>200<1NickelppmASTM D5185(m)>400TitaniumppmASTM D5185(m)>300SilverppmASTM D5185(m)>300LeadppmASTM D5185(m)>3037CopperppmASTM D5185(m)>1539VanadiumppmASTM D5185(m)>2016SiliconppmASTM D5185(m)>2016FuelWC Method>557WaterwC Method>0.2NEGNEGSulfationAbs/cmASTM D7844'>300NitrationAbs/cmASTM D7844'>300SulfationppmASTM D7858(m)11.8420.7SulfationAbs/cmASTM D7844'>300SulfationAbs/cmASTM D7858(m)13.11.82SulfationAbs/cmASTM D7858(m)2A.85.6SulfationAbs/cmASTM D7858(m)<	Oil Age	hrs	Client Info		0	0	
Filter Changed Sample Status   Client Info   N/A   N/A   N/A   A     Iron   ppm   ASTM D5185(m)   >100   6   8      Chromium   ppm   ASTM D5185(m)   >20   0   <1      Nickel   ppm   ASTM D5185(m)   >4   0   0      Nickel   ppm   ASTM D5185(m)   >4   0   0      Silver   ppm   ASTM D5185(m)   >20   <1   1      Aluminum   ppm   ASTM D5185(m)   >30   0   0      Qopper   ppm   ASTM D5185(m)   >15   3   9      Vanadium   ppm   ASTM D5185(m)   >25   5   7      Silicon   ppm   ASTM D5185(m)   >20   1   6      Vanadium   ppm   ASTM D5185(m)   >20   1   6      Silicon   ppm   ASTM D5185(m)   >	Filter Age	hrs	Client Info		0	0	
Sample StatusNORMALMARGINALIronppmASTM D5185(m)>10068ChromiumppmASTM D5185(m)>200<1NickelppmASTM D5185(m)>400TitaniumppmASTM D5185(m)>300SilverppmASTM D5185(m)>20<11LeadppmASTM D5185(m)>40<12CopperppmASTM D5185(m)>40<12TinppmASTM D5185(m)>339SiliconppmASTM D5185(m)>2557FuelWC Method>5<1.0A2.9GlycolWC Method>20NEGNEGSolifationAbs/tmASTM D5185(m)>2016FuelWC Method>01ASTM 2.9SolifationAbs/tmASTM D5185(m)>2018.420.7SolifationAbs/tmASTM D5185(m)018.420.7SolifationAbs/tmASTM D5185(m)100MateryASTM D5185(m)131182MaterppmASTM D5185(m)10SolifationAbs/tmASTM D5185(m)10 <td< th=""><th>Oil Changed</th><th></th><th>Client Info</th><th></th><th>N/A</th><th>N/A</th><th></th></td<>	Oil Changed		Client Info		N/A	N/A	
Iron   ppm   ASTM D5185(m)   >100   6   8	Filter Changed		Client Info		N/A	N/A	
Chromium   ppm   ASTM D5185(m)   >20   0   <1	Sample Status				NORMAL	MARGINAL	
Chromium   ppm   ASTM D5185(m)   >20   0   <1							
Nickel   ppm   ASTM D5185(m)   >4   0   0      Titanium   ppm   ASTM D5185(m)   S   0   0      Silver   ppm   ASTM D5185(m)   >3   0   0      Aluminum   ppm   ASTM D5185(m)   >20   <1   1      Lead   ppm   ASTM D5185(m)   >40   <1   2      Copper   ppm   ASTM D5185(m)   >40   <1   2      Vanadium   ppm   ASTM D5185(m)   >15   3   9      Vanadium   ppm   ASTM D5185(m)   >20   1   6      Vanadium   ppm   ASTM D5185(m)   >20   1   6      Vanadium   ppm   ASTM D5185(m)   >20   1   6      Silicon   ppm   ASTM D5185(m)   >20   1   6      Fuel   WC Method   >0.2   NEG </th <th></th> <th></th> <th>. ,</th> <th></th> <th></th> <th>-</th> <th></th>			. ,			-	
Titanium   ppm   ASTM D5185(m)   >3   0   0      Silver   ppm   ASTM D5185(m)   >3   0   0      Aluminum   ppm   ASTM D5185(m)   >20   <1   1      Lead   ppm   ASTM D5185(m)   >30   3   7      Copper   ppm   ASTM D5185(m)   >330   3   7      Vanadium   ppm   ASTM D5185(m)   >30   3   7      Vanadium   ppm   ASTM D5185(m)   >25   5   7      Vanadium   ppm   ASTM D5185(m)   >20   1   6      Vanadium   ppm   ASTM D5185(m)   >20   1   6      Silicon   ppm   ASTM D5185(m)   >20   1   6      Water   WC Method   >0.2   NEG   NEG      Sotd %   %   ASTM D71415   >30   1		ppm	· /				
Silver   ppm   ASTM D5185(m)   >3   0   0      Aluminum   ppm   ASTM D5185(m)   >20   <1				>4	-	-	
Aluminum   ppm   ASTM D5185(m)   >20   <1		ppm	( /				
Lead   ppm   ASTM D5185(m)   >40   <1	Silver	ppm		>3	0	0	
Copper   ppm   ASTM D5185(m)   >330   3   7      Tin   ppm   ASTM D5185(m)   >15   3   9      Vanadium   ppm   ASTM D5185(m)   >15   3   9      Silicon   ppm   ASTM D5185(m)   >25   5   7      Potassium   ppm   ASTM D5185(m)   >20   1   6      Fuel   WC Method   >5   <1.0   ▲ 2.9      Water   WC Method   >0.2   NEG   NEG      Soot %   %   ASTM D7844*   >3   0   0      Solt %   %   ASTM D7624*   >20   4.8   5.6      Sulfation   Abs/rmm   ASTM D7145*   >30   18.4   20.7      Sodium   ppm   ASTM D5185(m)   1   31   182      Boron   ppm   ASTM D5185(m)   1   0	Aluminum	ppm	( )	>20	<1		
Tin   ppm   ASTM D5185(m)   >15   3   9      Vanadium   ppm   ASTM D5185(m)   >15   0   0      Silicon   ppm   ASTM D5185(m)   >25   5   7      Potassium   ppm   ASTM D5185(m)   >20   1   6      Fuel   WC Method   >5   <1.0	Lead	ppm	ASTM D5185(m)	>40		2	
Vanadium   ppm   ASTM D5185(m)   0   0      Silicon   ppm   ASTM D5185(m)<>25   5   7      Potassium   ppm   ASTM D5185(m)<>20   1   6      Fuel   WC Method   >5   <1.0   ▲ 2.9      Water   WC Method   >0.2   NEG   NEG      Glycol   WC Method   >0.2   NEG   0.0      Soot %   %   ASTM D7844*   >3   0   0      Soot %   %   ASTM D7624*   >20   4.8   5.6      Sulfation   Abs/.1mm   ASTM D7624*   >20   4.8   5.6      Sulfation   Abs/.1mm   ASTM D7624*   >20   4.8   5.6      Sulfation   Abs/.1mm   ASTM D7624*   >20   NEG      Sulfation   Abs/.1mm   ASTM D7624*   >20   NEG      Sulfation   p	Copper	ppm	( )	>330	3	7	
Silicon   ppm   ASTM D5185(m)   >25   5   7      Potassium   ppm   ASTM D5185(m)   >20   1   6      Fuel   WC Method   >5   <1.0   ▲ 2.9      Water   WC Method   >0.2   NEG   NEG      Glycol   WC Method   >0.2   NEG   0.0      Soot %   %   ASTM D7844*   >3   0   0      Soot %   %   ASTM D7844*   >3   0   0      Sulfation   Abs/rm   ASTM D7624*   >20   4.8   5.6      Sulfation   Abs/rm   ASTM D71415*   >30   18.4   20.7      Emulsified Water   scalar   Visual*   >0.2   NEG   NEG      Sodium   ppm   ASTM D5185(m)   1   0       Boron   ppm   ASTM D5185(m)   1   55   25	Tin	ppm	ASTM D5185(m)	>15	3	9	
Potassium   ppm   ASTM D5185(m)   >20   1   6      Fuel   WC Method   >5   <1.0	Vanadium	ppm	ASTM D5185(m)		0	0	
Potassium   ppm   ASTM D5185(m)   >20   1   6      Fuel   WC Method   >5   <1.0	Silicon	nnm	ASTM D5185(m)	>25	5	7	
Fuel WC Method >5 <1.0							
Water   WC Method   >0.2   NEG   NEG      Glycol   WC Method   NEG   0.0      Soot %   %   ASTM D7844*   >3   0   0      Nitration   Abs/cm   ASTM D7624*   >20   4.8   5.6      Sulfation   Abs/cm   ASTM D7624*   >20   4.8   5.6      Sulfation   Abs/cm   ASTM D7624*   >20   4.8   5.6      Sulfation   Abs/cm   ASTM D7624*   >20   4.8   20.7      Sodium   ppm   ASTM D715*   >30   18.4   20.7      Sodium   ppm   ASTM D5185(m)   1   31   182      Boron   ppm   ASTM D5185(m)   1   0   0      Molybdenum   ppm   ASTM D5185(m)   1   0   <1      Magnesium   ppm   ASTM D5185(m)   3032   1198   1852		ppiii	. ,		-		
Glycol   WC Method   NEG   0.0      Soot %   %   ASTM D7844*   >3   0   0      Nitration   Abs/cm   ASTM D7624*   >20   4.8   5.6      Sulfation   Abs/cm   ASTM D7624*   >20   4.8   5.6      Sulfation   Abs/lm   ASTM D7624*   >20   18.4   20.7      Emulsified Water   scalar   Visual*   >0.2   NEG   NEG      Sodium   ppm   ASTM D5185(m)   1   31   182      Boron   ppm   ASTM D5185(m)   1   0   0      Malganese   ppm   ASTM D5185(m)   1   0   <1      Magnesium   ppm   ASTM D5185(m)   10   861   227      Phosphorus   ppm   ASTM D5185(m)   3032   1198   1852      Zinc   ppm   ASTM D5185(m)   332 </th <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>							
Soot %   %   ASTM D7844*   >3   0   0      Nitration   Abs/cm   ASTM D7624*   >20   4.8   5.6      Sulfation   Abs/cm   ASTM D7415*   >30   18.4   20.7      Emulsified Water   scalar   Visual*   >0.2   NEG   NEG      Sodium   ppm   ASTM D5185(m)   1   31   182      Boron   ppm   ASTM D5185(m)   1   0   0      Barium   ppm   ASTM D5185(m)   1   55   25      Manganese   ppm   ASTM D5185(m)   10   861   227      Magnesium   ppm   ASTM D5185(m)   3032   1198   1852      Phosphorus   ppm   ASTM D5185(m)   3032   1198   1852      Zinc   ppm   ASTM D5185(m)   1054   1008   994      Zinc   ppm				20.2			
Nitration   Abs/cm   ASTM D7624*   >20   4.8   5.6      Sulfation   Abs/.tm   ASTM D7415*   >30   18.4   20.7      Emulsified Water   scalar   Visual*   >0.2   NEG   NEG      Sodium   ppm   ASTM D5185(m)   2   4       Boron   ppm   ASTM D5185(m)   1   31   182      Barium   ppm   ASTM D5185(m)   1   0   0      Molybdenum   ppm   ASTM D5185(m)   1   55   25      Manganese   ppm   ASTM D5185(m)   10   861   227      Magnesium   ppm   ASTM D5185(m)   3032   1198   1852      Phosphorus   ppm   ASTM D5185(m)   3032   1167   1066      Zinc   ppm   ASTM D5185(m)   3385   2765   2869      Sulfur   <		%		>3			
Sulfation   Abs/.1mm   ASTM D7415*   >30   18.4   20.7      Emulsified Water   scalar   Visual*   >0.2   NEG   NEG      Sodium   ppm   ASTM D5185(m)   2   4      Boron   ppm   ASTM D5185(m)   1   31   182      Barium   ppm   ASTM D5185(m)   1   0   0      Molybdenum   ppm   ASTM D5185(m)   1   55   25      Manganese   ppm   ASTM D5185(m)   10   861   22.7      Calcium   ppm   ASTM D5185(m)   3032   1198   1852      Phosphorus   ppm   ASTM D5185(m)   3032   1198   1852      Zinc   ppm   ASTM D5185(m)   1332   1167   1066      Sulfur   ppm   ASTM D5185(m)   3985   2765   2869      Oxidation   Abs/.1mm							
Emulsified WaterscalarVisual*>0.2NEGNEGSodiumppmASTM D5185(m)24BoronppmASTM D5185(m)131182BariumppmASTM D5185(m)100MolybdenumppmASTM D5185(m)15525ManganeseppmASTM D5185(m)10861227MagnesiumppmASTM D5185(m)303211981852PhosphorusppmASTM D5185(m)10541008994ZincppmASTM D5185(m)133211671066SulfurppmASTM D5185(m)398527652869OxidationAbs/.1mmASTM D7414'>2513.515.1							
Sodium   ppm   ASTM D5185(m)   2   4      Boron   ppm   ASTM D5185(m)   1   31   182      Barium   ppm   ASTM D5185(m)   1   31   182      Malybdenum   ppm   ASTM D5185(m)   1   0   0      Malganese   ppm   ASTM D5185(m)   1   55   25      Magnesium   ppm   ASTM D5185(m)   10   861   227      Calcium   ppm   ASTM D5185(m)   10   861   227      Phosphorus   ppm   ASTM D5185(m)   3032   1198   1852      Zinc   ppm   ASTM D5185(m)   1054   1008   994      Sulfur   ppm   ASTM D5185(m)   1332   1167   1066      Sulfur   ppm   ASTM D5185(m)   3985   2765   2869      Oxidation   Abs/.1mm   ASTM D7414							
Boron   ppm   ASTM D5185(m)   1   31   182      Barium   ppm   ASTM D5185(m)   1   0   0      Molybdenum   ppm   ASTM D5185(m)   1   0   0      Manganese   ppm   ASTM D5185(m)   1   55   25      Magnesium   ppm   ASTM D5185(m)   10   861   227      Calcium   ppm   ASTM D5185(m)   3032   1198   1852      Phosphorus   ppm   ASTM D5185(m)   1054   1008   994      Zinc   ppm   ASTM D5185(m)   1332   1167   1066      Sulfur   ppm   ASTM D5185(m)   3985   2765   2869      Oxidation   Abs/.1mm   ASTM D7414*<>25   13.5   15.1							
Barium   ppm   ASTM D5185(m)   1   0   0      Molybdenum   ppm   ASTM D5185(m)   1   55   25      Manganese   ppm   ASTM D5185(m)   1   55   25      Magnesium   ppm   ASTM D5185(m)   10   861   227      Magnesium   ppm   ASTM D5185(m)   100   861   227      Calcium   ppm   ASTM D5185(m)   3032   1198   1852      Phosphorus   ppm   ASTM D5185(m)   1054   1008   994      Zinc   ppm   ASTM D5185(m)   1332   1167   1066      Sulfur   ppm   ASTM D5185(m)   3985   2765   2869      Oxidation   Abs/.1mm   ASTM D7414*   >25   13.5   15.1	Sodium	ppm	ASTM D5185(m)		2	4	
Molybdenum   ppm   ASTM D5185(m)   1   55   25      Manganese   ppm   ASTM D5185(m)   0   <1      Magnesium   ppm   ASTM D5185(m)   10   861   227      Magnesium   ppm   ASTM D5185(m)   10   861   227      Calcium   ppm   ASTM D5185(m)   3032   1198   1852      Phosphorus   ppm   ASTM D5185(m)   1054   1008   994      Zinc   ppm   ASTM D5185(m)   1332   1167   1066      Sulfur   ppm   ASTM D5185(m)   3985   2765   2869      Oxidation   Abs/.1mm   ASTM D7414*   >25   13.5   15.1	Boron	ppm	ASTM D5185(m)	1	31	182	
Manganese   ppm   ASTM D5185(m)   0   <1	Barium	ppm	ASTM D5185(m)	1	0	0	
Magnesium   ppm   ASTM D5185(m)   10   861   227      Calcium   ppm   ASTM D5185(m)   3032   1198   1852      Phosphorus   ppm   ASTM D5185(m)   1054   1008   994      Zinc   ppm   ASTM D5185(m)   1332   1167   1066      Sulfur   ppm   ASTM D5185(m)   3985   2765   2869      Oxidation   Abs/.1mm   ASTM D7414*   >25   13.5   15.1	Molybdenum	ppm	ASTM D5185(m)	1	55	25	
Calcium   ppm   ASTM D5185(m)   3032   1198   1852      Phosphorus   ppm   ASTM D5185(m)   1054   1008   994      Zinc   ppm   ASTM D5185(m)   1332   1167   1066      Sulfur   ppm   ASTM D5185(m)   3985   2765   2869      Oxidation   Abs/.1mm   ASTM D7414*   >25   13.5   15.1	Manganese	ppm	ASTM D5185(m)		0	<1	
Phosphorus   ppm   ASTM D5185(m)   1054   1008   994      Zinc   ppm   ASTM D5185(m)   1332   1167   1066      Sulfur   ppm   ASTM D5185(m)   3985   2765   2869      Oxidation   Abs/.1mm   ASTM D7414*   >25   13.5   15.1	Magnesium	ppm	ASTM D5185(m)	10	861	227	
Zinc   ppm   ASTM D5185(m)   1332   1167   1066      Sulfur   ppm   ASTM D5185(m)   3985   2765   2869      Oxidation   Abs/.1mm   ASTM D7414*   >25   13.5   15.1	Calcium	ppm	ASTM D5185(m)	3032	1198	1852	
Sulfur   ppm   ASTM D5185(m)   3985   2765   2869      Oxidation   Abs/.1mm   ASTM D7414*   >25   13.5   15.1	Phosphorus	ppm	ASTM D5185(m)	1054	1008	994	
Oxidation   Abs/.1mm   ASTM D7414*   >25   13.5   15.1	Zinc	ppm	ASTM D5185(m)	1332	1167	1066	
	Sulfur	ppm	ASTM D5185(m)	3985	2765	2869	
Visc @ 100°C cSt ASTM D7279(m) 15.4 13.0 12.9	Oxidation	Abs/.1mm	ASTM D7414*	>25	13.5	15.1	
	Visc @ 100°C	cSt	ASTM D7279(m)	15.4	13.0	12.9	

Contact/Location: Selome Afework - NORWOO







Contact/Location: Selome Afework - NORWOO Page 2 of 2