

OIL ANALYSIS REPORT

Area **KEMP** QUARRIES / BCS - STILLWELL [68279] WL144

Transmission Fluid PETRO CANADA HYDREX AW 68 (--- GAL)

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor. (Customer Sample Comment: $\mbox{PM-2}$ changed fluid and filters)

Wear

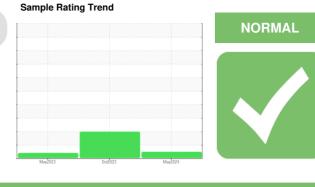
All component wear rates are normal.

Contamination

There is no indication of any contamination in the fluid.

Fluid Condition

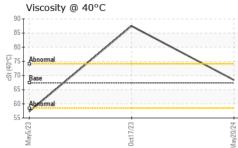
The condition of the fluid is acceptable for the time in service.



	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		PCA0109090	PCA0084809	PCA0085710
Sample Date		Client Info		20 May 2024	17 Oct 2023	05 May 2023
Machine Age	hrs	Client Info		23340	22822	22358
Oil Age	hrs	Client Info		23340	22822	22358
Oil Changed		Client Info		Changed	N/A	N/A
Sample Status				NORMAL	ATTENTION	ATTENTION
CONTAMINAT	ION	method	limit/base	current	history1	history2
Water		WC Method	>0.1	NEG	NEG	NEG
WEAR METAL	.S	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>200	2	3	19
Chromium	ppm	ASTM D5185m	>10	0	<1	1
Nickel	ppm	ASTM D5185m		<1	0	<1
Titanium	ppm	ASTM D5185m		0	<1	<1
Silver	ppm	ASTM D5185m		0	0	0
Aluminum	ppm	ASTM D5185m	>50	<1	2	<1
Lead	ppm	ASTM D5185m	>50	0	1	<1
Copper	ppm	ASTM D5185m	>200	<1	7	4
Tin	ppm	ASTM D5185m	>10	<1	<1	<1
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	<1	0
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	0	<1	4	35
Barium	ppm	ASTM D5185m	0	0	10	0
Danun	ppin	ASTIVI DJ TOJITI	0	U	10	0
Molybdenum	ppm	ASTM D5185m	0	11	2	25
		ASTM D5185m		-		
Molybdenum	ppm	ASTM D5185m	0	11	2	25
Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m	0	11 <1	2 0	25 <1
Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	0 0 0	11 <1 167	2 0 23	25 <1 98
Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 0 50	11 <1 167 533	2 0 23 2868	25 <1 98 1726
Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 0 50 330	11 <1 167 533 548	2 0 23 2868 938	25 <1 98 1726 633
Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 0 50 330 430	11 <1 167 533 548 651	2 0 23 2868 938 1140	25 <1 98 1726 633 796
Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 50 330 430 760	11 <1 167 533 548 651 1790	2 0 23 2868 938 1140 4357	25 <1 98 1726 633 796 2328
Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 50 330 430 760	11 <1 167 533 548 651 1790 current	2 0 23 2868 938 1140 4357 history1	25 <1 98 1726 633 796 2328 history2
Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 0 50 330 430 760 Limit/base >50	11 <1 167 533 548 651 1790 current 2	2 0 23 2868 938 1140 4357 history1 4	25 <1 98 1726 633 796 2328 history2 5
Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 0 50 330 430 760 Limit/base >50	11 <1 167 533 548 651 1790 current 2 2 2	2 0 23 2868 938 1140 4357 history1 4 0	25 <1 98 1726 633 796 2328 history2 5 0
Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm TS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 0 50 330 430 760 limit/base >50	11 <1 167 533 548 651 1790 current 2 2 2 2	2 0 23 2868 938 1140 4357 history1 4 0 2	25 <1 98 1726 633 796 2328 history2 5 0 2
Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium VISUAL	ppm ppm ppm ppm ppm ppm ppm tTS	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	0 0 0 50 330 430 760 imit/base >50 >20	11 <1 167 533 548 651 1790 current 2 2 2 2 2 2	2 0 23 2868 938 1140 4357 history1 4 0 2 kistory1	25 <1 98 1726 633 796 2328 history2 5 0 2 2 history2
Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium VISUAL White Metal Yellow Metal	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m XSTM D5185m	0 0 0 50 330 430 760 <i>limit/base</i> >50 >20 <i>limit/base</i> NONE	11 <1 167 533 548 651 1790 current 2 2 2 2 2 2 2 0 current NONE	2 0 23 2868 938 1140 4357 history1 4 0 2 history1 NONE	25 <1 98 1726 633 796 2328 history2 5 0 2 2 history2 NONE
Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium VISUAL White Metal	ppm ppm ppm ppm ppm ppm ppm TS ppm ppm ppm ppm scalar	ASTM D5185m ASTM D5185m XFM D5185m	0 0 0 50 330 430 760 imit/base >50 imit/base NONE NONE	11 <1 167 533 548 651 1790 current 2 2 2 2 2 2 2 0 0 0 0 0 0 0 0 0 0 0 0	2 0 23 2868 938 1140 4357 history1 4 0 2 kistory1 A 0 2 NONE NONE	25 <1 98 1726 633 796 2328 history2 5 0 2 2 history2 NONE NONE
Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium VISUAL White Metal Yellow Metal Precipitate	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m Yisual	0 0 0 50 330 430 760 limit/base >50 limit/base >20 limit/base NONE NONE NONE NONE	11 <1 167 533 548 651 1790 current 2 2 2 2 2 2 2 2 2 2 0 0 0 0 0 0 0 0 0	2 0 23 2868 938 1140 4357 history1 4 0 2 2 history1 NONE NONE NONE NONE	25 <1 98 1726 633 796 2328 history2 5 0 2 2 history2 NONE NONE NONE NONE
Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium VISUAL White Metal Yellow Metal Precipitate Silt	ppm ppm ppm ppm ppm ppm ppm ppm vrs ppm ppm ppm scalar scalar scalar scalar	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *Visual *Visual *Visual	0 0 0 50 330 430 760 i mit/base >50 i mit/base NONE NONE NONE NONE NONE	11 <1 167 533 548 651 1790 current 2 2 2 2 2 2 2 2 2 2 0 0 0 0 0 0 0 0 0	2 0 23 2868 938 1140 4357 history1 4 0 2 2 history1 NONE NONE NONE NONE NONE NONE	25 <1 98 1726 633 796 2328 history2 5 0 2 2 history2 NONE NONE NONE NONE NONE
Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium VISUAL White Metal Yellow Metal Precipitate Silt Debris	ppm ppm ppm ppm ppm ppm ppm trs ppm ppm ppm ppm scalar scalar scalar scalar scalar	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *Visual *Visual *Visual *Visual *Visual *Visual	0 0 0 50 330 430 760 i mit/base >50 i mit/base >20 i mit/base NONE NONE NONE NONE NONE NONE	11 <1 167 533 548 651 1790 current 2 2 2 2 2 2 2 2 0 0 0 0 0 0 0 0 0 0 0	2 0 23 2868 938 1140 4357 history1 4 0 2 history1 A NONE NONE NONE NONE NONE NONE NONE	25 <1 98 1726 633 796 2328 history2 5 0 2 5 0 2 Vone NONE NONE NONE NONE NONE NONE NONE
Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium VISUAL White Metal Yellow Metal Precipitate Silt Debris Sand/Dirt	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *Visual *Visual *Visual *Visual *Visual *Visual *Visual	0 0 0 50 330 430 760 imit/base >50 imit/base >20 imit/base NONE NONE NONE NONE NONE NONE NONE	11 <1 167 533 548 651 1790 current 2 2 2 2 2 2 2 2 2 2 0 0 0 0 0 0 0 0 0	2 0 23 2868 938 1140 4357 history1 4 0 2 history1 NONE NONE NONE NONE NONE NONE NONE NON	25 <1 98 1726 633 796 2328 history2 5 0 2 5 0 2 history2 NONE NONE NONE NONE NONE NONE NONE NON
Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium VISUAL White Metal Yellow Metal Yellow Metal Precipitate Silt Debris Sand/Dirt Appearance	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *Visual *Visual *Visual *Visual *Visual *Visual *Visual *Visual	0 0 0 50 330 430 760 760 760 760 760 760 760 760 760 76	11 <1 167 533 548 651 1790 current 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	2 0 23 2868 938 1140 4357 history1 4 0 2 history1 8 NONE NONE NONE NONE NONE NONE NONE NO	25 <1 98 1726 633 796 2328 history2 5 0 2 5 0 2 history2 NONE NONE NONE NONE NONE NONE NONE NON
Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINAN Silicon Sodium Potassium VISUAL Vhite Metal Yellow Metal Yellow Metal Precipitate Silt Debris Sand/Dirt Appearance Odor	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m *Visual *Visual *Visual *Visual *Visual *Visual *Visual *Visual *Visual *Visual *Visual	0 0 0 50 330 430 760 imit/base >50 imit/base >20 imit/base NONE NONE NONE NONE NONE NONE NONE NON	11 <1 167 533 548 651 1790 current 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	2 0 23 2868 938 1140 4357 history1 4 0 2 <u>history1</u> 4 0 2 <u>history1</u> NONE NONE NONE NONE NONE NONE NONE NON	25 <1 98 1726 633 796 2328 history2 5 0 2 2 history2 NONE NONE NONE NONE NONE NONE NONE NON



OIL ANALYSIS REPORT



	FLUID PROPER	RTIES	method	limit/base	current	history1	history2
	Visc @ 40°C	cSt	ASTM D445	67.4	68.4	87.5	57.3
	SAMPLE IMAG	ES	method	limit/base	current	history1	history2
24	Color				no image	no image	no image
May20/24	Bottom				no image	no image	no image
	GRAPHS					' 	
	Iron (ppm)			200	Lead (ppm)		
	400 - Severe			150	Severe		
шdd	300			톮 100)		
		1		50	Abnormal		
	100						
	May5/23	0ct17/23 -		May20/24 -	May5/23	0ct17/23 -	
	≊ Aluminum (ppm)	0		May	≊ Chromium (µ		:
	⁸⁰			30	Smiller	, , , , , , , , , , , , , , , , , , ,	
	60 Abnormal			25			
	40			<u>E</u> 15	;		
	20			10			
	May5/23	0ct17/23		May20/24	May5/23	0ct17/23	
	Copper (ppm)				Silicon (ppm))	
	500 400 - Severe	1		140	Severe		
				100 E 80			
udd	300 - Abnormal			ā 60	Abnormal		
	100			40	1		
	0 2/33	//23)/24	2/53	/23	
	May5/23	0ct17/23		May20/24	May5/23	0ct17/23	
	Viscosity @ 40°C			3000	Additives		
	85-	\wedge		2500	calcium phospho		
40°C)	80 75 Abnormal 70 Base			2000 長	zine		
1.02	5 70 Base			1500	1		
	60 Abromal			1000	To Terrent and the test of	A REAL FOR THE REAL PROPERTY OF THE REAL PROPERTY O	
	255	0ct17/23 +		May20/24	May5/23	0ct17/23 -	
	WearCheck USA - 501 PCA0109090 06193168		ved : 28 d : 30		Kemp Q	uarries - Benton Co	

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

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