

Inspection Date:	April 29, 2021	A#:	0603142
Client:	Blackspur Oil Corp	National Board #:	N/A
District:	Beaverdam	Owner Asset #:	V-2020
Facility/Area:	Gemini Oilsands Project	Equipment Description:	Crude Emulsion Treater
Surface Location:	2-14-060-03W4	Manufacturer:	NATCO
Bottom Hole Location:	N/A	Manufactured Date:	2011
Vessel Volume (m3):	N/A	Manufacturer's Serial #:	9265
Equipment Orientation:	Horizontal	CRN #:	V 3196.2
Equipment Length/Height:	40'	QTI Identification #:	N/A
Equipment Outside Diameter:	8'	MAWP:	517 kpa @ -29 °C
Shell Thickness:	0.375"	MDMT:	-29°C @ 517 kpa
Shell Material:	SA51670N	Corrosion Allowance:	0.0625"
Head Thickness:	North Head - 0.3125" South Head – 0.500"	PWHT:	No
Head Material:	SA51670N	RT Level:	RT-3
Suitable for Continued Service:	Yes		
Recommended Insp Interval:	5 Years	Construction Code:	ASME Sec VIII Div 1 2007 Edition
Inspector's Qualifications:	API 510/570, ABSA IPV, CWB	Inspector's Name / Signature:	Cody Hankinson
Inspection Type:	External <input checked="" type="checkbox"/> Internal <input checked="" type="checkbox"/> NDE <input checked="" type="checkbox"/>	NDE Type:	UT Thickness Survey
SUMMARY:			

The Treater was inspected in accordance with API 510 and QTI-VIN-0014. The overall condition of the vessel and its components are in good condition at time of inspection. The insulation installed is in overall good condition. The heads, shell, and nozzle connections appeared to be in good condition. The building skid and support saddles did not show any signs of damage. The nameplate is securely attached and legible. No concerns with any existing weld. The internal anodes showed signs of some degradation. All internal components are secure and in good condition. PSV was inaccessible at time of inspection.

UT thickness Survey was completed during inspection. Could not access either head. All the shell readings were at or above nominal. CML 20, 25, 35, 55, 60, 70, 75, 85, 90, 95 all have one or more reading below nominal. All these CML points are on the nozzles. Please see attached UT report for further information.

Recommended inspection interval as per ABSA AB-506 is set at 5 years for grade 2 upstream pressure vessels and 5 years for PSV servicing.

Action Items/Key Follow up Items – Recommendations

Item	Description	Communicated to	Date:
PSV Access 1	PSV not accessible. Must ensure proper protection before use.	Kevin Saizew	May 02, 2021
Anodes 2	Some degradation. Recommendation: Replace with new anode.	Kevin Saizew	May 02, 2021
3	1 year UT survey to establish short term corrosion rate under the vessels new service conditions.	Kevin Saizew	May 02, 2021
4			
5			
6			
7			
8			

Vessel Exterior		Condition	Additional Comments			
	External Shell	Good	No concerns. Majority of vessel was insulated. Only could inspect east side inside building.			
	External Heads	N/A	Could not inspect due to insulation			
	Paint	Good	No concerns			
	External Flange Faces	Good	No concerns			
	Grounding	Good	No concerns			
	Insulation / Cladding	Good	No concerns. Vessel will be moved.			
	Manway	Good	Size	24"	Access	North and West
	External Nozzles / Repads	Good	No concerns			
	External Shell	Good	No concerns			
External Attachments		Condition	Additional Comments			
	Nameplate	Good	Secure and legible. No concerns			
	Flange Bolting	Good	No concerns			
	External Piping	Good	No concerns			
	Gaskets	Good	No concerns			
	Handrails / Ladders	Good	No concerns			
	Support	Good	Type		Saddles	
	Anchored	Good	Type		Anchored to saddles and building skid	
	Foundation	Good	Type		Building skid	
	Grating	N/A	Not associated with the equipment.			

External Inspection Items	Good	Fair	Poor	N/A	Comments
Insulation - Verify sealed around manways, nozzles, no damage present, and there is no egress of moisture. Are straps secure?	✓				Insulation in good condition. Vessel will be moved.
External Condition - Assess paint condition, areas peeling, record any corrosion, damage, distortion etc. (record location, size and depth of corrosion or damage)	✓				No signs of damage or distortion where accessible.
Leakage - Record any leakage at flanges, threaded joints, weep holes on reads, etc.	✓				No signs of leakage.
Skirt/Saddle - Assess condition of paint, fire protection, concrete. Look for corrosion, buckling, dents, etc. Look at vessel surface area near supports. Verify no signs of leakage at attachment to vessel and attachment welds are acceptable. Is ground wire attached?	✓				No issues at time of inspection.
Anchor Bolts - Hammer tap to ensure secure. Look for corrosion, cracking in the threads or signs of deformation.	✓				No issues at time of inspection.
Concrete Foundation - Check for cracks, spalling, etc.	✓				Vessel on building skid. No issues at time of inspection.
Ladder/Platform - Describe general condition, ensure support is secure to vessel, describe any hazards.	✓				No issues at time of inspection.
External Piping - Ensure pipe is well supported. All clamps, supports, shoes, etc. In place. Look for evidence of structural overload, deflection, etc. Paint condition, external corrosion?	✓				No signs of structural overload or deflection. Piping was insulated at time of inspection.
Gauges - Ensure gauges are visible, working, no leakage, and suitable for range of MAWP/Temp.				✓	Vessel not in service at time of inspection.
Nozzle - Assess paint, look for leakage, and ensure stud threads are fully engaged. Record any damage, deflection, etc. Are nozzles gusseted? Inspect gussets for cracking.	✓				No issues at time of inspection.

Valving - Ensure no leaks are visible. Valves are properly supported and chained if necessary.	✓				No issues at time of inspection.
PRV - Ensure PRV is set at pressure at or below that of vessel. Discharge piping is same size as outlet and is properly supported and routed.				✓	Could not access PSV. Located on top on vessel.
PRV seals in place? Ensure no block valves between PRV and vessel, or if there are that they are locked/sealed open.				✓	Could not access PSV. Located on top on vessel.
Other Observations:					
No other observations.					

External Controls & Safety Devices			Condition		Condition		
Level - Control			N/A		Pressure - Control		N/A
Temperature - Control			N/A		Flow Control		N/A
PSV							
PSV Location			Top of vessel. Not assessable		Manufacturer		
Does the PSV properly protect the vessel			<input type="checkbox"/> Yes		<input type="checkbox"/> No		
Serial Number					CRN #		
Set Pressure PSI					Capacity		
Code Stamping					Location		
Inlet Size			Type		Outlet Size		Type
Service Provider					Service Provider Id.#		
Last Service					Set Pres. < Equip.MAWP		
Vessel Interior			Condition				
General Cleanliness			Fair	Minor product in some hard-to-reach areas.			
Head Corrosion, Damage, Defects, or discontinuities			Good	No issues at time of inspection.			
Shell Corrosion, Damage, Defects, or Discontinuities			Good	No issues at time of inspection.			
Nozzle Corrosion, Damage, Defects, or Discontinuities			Good	No issues at time of inspection.			
Nozzles Blocked			Good	Nozzles are free of debris and product.			
Baffle Corrosion			Good	No issues at time of inspection.			
Impingement plate Damage			Good	No issues at time of inspection.			
Mixer Agitator			N/A	Not associated with the vessel.			
Thermowells			N/A	Not associated with the vessel.			
Trays			N/A	Not associated with the vessel.			
Refractory			N/A	Not associated with the vessel.			
Vents/Drains			Good	No issues at time of inspection.			
Plugged Distributor			Good	No issues at time of inspection.			
Expansion Joints			N/A	Not associated with the vessel.			
Demister			N/A	Not associated with the vessel.			
Other			Good	All other internals in good condition.			

Process Conditions		
Service	Sweet	
Normal Operating Pressure Range	N/A	Please see data sheet.
Normal Operating Temperature Range	N/A	Please see data sheet.
Commodity		

Additional Inspection Comments:

Intervals: Inspection Intervals are correct and need not be revised based on the inspection results

Remaining Life Calculation:

- Remaining Life = $RL = \frac{T_{act} - T_{req}}{CR}$

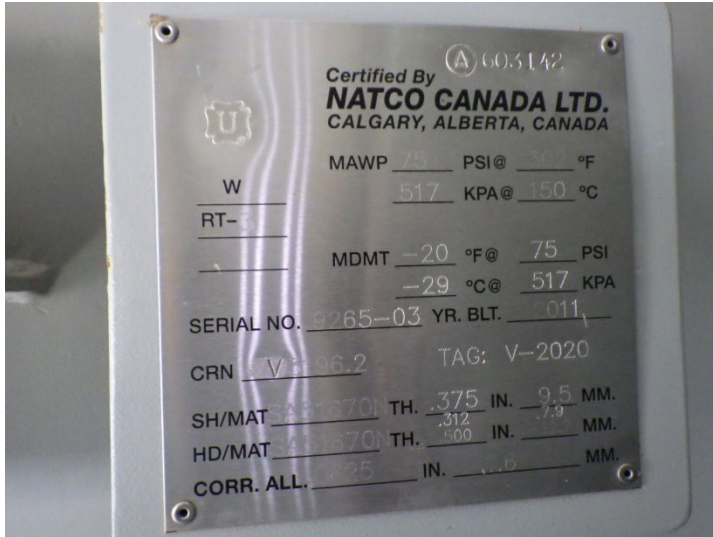
Remaining life calculation below is based on pervious service conditions (sweet) and calculated from the lowest T min reading, which is CML-25. See UT report 2021-0429-LRUT-001.

CR= 0.0174 mm/year
T act= 7.44 mm
T req= 5.11 mm

RL= 133 Years

Recommendation is to conduct a 1-year UT survey to establish short term corrosion rate under the vessels new service conditions (sour).

Nameplate 1



Nameplate 2

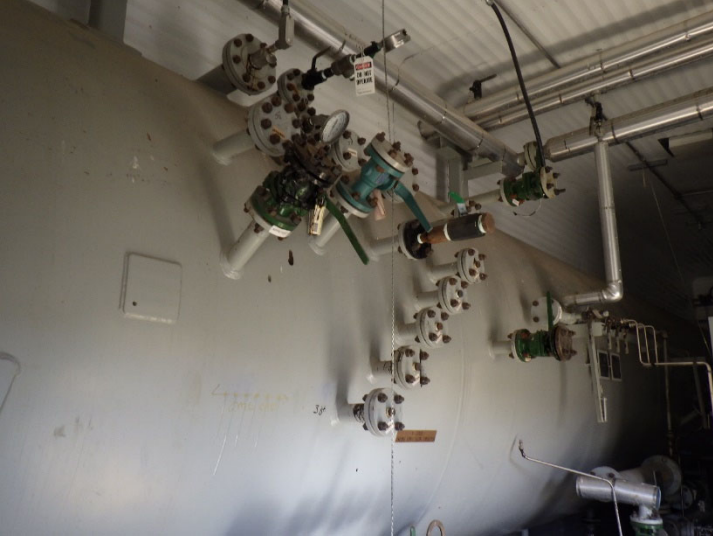





Overview



PSV – not accessible



<p>Nozzles</p> 	<p>Internal overview</p> 
<p>Internal Components</p> 	<p>Deflector plate</p> 

<p>Internal Anode</p> 	<p>Internal Anode</p> 
<p>Internal coil</p> 	<p>Residual product</p> 



Visual External UT Report

Report No: 2021-0429-LRUT-001
Date: Apr 29 2021, 08:01:34 MDT

Client: Blackspur Oil Corp.

Field: Cold Lake

LSD: 2-14-060-3 W4

Facility Description:

Asset #:

Equipment Description: Treater

Equipment CRN#: V3196.2

A#: 603142

Min. Thickness: 7.44mm Band 25 Nozzle n6A

CML Points

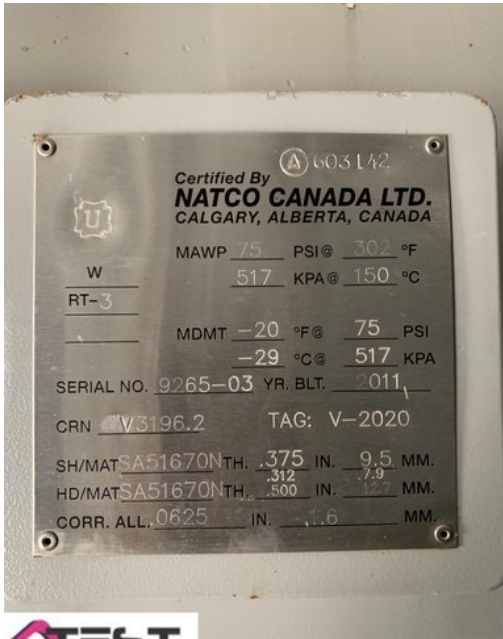
Description	Type	Ref. Drawing	Nom. Thk(mm)	Corr. Allowance(mm)	Flag Thk(mm)	Rem. Life	Comments
Top Shell	Band Scan	D-9265-03	9.5	1.6	6.76		Band 05
Mid Shell	Band Scan	D-9265	9.5	1.6	6.76		Band 10
Bottom Shell	Band Scan	D-9265-03	9.5	1.6	6.76		Band 15
N14A Nozzle	Band Scan	D-9265-03	7.62	1.6	5.11		Band 20
N6A Nozzle	Band Scan	D-9265-03	7.62	1.6	5.11		Band 25
N4A Nozzle	Band Scan	D-9265-03	7.62	1.6	5.11		Band 30
N13A Nozzle	Band Scan	D-9265-03	7.62	1.6	5.11		Band 35
N14B Nozzle	Band Scan	D-9265-03	7.62	1.6	5.11		Band 55
N4B Nozzle	Band Scan	D-9265-03	8.74	1.6	6.1		Band 60
N14C Nozzle	Band Scan	D-9265-03	7.62	1.6	5.11		Band 65
N6B Nozzle	Band Scan	D-9265-03	7.62	1.6	5.11		Band 70
N4C Nozzle	Band Scan	D-9265-03	8.74	1.6	6.1		Band 75
N14D Nozzle	Band Scan	D-9265-03	7.62	1.6	5.11		Band 80
N13B Nozzle	Band Scan	D-9265-03	7.62	1.6	5.11		Band 85
N13C Nozzle	Band Scan	D-9265-03	7.62	1.6	5.11		Band 90
N13D Nozzle	Band Scan	D-9265-03	7.62	1.6	5.11		Band 95
Bottom Shell	Band Scan	D-9265-03	9.5	1.6	6.76		Band 40
Mid Shell	Band Scan	D-9265-03	9.5	1.6	6.76		Band 45
Top Shell	Band Scan	D-9265-03	9.5	1.6	6.76		Band 50

Vessel Survey

Point Data		Current Readings (mm)			Information		
Band	Description	Ref	Min	Avg	Nom	Flag Thickness	Comments
05	Top Shell	9.65	9.60	9.68	9.5	6.76	NW of Partition Wall
10	Mid Shell	9.66	9.60	9.73	9.5	6.76	W of Partition Wall
15	Bottom Shell	9.64	9.63	9.70	9.5	6.76	Bottom by partition Wall
40	Bottom Shell	9.65	9.58	9.63	9.5	6.76	Bottom by Partition Wall
45	Mid Shell	9.65	9.58	9.68	9.5	6.76	E of partition Wall
50	Top Shell	9.70	9.50	9.60	9.5	6.76	NE of Partition Wall

Piping Survey

Point Data				Current Readings (mm)			Information		
Band	Description	Size	Sch	Ref	Min	Avg	Nom	Flag Thickness	Comments
20	N14A Nozzle	3	80	7.55	7.47	7.57	7.62	5.11	No Comments
25	N6A Nozzle	3	80	7.51	7.44	7.49	7.62	5.11	No Comments
30	N4A Nozzle	3	80	7.58	7.52	7.65	7.62	5.11	No Comments
35	N13A Nozzle	3	80	7.66	7.57	7.65	7.62	5.11	No Comments
55	N14B Nozzle	3	80	7.65	7.49	7.65	7.62	5.11	No Comments
60	N4B Nozzle	2	160	8.64	8.51	8.61	8.74	6.1	No Comments
65	N14C Nozzle	3	80	7.69	7.65	7.67	7.62	5.11	No Comments
70	N6B Nozzle	3	80	7.64	7.54	7.75	7.62	5.11	No Comments
75	N4C Nozzle	2	160	8.64	8.56	8.66	8.74	6.1	No Comments
80	N14D Nozzle	3	80	7.88	7.80	7.90	7.62	5.11	No Comments
85	N13B Nozzle	3	80	7.67	7.52	7.54	7.62	5.11	No Comments
90	N13C Nozzle	3	80	7.60	7.52	7.65	7.62	5.11	No Comments
95	N13D Nozzle	3	80	7.57	7.49	7.54	7.62	5.11	No Comments



Treater Data Plate

