

**REVIEWED**

By DavidSel at 2:45 pm, Jan 26, 2024



VISUAL INSPECTION REPORT – PRESSURE VESSEL  
1903, 19th AVE Wainwright, Alberta T9W 1L2 Ph. 1-780-806-6224  
www.sharptailinspection.com, derek@sharptailinspection.com

**Vessel Static**

<b>Date:</b> 2024-01-24		<b>Equip. Name:</b> Line Heater & Coil		<b>Job #:</b> 4204
<b>Inspector:</b> Derek Pfisterer		<b>Jurisdiction #:</b> A0674574		<b>Fluid:</b> Natural Gas
<b>Agent Co:</b> Sharptail Inspection		<b>S/N:</b> 181048		<b>Service Type:</b> Sweet
<b>Owner:</b> CNRL		<b>CRN:</b> Y8483.2		<b>MAWP (psi):</b> 14.9
<b>Province:</b> Albera		<b>Manufacturer:</b> FourStar Resources		<b>Design T (F):</b> 600
<b>Area:</b> West Siebert		<b>Year Built:</b> 2018		<b>MDMT (F):</b> -20
<b>LSD:</b> 6-17-64-8W4		<b>Unit/Equip #:</b> E-2040		<b>Head Thick (in):</b> NA
<b>District:</b> Bonyville Heavy Oil		<b>Facility Type:</b> Pad Site		<b>Assumed Shell Thick (in):</b> 0.250
				<b>Dia. (in):</b> 72.000

**PSV Static**

Threaded or Flanged	Set P (psi)	In/Out Size "	Manufacturer	S/N	Service Company	Service Date	IV	CSO	Seal Wire Intact	Capacity (scfm)
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

**Visual External/PSV Inspection Summary**

NCR Type

- An external visual inspection and on-stream UT survey was performed on the vessel and associated piping and was found to be acceptable
- Vessel Static information on Nameplate is primary for Coil Piping
- No PSV as vessel is open to atmosphere and does not require one
- Vessel is being relocated to Ferrier 1-20-39-7W5

**Visual Internal Inspection Summary**

Condition

- A visual internal was performed and vessel was entered through burner tube side on North
- Limited access top see top half of vessel due to Coils.
- Vessel is not internal coated and no internal corrosion was noted

**NDE Inspection Summary**

Condition

- An MT inspection were performed on all welds on burner tube and were found to be acceptable
- A UT corrosion survey was performed on vessel and found to be acceptable
- UT corrosion survey was performed on all 180 returns in vessel

**Recommendations**

- Have an installation inspected prior to start up

**Inspector Sign Off**

<b>Inspector:</b> Derek Pfisterer	<b>Date:</b> 2024-01-24
<b>Signature:</b>	<b>Inspector Cert. and Number:</b> ABSA ISI # 000876 Exp. May, 2025 TSASK Level 2 #252 Exp. June, 2026

External Inspection Form (General)					
External Inspection Items	Good	Fair	Poor	N/A	Comments
<b>General Condition:</b> Look for obvious external corrosion, areas of wear or fretting, bulging, buckling, bending, misalignment or leaks.					Acceptable to regulation
<b>External Coating:</b> State whether the vessels is painted or has an external coating, its condition (rusting spots, blisters, disbondment), and any corrosion where coating has failed.					NA
<b>Insulation / Cladding:</b> Look for areas of moisture ingress, staining, and poor caulking that may indicate CUI. Record general condition of insulation and cladding, and any concerns (moss or vegetation in insulation). State if insulation is asbestos (if stated).					Insulated Acceptable to regulation
<b>Nozzles, Piping and Connections:</b> Assess condition of nozzles and associated piping (look for product staining / leaking from repad tell tale holes, misalignment of piping, buckling or bending at nozzle connections, possible dead legs, any short bolting of flanged connections, and any leaking valve packing glands or other leaks in the system).					Acceptable to regulation
<b>Ladders Platforms and Walkways:</b> Look at any ladders, platforms or walkways associated with the equipment and flag any loose hardware, cracked welds, or notable deflection in load carrying supports.					Ladder Acceptable to regulation
<b>Foundations and Supports:</b> Ensure equipment is properly supported by foundation. Look for spalling or degradation of concrete foundations, and ensure anchor bolts are secure (tap with hammer).					Steel Support Acceptable to regulation

<b>External Inspection Form (General)</b>	
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External Inspection Items	Good	Fair	Poor	N/A	Comments
<b>Saddle/Skirts:</b> For skirts, inspect for corrosion of the skirt and any signs of leakage from inside skirt. For saddles, ensure one end is free to move during expansion / contraction (skid plate and loose studs/nuts), and that other end is secure. Look for any corrosion under fireproofing material.					Saddle is free to move Acceptable to regulation
<b>Grounding:</b> Ensure equipment is directly grounded, or that grounding is achieved through the skid (if applicable).					Direct Acceptable to regulation
<b>Gauges and Instrumentation:</b> Look for general condition and accuracy of gauges and instrumentation, fouling or damage of sight glasses, and any instrumentation appearing not to be functioning properly. Ensure anode wires are secure and connected to equipment.					Pressure gauge Temperature Gauge Fluid Level Acceptable to regulation
<b>PSV:</b> Verify that CRN is correct for province, drainage/discharge slopes downwards from valve or has weep hole, PSV is in the upright position, If in-line valves are installed are they carsealed open					No PSV as vessel is open to atmosphere

Chief Inspector Sign Off			
Chief Inspector Sign Off and Date:		Signature:	

**Internal Inspection Form (General)**

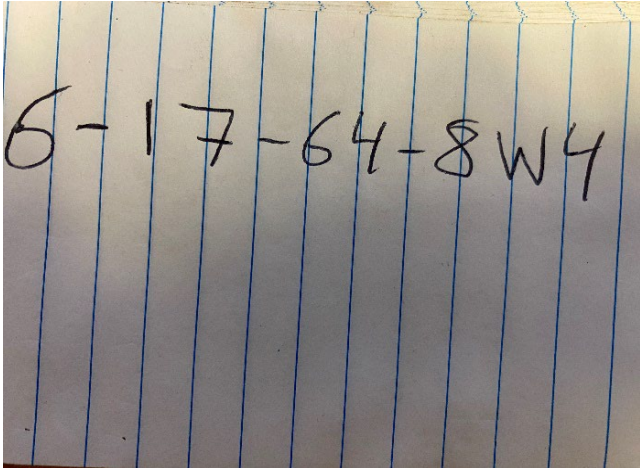


Internal Inspection Items	Good	Fair	Poor	N/A	Comments
<b>Inlet Area:</b> Describe corrosion, erosion and impingement areas and patterns and address size and area. Look at nozzles, couplings and areas of damage. Describe any deflector or impingement plates and condition.					Acceptable to regulation
<b>Internal Piping:</b> Describe any internal piping, condition (corrosion, erosion, mechanical damage, etc.) and ensure supports are intact and secure.					Coils inside vessels were in acceptable condition and UT performed on 180 returns
<b>Baffles, Trays, Deflector Plates, Weir Plates, etc:</b> If present, describe condition. Look closely at attachment welds (especially welds to shell and head, and note any deflection or warping of plates.					NA
<b>Cathodic Protection/Anodes:</b> How many anodes, Type, Percentage of consumption. If placement of anodes are at appropriate fluid levels. Connections are grounded properly. New anodes installed and how many/type					NA
<b>Demister Pad:</b> Is the demister pad and holder secure and in place. Describe any fraying or fouling. Note any corrosion, and if corrosion is suspected, remove to inspect above the demister pad.					NA
<b>Heads:</b> Note all corrosion, erosion or mechanical damage (for vertical vessels, this is the top head, for horizontal vessels, identify direction of this head).					End plates were acceptable
<b>Shell Sections:</b> Record the number of shell sections. Document location, size and depth of all erosion, corrosion or mechanical damage. Describe the general condition and document changes since the last inspection.					Acceptable to regulation
<b>Nozzles / Manways:</b> Check all nozzles for cleanliness, corrosion and erosion. Document any nozzles not accessible for inspection.					Acceptable to regulation
<b>Vortex Breakers, Drains, etc:</b> Is there a vortex breaker, and if so, is it attached to the shell / head or removable. If corrosion is suspected, it may be necessary to remove the vortex breaker for a proper evaluation.					Acceptable to regulation
<b>Welds:</b> Inspect all welds, including attachment welds. Document all service and manufacturing related damages, if any and discuss with the Chief Inspector before closing the vessel.					Acceptable to regulation
<b>Internal Coating:</b> Document the condition of the internal coating (if applicable). Look for failures in the coating and note any active corrosion where coating has failed.					NA

**Inspector Sign Off**

Chief Inspector Sign Off and Date:		Signature:	
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Pictures



Picture 1: LSD Sign



Picture 2: Nameplate



Picture 3: Vessel Overall



Picture 4: Flanges still partially connected



Picture 5: Saddle and directly grounded



Picture 6: Vessel Overall

Pictures



Picture 7: Fluid Level



Picture 8: Temperature Gauge



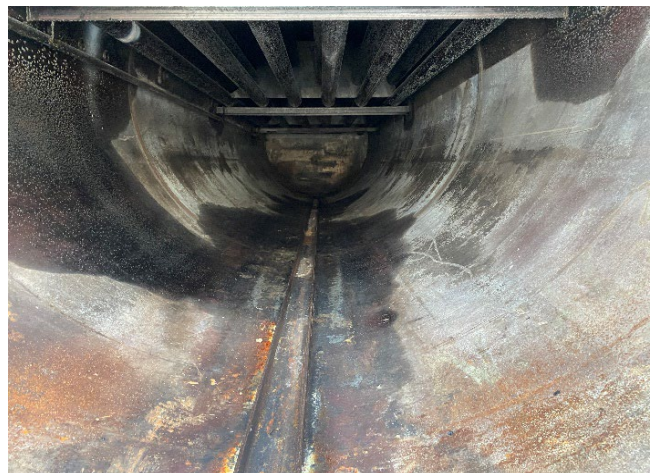
Picture 9: Piping, valves and gauges



Picture 10: Pressure Gauge



Picture 11: Internal Vessel Overall



Picture 12: Bottom side of vessel

Pictures



Picture 13: Coils blocking visual of top side of shell



Picture 14: South End Plate



Picture 15: Internal vessel overall



Picture 16 Burner Tubes



Picture 17: Burner Tube and North End Plate

Picture 18:

# ULTRASONIC EXAMINATION REPORT



UT EXAMINATION REPORT - Procedure: UT.THICK. Rev 1.1  
 1903, 19th AVE Wainwright, Alberta T9W 1L2 Ph. 1-833-274-6381 www.sharptailinspection.com

Date:	2024-01-24	Sharptail Job Number:	4204
Client:	CNRL	UT Corrosion Survey:	Acceptable
<b>VESSEL STATIC INFORMATION</b>		<b>NDE EQUIPMENT</b>	
Jurisdiction #:	A0674574	UT Machine (SN)	Olympus Epoch 600 130477502
Manufacturer:	FourStar Resources	Calibration Date	1/16/2024
Serial Number:	181048	Calibration Block	Carbon Steel / 0.100"-0.500" (S/N: 19-2178)
CRN:	Y8483.2	Transducer	D799 / 5.0 MHz / 0.5" dia. / Dual
LSD:	6-17-64-8W4	Scanning Method	Continuous

## CML'S



### INSPECTION SIGN OFF

Technician: <u>Derek Pfisterer</u>	CGSB Cert # <u>18452</u>	Sign off: <u><i>Derek Pfisterer</i></u>	Date: <u>2024-01-24</u>
Reviewed By: _____	Expiry Date: <u>Apr-2025</u>	Sign off: _____	Date: _____



**CML Number 0**

Minimum thickness **0.236**

Average thickness **0.243**

CML Location Shell

Year Built 2018  
Current Year 2024

Comments:

No indications to note



Assumed Shell Thick (in):	Last Survey Date	Last Survey Thickness	Current Survey Thickness	Short Term CR (in/yr)	Long Term CR (in/yr)	T Min	Short Term Remaining Life to T Min (yrs)	Long Term Remaining life to T Min (yrs)
0.250	N/A	N/A	0.236	N/A	0.002	0.031	N/A	88.000
0.250	N/A	N/A	0.243	N/A	0.001	0.031	N/A	182.000

**CML Number 5**

Minimum thickness **0.216**

Average thickness **0.239**

CML Location Shell

Year Built 2018  
Current Year 2024

Comments:

No indications to note

Assumed Shell Thick (in):	Last Survey Date	Last Survey Thickness	Current Survey Thickness	Short Term CR (in/yr)	Long Term CR (in/yr)	T Min	Short Term Remaining Life to T Min (yrs)	Long Term Remaining life to T Min (yrs)
0.250	N/A	N/A	0.216	N/A	0.006	0.031	N/A	<b>32.706</b>
0.250	N/A	N/A	0.239	N/A	0.002	0.031	N/A	113.636

**CML Number 10**

Minimum thickness **0.217**

Average thickness **0.232**

CML Location Shell

Year Built 2018  
Current Year 2024

Comments:

No indications to note

Assumed Shell Thick (in):	Last Survey Date	Last Survey Thickness	Current Survey Thickness	Short Term CR (in/yr)	Long Term CR (in/yr)	T Min	Short Term Remaining Life to T Min (yrs)	Long Term Remaining life to T Min (yrs)
0.250	N/A	N/A	0.217	N/A	0.006	0.031	N/A	<b>33.879</b>
0.250	N/A	N/A	0.232	N/A	0.003	0.031	N/A	67.111

**CML Number 15**

Minimum thickness **0.231**

Average thickness **0.243**

CML Location Shell

Year Built 2018  
Current Year 2024

Comments:

No indications to note



Assumed Shell Thick (in):	Last Survey Date	Last Survey Thickness	Current Survey Thickness	Short Term CR (in/yr)	Long Term CR (in/yr)	T Min	Short Term Remaining Life to T Min (yrs)	Long Term Remaining life to T Min (yrs)
0.250	N/A	N/A	0.231	N/A	0.003	0.031	N/A	63.263
0.250	N/A	N/A	0.243	N/A	0.001	0.031	N/A	182.000

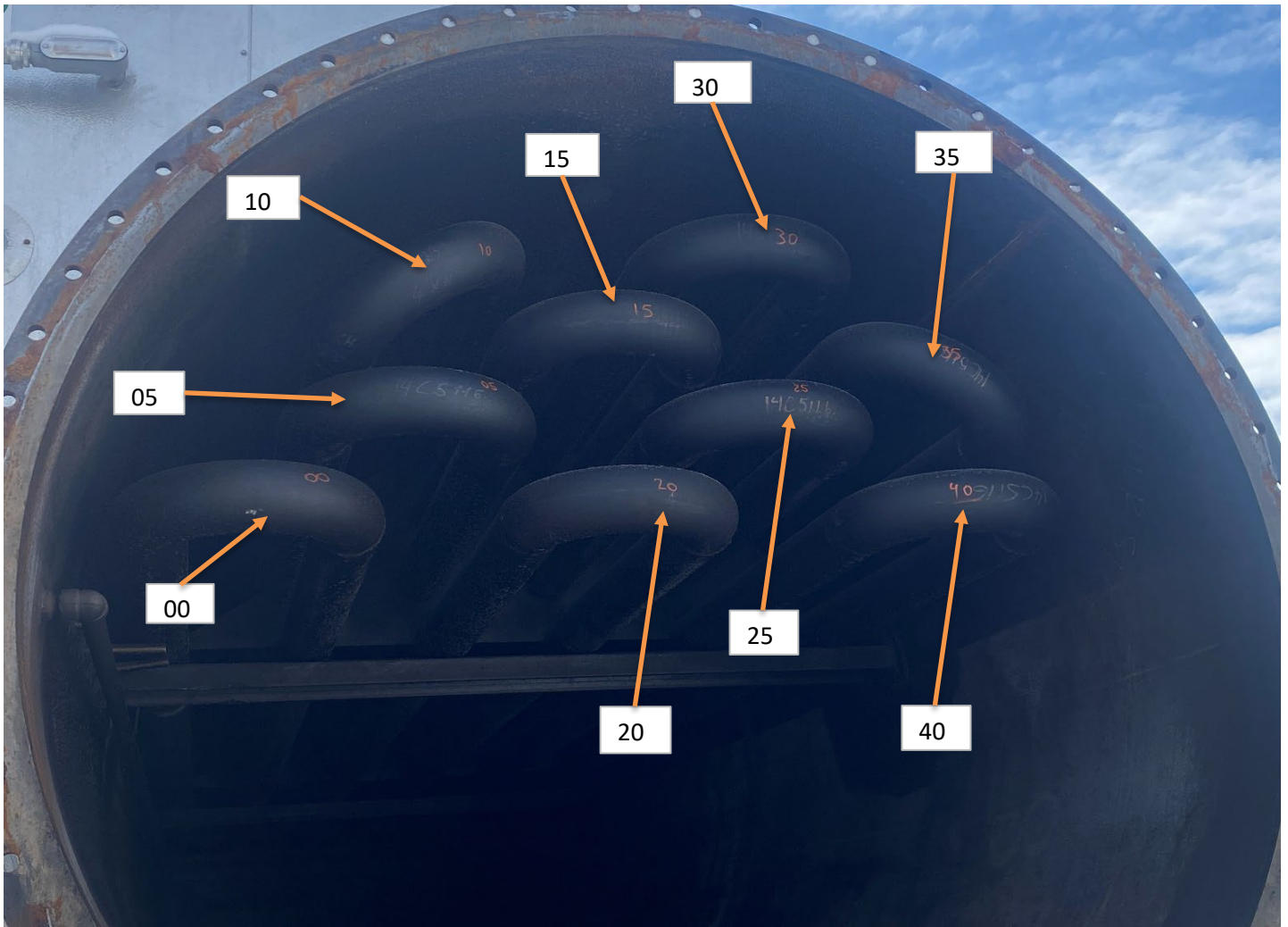
# ULTRASONIC EXAMINATION REPORT



UT EXAMINATION REPORT - Procedure: UT.THICK. Rev 1.1  
 1903, 19th AVE Wainwright, Alberta T9W 1L2 Ph. 1-833-274-6381 www.sharptailinspection.com

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Client:	CNRL	UT Corrosion Survey:	Acceptable
<b>VESSEL STATIC INFORMATION</b>		<b>NDE EQUIPMENT</b>	
Jurisdiction #:	A0674574	UT Machine (SN)	Olympus Epoch 600 130477502
Manufacturer:	FourStar Resources	Calibration Date	1/16/2024
Serial Number:	181048	Calibration Block	Carbon Steel / 0.100"-0.500" (S/N: 19-2178)
CRN:	Y8483.2	Transducer	D799 / 5.0 MHz / 0.5" dia. / Dual
LSD:	6-17-64-8W4	Scanning Method	Continuous

## CML'S



## INSPECTION SIGN OFF

Technician:	Derek Pfisterer	CGSB Cert #	18452	Sign off:		Date:	2024-01-24
		Expiry Date:	Apr-2025				
Reviewed By:				Sign off:		Date:	

# ULTRASONIC EXAMINATION REPORT

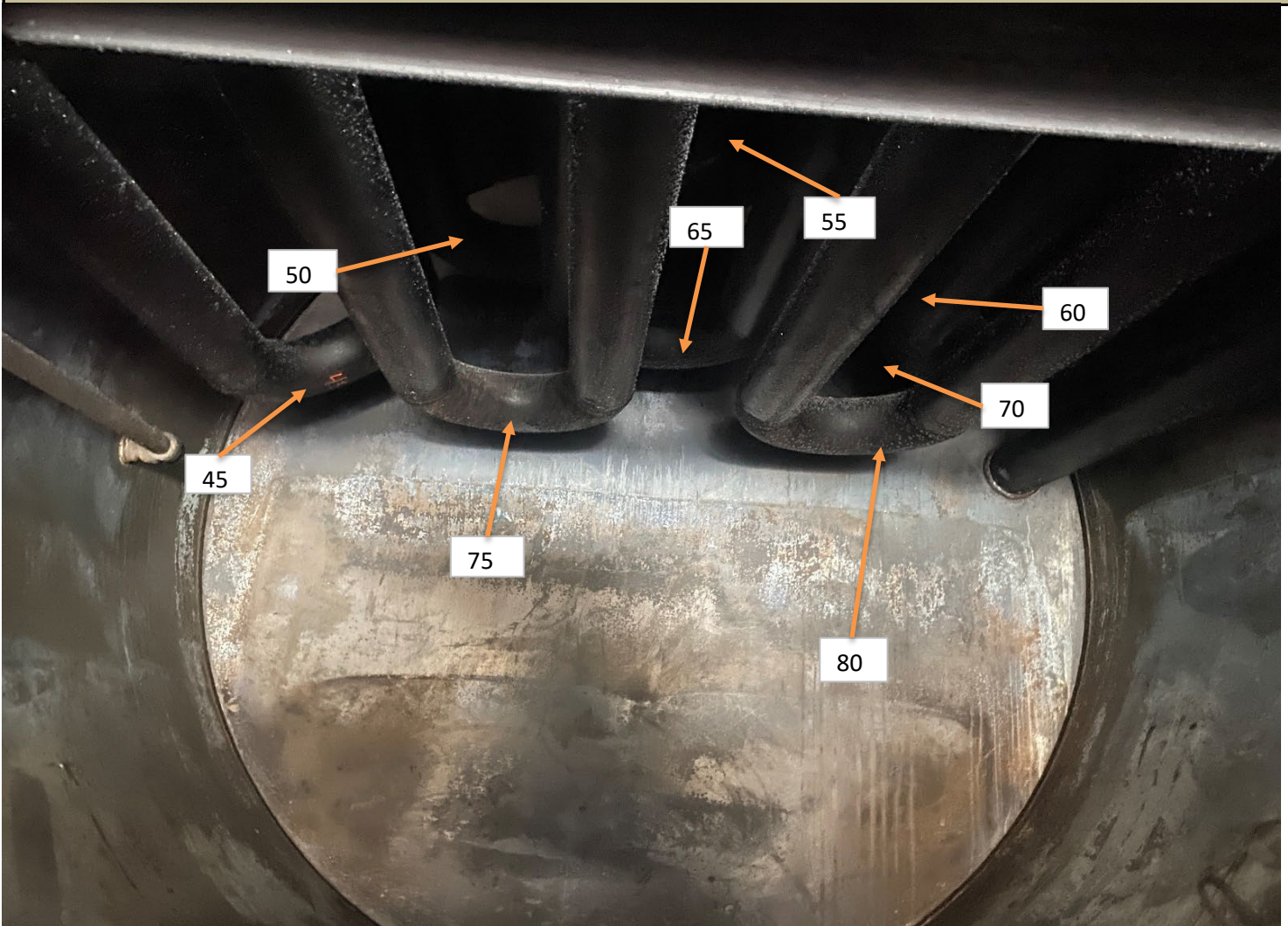


UT EXAMINATION REPORT - Procedure: UT.THICK. Rev 1.1

1903, 19th AVE Wainwright, Alberta T9W 1L2 Ph. 1-833-274-6381 www.sharptailinspection.com

Date:	2024-01-24	Sharptail Job Number:	4204
Client:	CNRL	UT Corrosion Survey:	Acceptable
<b>VESSEL STATIC INFORMATION</b>		<b>NDE EQUIPMENT</b>	
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## CML'S



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Technician: <u>Derek Pfisterer</u>	CGSB Cert # <u>18452</u>	Sign off:	Date: <u>2024-01-24</u>
Reviewed By: _____	Expiry Date: <u>Apr-2025</u>	Sign off: _____	Date: _____

**CML Number 0**

Diameter 4

Nominal thickness 0.337

Minimum thickness 0.308

Year Built 2018

Average thickness 0.321

Current Year 2024

CML Location 180 Return

Comments:

No indications to note



Nominal Thickness (less Mill Allowance)	Last Survey date	Last survey thickness	Current Survey thickness	Short Term CR (in/yr)	Long term CR (in/yr)	T Min	Short Term Remaining life to T Min	Long Term Remaining life to T Min
0.295	N/A	N/A	0.308	N/A	0.000	0.090	N/A	Above Nominal
0.295	N/A	N/A	0.321	N/A	0.000	0.090	N/A	Above Nominal

**CML Number 5**

Diameter 4

Nominal thickness 0.337

Minimum thickness 0.302

Year Built 2018

Average thickness 0.322

Current Year 2024

CML Location 180 Return

Comments:

No indications to note

Nominal Thickness (less Mill Allowance)	Last Survey date	Last survey thickness	Current Survey thickness	Short Term CR (in/yr)	Long term CR (in/yr)	T Min	Short Term Remaining life to T Min	Long Term Remaining life to T Min
0.295	N/A	N/A	0.302	N/A	0.000	0.090	N/A	Above Nominal
0.295	N/A	N/A	0.322	N/A	0.000	0.090	N/A	Above Nominal

**CML Number 10**

Diameter 4

Nominal thickness 0.337

Minimum thickness 0.275

Year Built 2018

Average thickness 0.310

Current Year 2024

CML Location 180 Return

Comments:

No indications to note

Nominal Thickness (less Mill Allowance)	Last Survey date	Last survey thickness	Current Survey thickness	Short Term CR (in/yr)	Long term CR (in/yr)	T Min	Short Term Remaining life to T Min	Long Term Remaining life to T Min
0.295	N/A	N/A	0.275	N/A	0.003	0.090	N/A	55.849
0.295	N/A	N/A	0.31	N/A	0.000	0.090	N/A	Above Nominal

**CML Number 15**

Diameter 4

Nominal thickness 0.337

Minimum thickness 0.310

Year Built 2018

Average thickness 0.319

Current Year 2024

CML Location 180 Return

Comments:

No indications to note

Nominal Thickness (less Mill Allowance)	Last Survey date	Last survey thickness	Current Survey thickness	Short Term CR (in/yr)	Long term CR (in/yr)	T Min	Short Term Remaining life to T Min	Long Term Remaining life to T Min
0.295	N/A	N/A	0.31	N/A	0.000	0.090	N/A	Above Nominal
0.295	N/A	N/A	0.319	N/A	0.000	0.090	N/A	Above Nominal

**CML Number 20**

Diameter 4

Nominal thickness 0.337

Minimum thickness 0.264

Year Built 2018

Average thickness 0.310

Current Year 2024

CML Location 180 Return

Comments:

No indications to note

Nominal Thickness (less Mill Allowance)	Last Survey date	Last survey thickness	Current Survey thickness	Short Term CR (in/yr)	Long term CR (in/yr)	T Min	Short Term Remaining life to T Min	Long Term Remaining life to T Min
0.295	N/A	N/A	0.264	N/A	0.005	0.090	N/A	33.814
0.295	N/A	N/A	0.31	N/A	0.000	0.090	N/A	Above Nominal

**CML Number 25**

Diameter 4

Nominal thickness 0.337

Minimum thickness **0.311**

Year Built 2018

Average thickness **0.324**

Current Year 2024

CML Location **180 Return**Comments:

No indications to note



Nominal Thickness (less Mill Allowance)	Last Survey date	Last survey thickness	Current Survey thickness	Short Term CR (in/yr)	Long term CR (in/yr)	T Min	Short Term Remaining life to T Min	Long Term Remaining life to T Min
0.295	N/A	N/A	0.311	N/A	0.000	0.090	N/A	Above Nominal
0.295	N/A	N/A	0.324	N/A	0.000	0.090	N/A	Above Nominal

**CML Number 30**

Diameter 4

Nominal thickness 0.337

Minimum thickness **0.276**

Year Built 2018

Average thickness **0.304**

Current Year 2024

CML Location **180 Return**Comments:

No indications to note

Nominal Thickness (less Mill Allowance)	Last Survey date	Last survey thickness	Current Survey thickness	Short Term CR (in/yr)	Long term CR (in/yr)	T Min	Short Term Remaining life to T Min	Long Term Remaining life to T Min
0.295	N/A	N/A	0.276	N/A	0.003	0.090	N/A	59.126
0.295	N/A	N/A	0.304	N/A	0.000	0.090	N/A	Above Nominal

**CML Number 35**

Diameter 4

Nominal thickness 0.337

Minimum thickness **0.294**

Year Built 2018

Average thickness **0.324**

Current Year 2024

CML Location **180 Return**Comments:

No indications to note

Nominal Thickness (less Mill Allowance)	Last Survey date	Last survey thickness	Current Survey thickness	Short Term CR (in/yr)	Long term CR (in/yr)	T Min	Short Term Remaining life to T Min	Long Term Remaining life to T Min
0.295	N/A	N/A	0.294	N/A	0.000	0.090	N/A	1398.857
0.295	N/A	N/A	0.324	N/A	0.000	0.090	N/A	Above Nominal

**CML Number 40**

Diameter 4

Nominal thickness 0.337

Minimum thickness **0.309**

Year Built 2018

Average thickness **0.327**

Current Year 2024

CML Location **180 Return**Comments:

No indications to note

Nominal Thickness (less Mill Allowance)	Last Survey date	Last survey thickness	Current Survey thickness	Short Term CR (in/yr)	Long term CR (in/yr)	T Min	Short Term Remaining life to T Min	Long Term Remaining life to T Min
0.295	N/A	N/A	0.309	N/A	0.000	0.090	N/A	Above Nominal
0.295	N/A	N/A	0.327	N/A	0.000	0.090	N/A	Above Nominal

**CML Number 45**

Diameter 4

Nominal thickness 0.337

Minimum thickness **0.321**

Year Built 2018

Average thickness **0.345**

Current Year 2024

CML Location **180 Return**Comments:

No indications to note

Nominal Thickness (less Mill Allowance)	Last Survey date	Last survey thickness	Current Survey thickness	Short Term CR (in/yr)	Long term CR (in/yr)	T Min	Short Term Remaining life to T Min	Long Term Remaining life to T Min
0.295	N/A	N/A	0.321	N/A	0.000	0.090	N/A	Above Nominal
0.295	N/A	N/A	0.345	N/A	0.000	0.090	N/A	Above Nominal

**CML Number 50**

Diameter 4

Nominal thickness 0.337

Minimum thickness **0.326** Year Built 2018Average thickness **0.331** Current Year 2024CML Location **180 Return**

Comments:

No indications to note



Nominal Thickness (less Mill Allowance)	Last Survey date	Last survey thickness	Current Survey thickness	Short Term CR (in/yr)	Long term CR (in/yr)	T Min	Short Term Remaining life to T Min	Long Term Remaining life to T Min
0.295	N/A	N/A	0.326	N/A	0.000	0.090	N/A	Above Nominal
0.295	N/A	N/A	0.331	N/A	0.000	0.090	N/A	Above Nominal

**CML Number 55**

Diameter 4

Nominal thickness 0.337

Minimum thickness **0.319** Year Built 2018Average thickness **0.337** Current Year 2024CML Location **180 Return**

Comments:

No indications to note

Nominal Thickness (less Mill Allowance)	Last Survey date	Last survey thickness	Current Survey thickness	Short Term CR (in/yr)	Long term CR (in/yr)	T Min	Short Term Remaining life to T Min	Long Term Remaining life to T Min
0.295	N/A	N/A	0.319	N/A	0.000	0.090	N/A	Above Nominal
0.295	N/A	N/A	0.337	N/A	0.000	0.090	N/A	Above Nominal

**CML Number 60**

Diameter 4

Nominal thickness 0.337

Minimum thickness **0.287** Year Built 2018Average thickness **0.316** Current Year 2024CML Location **180 Return**

Comments:

No indications to note

Nominal Thickness (less Mill Allowance)	Last Survey date	Last survey thickness	Current Survey thickness	Short Term CR (in/yr)	Long term CR (in/yr)	T Min	Short Term Remaining life to T Min	Long Term Remaining life to T Min
0.295	N/A	N/A	0.287	N/A	0.001	0.090	N/A	150.095
0.295	N/A	N/A	0.316	N/A	0.000	0.090	N/A	Above Nominal

**CML Number 65**

Diameter 4

Nominal thickness 0.337

Minimum thickness **0.310** Year Built 2018Average thickness **0.341** Current Year 2024CML Location **180 Return**

Comments:

No indications to note

Nominal Thickness (less Mill Allowance)	Last Survey date	Last survey thickness	Current Survey thickness	Short Term CR (in/yr)	Long term CR (in/yr)	T Min	Short Term Remaining life to T Min	Long Term Remaining life to T Min
0.295	N/A	N/A	0.31	N/A	0.000	0.090	N/A	Above Nominal
0.295	N/A	N/A	0.341	N/A	0.000	0.090	N/A	Above Nominal

**CML Number 70**

Diameter 4

Nominal thickness 0.337

Minimum thickness **0.312** Year Built 2018Average thickness **0.343** Current Year 2024CML Location **180 Return**

Comments:

No indications to note

Nominal Thickness (less Mill Allowance)	Last Survey date	Last survey thickness	Current Survey thickness	Short Term CR (in/yr)	Long term CR (in/yr)	T Min	Short Term Remaining life to T Min	Long Term Remaining life to T Min
0.295	N/A	N/A	0.312	N/A	0.000	0.090	N/A	Above Nominal
0.295	N/A	N/A	0.343	N/A	0.000	0.090	N/A	Above Nominal

**CML Number 75**

Diameter 4

Nominal thickness 0.337

Minimum thickness **0.293**

Year Built 2018

Average thickness **0.306**

Current Year 2024

CML Location

180 Return

Comments:

No indications to note



Nominal Thickness (less Mill Allowance)	Last Survey date	Last survey thickness	Current Survey thickness	Short Term CR (in/yr)	Long term CR (in/yr)	T Min	Short Term Remaining life to T Min	Long Term Remaining life to T Min
0.295	N/A	N/A	0.293	N/A	0.000	0.090	N/A	649.600
0.295	N/A	N/A	0.306	N/A	0.000	0.090	N/A	Above Nominal

**CML Number 80**

Diameter 4

Nominal thickness 0.337

Minimum thickness **0.310**

Year Built 2018

Average thickness **0.347**

Current Year 2024

CML Location

180 Return

Comments:

No indications to note

Nominal Thickness (less Mill Allowance)	Last Survey date	Last survey thickness	Current Survey thickness	Short Term CR (in/yr)	Long term CR (in/yr)	T Min	Short Term Remaining life to T Min	Long Term Remaining life to T Min
0.295	N/A	N/A	0.31	N/A	0.000	0.090	N/A	Above Nominal
0.295	N/A	N/A	0.347	N/A	0.000	0.090	N/A	Above Nominal

# MAGNETIC PARTICLE EXAMINATION REPORT



**MT EXAMINATION REPORT - Procedure: MT.1 REV 1.3**

**1903, 19th AVE Wainwright, Alberta T9W 1L2 Ph. 1-833-274-6381 www.sharptailinspection.com**

<b>Code:</b>	ASME Sec VIII, Div. 1. Appendix 6-4	<b>Procedure # MT.1, Rev 1.3</b> Magnetic Particle Examination		
<b>Client:</b>	CNRL	<b>Location:</b>	6-17-64-8W4	<b>Date:</b> 2024-01-24
<b>Report #:</b>	4204-1	<b>Technique:</b>	MT1: Visible Dry Powder <input type="checkbox"/>	MT2: Visible Black & White <input checked="" type="checkbox"/>
<b>Job #:</b>	4204		MT3: Visible Fluorescent <input type="checkbox"/>	
<b>Ser. #:</b>	181048	<b>Surface Condition:</b>	<input checked="" type="checkbox"/> Buffed <input type="checkbox"/> As Ground	
<b>CRN:</b>	Y8483.2		<input type="checkbox"/> Machined <input type="checkbox"/> Sandblast <input type="checkbox"/> Painted <input type="checkbox"/> Other	
<b>Jurisdiction #:</b>	A0674574	<b>Equipment Type:</b>	<input checked="" type="checkbox"/> Yoke <input type="checkbox"/> Coil <input checked="" type="checkbox"/> AC <input type="checkbox"/> DC	
<b>Manufacturer:</b>	FourStar Resources		<input checked="" type="checkbox"/> Continuous <input type="checkbox"/> Residual <input checked="" type="checkbox"/> 120V <input type="checkbox"/> Other	
<b>Unique #:</b>	NA	<b>Lighting Source:</b>	<input type="checkbox"/> LED <input checked="" type="checkbox"/> Halogen <input checked="" type="checkbox"/> Day Light <input type="checkbox"/> Blacklight	
<b>Client ID #:</b>	E-2040	<b>Particle Type:</b>	<input type="checkbox"/> 2A Red Dry <input checked="" type="checkbox"/> Visible Black & White <input type="checkbox"/> Visible Fluorescent	
<b>Items Inspected:</b>	Right Burner Tube		<b>Manufacturer:</b>	Ardrox
		<b>Description:</b>	Perform MT on welds on burner tube	
		<b>Material Type:</b>	Carbon Steel	

WELD I.D. / MT#	WALL THICKNESS	SIZE	Welder Stamp	Accept	Reject	REMARKS
1	0.250"	18" Dia.		✓		Internal Tube Sheet
2	0.250"	18" Dia.		✓		Internal Tube Sheet
3	0.250"	12"		✓		Support Weld
4	0.250"	12"		✓		Support Weld
5	0.250"	18" Dia.		✓		Circ Weld
6	0.250"	18" Dia.		✓		Circ Weld
7	0.250"	18" Dia.		✓		Miter Weld
8	0.250"	18" Dia.		✓		Miter Weld
9	0.250"	18" Dia.		✓		Miter Weld

## INSPECTION SIGN OFF

<b>Technician Name</b>	Derek Pfisterer	<b>Signature</b>		<b>Certification #</b>	18452
<b>Yoke Model:</b>	Y-2	<b>Yoke SN#</b>	N-4871	<b>Last Calibration</b>	Jan-24

**Yoke Tested with 10lb lift test prior to use. Yoke calibration block SN# 1725**

**White Light Tested prior to inspection. ≥100 FC or 1000 Lx at examination surface. Light Meter SN# 150502707**



PICTURES

**NDTCB OCEND**

NRCAN NATIONAL NON-DESTRUCTIVE TESTING CERTIFICATION BODY  
ORGANISME DE CERTIFICATION NATIONAL EN ESSAIS NON DESTRUCTIFS DE RNCAN

Name | Nom **Derek Pfisterer**  
Reg. Number | No. matricule **18452**  
Issue Date | Date d'émission **2021/01/18**

Corrective lenses for vision required  
Verres correctifs pour la vision sont nécessaires **No | Non**

Colour vision limitation  
Limitation de la vision des couleurs **No | Non**

This certification card does not identify that the stated individual is an employee or representative of Natural Resources Canada, Government of Canada.  
Cette carte de certification n'identifie pas l'individu d'être un employé ou un représentant de Ressources naturelles Canada, Gouvernement du Canada.

**Canada**

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ORGANISME DE CERTIFICATION NATIONAL EN ESSAIS NON DESTRUCTIFS DE RNCAN

Name | Nom **Derek Pfisterer**   
Reg. Number | No. matricule **18452**

Certified to **CAN/CGSB-48.9712-2014** | Certifié selon **CAN/CGSB-48.9712-2014**

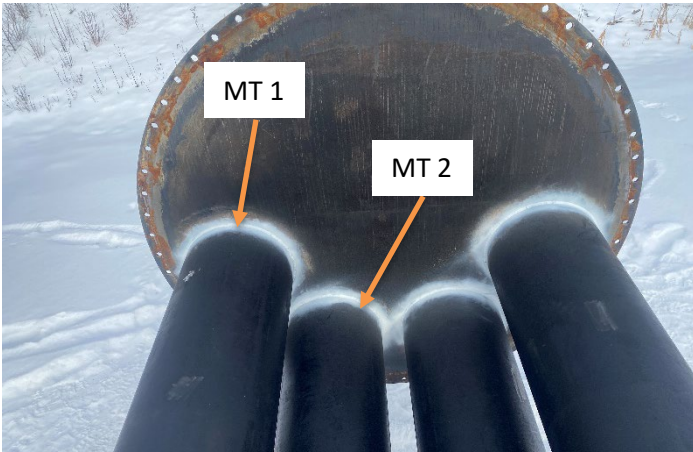
METHOD MÉTHODE	LEVEL NIVEAU	SECTOR SECTEUR	EFFECTIVE DATE DATE EFFECTIVE	EXPIRY DATE EXPIRATION
UT	2	EMC	2021/01/12	2025/04/15
MT	2	EMC	2019/08/20	2024/04/15

For verification of certification status, policies and definitions visit the Natural Resources Canada (NRCAN) National Non-Destructive Testing Certification Body (NDTCB) website.  
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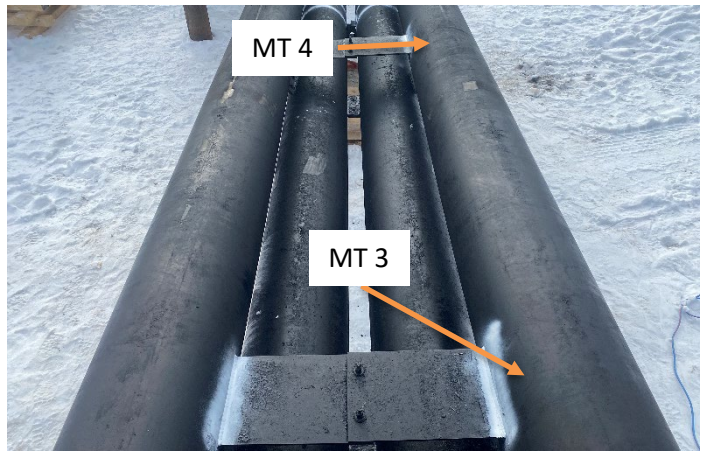
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P. K. Yuen | Director, NDTCB | Directeur, OCEND

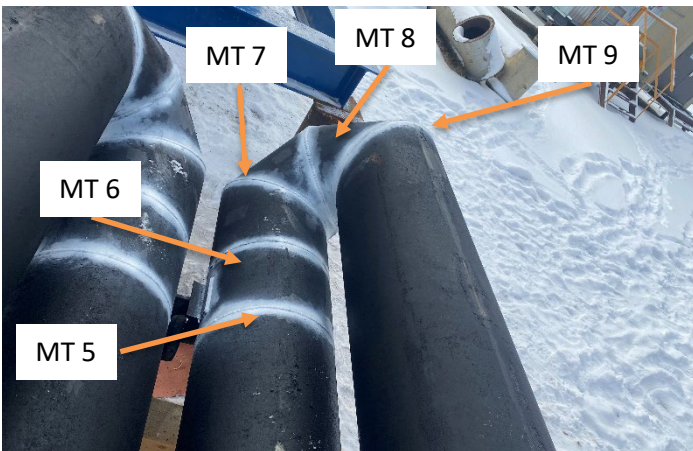
**Canada**



Picture 1: MT 1-2



Picture 2: MT 3-4



Picture 3: MT 5-9

Picture 4: \_\_\_\_\_

# BURNER TUBE VISUAL AND UT REPORT



## BURNER TUBE VISUAL AND UT EXAMINATION REPORT -

1903, 19th AVE Wainwright, Alberta T9W 1L2 Ph. 1-833-274-6381 www.sharptailinspection.com

### BURNER TUBE INSPECTION REPORT

Client	CNRL	Location	6-17-64-8W4	
Job #	4204	Report #	4204-2	Date
Ser. #	181048	Inspection Type	VE <input checked="" type="checkbox"/> UT <input checked="" type="checkbox"/> MT <input checked="" type="checkbox"/> PT <input type="checkbox"/> HT <input type="checkbox"/>	
CRN:	Y8483.2	Surface Condition	<input type="checkbox"/> Washed <input type="checkbox"/> Sandblasted <input checked="" type="checkbox"/> Other Buffed	
Ⓐ #	A0674574	Miter Type	<input type="checkbox"/> 180 Return <input type="checkbox"/> 3 Piece Miter <input checked="" type="checkbox"/> 2 Piece Miter	
Manufacturer	FourStar Resources		<input type="checkbox"/> 1 Piece Miter <input type="checkbox"/> Other	
Unique #	NA	Service	<input checked="" type="checkbox"/> Sweet <input type="checkbox"/> Sour	Wall Thickness
Client ID #	Right Burner Tube	Length of Tube	27.5'	Diameter
Diameter				
18" Dia.				

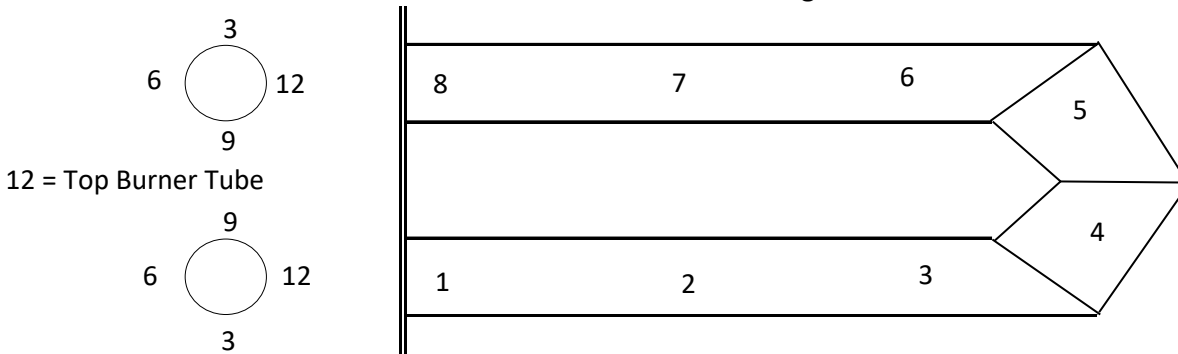
#### Attachments

Stiffener	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Desand Line	No <input type="checkbox"/>	Anode Holder	No <input type="checkbox"/> Yes <input checked="" type="checkbox"/>
Hanger	No <input type="checkbox"/>	Hanger Repad	No <input type="checkbox"/>	Gusset	No <input type="checkbox"/>
Other			Other		

#### Visual Comments

Stack	Acceptable to Regulation
Deflector	NA
Vessel Flange	Acceptable to Regulation
Burner Flange	Acceptable to Regulation
General/Pitting	Acceptable to Regulation
Corrosion	
Visual Defects	Acceptable to Regulation
UT Results	Acceptable to Regulation
MT/PT Results	Pass, See MT Report 4204-1
Recommendations	None

#### Visual Markings



Inspector/Technician	Derek Pfisterer	Signature		CGSB Level 2 UT MT #	18452 Exp. Apr 2025
UT Scanner:	Epoch 600	S/N:	130477502	Calibration Date:	Jan-24
Calibration Block	Carbon Steel / 0.100" - 0.500" (S/N: 19-2178)				
Transducer:	D799 / 5.0 MHz / 0.5" dia. / Dual		Scanning Method:	Continuous	

# MAGNETIC PARTICLE EXAMINATION REPORT



## MT EXAMINATION REPORT - Procedure: MT.1 REV 1.3

1903, 19th AVE Wainwright, Alberta T9W 1L2 Ph. 1-833-274-6381 [www.sharptailinspection.com](http://www.sharptailinspection.com)

<b>Code:</b>	ASME Sec VIII, Div. 1. Appendix 6-4	<b>Procedure # MT.1, Rev 1.3</b> Magnetic Particle Examination		
<b>Client:</b>	CNRL	<b>Location:</b>	6-17-64-8W4	<b>Date:</b> 2024-01-24
<b>Report #:</b>	4204-3	<b>Technique:</b>	MT1: Visible Dry Powder <input type="checkbox"/>	MT2: Visible Black & White <input checked="" type="checkbox"/>
<b>Job #:</b>	4204		MT3: Visible Fluorescent <input type="checkbox"/>	
<b>Ser. #:</b>	181048	<b>Surface Condition:</b>	<input checked="" type="checkbox"/> Buffed <input type="checkbox"/> As Ground	
<b>CRN:</b>	Y8483.2		<input type="checkbox"/> Machined <input type="checkbox"/> Sandblast <input type="checkbox"/> Painted <input type="checkbox"/> Other	
<b>Jurisdiction #:</b>	A0674574	<b>Equipment Type:</b>	<input checked="" type="checkbox"/> Yoke <input type="checkbox"/> Coil <input checked="" type="checkbox"/> AC <input type="checkbox"/> DC	
<b>Manufacturer:</b>	FourStar Resources		<input checked="" type="checkbox"/> Continuous <input type="checkbox"/> Residual <input checked="" type="checkbox"/> 120V <input type="checkbox"/> Other	
<b>Unique #:</b>	NA	<b>Lighting Source:</b>	<input type="checkbox"/> LED <input checked="" type="checkbox"/> Halogen <input checked="" type="checkbox"/> Day Light <input type="checkbox"/> Blacklight	
<b>Client ID #:</b>	E-2040	<b>Particle Type:</b>	<input type="checkbox"/> 2A Red Dry <input checked="" type="checkbox"/> Visible Black & White <input type="checkbox"/> Visible Fluorescent	
<b>Items Inspected:</b>	Left Burner Tube		<b>Manufacturer:</b>	Ardrox
		<b>Description:</b>	Perform MT on welds on burner tube	
		<b>Material Type:</b>	Carbon Steel	

WELD I.D. / MT#	WALL THICKNESS	SIZE	Welder Stamp	Accept	Reject	REMARKS
1	0.250"	18" Dia.		✓		Internal Tube Sheet
2	0.250"	18" Dia.		✓		Internal Tube Sheet
3	0.250"	12"		✓		Support Weld
4	0.250"	12"		✓		Support Weld
5	0.250"	18" Dia.		✓		Circ Weld
6	0.250"	18" Dia.		✓		Circ Weld
7	0.250"	18" Dia.		✓		Miter Weld
8	0.250"	18" Dia.		✓		Miter Weld
9	0.250"	18" Dia.		✓		Miter Weld

INSPECTION SIGN OFF					
<b>Technician Name</b>	Derek Pfisterer	<b>Signature</b>		<b>Certification #</b>	18452
<b>Yoke Model:</b>	Y-2	<b>Yoke SN#</b>	N-4871	<b>Last Calibration</b>	Jan-24
Yoke Tested with 10lb lift test prior to use. Yoke calibration block SN# 1725					
White Light Tested prior to inspection. ≥100 FC or 1000 Lx at examination surface. Light Meter SN# 150502707					

PICTURES

**NDTCB OCEND**

NRCAN NATIONAL NON-DESTRUCTIVE TESTING CERTIFICATION BODY  
ORGANISME DE CERTIFICATION NATIONAL EN ESSAIS NON DESTRUCTIFS DE RNCAN

Name | Nom **Derek Pfisterer**  
Reg. Number | No. matricule **18452**  
Issue Date | Date d'émission **2021/01/18**

Corrective lenses for vision required  
Verres correctifs pour la vision sont nécessaires **No | Non**

Colour vision limitation  
Limitation de la vision des couleurs **No | Non**

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**Canada**

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Name | Nom **Derek Pfisterer**   
Reg. Number | No. matricule **18452**

Certified to CAN/CGSB-48.9712-2014 | Certifié selon CAN/CGSB-48.9712-2014

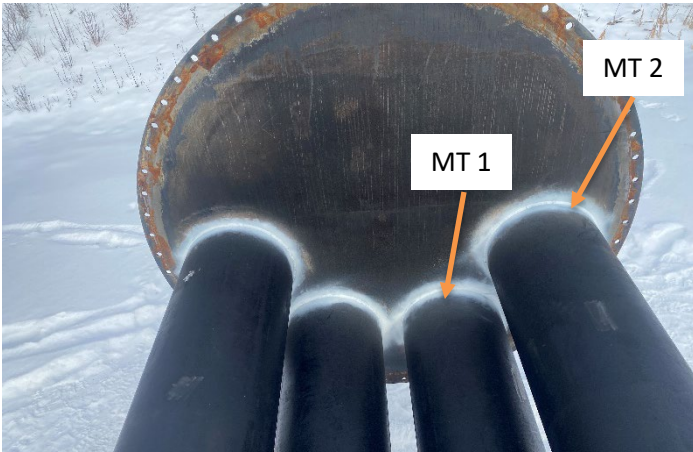
METHOD MÉTHODE	LEVEL NIVEAU	SECTOR SECTEUR	EFFECTIVE DATE DATE EFFECTIVE	EXPIRY DATE EXPIRATION
UT	2	EMC	2021/01/12	2025/04/15
MT	2	EMC	2019/08/20	2024/04/15

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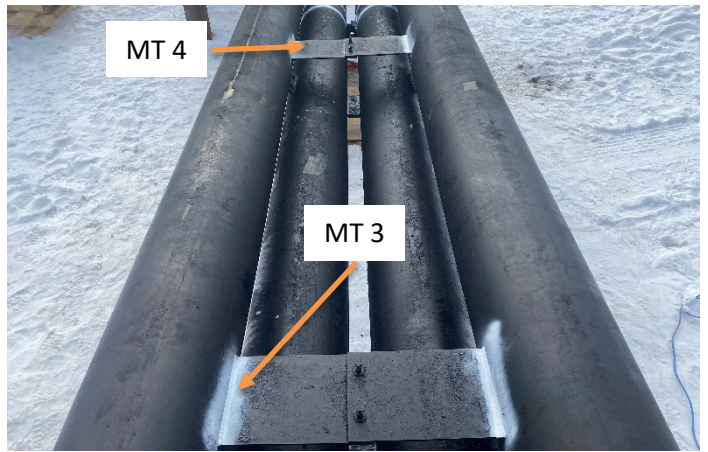
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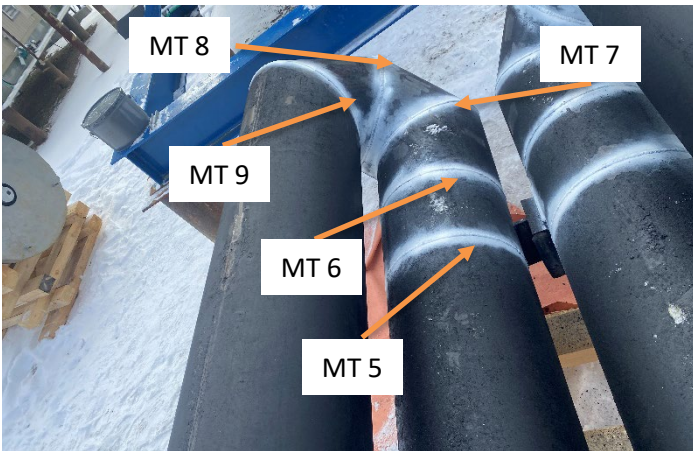
**Canada**



Picture 1: MT 1-2



Picture 2: MT 3-4



Picture 3: MT 5-9

Picture 4: \_\_\_\_\_

# BURNER TUBE VISUAL AND UT REPORT



## BURNER TUBE VISUAL AND UT EXAMINATION REPORT -

1903, 19th AVE Wainwright, Alberta T9W 1L2 Ph. 1-833-274-6381 www.sharptailinspection.com

### BURNER TUBE INSPECTION REPORT

Client	CNRL	Location	6-17-64-8W4	
Job #	4204	Report #	4204-3	Date
Ser. #	181048	Inspection Type	VE <input checked="" type="checkbox"/> UT <input checked="" type="checkbox"/> MT <input checked="" type="checkbox"/> PT <input type="checkbox"/> HT <input type="checkbox"/>	
CRN:	Y8483.2	Surface Condition	<input type="checkbox"/> Washed <input type="checkbox"/> Sandblasted <input checked="" type="checkbox"/> Other <input type="checkbox"/> Buffed	
Ⓐ #	A0674574	Miter Type	<input type="checkbox"/> 180 Return <input type="checkbox"/> 3 Piece Miter <input checked="" type="checkbox"/> 2 Piece Miter	
Manufacturer	FourStar Resources		<input type="checkbox"/> 1 Piece Miter <input type="checkbox"/> Other	
Unique #	NA	Service	<input checked="" type="checkbox"/> Sweet <input type="checkbox"/> Sour	Wall Thickness
Client ID #	Left Burner Tube	Length of Tube	27.5'	Diameter
Diameter				
18" Dia.				

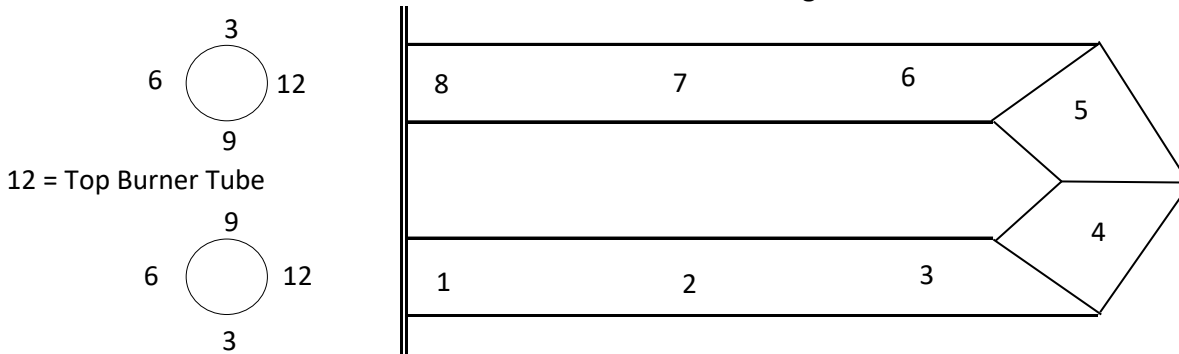
#### Attachments

Stiffener	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Desand Line	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Anode Holder	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes
Hanger	<input type="checkbox"/> No <input type="checkbox"/> Yes	Hanger Repad	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Gusset	<input type="checkbox"/> No <input type="checkbox"/> Yes
Other			Other		

#### Visual Comments

Stack	Acceptable to Regulation
Deflector	NA
Vessel Flange	Acceptable to Regulation
Burner Flange	Acceptable to Regulation
General/Pitting	Acceptable to Regulation
Corrosion	
Visual Defects	Acceptable to Regulation
UT Results	Acceptable to Regulation
MT/PT Results	Pass, See MT Report 4204-1
Recommendations	None

#### Visual Markings



Inspector/Technician	Derek Pfisterer	Signature		CGSB Level 2 UT MT #	18452 Exp. Apr 2025
UT Scanner:	Epoch 600	S/N:	130477502	Calibration Date:	Jan-24
Calibration Block	Carbon Steel / 0.100" - 0.500" (S/N: 19-2178)				
Transducer:	D799 / 5.0 MHz / 0.5" dia. / Dual		Scanning Method:	Continuous	

### UT Readings (Right Burner Tube)

TML #	Position on Burner Tube	First Survey Thickness	First Survey Date	Last Survey Thickness	Last Survey Date	% WALL LOSS	Corrosion Rate(Inches/Years)	Remaining Life of Burner Tube(Years)
1	12	0.250	2018	0.23	2024	8	0.00	69.00
1	3	0.250	2018	0.235	2024	6	0.00	94.00
1	6	0.250	2018	0.233	2024	6.8	0.00	82.24
1	9	0.250	2018	0.229	2024	8.4	0.00	65.43
2	12	0.250	2018	0.226	2024	9.6	0.00	56.50
2	3	0.250	2018	0.238	2024	4.8	0.00	119.00
2	6	0.250	2018	0.238	2024	4.8	0.00	119.00
2	9	0.250	2018	0.243	2024	2.8	0.00	208.29
3	12	0.250	2018	0.239	2024	4.4	0.00	130.36
3	3	0.250	2018	0.232	2024	7.2	0.00	77.33
3	6	0.250	2018	0.225	2024	10	0.00	54.00
3	9	0.250	2018	0.234	2024	6.4	0.00	87.75
4	12	0.250	2018	0.226	2024	9.6	0.00	56.50
4	3	0.250	2018	0.236	2024	5.6	0.00	101.14
4	6	0.250	2018	0.231	2024	7.6	0.00	72.95
4	9	0.250	2018	0.232	2024	7.2	0.00	77.33
5	12	0.250	2018	0.227	2024	9.2	0.00	59.22
5	3	0.250	2018	0.236	2024	5.6	0.00	101.14
5	6	0.250	2018	0.225	2024	10	0.00	54.00
5	9	0.250	2018	0.236	2024	5.6	0.00	101.14
6	12	0.250	2018	0.226	2024	9.6	0.00	56.50
6	3	0.250	2018	0.234	2024	6.4	0.00	87.75
6	6	0.250	2018	0.231	2024	7.6	0.00	72.95
6	9	0.250	2018	0.228	2024	8.8	0.00	62.18
7	12	0.250	2018	0.227	2024	9.2	0.00	59.22
7	3	0.250	2018	0.233	2024	6.8	0.00	82.24
7	6	0.250	2018	0.237	2024	5.2	0.00	109.38
7	9	0.250	2018	0.234	2024	6.4	0.00	87.75
8	12	0.250	2018	0.245	2024	2	0.00	294.00
8	3	0.250	2018	0.227	2024	9.2	0.00	59.22
8	6	0.250	2018	0.24	2024	4	0.00	144.00
8	9	0.250	2018	0.228	2024	8.8	0.00	62.18

## UT Readings (Left Burner Tube)

TML #	Position on Burner Tube	First Survey Thickness	First Survey Date	Last Survey Thickness	Last Survey Date	% WALL LOSS	Corrosion Rate(Inches/Years)	Remaining Life of Burner Tube(Years)
1	12	0.250	2018	0.236	2024	5.6	0.00	101.14
1	3	0.250	2018	0.237	2024	5.2	0.00	109.38
1	6	0.250	2018	0.227	2024	9.2	0.00	59.22
1	9	0.250	2018	0.239	2024	4.4	0.00	130.36
2	12	0.250	2018	0.236	2024	5.6	0.00	101.14
2	3	0.250	2018	0.232	2024	7.2	0.00	77.33
2	6	0.250	2018	0.233	2024	6.8	0.00	82.24
2	9	0.250	2018	0.241	2024	3.6	0.00	160.67
3	12	0.250	2018	0.234	2024	6.4	0.00	87.75
3	3	0.250	2018	0.234	2024	6.4	0.00	87.75
3	6	0.250	2018	0.239	2024	4.4	0.00	130.36
3	9	0.250	2018	0.231	2024	7.6	0.00	72.95
4	12	0.250	2018	0.228	2024	8.8	0.00	62.18
4	3	0.250	2018	0.235	2024	6	0.00	94.00
4	6	0.250	2018	0.243	2024	2.8	0.00	208.29
4	9	0.250	2018	0.226	2024	9.6	0.00	56.50
5	12	0.250	2018	0.221	2024	11.6	0.00	45.72
5	3	0.250	2018	0.233	2024	6.8	0.00	82.24
5	6	0.250	2018	0.23	2024	8	0.00	69.00
5	9	0.250	2018	0.233	2024	6.8	0.00	82.24
6	12	0.250	2018	0.231	2024	7.6	0.00	72.95
6	3	0.250	2018	0.228	2024	8.8	0.00	62.18
6	6	0.250	2018	0.234	2024	6.4	0.00	87.75
6	9	0.250	2018	0.231	2024	7.6	0.00	72.95
7	12	0.250	2018	0.234	2024	6.4	0.00	87.75
7	3	0.250	2018	0.238	2024	4.8	0.00	119.00
7	6	0.250	2018	0.244	2024	2.4	0.00	244.00
7	9	0.250	2018	0.228	2024	8.8	0.00	62.18
8	12	0.250	2018	0.226	2024	9.6	0.00	56.50
8	3	0.250	2018	0.243	2024	2.8	0.00	208.29
8	6	0.250	2018	0.232	2024	7.2	0.00	77.33
8	9	0.250	2018	0.232	2024	7.2	0.00	77.33

Pictures

**NDTCB OCEND**

NRCAN NATIONAL NON-DESTRUCTIVE TESTING CERTIFICATION BODY  
ORGANISME DE CERTIFICATION NATIONAL EN ESSAIS NON DESTRUCTIFS DE NRCAN

Name | Nom **Derek Pfisterer**

Reg. Number | No. matricule **18452**

Issue Date | Date d'émission **2021/01/18**

Corrective lenses for vision required  
Verres correctifs pour la vision sont nécessaires **No | Non**

Colour vision limitation  
Limitation de la vision des couleurs **No | Non**

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*Derek Pfisterer*

Canada

NRCAN NATIONAL NON-DESTRUCTIVE TESTING CERTIFICATION BODY  
ORGANISME DE CERTIFICATION NATIONAL EN ESSAIS NON DESTRUCTIFS DE NRCAN

Name | Nom **Derek Pfisterer** Reg. Number | No. matricule **18452**

Certified to **CAN/CGSB-48.9712-2014** | Certifié selon **CAN/CGSB-48.9712-2014**

METHOD MÉTHODE	LEVEL NIVEAU	SECTOR SECTEUR	EFFECTIVE DATE DATE EFFECTIVE	EXPIRY DATE EXPIRATION
UT	2	EMC	2021/01/12	2025/04/15
MT	2	EMC	2019/08/20	2024/04/15

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Pour la vérification de la certification, les politiques et les définitions, visitez le site-web de l'organisme de certification national en essais non destructifs (OCEND) de Ressources naturelles Canada (NRCAN).

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P. K. Yuen | Director, NDTCB | Directeur, OCEND

Canada



Picture 1:                     Burner Tubes Overall                    



Picture 2:                     Miter Welds                    



Picture 3:                     Internal Tube Sheet Flange                    



Picture 4:                     Supports



Pictures



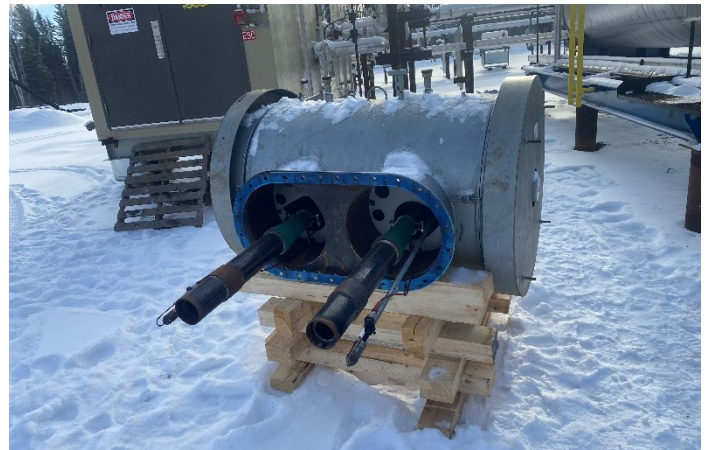
Picture 5: External Tube Sheet and Endplate



Picture 6: Internal Tube Overall



Picture 7: Stacks



Picture 8: Burner

Picture 9: \_\_\_\_\_

Picture 10: \_\_\_\_\_