Canadian Natural Resources Limited
GENERAL PRESSURE VESSEL INFORMATION **10.114808**

District: Swan hills , AB	Skid No.
Facility: Waskahigan Gas Gathering	Location (LSD): 05-15-63-24W5M
Vessel Name Equipment Number: Line heater	
Orientation: Horizontal	
Status: In service	Regulatory Inspection

PRESSURE VESSEL NAMEPLATE DATA

"A" or "G" or "S" (Sask.) or BC Registration Number. A429766		CRN Number: M-5492.2	
Vessel serial number: 1946H401-4		Size: 42 in x 244 in	
Shell thickness: 6.4mm		Shell material: SA-36	
Head thickness: 6.4mm		Head material: SA 36	
Tube wall thickness:		Tube material:	
Tube diameter:		Tube length:	
Channel thickness:		Channel material:	
Design pressure	Shell: Atmospheric	Operating pressure	Shell:
	Tubes: Coil 9308 KPA		Tubes:
Design Temp.	Shell:	Operating temperature	Shell:
	Tubes: Coil 93 Deg F		Tubes:
X-ray: 100 %		Heat treatment: Yes	
Code parameters: ASME VIII, Div 1		Coated: Nil	
Manufacturer: Plains Oil Ltd		Year built: 1997	
Corrosion allowance: 3.2 mm		Manway: Yes	

PRESSURE SAFETY VALVE NAMEPLATE DATA

PSV Tag	Manufacture / Model / Serial	Set Pressure (PSI / kPa)	Capacity (scfm / usgpm)	Size	Block Valve	Location	Service by / Date
No PSV							

SERVICE CONDITIONS-INDICATE ALL THAT APPLY

Sweet X	Sour	Oil	Gas X	Water X
Amine	LPG	Condensate	Air	Glycol
Other (Describe):				

Inspection Interval _____ **PSV Service Interval** _____

(Determined by MIC in conjunction with Chief Inspector following guidelines of Canadian Natural Resources Limited Owner-User Inspection Program)

Reports reviewed and accepted by:

Mechanical Integrity Coordinator _____ **Date** Mar 20/2015

Fill out all forms as completely as possible. All information is important! Use back of sheets to record additional information or sketch if required.
Copy of report to be filed by MIC at site, and copy sent to Chief Inspector

External Inspection Items	G	F	P	N/A	Comments
Insulation Verify sealed around manways, nozzles, no damage present, and there is no egress of moisture.	X				Insulation is in good condition – no open or torn sections.
External Condition Assess paint condition, areas peeling, record any corrosion, damage, etc (record location, size and depth of corrosion or damage)	X				Paint is in good condition – no exposed metal or corrosion present.
Leakage Record any leakage at flanges, threaded joints, weep holes on repads, etc.	X				No leaks present.
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. Ground wire attached?	X				Saddle is firmly bolted to skid deck – no buckling or dents present. Paint is in good condition – no corrosion – no leaks. Skid package is grounded.
Anchor Bolts Hammer tap to ensure secure. Look for cracking in treads or signs of deformation.	X				Securely bolted to skid deck
Concrete foundation Check for cracks, spalling, etc.				X	
Ladder / Platform Describe general condition, ensure support is secure to vessel, describe any hazards.				X	
Nozzle Assess paint, look for leakage, and ensure stud threads are fully engaged. Record any damage, deflection, etc. Are nozzles gusseted?	X				All studs fully engaged to nuts – no short bolts. No distortion – no leaks. No gussets present.
Gauges Ensure gauges are visible, working, no leakage, and suitable for range of MAWP/ Temp.	X				Pressure gauge (0-600 PSI) Not Suitable for MAWP of Vessel Temperature Gauge (50-500 °F) Suitable for Range Gauges are clear and visible.
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?	X				Well supported, no deflection, all clamps in place. Paint is in good condition – no corrosion.
Valving Ensure no leaks are visible. Valves are properly supported and chained if necessary.	X				Valves are properly supported, no leaks.
PSV Ensure PSV is set at pressure at or below that of vessel.				X	None.
NDE methods Was UT/ MPI done on vessel (MI coordinator to review results)	X				Ultrasonic corrosion survey carried out - no metal thickness detected below nominal minus corrosion allowance.
Burner:	X				Burner appears to be in good condition. Flame arrestor is clean and intact.

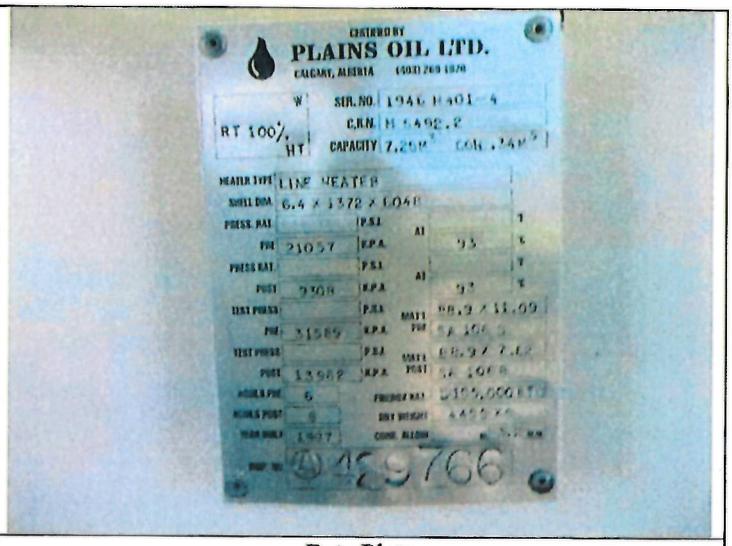
Recommendations or corrective actions: (Vessel is Fit for Service or describe corrective actions required)
(MIC to review corrective actions with Operations, discuss with Chief Inspector where necessary, and get remedial action implemented)
Recommendations: No recommendations at this time.
Summary: Vessel is in overall good condition, visual external inspection and ultrasonic corrosion survey performed - no metal thickness detected below nominal minus corrosion allowance.
Vessel is fit for service.

API 20981 / PESL 275
Inspected By: Dellas Wiedman
Dustin Kowal

Date: July 14, 2014

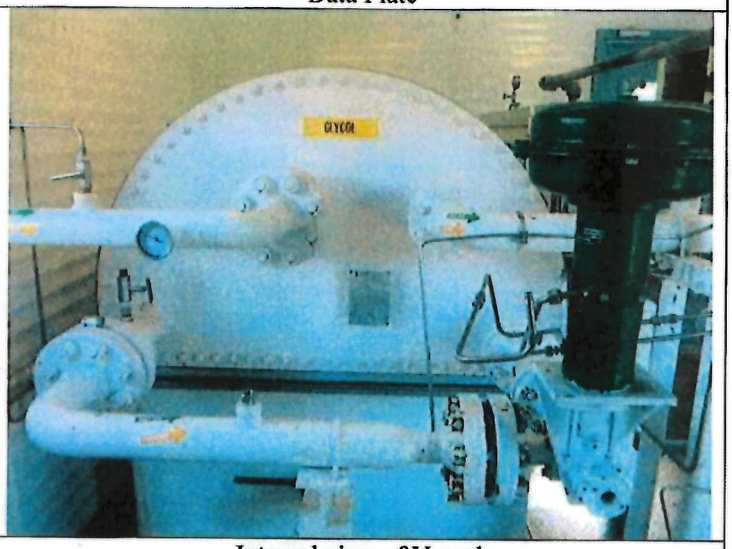
Photo Table

Lsd Sign

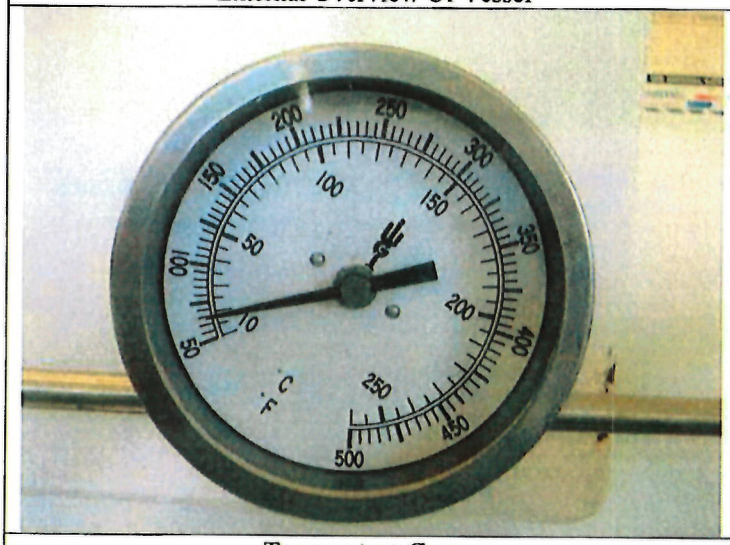


Data Plate

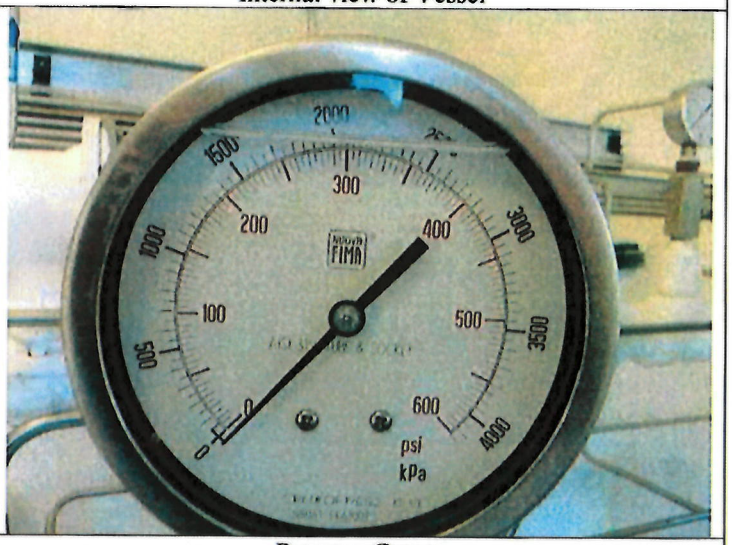
External Overview Of Vessel



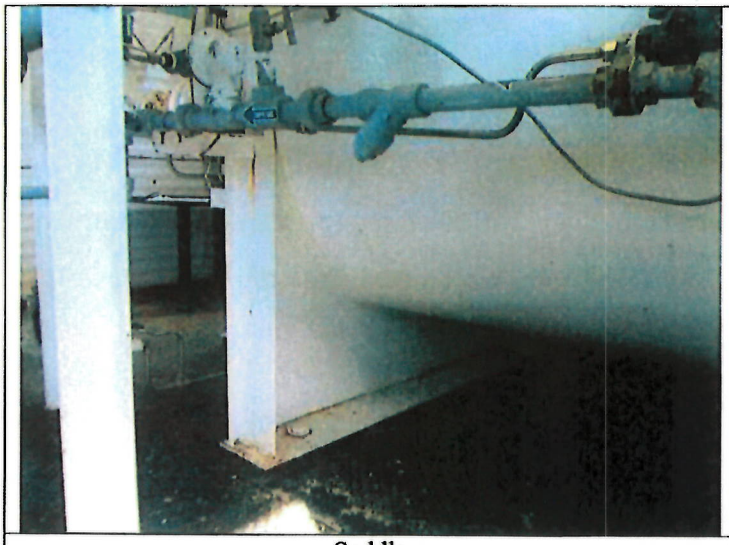
Internal view of Vessel

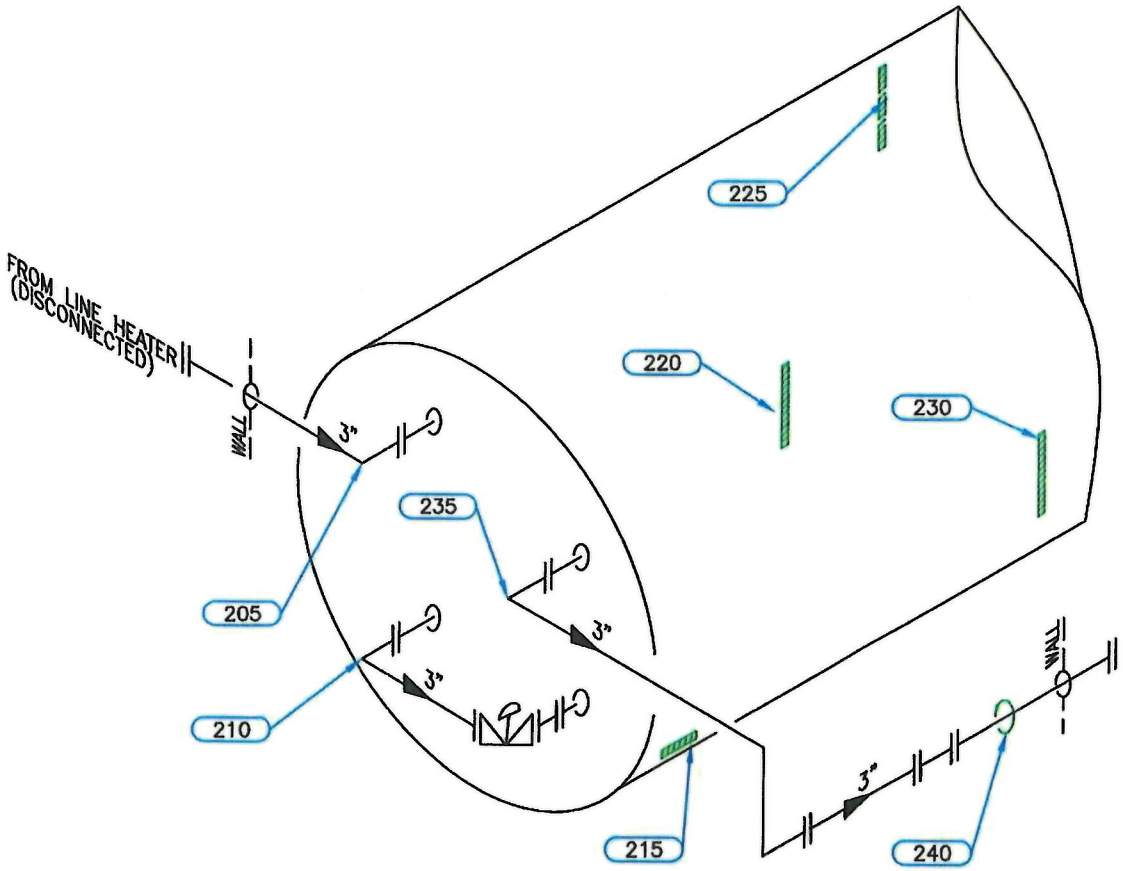


Temperature Gauge



Pressure Gauge

	
Saddle	



Equip. No. _____ Prov. Reg. No. Ⓐ 429766 C.R.N. M-5492.2 Serial No. 1946H401-4 Yr. Inst. _____

Code/Div. ASME B31.3 Size: 42in x 20ft Manufacturer: PLAINS OIL LTD Yr. Blt. 1997

C. Stamp: NONE Service: SOUR PWHT: HT Radiography: 100% Insulated: 50%

Design & Materials Data

HEAD:
Top Mat'l. SA 36 Top Nom. 6.4mm Top C.A. _____
Btm. Mat'l. _____ Btm. Nom. _____ Btm. C.A. _____

CHANNEL:
Material: _____ Nominal: _____ C.A. _____

BOOT
Head Mat'l. _____ Head Nom. _____ Head C.A. _____
Shell Mat'l. _____ Shell Nom. _____ Shell C.A. _____

SHELL
Material: SA 36 Nominal: 6.4mm C.A. _____

MAWP Shell Side: 9308 kPa @ Temp. 34°C

MAWP Tube Side: _____ @ Temp. _____

CLIENT	CANADIAN NATURAL RESOURCES	
FACILITY	WASKAHIGAN GAS GATHERING LSD 05-15-23-64 W5M	
ITEM	LINE HEATER	
BY: NR	DATE: 07/2014	DWG.# 223

UTS DATA

CLIENT: CANADIAN NATURAL RESOURCES
FACILITY: WASKAHIGAN GAS GATHERING
EQUIPMENT: LINE HEATER
SERVICE: SOUR
CRN#: M-5492.2
LOCATION: 05-15-23-64 W5M
PROV REG: A 429766
RTD JOB #: 10.114808
TESTED ON STREAM
REFER TO DRAWING: 223

Test Point	THICKNESS DATA	Flag	T-Min	C.A.	Nom.	Short Term	Long Term	Ave. mm/py	Retirement Date
215									
Description:	BOTTOM SHELL								
	2014 7								
Min. Thick.	6.5	0.00							
Average:	6.6					0	0		
Analysis:									
220									
Description:	MID SHELL								
	2014 7								
Min. Thick.	7.1	0.00							
Average:	7.2					0	0		
Analysis:									
225									
Description:	UPPER SHELL								
	2014 7								
Min. Thick.	6.8	0.00							
Average:	6.9					0	0		
Analysis:									
230									
Description:	LOWER SHELL								
	2014 7								
Min. Thick.	6.7	0.00							
Average:	6.8					0	0		
Analysis:									

UTS DATA

CLIENT: CANADIAN NATURAL RESOURCES
EQUIPMENT: LINE HEATER PIPING
CRN#:
PROV REG:
TESTED ON STREAM

FACILITY: WASKAHIGAN GAS GATHERING
SERVICE: SOUR
LOCATION: 05-15-23-64 W5M
RTD JOB #: 10.114808
REFER TO DRAWING: 223

Test Point	THICKNESS DATA	Flag	T-Min	C.A.	Nom.	Short Term	Long Term	Ave. mm/py	Retirement Date
205									
Description:	3" 90° ELBOW								
	2014 7								
Min. Thick.	10.6	9.71		1.4	11.10				
Average:	11.2					0	0		
Analysis:									
210									
Description:	3" 90° ELBOW								
	2014 7								
Min. Thick.	11.4	9.71		1.4	11.10				
Average:	11.7					0	0		
Analysis:									
235									
Description:	3" 90° ELBOW								
	2014 7								
Min. Thick.	7.4	6.65		1	7.60				
Average:	7.7					0	0		
Analysis:									
240									
Description:	3" 90° ELBOW								
	2014 7								
Min. Thick.	7.4	6.65		1	7.60				
Average:	7.7					0	0		
Analysis:									