Canadian Natural Resources Limited
GENERAL PRESSURE VESSEL INFORMATION **Job # 10.110674**

District: **Grande Prairie, AB**	Skid No.:
Facility: **Saddle Hills Gas Gathering**	Location (LSD): **04-23-75-07 w6m**
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. **A0481338**		CRN Number: **K 1977.12**	
Vessel serial number: 126-89-01-C		Size: 38 in x 16 ft	
Shell thickness: 6.4 mm		Shell material: SA 36	
Head thickness: 6.4 mm		Head material: SA 36	
Tube wall thickness:		Tube material: SA106 B	
Tube diameter:		Tube length:	
Channel thickness:		Channel material:	
Design pressure	Shell: Atmos	Operating pressure	Shell: 0 to 3000 kPa
	Tubes: Pre: 20340 kPa (2950 PSI) Post: 13962 kPa (2025 PSI)		Tubes:
Design Temp.	Shell: 93°C	Operating temperature	Shell:
	Tubes:		Tubes:
X-ray: RT-1		Heat treatment: HT	
Code parameters: ASME B31.3		Coated: No	
Manufacturer: Mar-Quinn Industries Ltd.		Year built: 2001	
Corrosion allowance: 3.2 mm		Manway: Removable end plates	

PRESSURE SAFETY VALVE NAMEPLATE DATA

PSV Tag #	Manufacturer	Model #	Serial #	Set Pressure (PSI)	Capacity (scfm)	Service Date
Not Required						
CRN #	Service By	Block Valve	Location	Size	Code Stamp	

SERVICE CONDITIONS-INDICATE ALL THAT APPLY

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

Inspection Interval _____ **PSV Service Interval** _____

(Determined by MIC in conjunction with Chief Inspector following guidelines of CNRL Owner-User Inspection Program)

Reports reviewed and accepted by:

Mechanical Integrity Coordinator _____ **Date** _____

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			**Vessel is 80% insulated.** **Cladding is securely fastened. No open or loose sections** **Wall closure sealed – no egress of moisture.** **Cladding not sealed at expansion tank.**
External Condition Assess paint condition, areas peeling, record any corrosion, damage, etc (record location, size and depth of corrosion or damage)	X				**Paint chipped to 5% exposed metal – no corrosion.** **No damage. No corrosion.**
Leakage Record any leakage at flanges, threaded joints, weep holes on repads, etc.	X				**No leaks observed.**
Saddle/Skirt 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				**Vessel saddle is bolted to skid.** **No evidence of corrosion at shell to saddle weld – no leaks.** **Paint in good condition – no exposed metal.** **No distortion. No buckles.** **Skid package is mounted to pilings above ground level.** **Skid package has ground wire attached.**
Anchor Bolts Hammer tap to ensure secure. Look for cracking in treads or signs of deformation.	X				**Anchor bolts are securely fastened.**
Concrete foundation Check for cracks, spalling, etc.				X	**Steel skid.**
Ladder / Platform Describe general condition, ensure support is secure to vessel, describe any hazards.				X	**No ladder attached.**
Nozzle Assess paint, look for leakage, and ensure stud threads are fully engaged. Record any damage, deflection, etc. Are nozzles gusseted?	X				**Threaded nozzle joints are fully engaged.** **Studs are fully engaged to nuts – no short bolts.** **Nozzles are not gusseted. No damage. No deflections.** **Paint in good condition – no exposed metal.**
Gauges Ensure gauges are visible, working, no leakage, and suitable for range of MAWP/ Temp.	X				**Pressure and liquid level gauges attached.** **Clean, clear and in working condition. No leaks.** **Pressure gauge: 0 to 20685 kPa. Within range of service.**
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				**Piping is well supported.** **All clamps, supports and shoes are in place.** **No structural overloads or deflections noted.** **Paint chipped to 5% exposed metal. No corrosion.**
Valving Ensure no leaks are visible. Valves are properly supported and chained if necessary.	X				**Valves are properly supported.** **No leak detected.**
PSV Ensure PSV is set at pressure at or below that of vessel.				X	**Not required.**
NDE methods Was UT/ MPI done on vessel (MI coordinator to review results)	X				**Ultrasonic thickness survey carried out – pipe metal thickness detected below nominal minus corrosion allowance. Ultrasonic corrosion survey carried out – pipe metal thickness detected below nominal minus corrosion allowance. Thickness calculations carried out:** **3" Elbow – nominal thickness is 7.6mm / min thickness is 6.3mm / T min thickness is 6.2mm.**
Other					

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: 1. Reseal cladding at expansion tank.

Summary: Vessel is in overall good condition, visual external inspection and ultrasonic corrosion survey performed – pipe metal thickness detected below nominal minus corrosion allowance. Thickness calculations carried out to ensure sufficient metal exists for safe operation.

Vessel is fit for service.

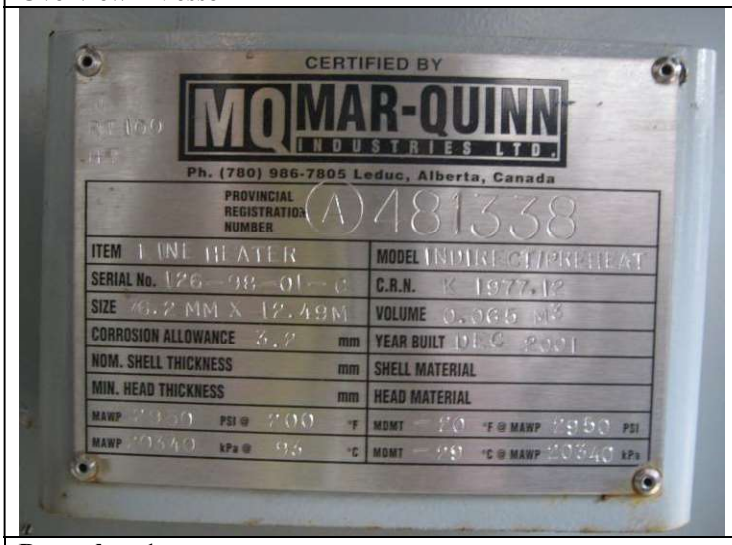
Inspected By: Chris Maxsom **Date:** October 18, 2011

LSD

Overview – Skid

Overview – Vessel

Overview - Vessel



Data plate 1

Data plate 2

Expansion tank with liquid level

Saddle

Inlet pressure gauge

Closure not sealed around expansion tank