Canadian Natural Resources Limited
GENERAL PRESSURE VESSEL INFORMATION **Job# 05.001317**

District: **Grange Prairie AB.**	Skid No.
Facility**: Gold Creek Gas Gathering**	Location (LSD): **02-11-68-06-W6M**
Vessel Name Equipment Number: **Treater (Crude Emulsion)**	
Orientation: **Horizontal**	
Status: **In Service**	**Regulatory Inspection**

PRESSURE VESSEL NAMEPLATE DATA

"A" or "G" or "S" (Sask.) or BC Registration Number. **A 199858**		CRN Number: F 4260.2	
Vessel serial number: 85C-3345-01		Size: 72 in. x 16 ft.	
Shell thickness: 9.5 mm		Shell material: SA 516-70	
Head thickness: 9.0 mm / 12.0 mm		Head material: SA 516-70	
Tube wall thickness:		Tube material:	
Tube diameter:		Tube length:	
Channel thickness:		Channel material:	
Design pressure	Shell: 50 PSI	Operating pressure	Shell: 0 – 160 PSI
	Tubes:		Tubes:
Design Temp.	Shell: 149 Deg F	Operating temperature	Shell: 20 – 240 Deg F
	Tubes:		Tubes:
X-ray: RT 2		Heat treatment: no	
Code parameters: ASME VIII, Div 1		Coated: yes	
Manufacturer: Alco Gas & Oil		Year built: 1985	
Corrosion allowance: 3.2mm		Manway: yes	

PRESSURE SAFETY VALVE NAMEPLATE DATA

PSV Tag #	Manufacture	Model #	Serial #	Set Pressure (kPa)	Capacity (scfm)	Service Date
G17665	**Consolidated**	**1905HCI**	**84C2627**	**50 PSI**	**2788**	**4/05**
CRN #	Service By	Block Valve	Location	Size	Code Stamp	
01832.568312	**Tyco Black Gold**	**No**	**top shell**	**1.5"x 3"**	**UV**	

SERVICE CONDITIONS-INDICATE ALL THAT APPLY

Sweet X	Sour	Oil X	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's Owner-User Inspection Program)

Reports reviewed and accepted by:
Mechanical Integrity Coordinator_____Date_____

Fill out all forms as completely as possible. <u>All information</u> 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**				**50% of vessel insulated – no damage present-no egress of moisture – sealed around skid building and nozzles**
External Condition Assess paint condition, areas peeling, record any corrosion, damage, etc (record location, size and depth of corrosion or damage)	**X**				**Paint in good overall condition – no exposed metal.**
Leakage Record any leakage at flanges, threaded joints, weep holes on repads, etc.		**X**			**Leakage at piping and valve threaded joints – all small bore items.**
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**				**Saddle: Bolted directly to skid deck.** **No buckling or dents to saddle – no corrosion at attachment welds to vessel.** **Paint in good condition – no exposed metal** **Ground wire attached to skid.**
Anchor Bolts Hammer tap to ensure secure. Look for cracking in treads or signs of deformation.	**X**				**Anchor bolts are securely fastened.** **No deformation**
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**				**Threaded nozzle joints are fully engaged.** **No leaks observed.** **No damage or deflections.** **Nozzles are not gusseted**
Gauges Ensure gauges are visible, working, no leakage, and suitable for range of MAWP/ Temp.	**X**				**Gauge is clear and clean. No leakage.** **Suitable for range of MAWP of vessel.** **Temperature gauge: 20 – 240 Deg F** **Pressure gauge: 0 – 160 PSI**
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 and supports are in place.** **No structural overloads or deflections.** **Paint in good condition – no exposed metal** **Leakage at threaded joints**
Valving Ensure no leaks are visible. Valves are properly supported and chained if necessary.		**X**			**Leaks are visible at valve.** **Valves are supported properly**
PSV Ensure PSV is set at pressure at or below that of vessel.	**X**				**Located on top shell – set at MAWP of vessel. PSV sent out for servicing at this time.** **Discharge piping is same size as valve outlet – found plugged with hydrate – cleaned out.** **PSV seal in place – no block valve between vessel and PSV.**

NDE methods Was UT/ MPI done on vessel (MI coordinator to review results)	**X**				**Ultrasonic thickness survey carried out – piping metal thickness detected below nominal. Calculations carried out to ensure sufficient metal exists for safe operation.**
Other	**X**				**Vessel over pressured – operator saw PSV inlet and discharge piping froze up causing over pressure of vessel**

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)

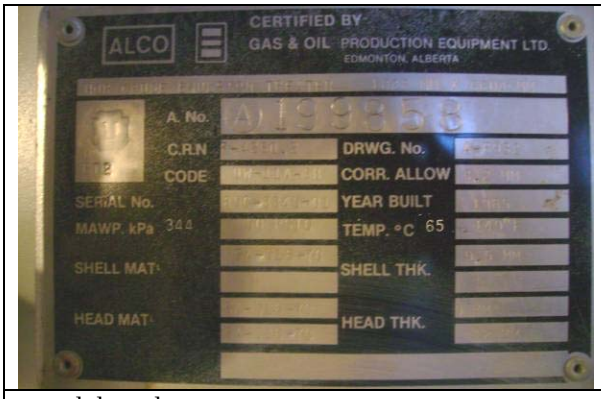
Recommendations: Seal all leaking pipe and valve joints identified with leaks.
Summary: Vessel is in overall good condition, visual external, ultrasonic corrosion survey performed, and magnetic particle inspection carried out on all nozzles.

1. Ultrasonic thickness inspection – piping metal thickness detected below nominal. Calculations carried out to ensure sufficient metal exists for safe operation.
2. Magnetic Particle inspection carried out on all nozzle welds – no cracking detected.
3. Visual external and surface measurements showed no signs of distortion, some leaking at small diameter valves – it is unknown as to condition of valves prior to over pressure incident. PSV discharge piping detected with hydrate blockage – identified as primary source of over pressure condition – 160 PSI.

Vessel is fit for service.

Inspected By: Gerry Avery **Date:** January 21, 2008

Photo Table



vessel data plate

vessel temperature gauge

vessel pressure gauge

vessel overview of manway

	
leak at valve	pipe threads leaking
	
vessel overview	