



**PRESSURE VESSEL  
VISUAL INSPECTION  
REPORT**

Report #: **156732-MD-38**  
 Inspect Date: 06/07/2012  
 Page: 1 of 14  
 Insp. Co. Job #: 156732

**Criticality Designation:**

    **Yellow**  

Insp. Comp: Matrix Inspection District: Grande Prairie - North Field: North Hamburg  
 Location: 11-27-097-09W6 Unit / Skid #: 16970 LSD: 11-27-097-09W6  
 Jurisdiction #: A0444297 Equip Tag #: N/A Serial #: 2418 V201  
 CRN #: K1554.12 Nat'l Bd #: N/A Year Built: 1999  
 Manufacturer: Plains Oil Ltd Equipment Description: Other: Oil Feed Drum  
 Status: In Service - Equip. Type: Vessel: Separator Service: Sweet  
 MAWP Shell: 9300 kPa @ 93 °C Volume: \_\_\_\_\_ Code Stamp:  Y  N  
 MAWP Tube: \_\_\_\_\_ @ \_\_\_\_\_ Height/Length: 20 Ft. Insulated:  Y  N  
 MDMT: -28 °C RT: RT-1 Size/Diameter.: 96 in. O.D. PWHT:  Y  N  
 Support: Saddle Vessel on Original CNRL Inventory List:  Y  N Manway:  Y  N  
 C.A.: 3.2 mm Coated: N/A Clad: N/A J.E.: 1.00 Remote Access:  - Winter Road

Component	Material	Nominal Thk	Diameter	OD/ID	Tube Side	Shell Side
1 Main - Shell	SA-516-70N	69.850 mm	96.000 in.	OD	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2 East - Head	SA-516-70N	65.510 mm	96.000 in.	OD	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3 West - Head	SA-516-70N	65.510 mm	96.000 in.	OD	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4 -					<input type="checkbox"/>	<input type="checkbox"/>
5 -					<input type="checkbox"/>	<input type="checkbox"/>

Static Data: Confirmed  Changed (See Comments)

Comments:

Static data updated

**PSV Static Data**

PSV -1 Tag #: G708020 Serial #: FAS006261 01 CRN: 0G0201.2C  
 Model #: 991107M A Capacity: 7258 SCFM Set Pressure: 720 psi  
 Manufacturer: Crosby Service Company: Unified Valve  
 Inlet Size & Type: 1.50 in. - Threaded Last Service Date: 10/06/2011  
 Outlet Size & Type: 2.50 in. - Threaded Block Valve: N/A - -  
 Carseal Intact: Yes Code Stamp: Yes  
 Shell Side / Tube Side: Shell Side Out for Service During Insp.: N Location of PSV: On Vessel

PSV -2 Tag #: \_\_\_\_\_ Serial #: \_\_\_\_\_ CRN: \_\_\_\_\_  
 Model #: \_\_\_\_\_ Capacity: \_\_\_\_\_ Set Pressure: \_\_\_\_\_  
 Manufacturer: \_\_\_\_\_ Service Company: \_\_\_\_\_  
 Inlet Size & Type: \_\_\_\_\_ - \_\_\_\_\_ Last Service Date: \_\_\_\_\_  
 Outlet Size & Type: \_\_\_\_\_ - \_\_\_\_\_ Block Valve: \_\_\_\_\_ - \_\_\_\_\_  
 Carseal Intact: \_\_\_\_\_ Code Stamp: \_\_\_\_\_  
 Shell Side / Tube Side: \_\_\_\_\_ Out for Service During Insp.: \_\_\_\_\_ Location of PSV: \_\_\_\_\_

**PSV Comments**

Set pressure is well below the MAWP



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Report #: **156732-MD-38**  
 Inspect Date: 06/07/2012  
 Page: 2 of 14  
 Insp. Co. Job #: 156732

Insp. Company: Matrix Inspection LSD: 11-27-097-09W6 Jurisdiction #: A0444297

**External Inspection Results – VE External Inspection Performed**

Item	N/A	Condition	Comment (Check Status Bar or Press F1 for Help)	NCR	Action Item Integrity	Action Item Maintenance
Nameplate	<input type="checkbox"/>	Accept	Firmly affixed and legible	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Foundation and Supports	<input type="checkbox"/>	Accept	Welded saddle anchored to skid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Anchor Bolts	<input type="checkbox"/>	Accept	Well anchored with no deformation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Grounding	<input type="checkbox"/>	Accept	Grounded by skid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Insulation Condition	<input checked="" type="checkbox"/>		No insulation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PSV	<input type="checkbox"/>	Accept	Set pressure well below MAWP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shell Heads & Nozzles	<input type="checkbox"/>	Accept	Minor surface corrosion noted throughout	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Metal Surfaces (Paint)	<input type="checkbox"/>	Accept	Coating chipped on exposing base metal	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Aux Equipment	<input type="checkbox"/>	Accept	Secure and well supported	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cathodic Protection	<input checked="" type="checkbox"/>		No external anode	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Alignment	<input type="checkbox"/>	Accept	Level with skid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flange Connections	<input type="checkbox"/>	Reject	Lack of thread engagement on Float cell flange	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pressure Gauge	<input type="checkbox"/>	Reject	0-4000 kPa: not within MAWP range	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Temperature Gauge	<input type="checkbox"/>	Accept	-20-120°C: acceptable range	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sight Glass	<input type="checkbox"/>	Accept	Intact and visible liquid level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ladder / Platform	<input checked="" type="checkbox"/>		No ladders or platform	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leaks	<input type="checkbox"/>	No	No leaks noted at time of inspection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Piping from Vessel	<input type="checkbox"/>	Accept	Adequately supported piping circuit			
Previous UT Survey	<input type="checkbox"/>	Yes	Locations marked, no history provided	UT Company: N/A		

**External Visual Observations**

The overall condition is good.

There is dirt on the top section of the shell from personnel walking on surface

Mirror surface corrosion noted on the bottom shell.

The pressure gauge is not within range of the MAWP

Float cell flanged connections have lack of thread engagement in multiple locations

The coating is chipped and flaked exposing the base metal to very minor surface corrosion

A UT corrosion survey was performed at the time of inspection with no significant wall losses recorded

**Recommendations:**

Clean loose coating and touch-up to aid in corrosion protection

Ensure full thread engagement on Float cell flanged connections

Confirm with operations that the pressure does not exceed gauge rating, replace as required



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Report #: **156732-MD-38**  
 Inspect Date: 06/07/2012  
 Page: 3 of 14  
 Insp. Co. Job #: 156732

Insp. Company: Matrix Inspection LSD: 11-27-097-09W6 Jurisdiction #: A0444297

**Internal Inspection Results – VI Internal Inspection Performed**

Item	N/A	Condition	Comment (Check Status Bar or Press F1 for Help)	NCR	Action Item Integrity	Action Item Maintenance
Shell	<input type="checkbox"/>	Accept	"finger print" like scale on shell	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Heads	<input type="checkbox"/>	Accept	"finger print" like mill scale noted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Manway	<input type="checkbox"/>	Accept	Good condition, minor surface corrosion noted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gasket Surfaces	<input type="checkbox"/>	Accept	Adequate serrated sealing area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Welds	<input type="checkbox"/>	Accept	mill scale/ corrosion noted on welds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Refractory	<input checked="" type="checkbox"/>		Not applicable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Heating Coils	<input checked="" type="checkbox"/>		Not applicable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Demister Pad	<input checked="" type="checkbox"/>		Not applicable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vane Pack	<input checked="" type="checkbox"/>		Not applicable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Baffles	<input checked="" type="checkbox"/>		Not applicable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Trays	<input checked="" type="checkbox"/>		Not applicable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Filter	<input checked="" type="checkbox"/>		Not applicable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Internal Coating	<input checked="" type="checkbox"/>		Not applicable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tubesheet	<input checked="" type="checkbox"/>		Not applicable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tube Bundle	<input checked="" type="checkbox"/>		Not applicable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Internal Visual Observations**

An internal inspection was carried out on June 07 2012 during the 2012 TA

The overall internal condition was found to be in good shape, with previous writing clearly legible on the shell and head walls

There is some mill scale (up to 0.062" deep) noted throughout the shell and heads of the vessel that resemble finger print markings

Minor surface/ flash corrosion noted in various locations on welds, manway and internal surfaces

There are iron oxides forming on the outlet nozzle and a white crystallization forming in the vapour section of the shell

**Recommendations:**

No recommendations made at the time of inspection, recommended for continued normal safe operations



**PRESSURE VESSEL  
VISUAL INSPECTION  
REPORT**

Report #: **156732-MD-38**  
 Inspect Date: 06/07/2012  
 Page: 4 of 14  
 Insp. Co. Job #: 156732

Insp. Company: Matrix Inspection LSD: 11-27-097-09W6 Jurisdiction #: A0444297

Firetube Static Data N/A (Not Applicable)

Diameter: Not Applicable Nom Thickness: Not Applicable Bend: Not Applicable

Length: Not Applicable Firetube Description: Not Applicable

Firetube NDE Performed: UT  Report#: Not Applicable ET  Report#: Not Applicable  
 MT  Report#: Not Applicable RT  Report#: Not Applicable  
 PT  Report#: Not Applicable Other  Report#: Not Applicable

Firetube Inspection Results

Item	N/A	Condition	Comment (Check Status Bar or Press F1 for Help)	NCR	Action Item Integrity	Action Item Maintenance
Burner	<input checked="" type="checkbox"/>		No Firetube Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stack	<input checked="" type="checkbox"/>		No Firetube Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flange (Throat)	<input checked="" type="checkbox"/>		No Firetube Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tube Sheet	<input checked="" type="checkbox"/>		No Firetube Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hot Side	<input checked="" type="checkbox"/>		No Firetube Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Miter	<input checked="" type="checkbox"/>		No Firetube Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Return Bend	<input checked="" type="checkbox"/>		No Firetube Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Supports	<input checked="" type="checkbox"/>		No Firetube Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Butt Welds	<input checked="" type="checkbox"/>		No Firetube Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fillet Welds	<input checked="" type="checkbox"/>		No Firetube Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Firetube Visual Observations

No Firetube Inspection Carried Out

Recommendations:

No Firetube Inspection Carried Out



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VISUAL INSPECTION  
REPORT

Report #: **156732-MD-38**  
Inspect Date: 06/07/2012  
Page: 5 of 14  
Insp. Co. Job #: 156732

Insp. Company: Matrix\_Inspection LSD: 11-27-097-09W6 Jurisdiction #: A0444297

**Vessel NDE and Final Summary:**

NDE Performed: UT  Report#: \_\_\_\_\_ ET  Report#: \_\_\_\_\_  
MT  Report#: \_\_\_\_\_ RT  Report#: \_\_\_\_\_  
PT  Report#: \_\_\_\_\_ Other  Report#: \_\_\_\_\_

**Maxi-Trak Observations Summary (Summarize inspection results Max 255 Characters):**

Mirror surface corrosion noted on bottom shell  
Pressure gauge not within range of MAWP  
Float cell flanged connections have lack of thread engagement in multiple locations  
Chipped coating exposing the base metal to very minor surface corrosion

**Maxi-Trak Recommendations Summary (Summarize Recommendations Max 255 Characters):**

Clean loose coating and touch-up to aid in corrosion protection  
Ensure full thread engagement on Float cell flanged connections  
Confirm with operations that the pressure does not exceed gauge rating, replace as required

**Actions Corrected at Time of Inspection: (If actions were corrected at the time of Inspection – note the corrected actions here.)**

No actions were corrected at the time of inspection

**Additional Visual Observations**

No additional observations noted at the time of inspection

**Any other safety concerns or observations from associated equipment: (for example associated piping, buildings, pumps etc...)**

No safety concerns noted at the time of inspection



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VISUAL INSPECTION  
REPORT

Report #: **156732-MD-38**  
Inspect Date: 06/07/2012  
Page: 6 of 14  
Insp. Co. Job #: 156732

Insp. Company: Matrix Inspection LSD: 11-27-097-09W6 Jurisdiction #: A0444297

**Thickness and Remaining Life Evaluation “ Must be Completed ”**

**MUST BE COMPLETED AND RESOLVED WITH CNRL IMMEDIATELY UPON DISCOVERY OF LOW WALL THICKNESS AREAS**

Step 1: Was any thickness measurement location found to be less than (Nominal WT – Corrosion Allowance)?: **No**

If YES, proceed to Step 2; if NO, proceed to “Crack Evaluation” and “CNRL Criticality Designation”.

Step 2: Which component(s) were found below (Nominal WT – Corrosion Allowance)?

Components found below Nom - CA:

Components
N/A - N/A
N/A - N/A
N/A - N/A
N/A - N/A
N/A - N/A

Perform Steps 3 – 8 for each component with actual thickness less than (Nominal WT – Corrosion Allowance).

Step 3: Describe Location and Extent of Corrosion:

Components	Location and Extent of Corrosion
N/A - N/A	Not Applicable for this Inspection
N/A - N/A	Not Applicable for this Inspection
N/A - N/A	Not Applicable for this Inspection
N/A - N/A	Not Applicable for this Inspection
N/A - N/A	Not Applicable for this Inspection

Notes:  
Not Applicable for this Inspection

Step 4:

- For shells and nozzles, calculate minimum required thickness (T-min) as per ASME Section VIII UG-27.
- For heads, calculate minimum required thickness (T-min) as per ASME Section VIII UG-32.

Components	T-Min
N/A - N/A	N/A
N/A - N/A	N/A
N/A - N/A	N/A
N/A - N/A	N/A
N/A - N/A	N/A



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VISUAL INSPECTION  
REPORT

Report #: **156732-MD-38**  
Inspect Date: 06/07/2012  
Page: 7 of 14  
Insp. Co. Job #: 156732

Insp. Company: Matrix\_Inspection LSD: 11-27-097-09W6 Jurisdiction #: A0444297

**Thickness and Remaining Life Evaluation (Continued)**

Step 5: Is any measured thickness less than calculated minimum required thickness (T-min)? **N/A**

*If YES, complete Step 6  
If NO, proceed to Step 7..*

Step 6: Is nature and extent of pitting acceptable as per API 510? **N/A**

Step 7: Calculate Remaining Life as per API 510. How? (Find last reading; use nominal thickness if nothing available). Short Term Corrosion Rates and Long Term Corrosion Rates.

Components	Remaining Life (Yrs)
N/A - N/A	N/A
N/A - N/A	N/A
N/A - N/A	N/A
N/A - N/A	N/A
N/A - N/A	N/A

Step 8: Contact CNRL Integrity Coordinator to discuss above results.

- Name of CNRL contact: Not Applicable for this Inspection
- Date and time of conversation: Not Applicable for this Inspection

Summary/results of conversation:  
Not Applicable for this Inspection

**Crack Evaluation by Magnetic Particle or Alternative Inspection “Must be Completed”**

**MUST BE COMPLETED AND RESOLVED WITH CNRL IMMEDIATELY UPON DISCOVERY OF CRACK-LIKE INDICATIONS**

Were any indications found to suggest the vessel contained cracks? **N/A**

If NO, proceed to “CNRL Criticality Designation”.

If YES, Contact CNRL Integrity Coordinator to discuss results.

- Name of CNRL contact: Not Applicable for this Inspection
- Date and time of conversation: Not Applicable for this Inspection

Summary/results of conversation:  
Not Applicable for this Inspection



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VISUAL INSPECTION  
REPORT**

Report #: **156732-MD-38**  
 Inspect Date: 06/07/2012  
 Page: 8 of 14  
 Insp. Co. Job #: 156732

Insp. Company: Matrix\_Inspection LSD: 11-27-097-09W6 Jurisdiction #: A0444297

**CNRL Criticality Evaluation – “MUST BE COMPLETED”**

The CNRL In-Service Pressure Vessel Inspector MUST answer all the following questions

1. Is the vessel fit-for-service? : **Yes**
2. Was the measured thickness less than the calculated minimum required thickness (T-min) for any component?: **No**
3. Were MT indications found?: **N/A**
4. Was the remaining life less than 6 years for sour service vessels or less than 10 years for sweet service vessels?: **No**
5. Were NCR's or Action Items generated as a result of the inspection? : **Yes**
6. Were UT readings below (Nominal WT – Corrosion Allowance) found? : **No**

**Information on CNRL Owner User Program - Criticality Designation and Required Review**

**RED** – Vessel Inspection Results are deemed RED if one of the following occurred:

- The measured thickness was less than the calculated minimum required thickness (T-min) for any component.
- MT indications were found.
- The remaining life was calculated to be less than 6 years for sour-service vessels or less than 10 years for sweet-service vessels.

*RED inspection reports must be signed off by the CNRL Chief Inspector.*

**YELLOW** – Vessel Inspection Results are deemed YELLOW if one or more of the following occurred:

- The vessel was declared NOT fit-for-service by the 3<sup>rd</sup> Party In-Service PV Inspector.
- NCR's or Action Items were generated as a result of the inspection.
- UT readings below (Nominal WT – Corrosion Allowance) were found.

*YELLOW inspection reports must be signed off by the CNRL Pressure Equipment Integrity Coordinator.*

**GREEN** – Vessel Inspection Results are deemed GREEN if all of the following are true:

- The vessel was declared fit-for-service by the 3<sup>rd</sup> Party In-Service PV Inspector.
- UT readings below (Nominal WT – Corrosion Allowance) were NOT found.
- MT indications were NOT found.
- NCR's or Action Items were NOT generated as a result of the VE inspection.


*GREEN inspection reports must be signed off by the 3<sup>rd</sup> Party In-Service Pressure Vessel Inspector.*

**Criticality Designation**



*Yellow*

Vehicle #: 380 Kms: \_\_\_\_\_  
 Time In: 00:00 Time Out: 00:00 Hrs \_\_\_\_\_  
 Time In: 00:00 Time Out: 00:00 Hrs \_\_\_\_\_  
 Personnel: SR, LP  
 Billing Info: AFE :

Inspector (Name): Matthew B Dickinson PESL: 601  
 Inspector (Signature):  Matthew Dickinson API: 39483  
2012.11.13 08:03:31 -07'00'  
 CNRL Coordinator (Name): \_\_\_\_\_  
 CNRL Coordinator (Signature): \_\_\_\_\_  
 CNRL Chief Inspector (Signature): \_\_\_\_\_  
 (I am in full agreement with report contents) \_\_\_\_\_  
 (I am in full agreement with report contents) \_\_\_\_\_



Equipment Photographs:



01 nameplate



02 overview



03 not within range



04 lack of thread engagement



**05 coating deterioration**

Equipment Photographs:



06 diverter overview



07 vortex breaker



**08** finger print



**09** iron oxides



**10 vapour section crystallization**