☐ Installation ☒ External ☐ Internal

Date:	Dec.22/2016	**Description:**	☒ Vessel ☐ Exchanger ☐ Furnace ☐ Boiler
Inspector:	Curtis Graham	**Unit #:**	**Equip #:**
Agent Co:	Streamline Inspection	**Equip. Name:**	Separator
Owner:	CNRL	**Jurisdiction #:**	A3054734 **CRN #:** K9874.213
Region:	St Albert	**Manufacturer:**	Nusco
Area:	Penhold	**Year Built:**	1995 **S/N:** 50309-200
Facility:	Satellite	**Location/LSD:**	16-15-037-26W4M

Service	☒Sweet ☐Sour	RT: 3	HT: No	**PSV Location**	Piping ☒ T ☐ F	**MDMT**	-20F

Zones:	MAWP	Design T	Set P	TAG#	Manufacturer	S/N	In. Sz	Out. Sz	Serv. Co.	Serv. Date	IV	CSO	Capacity
Shell Side	250psi	100F					2"						
Tube Side													
Other													

Components	Material	Nominal t	CA	Retire t	Lowest t	t OK?	Calc. t-min	Comment
Shell	SA516-70	0.375"				☐ Y ☐		
T Head	SA234-WPB	0.365"				☐ Y ☐		
Channel						☐ Y ☐		
Tube						☐ Y ☐		
Other						☐ Y ☐		Specify:

Orientation	☐Hor. ☒ Ver.	Foundation ☐ Concrete ☐ Gravel ☐ Timbers ☒ Steel ☐ Other:	Condition Acceptable
Dimensions	Length: 28"	Width: 24"	Volume:

Support	☐ Saddle	☐ Seal-welded ☐ Free to Move	Condition
	☒ Skirt	☒ Free of debris Comment: No UT Access	Condition Acceptable Good condition
	☐ Hangers	☐ Secure Comment:	Condition
	☐ Other	Specify:	Condition

Overall	General Condition Acceptable Good condition		Electrical grounding ☐ Direct ☐ Indirect ☒ None
Ext. Surface	☒ Painted ☐ Insulated ☐ Fire-proofed ☐ Cladded ☐Other:		Condition Acceptable Good condition
Ext. Fixtures	☐ Ladder ☐ Platform(s) ☐ Other:		Condition
	☐ Manway ☒ Port	Size: 2"	☐ Reinforcement Pads used ☐ Weep Holes Present
	Comment Acceptable Good condition		
Davit Arm	☐ Present	☐Greased ☐ Double Nutted	Condition N/A

Piping	☒ PSV	☐ Supported	☐ Joined per code	☐ Drains Properly	☐ Well Coated	Comment N/A
	☒ Inlet	☒ Supported	☒ Joined per code	☒ Free from leaks	☒ Well Coated	Comment Acceptable
	☒ Outlet	☒ Supported	☒ Joined per code	☒ Free from leaks	☒ Well Coated	Comment Acceptable
	☒ Drain	☒ Supported	☒ Joined per code	☒ Free from leaks	☒ Well Coated	Comment Acceptable
	☒ Instrumentation	☒ Supported	☒ Joined per code	☒ Free from leaks/kinks		Comment Acceptable
	☐ Process Fluid Identified	☐ Flow Direction Marked		Comment Poor		

Valves	☒ Manual Valves	☒ Free from leaks	Comment Acceptable Good condition
	☒ Automated Control Valve	☒ Free from leaks	Comment Acceptable Good condition
	☐ Vents and Drain plugged	Comment Fair Threaded connection on shell needs plug	

Gauges	☐Pressure	Reading:	Condition N/A No gauge located
	☐Temperature	Reading:	Condition N/A No gauge located
Sight Glass	☒Fluid Level	Reading:	Condition Acceptable Clear & Legible

Inspection Summary

This vessel was not in operation at the time of this inspection. Vessel and piping in good condition, piping well supported. All piping is threaded. Paint in good condition. Data plate is secured and legible. No short bolting was located on piping flange connections. Vessel ground wire was not located. There was no PSV at the time of this inspection. Vessel is secured to skid, skirt welded to floor. UT inspections performed by Streamline Inspection Ltd, Nov. 2016. No access for UT under vessel skirt.

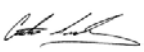
Recommended Actions:	**NCR/IDR**
Ensure vessel is directly or indirectly grounded before putting back into operation.	IDR
Ensure PSV is installed to code and set at or below mawp of vessel before put into service	IDR
Ensure all threaded connections have plugs	IDR

VESSEL STATUS

Integrity Status	Suitable for Continued Service ☒ Yes ☐ No ☐ Immediate Repairs Required ☐ Future Repairs Required ☐ Replace
Inventory Status	☒ In Service ☐ Out of Service ☐ Surplus ☐ Scrap ☐ Action Items Completed

Additional Notes on continuation page: ☐ (Report _____) Inspection Interval: _____ yrs. OR Changed to: _____ yrs.

IPV/IBPV Certificate #: 000785, API 510 51479 PSV Interval: 5 yrs. OR Changed to: _____ yrs.

Signature of In-Service Inspector: 

INSPECTION PHOTOGRAPHS

LSD SIGN

VESSEL DATA PLATE

VESSEL OVERVIEW

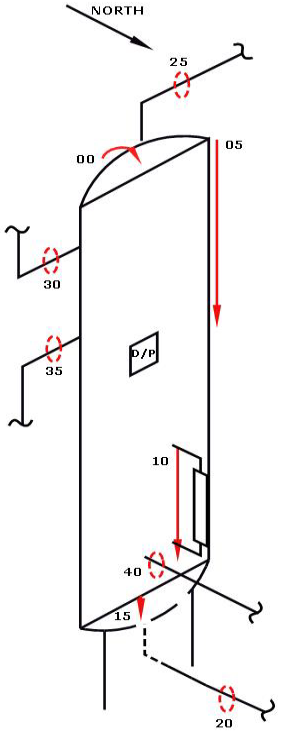
FOUNDATION OVERVIEW

MISSING PLUG ON THREADED CONNECTION (SHELL)

PSV INLET PIPING (NO PSV)

Location Name:	PENHOLD		**LSD:**	16-15-37-26W4	
Jur #:	A3054734		**Equipment/Tag No.**		
Equipment Description:	SEPARATOR				
Manufacturer:	NUSCO				
Serial Number:	50309-200		**CRN:**	K9874.213	
Shell MAWP:	250	PSI	**Shell Design Temp:**	100	°F
Tube MAWP:		PSI	**Tube Design Temp:**		°F
Shell Material:	SA-106-B		**Head Material:**	SA-516-70N	
Shell Thickness:	0.375	in	**Head Thickness:**	0.365	in
Corrosion Allowance:	0.0625	in	**Date Built:**	1995	
Size:	24	in	**Pipe / Rolled Plate:**	PIPE	
RT:	3		**Client DWG #:**		

NOTES: ALL PIPING ASSOCIATED TO VESSEL IS THREADED / NO ACCESS UNDER SKIRT



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Ultrasonic Corrosion Survey

*All values are in inches unless otherwise stated.

Survey Name: Canadian Natural **Date:** Dec 22, 2016

Inspector: D. Robak

LSD:	16-15-37-26W4	**Area:**	PENHOLD		**Location:**	FIELD			
Jur #:	A3054734	**Tag Number:**			**Vessel Name:**	SEPARATOR			
CRN:	K9874.213	**Year Built:**	1995		**Serial Number:**	50309-200			
RT:	3	**Vessel CA:**	0.063	in	**Manufacturer:**	NUSCO			
		Shell MAWP:	250 PSI	**MAWTF:** 100 °F	**Tube MAWP:**	PSI	**MAWTF:**	°F	**Pipe/Plate** PIPE

TML Description			Baseline			**Flange ANSI:**		**Material:**	SA-516-70N	
00	HEAD		**2016**	**Flag**	**CA**	**Nominal**	**T Min**	**STCR in/yr**	**LTCR in/yr**
Shape:	Ellipsoidal	**Min**	0.371	0.303	0.063	0.365		0.0000	0.0000
OD:	24	**Avg**	0.374					**Remaining Life:**	
Spec:	ASME VIII Div.1	**Comments:**						**Retirement Date:**	

TML Description			Baseline			**Flange ANSI:**		**Material:**	SA-106-B	
05	SHELL		**2016**	**Flag**	**CA**	**Nominal**	**T Min**	**STCR in/yr**	**LTCR in/yr**
Shape:	Cylindrical	**Min**	0.359	0.313	0.063	0.375		0.0000	0.0008
OD:	24	**Avg**	0.367					**Remaining Life:**	
Spec:	ASME VIII Div.1	**Comments:**						**Retirement Date:**	

TML Description			Baseline			**Flange ANSI:**		**Material:**	SA-106-B	
10	SHELL		**2016**	**Flag**	**CA**	**Nominal**	**T Min**	**STCR in/yr**	**LTCR in/yr**
Shape:	Cylindrical	**Min**	0.410	0.313	0.063	0.375		0.0000	0.0000
OD:	24	**Avg**	0.419					**Remaining Life:**	
Spec:	ASME VIII Div.1	**Comments:**						**Retirement Date:**	

TML Description			Baseline			**Flange ANSI:**		**Material:**	SA-516-70N	
15	HEAD		**2016**	**Flag**	**CA**	**Nominal**	**T Min**	**STCR in/yr**	**LTCR in/yr**
Shape:	Ellipsoidal	**Min**	0.356	0.303	0.063	0.365		0.0000	0.0004
OD:	24	**Avg**	0.364					**Remaining Life:**	
Spec:	ASME VIII Div.1	**Comments:**						**Retirement Date:**	

Ultrasonic Corrosion Survey

*All values are in inches unless otherwise stated.

Survey Name: Canadian Natural **Date:** Dec 22, 2016

Inspector: D. Robak

LSD:	16-15-37-26W4	**Area:**	PENHOLD		**Location:**	FIELD			
Jur #:	A3054734	**Tag Number:**			**Vessel Name:**	SEPARATOR			
CRN:	K9874.213	**Year Built:**	1995		**Serial Number:**	50309-200			
RT:	3	**Vessel CA:**	0.063	in	**Manufacturer:**	NUSCO			
		Shell MAWP:	250 PSI	**MAWTF:** 100 °F	**Tube MAWP:**	PSI	**MAWTF:**	°F	**Pipe/Plate** PIPE

TML Description			Baseline			**Flange ANSI:**		**Material:**	SA-106-B	
20	PIPING		**2016**	**Flag**	**CA**	**Nominal**	**T Min**	**STCR in/yr**	**LTCR in/yr**
Shape:	360° Circ	**Min**	0.332	0.300	0.043	0.343		0.0000	0.0005
OD:	2.375	**Avg**	0.350					**Remaining Life:**	
Spec:	ASME B31.3	**Comments:**	ASSUME NOMNAL					**Retirement Date:**	

TML Description			Baseline			**Flange ANSI:**		**Material:**	SA-106-B	
25	PIPING		**2016**	**Flag**	**CA**	**Nominal**	**T Min**	**STCR in/yr**	**LTCR in/yr**
Shape:	360° Circ	**Min**	0.186	0.135	0.019	0.154		0.0000	0.0000
OD:	2.375	**Avg**	0.191					**Remaining Life:**	
Spec:	ASME B31.3	**Comments:**	ASSUME NOMNAL					**Retirement Date:**	

TML Description			Baseline			**Flange ANSI:**		**Material:**	SA-106-B	
30	PIPING		**2016**	**Flag**	**CA**	**Nominal**	**T Min**	**STCR in/yr**	**LTCR in/yr**
Shape:	360° Circ	**Min**	0.147	0.135	0.019	0.154		0.0000	0.0003
OD:	2.375	**Avg**	0.159					**Remaining Life:**	
Spec:	ASME B31.3	**Comments:**	ASSUME NOMNAL					**Retirement Date:**	

TML Description			Baseline			**Flange ANSI:**		**Material:**	SA-106-B	
35	PIPING		**2016**	**Flag**	**CA**	**Nominal**	**T Min**	**STCR in/yr**	**LTCR in/yr**
Shape:	360° Circ	**Min**	0.199	0.191	0.027	0.218		0.0000	0.0009
OD:	2.375	**Avg**	0.212					**Remaining Life:**	
Spec:	ASME B31.3	**Comments:**	ASSUME NOMNAL					**Retirement Date:**	

Ultrasonic Corrosion Survey

*All values are in inches unless otherwise stated.

Survey Name: Canadian Natural **Date:** Dec 22, 2016

Inspector: D. Robak

LSD:	16-15-37-26W4	**Area:**	PENHOLD		**Location:**	FIELD			
Jur #:	A3054734	**Tag Number:**			**Vessel Name:**	SEPARATOR			
CRN:	K9874.213	**Year Built:**	1995		**Serial Number:**	50309-200			
RT:	3	**Vessel CA:**	0.063	in	**Manufacturer:**	NUSCO			
		Shell MAWP:	250 PSI	**MAWTF:** 100 °F	**Tube MAWP:**	PSI	**MAWTF:**	°F	**Pipe/Plate** PIPE

TML Description			Baseline			**Flange ANSI:**		**Material:**	SA-106-B	
40	PIPING		**2016**	**Flag**	**CA**	**Nominal**	**T Min**	**STCR in/yr**	**LTCR in/yr**
Shape:	360° Circ	**Min**	0.217	0.191	0.027	0.218		0.0000	0.0000
OD:	2.375	**Avg**	0.227					**Remaining Life:**	
Spec:	ASME B31.3	**Comments:**	ASSUME NOMNAL					**Retirement Date:**	