

## PRESSURE VESSEL & COLUMN INSPECTION REPORT

LSD: 07-27-051-19W5M

Date: JUNE 06, 2014

SAP Equipment ID: 66005380

VESSEL STATIC DATA						
Plant	Ansell Gas Plant	Op Unit		System		
Prov. Insp. #	A0436161	CRN	X-0170.2	Equip Tag #	V-102A (equip list). V101B (as per operations)	
Equipment Description		Slug Catcher Separator		Serial #	3625A	
Manufacturer		Vancouver Iron and Engineering		Vessel Class		
Internal Access:	yes	Description: 18" MW		Year Built	1997	
MAWP	400	PSI	@ 650	°F	MDMT	0 °F
CODE :		RT :		PWHT : Yes		
Diameter	78in	Length	(s/s) too high to measure	OAL	mm / in	Vertical
Shell Mat'l		Thickness		in	Corr Allowance	in
Head Mat'l		Thickness min		in	Corr Allowance	in
Nozzle Mat'l		Thickness		in	Corr Allowance	mm
Internal Coating: NO		Internal Clad : NO		Capacity	940 ft3	
Manway : yes		Inspection Port : no		Skirt		
Nozzle Rating	600	lb ANSI	Painted :	YES	Insulated	Yes – Skirt only
PROCESS DATA						
Product Description		Gas,liquids		Sweet		
Operating Pressure		PSI		Operating Temperature		°C
PSV STATIC DATA						
Serial No.	Location	Set Pressure	Capacity SCFM / Lbs/Hr / GPM	Manufacturer	Model / Type	Service Date / Company
C06-56100	Outlet piping	400psi	24261scfm	Anderson, Greenwood and Crosby	24310L34/S1	13-Sept-11, Wizard. PSV-1000
PSV DETAILS						
	Type (Thread/Flange)		ANSI Rating		Size (in)	
PRD Inlet	Flanged				3"	
PRD Outlet	Flanged				4"	
NDE Equipment records						
Procedure#	Description	Manufacturer	Model#	Serial#	Due Date	

### INSPECTION SUMMARY

A visual external and internal inspection was conducted on vessel during plant outage. West of control room.

**External:**

Vessel and piping are in good condition. Vessel and piping are painted, paint in good condition, no damage or corrosion noted. Vessel skirt is insulated and clad. Cladding in fair condition. There is an inspection access port cut in insulation with no coverplate, allowing moisture to get into insulation. Moss was found growing at top and at base of cladding / insulation. No visual access to skirt or anchor bolts as cladding comes down concrete foundation. Concrete foundation was found to be in acceptable condition, no significant cracking or damage noted. Vessel outlet piping is supported with a temporary support post resting on ground. Operations is aware of the poor support system for this section of piping. Manway davit arm appears in good condition, davit is double nutted. Piping off bottom is insulated and clad, cladding in fair condition with some minor damage noted. There is an inspection access under skirt to UT bottom head and drain elbow. This is considered a confined space. Some minor surface rusting noted on bottom head. Dataplate is securely attached to vessel, and is legible. Ground cable securely attached directly to skirt. PSV service is up to date, set at MAWP and vents to flare header. UT survey done 2014 by Streamline Inspection.

**Internal:**

Internal inspection was done after vessel was aired out. Internal access is through 18" manway. Manway flange gasket surface in acceptable condition, no corrosion or damage noted. Minor surface corrosion noted on bottom of manway nozzle throat, approx. 0.015" deep. Scaffolding was set up within vessel to visual access upper portions of shell and top head. General corrosion was found throughout bottom shell course. There is no evidence that the general corrosion found is active. General corrosion depths average 0.015" to 0.025". Some small areas of hard black deposits found on bottom shell. No under deposit corrosion noted when areas scraped clean. No significant corrosion noted on circs, longseam, nozzle or attachment welds. Bottom head was found to be in good condition, no significant corrosion or damage noted. Bottom nozzle vortex breaker was found to be in acceptable condition and securely attached. Inlet deflector plate and nozzle cover attachments are all securely attached. There is a ring welded around top shell below top head for a demister. However there is no demister currently installed or in use in vessel. There was a large loose nut found laying on top of demister ring. Loose nut was removed from vessel. Half way up the shell there

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was some waxy product buildup remaining of shell and top head. This wax buildup was easily scraped off to allow visual access to shell and top head surfaces. No significant corrosion or damage noted underneath wax buildup on areas where it was removed via scraping on mid, or top shell, or on top head. No corrosion noted on top head or mid shell. No corrosion, damage or obstructions noted within inlet, top outlet or bottom outlet nozzles. No nozzle obstructions noted.

Vessel was found to be in fair condition and fit for continued service.

Note: Vessel tagged as V-102A on equipment list and SAP but tagged V-101B on vessel and as per operations.

### RECOMMENDATIONS

Review UT survey results.  
Install coverplate over insulation cut out, and seal.  
Improve piping support for outlet piping – Pillings and structural steel supports

### NONCONFORMANCES / INSPECTION DEFICIENCIES


No non-conformances were noted during visual external inspection.

### INSPECTION PLANNING

Inspection Strategy	Availability	Inspection Interval
Inspection Date <u>June 06, 2014</u>	Date of Last Inspect      _____	Date of Next Inspect      _____

### REPORT CERTIFICATION

The signatures below certify that inspections/tests have been completed in accordance with the identified inspection strategy and that the specified equipment is considered fit for service until the date of next inspection.

Inspected by	<u>Ed Tymensen</u> 	Date	<u>June 06, 2014</u>
Company	<u>Streamline Inspection</u>	PESL #	<u>000711</u>
Reviewed and Approved by	_____	Date	_____
		PESL #	_____
Criticality Assessment Rerun	_____	Inspection Planning Rerun	_____
Assessed Next Inspection Date	_____		

**PRESSURE VESSEL & COLUMN INSPECTION REPORT**

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**DETAILED INSPECTION VISUAL EXTERNAL**

ID	Description	Condition	Location	NCR	Comments
V1	General Other (Please Explain)	Good			Overall
V2	General Corrosion	n/a			No significant corrosion noted
V3	General Leaks	n/a			No leaks noted
V4	Vibration	n/a			Plant was down during inspection
V5	Dissimilar Flange Rating	Good			Similar flange ratings
V6	Ladder/Stairway	n/a			
V7	Heads	Good			Minor surface rusting on bottom head
V8	Guy Wires	n/a			
V9	Electrical Ground	good	Attached to directly to skirt		Ground cable connection tight and secure
V10	Painted Inactive Corrosion	n/a			
V11	Coating/Painting	Good			No significant coating damage
V12	Expansion Joint or Bellows	n/a			
V13	Gauge/Site Glass	Good	Level		Gauges clear and legible
V14	Shell	Good			No significant corrosion or damage noted
V15	Jacket	n/a			
V21	Support Other (Please explain)	Fair	Outlet piping		Supported by temporary support post resting on ground
V22	Foundation	Good			Vessel on concrete foundation, no damage or cracks noted
V23	Anchor Bolts	n/a			No visual access to anchor bolts
V24	Saddle/Skirt	Good	Skirt		Visual limited to ID surface
V25	Davit	Good			Double nutted, no damage noted
V26	Fireproofing	n/a			
V31	Connections Other (Please explain)	Good			All connections secure
V32	Small Branches	n/a			
V33	Nozzles	Good			No corrosion or damage noted
V34	Manways	Good			No corrosion or damage, gasket surfaces acceptable
V35	Reinforcing Pads	Good			Weepholes present, free of debris, no evidence of leaks
V36	Inadequate Thread Engagement	Good			Adequate thread engagement
V37	Bolting	Good			Bolting tight and secure. No corrosion of threads noted
V38	Flanges	Good			No leaks or corrosion noted
V39	Leak Clamps	n/a			
V41	Insulation Other (Please explain)	Fair	Skirt and bottom outlet piping		Insulated and clad
V42	Damage	Good	Bottom outlet piping		Minor cladding damage
V43	Penetrations	Poor	No coverplate on skirt insulation cutout		No coverplate on skirt insulation cutout. Moisture has access under skirt. Moss growing on top and bottom of cladding, suggesting that the insulation behind cladding is moist.
V44	Insulation Jacket	Fair			Tin cladding
V45	Banding	Good			
V46	Seals/Joints	Fair			Some seal failure at top of cladding
V51	Relief Devices Other (Please explain)	Good	Outlet piping		PSV service up to date, set at MAWP, vents to flare
V52	Corrosion	n/a			None noted
V53	Leaks	n/a			None noted
V54	Restricted Inlet/Outlet	n/a			
V55	Manual Operation Lever	n/a			

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**DETAILED INSPECTION VISUAL INTERNAL**

ID	Description	Condition	Location	NCR	Comments
V1	General Other (Please Explain)	Good			Overall
V2	Corrosion (depth, length, width)	Fair	Bottom shell		General historic corrosion, 0.015" to 0.025" deep average bottom shell
V3	Erosion	n/a			No erosion noted
V4	Distortion	n/a			No distortions noted
V5	Blisters	n/a			No blisters noted
V6	Deposits	Fair			Waxy buildup on top half of shell and top head. Bottom half of shell was mostly clean. Some small areas of hard black deposits noted on bottom shell.
V7	Heads	Good			No significant corrosion or damage noted
V8	Welds	Good			No corrosion, damage or visible defects noted
V9	Nozzles	Good			No corrosion, damage or obstructions noted
V10	Shell	Fair	Bottom shell		General historic corrosion, 0.015" to 0.025" deep average bottom shell
V11	Gasket Surfaces	Good	manway		Acceptable condition, no corrosion or damage
V21	Internals Other (Please explain)	Good	Inlet deflector plate, vortex breaker, nozzle cover attachments		Securely attached
V22	Demister	n/a			
V23	Baffle/Wier	n/a			
V24	Sparger	n/a			
V25	Thermowells	Good			Securely attached
V26	Metallic Linings	n/a			
V27	Nonmetallic Linings	n/a			
V28	Trays	n/a			
V29	Tray Rings	Good	Demister ring		Securely attached. No demister in use within vessel.
V30	Other Welded Attachments	Good	Inlet deflector plate, vortex breaker, nozzle cover attachments		Securely attached

**DETAILED INSPECTION OTHER TECHNIQUES**

ID	Location	Observation/Measurement	Acceptance Criteria	NCR	Comments
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

**DETAILED INSPECTION UT THICKNESS**

CML	Nom. Thk	Current Reading	Short Term Corr Rate	Long Term Corr Rate	Remaining Life	Comments

**PRESSURE VESSEL & COLUMN INSPECTION REPORT**

LSD: 07-27-051-19W5M

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**PHOTOS**



LSD sign



Dataplate



Repair Dataplate



Vessel labeled V-101



Vessel overview



Bottom head piping cladding damage

**PRESSURE VESSEL & COLUMN INSPECTION REPORT**

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**PHOTOS**



Skirt insulation and cladding



No coverplate on skirt cladding inspection cut out



Concrete foundation



Temporary support for gas outlet piping, support post resting on ground



Temporary support for gas outlet piping, support post resting on ground



Moss growing at base of skirt cladding

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**PHOTOS**



Moss growing at top of skirt cladding



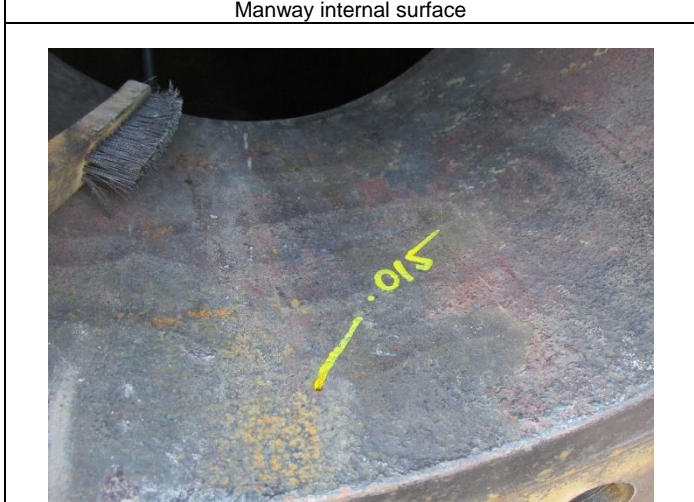
Davit arm



Manway internal surface



Manway flange face



General corrosion on bottom of manway nozzle throat



Manway and shell

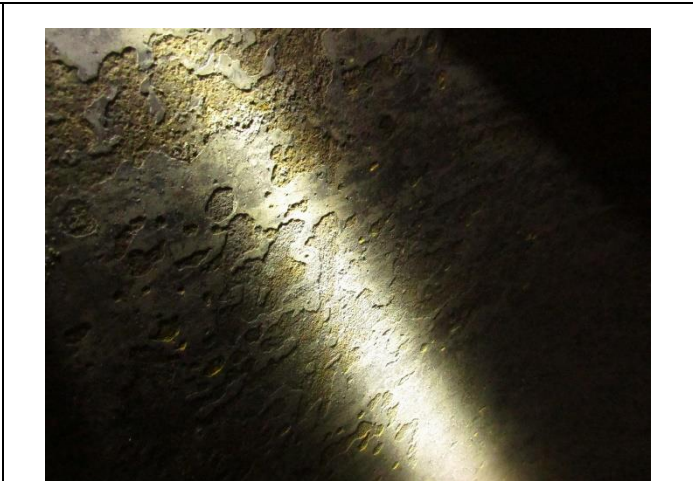
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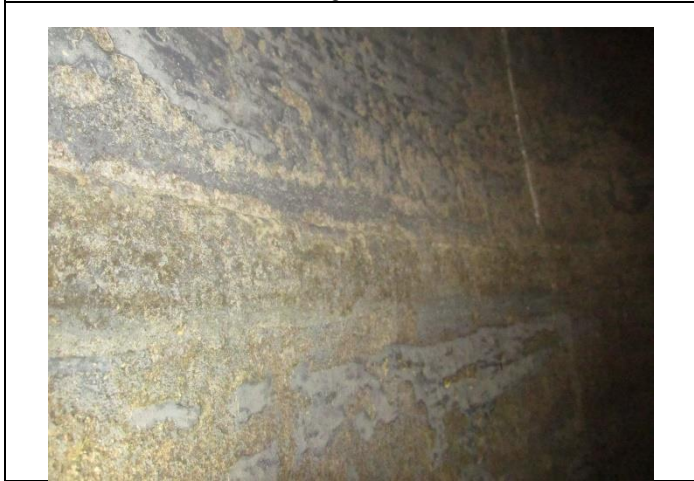
**PHOTOS**



Bottom shell general corrosion



Bottom shell general corrosion



Bottom shell general corrosion



Nozzle cover attachments



Nozzle



Bottom shell general corrosion



**PRESSURE VESSEL & COLUMN INSPECTION REPORT**

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**PHOTOS**



Mid shell waxy buildup



Inlet nozzle



Top shell nozzle cover attachment



Top shell

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**PHOTOS**



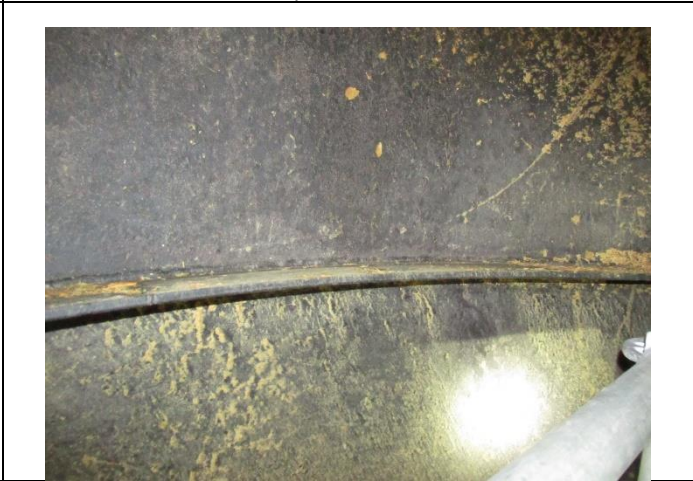
Top head



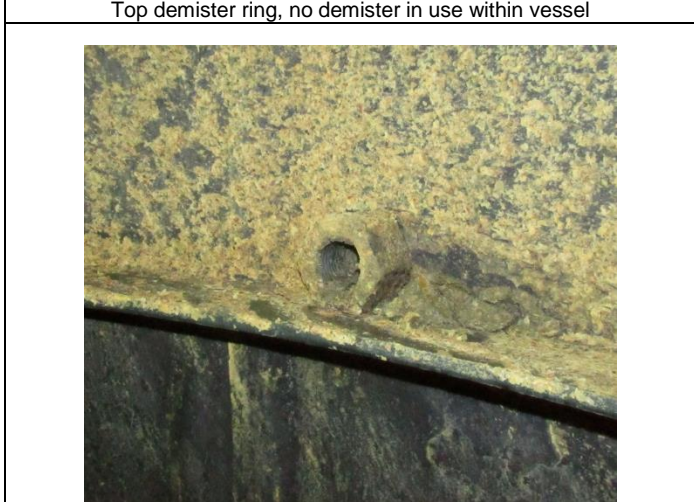
Top head nozzle



Top demister ring, no demister in use within vessel



Top demister ring



Loose nut found laying on top demister ring



Bottom head and vortex breaker

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**PHOTOS**



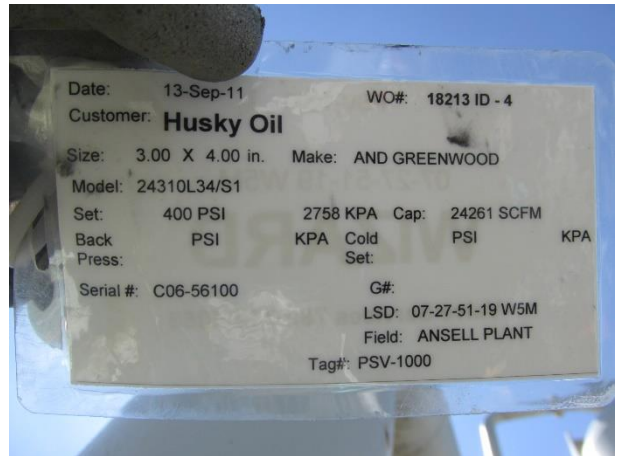
Bottom head nozzle



Loose bolt found on top of demister ring removed from vessel



Bottom shell hard black deposits



PSV service tag



PSV overview



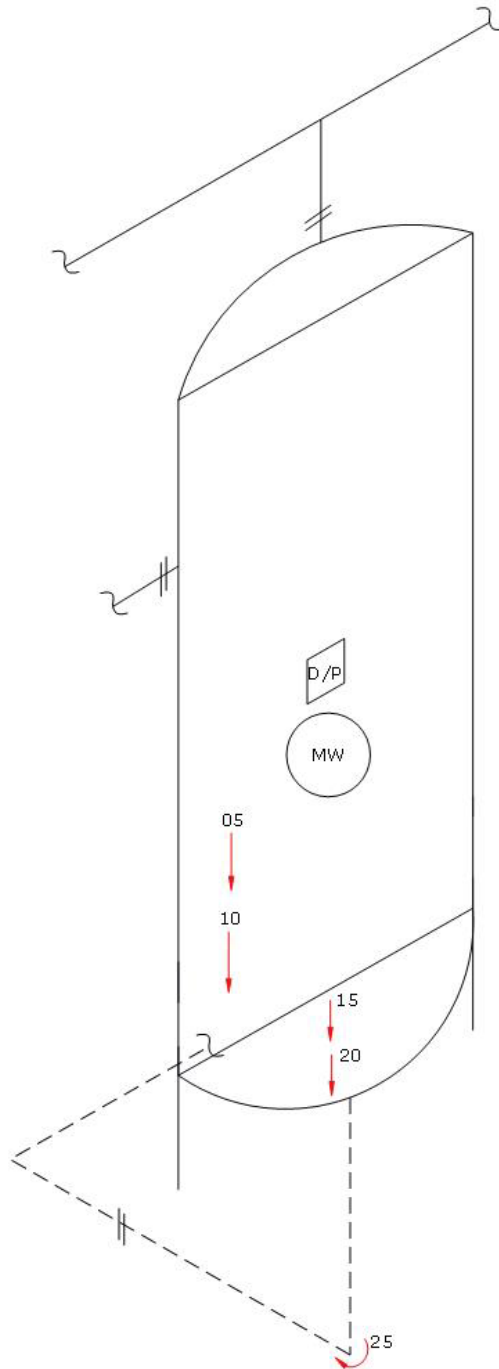
PSV tag



Location Name:	ANSELL GAS PLANT	LSD:	7-27-51-19W5
A#:	A0436161	Equipment/Tag No.	
Equipment Description:	SLUG CATCHER	Serial Number:	3625A
		CRN: (or other ID#)	X0170.2
MAWP:		Design Temp:	650F
Shell Material:		Head Material:	
Shell Thickness:		Head Thickness:	
Corrosion Allowance:		Date Built:	1997
Size:		Manufacturer:	CESSCO
RT:		Pipe / Rolled Plate:	

Notes: NO ACCESS TO TOP PART OF VESSEL, VESSEL HAS A HEMI HEAD. CML 25 ROUGH SURFACE LIMITED SCAN. LIMITED ACCESS TO DATA PLATE









# Ultrasonic Corrosion Survey

Survey Name: Husky Energy

Date: Jun 9, 2014

Inspector: W. Gill

<b>LSD:</b> 07-27-051-19W5	<b>Area:</b> Ansell	<b>Location:</b> Gas Plant
<b>A #:</b> A0436161	<b>Tag Number:</b>	<b>Vessel Name:</b> Slug Catcher
<b>CRN:</b> X0170.2	<b>Year Built:</b> 1997	<b>Serial Number:</b> 3625A
	<b>Vessel CA:</b> mm	<b>Manufacturer:</b> Cessco
	<b>Shell MAWP:</b>	<b>Tube MAWP:</b>
	<b>MAWTF:</b>	<b>MAWTF:</b>

<b>TML Description</b>	Baseline	<b>Material:</b> Unknown
<b>05</b> Shell	<b>2014</b>	<b>Corr. Rate</b>
<b>Shape:</b> Ellipsoidal	<b>Min</b> 61.420	<b>Flag</b> CA <b>Nominal</b> T Min
<b>OD:</b>	<b>Avg</b> 61.800	<b>Remaining Life:</b>
<b>Spec:</b> ASME VIII Div.1	<b>Comments:</b>	<b>Retirement Date:</b>

<b>TML Description</b>	Baseline	<b>Material:</b> Unknown
<b>10</b> Shell	<b>2014</b>	<b>Corr. Rate</b>
<b>Shape:</b> Cylindrical	<b>Min</b> 61.110	<b>Flag</b> CA <b>Nominal</b> T Min
<b>OD:</b>	<b>Avg</b> 61.470	<b>Remaining Life:</b>
<b>Spec:</b> ASME VIII Div.1	<b>Comments:</b>	<b>Retirement Date:</b>

<b>TML Description</b>	Baseline	<b>Material:</b> Unknown
<b>15</b> Head	<b>2014</b>	<b>Corr. Rate</b>
<b>Shape:</b> Ellipsoidal	<b>Min</b> 30.050	<b>Flag</b> CA <b>Nominal</b> T Min
<b>OD:</b>	<b>Avg</b> 32.310	<b>Remaining Life:</b>
<b>Spec:</b> ASME VIII Div.1	<b>Comments:</b>	<b>Retirement Date:</b>

<b>TML Description</b>	Baseline	<b>Material:</b> Unknown
<b>20</b> Head	<b>2014</b>	<b>Corr. Rate</b>
<b>Shape:</b> Ellipsoidal	<b>Min</b> 38.380	<b>Flag</b> CA <b>Nominal</b> T Min
<b>OD:</b>	<b>Avg</b> 38.810	<b>Remaining Life:</b>
<b>Spec:</b> ASME VIII Div.1	<b>Comments:</b>	<b>Retirement Date:</b>



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Date: Jun 9, 2014

Inspector: W. Gill

**LSD:** 07-27-051-19W5    **Area:** Ansell    **Location:** Gas Plant  
**A #:** A0436161    **Tag Number:**    **Vessel Name:** Slug Catcher  
**CRN:** X0170.2    **Year Built:** 1997    **Serial Number:** 3625A  
**Vessel CA:** mm    **Manufacturer:** Cessco  
**Shell MAWP:**    **MAWTF:**    **Tube MAWP:**    **MAWTF:**

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<b>TML Description</b>	Baseline				<b>Material:</b> A-234-WPB
<b>25</b> Nozzle	<b>2014</b>	<b>Flag</b>	<b>CA</b>	<b>Nominal</b>	<b>T Min</b> <b>Corr. Rate</b>
<b>Shape:</b> 90° Elbow	<b>Min</b> 24.640	22.914	3.273	26.187	
<b>OD:</b> 16"	<b>Avg</b> 26.240			Assumed	<b>Remaining Life:</b>
<b>Spec:</b> ASME VIII Div.1	<b>Comments:</b>				<b>Retirement Date:</b>

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A 436161

**NO**

# **DATA REPORT**

manufacturer -  
Vancouver Iron &  
Engineering Works  
sn- 77164-3  
CRN-X0170.2  
built-1963

mfr out of business.  
Oct. 12, 2000  
JT