



VISUAL INSPECTION REPORT – PRESSURE VESSEL

Inspection Type:		External													
Date:	May 9, 2014						Description:	Vessel							
Inspector:	Kurt Robak						Unit /Skid #:	N/A			Equip #:	FWKO-110			
Agent Co:	Alpine Integrity Services Inc.						Equip Name:	Free Water Knockout							
Owner:	Harvest Operations						Provincial #:	A3055474			CRN #:	M-6442.2			
District:	Provost						Manufacturer:	Process Industries							
Area:	Amisk						Year Built:	1994			S/N:	94-C2883-3000			
Facility:	Battery						Location/LSD:	12-15-40-08W4M							
Service:	Sour						PSV Location:	Shell - Flanged			MDMT:	20 F			
Zones:	MAWP	Design T	Set P (PSI)	Tag # (HOP)	Manufacturer		S/N	In. Sz	Out Sz	Serv. Co.	Serv. Date	IV	CSO	Capacity	
Shell Side:	100 PSI	140 F	100	0454	Farris		CE-40565-A14	6"	8"	Bee-Gee	6/2013	Yes	Yes	3186 USGPM	
Tube Side:															
Other:															
Components	Material		Nominal t (in)		CA (in)		OD Dia (in)		RT		PWHT		PSV IV Valve Carseal #		
	Shell	SA-516-70		0.375		0		144		RT-1		No		Inlet: UP036738	
	Head	SA-516-70		0.430		0		144		RT-1		No		Outlet: UP036797	
	Channel													PSV Service Seal Intact? N/A	
	Tube														
	Other														
Grounded:	Yes				PSV Serv Rpt Reviewed?		Yes		Set (PSI)	100	Pop (PSI)	101	% of set press.	0.99%	
Orientation:	Horizontal		Foundation:		Steel		Piles		Condition:		Acceptable				
Support:	Saddle		Seal Welded		Bolted		Condition:		Acceptable						
Internal Access:	Manway		Size (in):		24				Comment:						
Davit Arm:	Present								Condition:		Acceptable				
Vessel Ext. Condition:	Painted		Insulated & Cladded						Condition:		Acceptable				
Ladder / Platform:	Platform(s)								Condition:		Acceptable				
Piping:	Part	Supported?	Joined per code?	Free From Leaks?		Coating Cond.									
	Inlet	Yes	Yes	Yes		Good		Comment:	Acceptable						
	Outlet	Yes	Yes	Yes		Good		Comment:	Acceptable						
	Drain	Yes	No	Yes		Good		Comment:	Short bolting noted - see below						
	Instrumentation	Yes	Yes	Free from leaks & kinks				Comment:	Acceptable						
Process Fluid Identified?			Yes		Flow direction marked?		Yes		Comment:		Acceptable				
PSV	Supported?	Yes	Discharges Properly?		Yes	Piping Restrictions?		No		Comment:		Acceptable			
Valves:	Manual Isolation Valve		Yes		Free from leaks		Comment:		Acceptable						
	Automated Control Valve		Yes		Free from leaks		Comment:		Acceptable						
	Vents and Drain plugged		Yes				Comment:		Acceptable						
Gauges:	Pressure	Yes	Reading:	45 PSI	Condition:		Acceptable								
	Temperature	Yes	Reading:	80 F	Condition:		Acceptable								
Sight Glass:	Fluid Level	Yes	Reading:	Various	Condition:		All are acceptable								
Inspection Summary	- No concerns noted at time of inspection. Vessel is in good overall condition.														
	- UT performed by Alpine, primarily on piping. No issues noted.														
	- No access to PSV - too high. Static data is from service report. Carseal #'s from carseal log.														
	- Short bolting noted in south (back) end Manway. Loose bolt noted in North (front) end drain piping valve on upstream side.														
	- South end anode wire is not hooked up properly.														
Recommended Actions:												NCR/DR			
- Correct bolting in piping noted above.															
- Ground south anode to lug on nozzle neck.															
Fit For Service:		Yes													
Inventory Status		In Service													



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Inspection Interval: 4 yrs

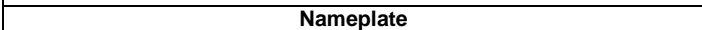
IPV/IBPV Certificate #: 000546

PSV Interval: 4 yrs

Signature of Inspector:

A handwritten signature in blue ink, appearing to be "K. S.", written over a yellow rectangular background.

PHOTOS

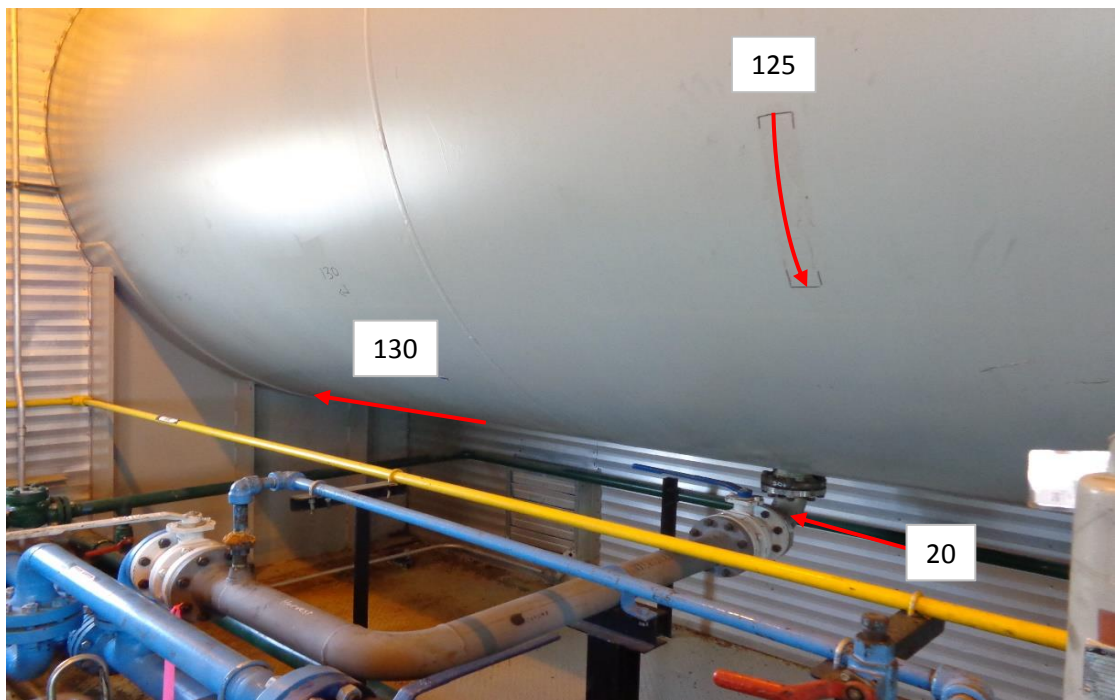
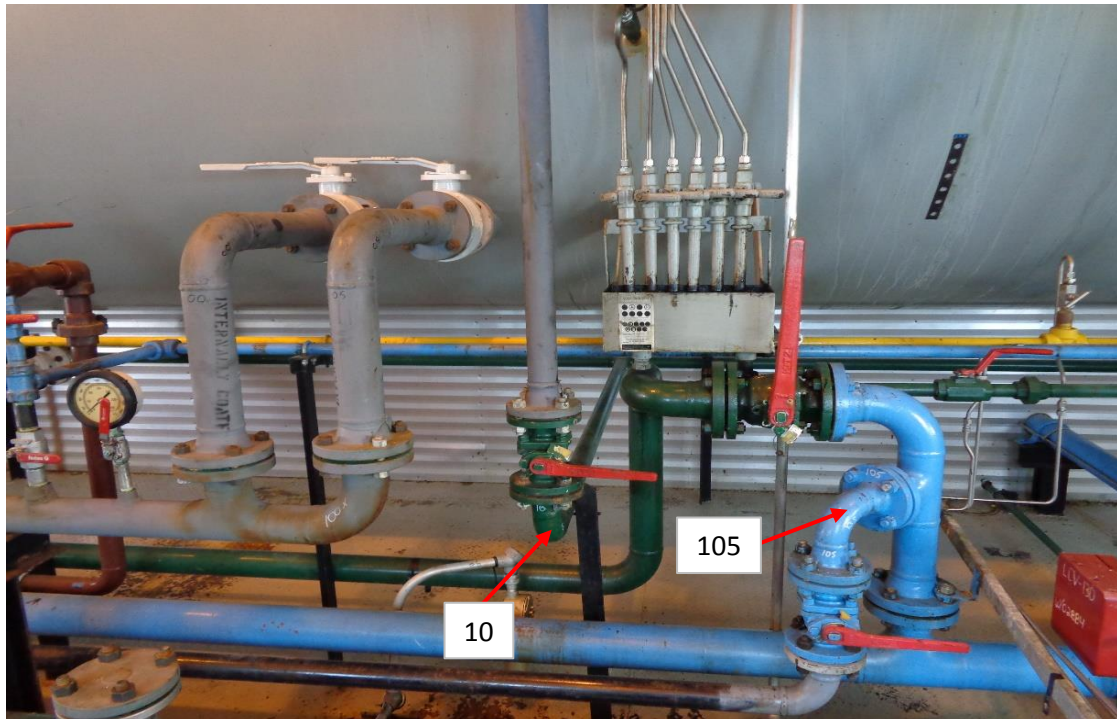


UT CORROSION SURVEY REPORT STATIC DATA & LOCATIONS

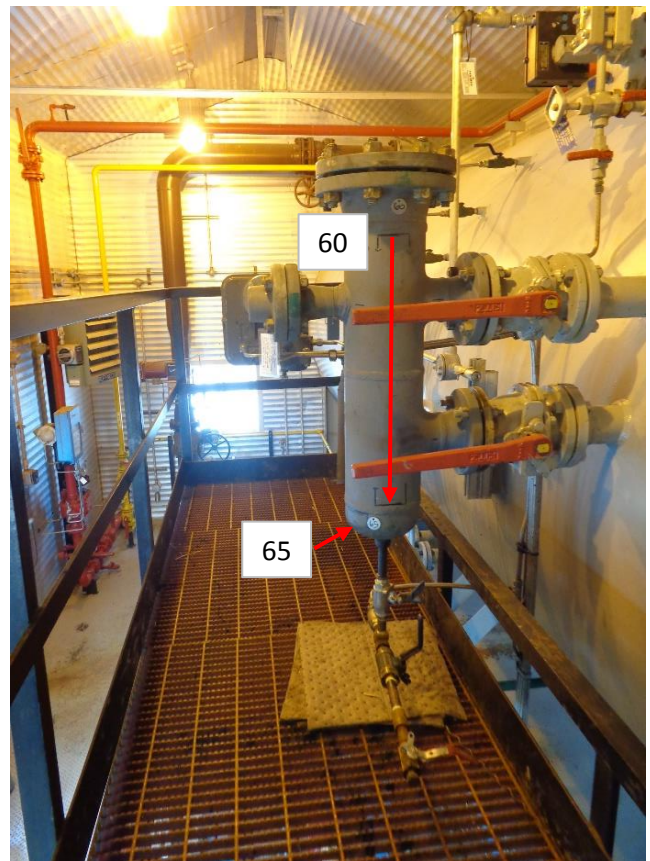
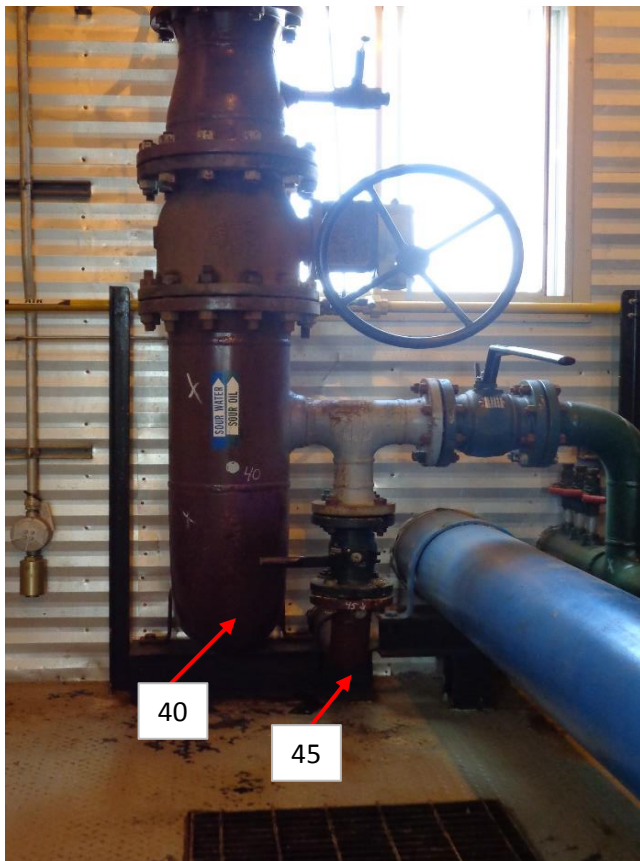
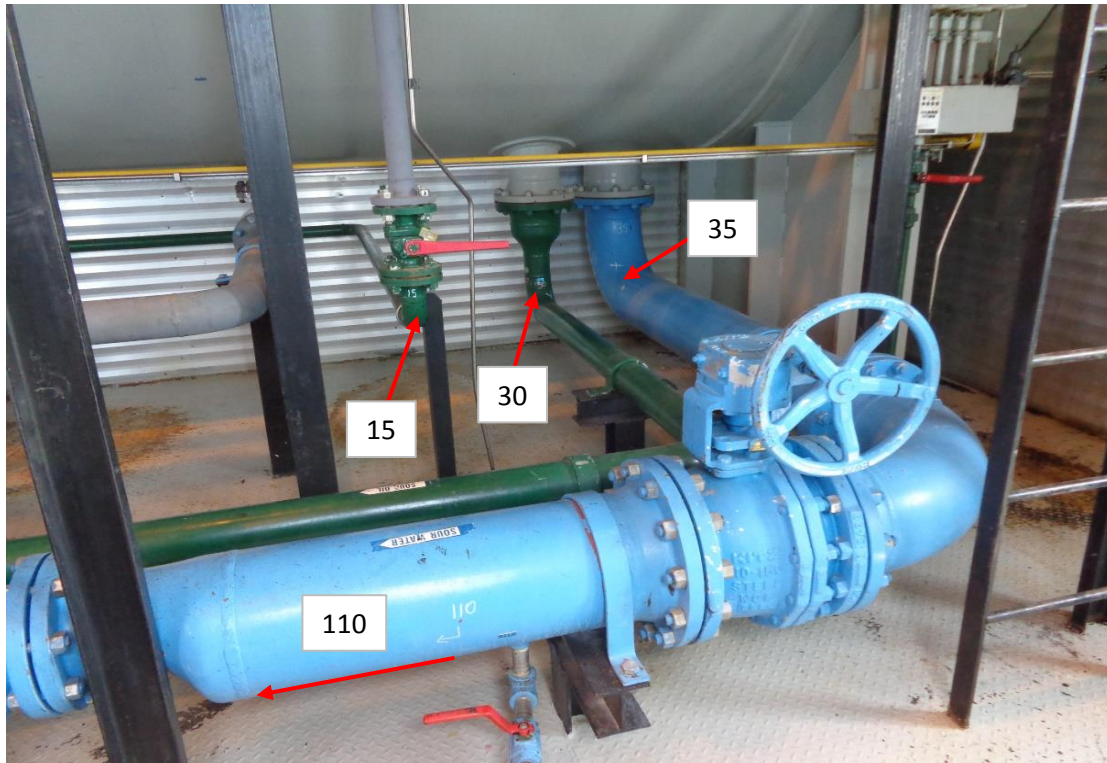
ALPINE INTEGRITY SERVICES														
Date:	May 10, 2014				Equip. Name:	Free Water Knockout								
Client/Owner:	Harvest Operations				Provincial #:	A3055474			Equip #:	FWKO-110				
District:	Provost				Manufacturer:	Process Industries			CRN:	M-6442.2				
Area:	Amisk				Year Built:	1994			S/N:	94-C2883-3000				
Facility:	Battery				RT (Joint Eff):	RT-1			CA:	N/A		in		
Location/LSD:	12-15-40-08W4M													
Shell:	MAWP	100	PSI	MAWT	140	F	Dia (OD)	144.00	in	Material	SA-516-70	Nominal	0.375	in
Head:	MAWP	100	PSI	MAWT	140	F	Dia (OD)	144.00	in	Material	SA-516-70	Nominal	0.430	in
Coil:	MAWP		PSI	MAWT		F	Dia (OD)		in	Material		Nominal		in
Hdr Box:	MAWP		PSI	MAWT		F	d x D (in)			Material		Nominal		in
TS Shell:	MAWP		PSI	MAWT		F	Dia (OD)		in	Material		Nominal		in
TS Head:	MAWP		PSI	MAWT		F	Dia (OD)		in	Material		Nominal		in
Shell 2:	MAWP		PSI	MAWT		F	Dia (OD)		in	Material		Nominal		in
Head 2:	MAWP		PSI	MAWT		F	Dia (OD)		in	Material		Nominal		in
Coil 2:	MAWP		PSI	MAWT		F	Dia (OD)		in	Material		Nominal		in
Notes:														



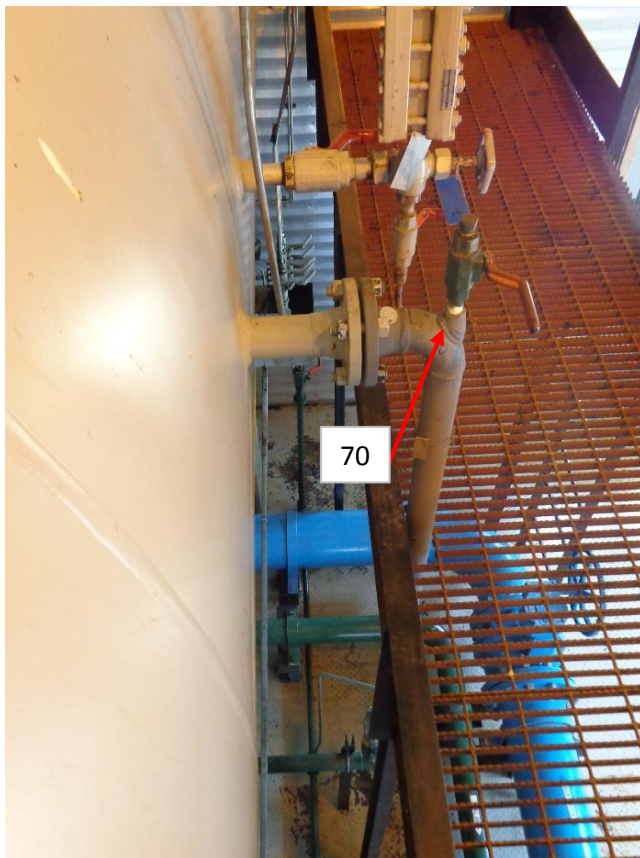
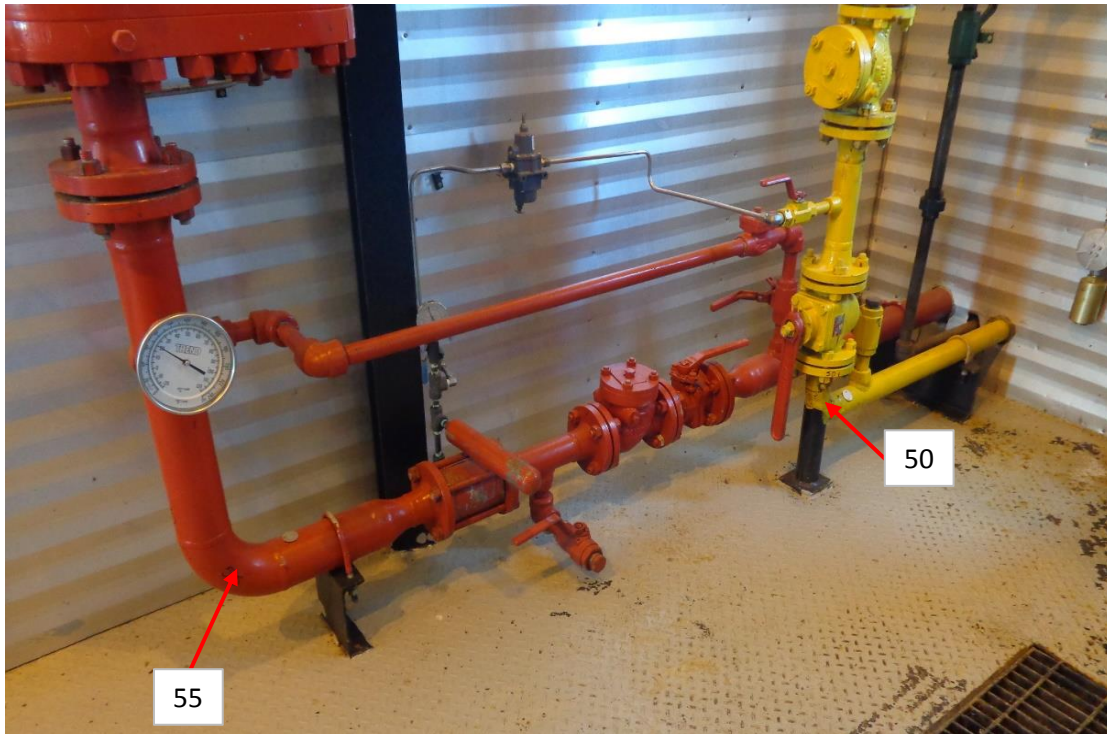
UT CORROSION SURVEY REPORT
STATIC DATA & LOCATIONS



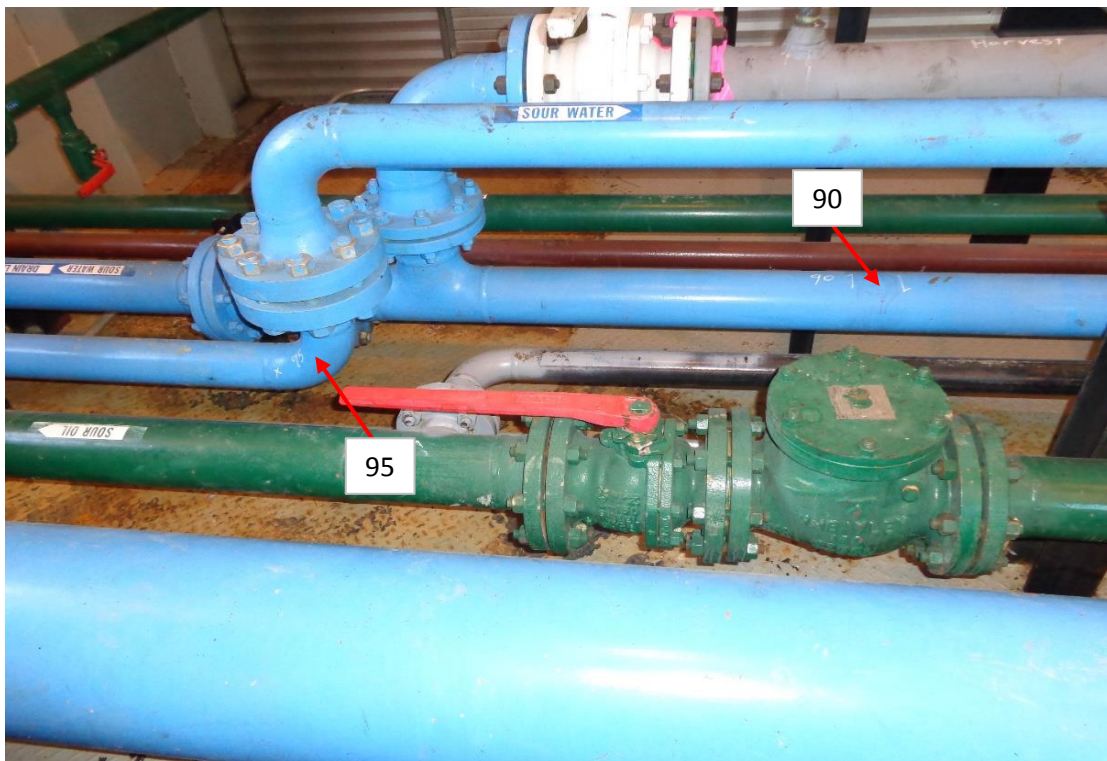
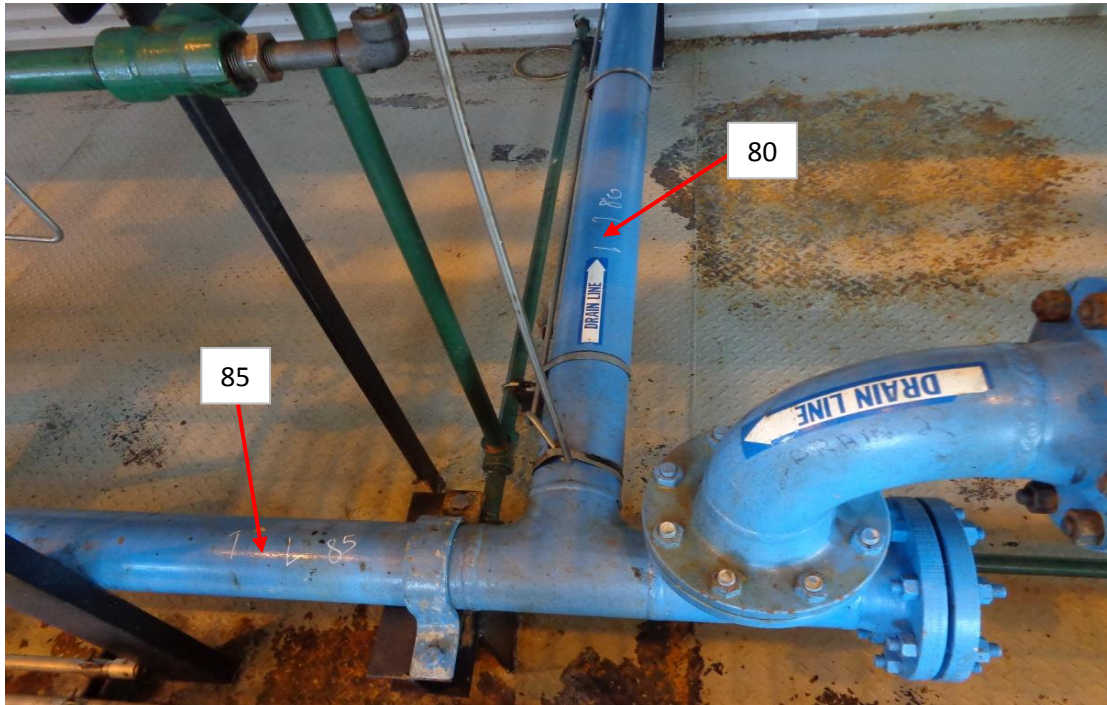
UT CORROSION SURVEY REPORT STATIC DATA & LOCATIONS



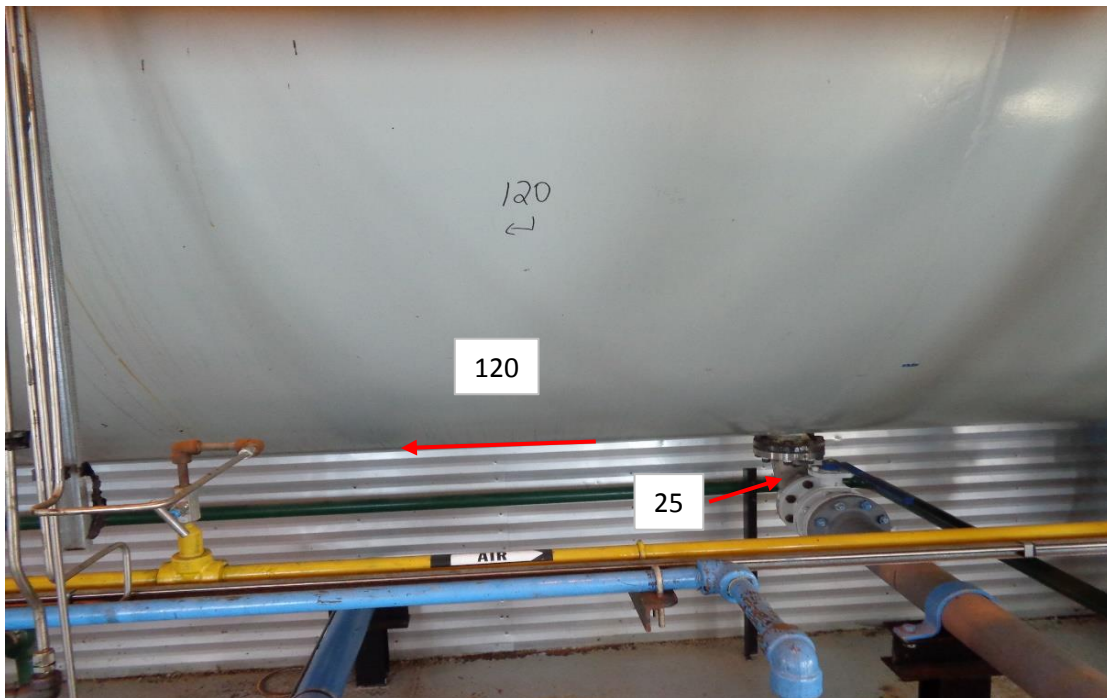
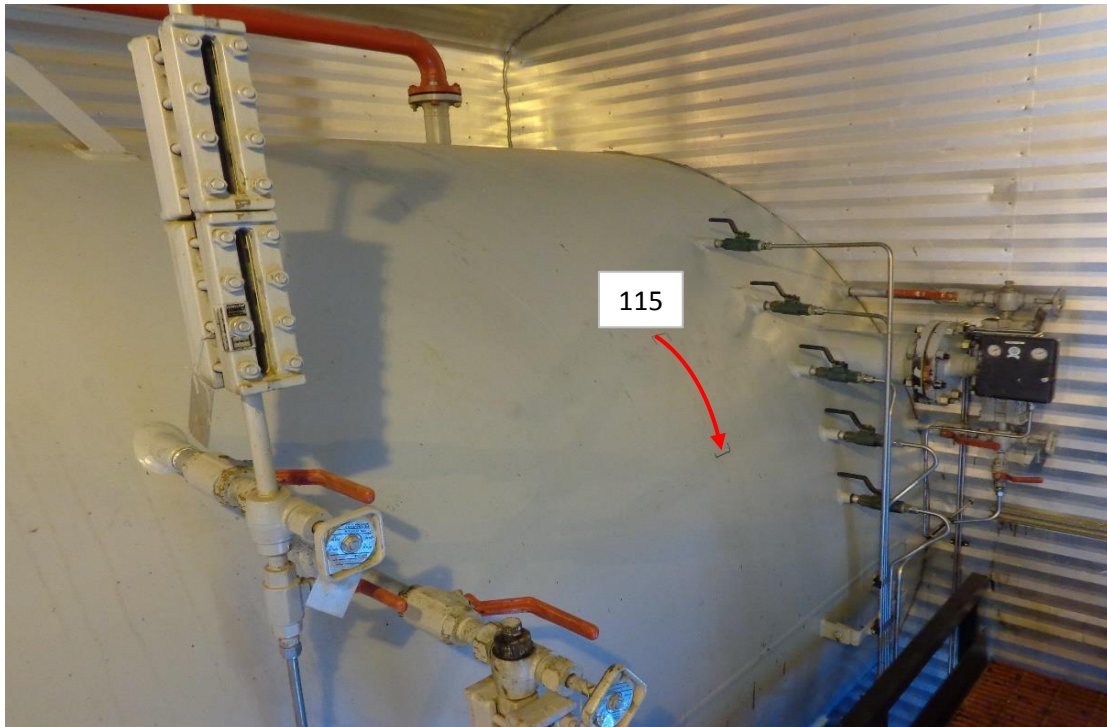
UT CORROSION SURVEY REPORT STATIC DATA & LOCATIONS



UT CORROSION SURVEY REPORT
STATIC DATA & LOCATIONS



UT CORROSION SURVEY REPORT
STATIC DATA & LOCATIONS





UT CORROSION SURVEY REPORT READINGS & SUMMARY

Date:	May 10, 2014	Area:	Amisk	Equip Name:	Free Water Knockout	Equip #:	FWKO-110
Client:	Harvest Operations	LSD:	12-15-40-08W4M	Prov #:	A3055474	S/N:	94-C2883-3000

VESSEL TMLS														
TML ID	Baseline		Previous		Current									
	1994		2011		2014									
	LOW	AVG	LOW	AVG	LOW	AVG	SIZE (OD)	NOM	STCR (/YR)	LTCR (/YR)	Tmin	RL (YRS)	% Loss	Component
115	0.375	0.375	N/A	N/A	0.415	0.420	144.000	0.375	N/A	0.0000	0.411	50.0	0.00%	Shell
120	0.375	0.375	N/A	N/A	0.400	0.404	144.000	0.375	N/A	0.0000	0.411	50.0	0.00%	Shell
125	0.375	0.375	N/A	N/A	0.412	0.423	144.000	0.375	N/A	0.0000	0.411	50.0	0.00%	Shell
130	0.375	0.375	N/A	N/A	0.390	0.396	144.000	0.375	N/A	0.0000	0.411	50.0	0.00%	Shell

ATTACHMENT / PIPING / NOZZLE TMLS																	
TML ID	Baseline		Previous		Current												
	1994		2011		2014												
	LOW	AVG	LOW	AVG	LOW	AVG	SIZE (OD)	NOM	STCR (/YR)	LTCR (/YR)	Tmin	RL (YRS)	% Loss	SCH	Assoc Comp	Shape	Type
00	0.216	0.216	0.185	0.211	0.200	0.210	3.5	0.216	0.0000	0.0008	0.009	50.0	7.41%	STD	Shell	90°	Piping
05	0.216	0.216	0.185	0.207	0.200	0.210	3.5	0.216	0.0000	0.0008	0.009	50.0	7.41%	STD	Shell	90°	Piping
10	0.154	0.154	0.135	0.143	0.151	0.160	2.375	0.154	0.0000	0.0002	0.006	50.0	1.95%	STD	Shell	90°	Piping
15	0.154	0.154	0.132	0.145	0.149	0.159	2.375	0.154	0.0000	0.0003	0.006	50.0	3.25%	STD	Shell	90°	Piping
20	0.337	0.337	0.307	0.334	0.337	0.354	4.5	0.337	0.0000	0.0000	0.011	50.0	0.00%	XS	Shell	90°	Piping
25	0.237	0.237	0.299	0.324	0.327	0.351	4.5	0.237	0.0000	0.0000	0.011	50.0	0.00%	STD	Shell	90°	Piping
30	0.237	0.237	0.219	0.229	0.228	0.251	4.5	0.237	0.0000	0.0004	0.011	50.0	3.80%	STD	Shell	90°	Piping
35	0.365	0.365	0.366	0.393	0.371	0.400	10.75	0.365	0.0000	0.0000	0.027	50.0	0.00%	STD	Shell	90°	Piping
40	0.365	0.365	0.350	0.393	0.375	0.400	10.75	0.365	0.0000	0.0000	0.027	50.0	0.00%	STD	Shell	90°	Piping
45	0.216	0.216	0.186	0.211	0.212	0.227	3.5	0.216	0.0000	0.0002	0.009	50.0	1.85%	STD	Shell	90°	Piping
50	0.154	0.154	0.133	0.149	0.150	0.161	2.375	0.154	0.0000	0.0002	0.006	50.0	2.60%	STD	Shell	90°	Piping
55	0.216	0.216	0.203	0.211	0.212	0.222	3.5	0.216	0.0000	0.0002	0.009	50.0	1.85%	STD	Shell	90°	Piping
60	0.280	0.280	0.326	0.358	0.340	0.360	6.625	0.280	0.0000	0.0000	0.017	50.0	0.00%	STD	Shell	Level Column	Shell
65	0.280	0.280	0.244	0.263	0.259	0.281	6.625	0.280	0.0000	0.0011	0.017	50.0	7.50%	STD	Shell	Level Column	Head / End Cap
70	0.218	0.218	0.142	0.182	0.170	0.190	2.375	0.218	0.0000	0.0024	0.006	50.0	22.02%	XS	Shell	90°	Piping
75	0.218	0.218	0.152	0.172	0.165	0.177	2.375	0.218	0.0000	0.0027	0.006	50.0	24.31%	XS	Shell	90°	Piping
80	0.237	0.237	N/A	N/A	0.234	0.252	4.5	0.237	N/A	0.0001	0.011	50.0	1.27%	STD	Shell	360°	Piping
85	0.237	0.237	N/A	N/A	0.218	0.232	4.5	0.237	N/A	0.0009	0.011	50.0	8.02%	STD	Shell	360°	Piping
90	0.237	0.237	N/A	N/A	0.227	0.240	4.5	0.237	N/A	0.0005	0.011	50.0	4.22%	STD	Shell	360°	Piping



UT CORROSION SURVEY REPORT READINGS & SUMMARY

95	0.337	0.337	N/A	N/A	0.287	0.301	4.5	0.337	N/A	0.0025	0.011	50.0	14.84%	XS	Shell	90°	Piping
100	0.216	0.216	N/A	N/A	0.186	0.202	3.5	0.216	N/A	0.0015	0.009	50.0	13.89%	STD	Shell	90°	Piping
105	0.154	0.154	N/A	N/A	0.150	0.163	2.375	0.154	N/A	0.0002	0.006	50.0	2.60%	STD	Shell	90°	Piping
110	0.365	0.365	N/A	N/A	0.376	0.385	10.75	0.365	N/A	0.0000	0.027	50.0	0.00%	STD	Shell		Piping

* TML's 80 - 130 were newly added in 2014 survey.

** TML 20 & 25 are both stainless steel. UT set was calibrated with carbon steel cal block.

*** Low readings found on TML 70 & 75, likely from manufacturing.


Notes:

**All readings are in inches.*

**RL maximum is 50 years.*

**% Wall loss is based on current low vs nominal.*

**Baseline is based off nominal if no previous readings available and started in year equipment was fabricated, unless other information is available to prove in-service date.*

Inspector:	Chad Oakes	Certifications:
Signature:		CGSB 16755 UT I