



RESULTS OF INSPECTION:

UT Inspection:
No corrosion was found with the ultrasonic inspection. Previous indications were determined to be midwall inclusions. Once the external coating was removed the ultrasonic signal sharpened and separation between the ID nozzle surfaces (backwall) and the inclusions was clearly evident. Shearwave UT was performed on the inclusions to confirm they are contained within the pipewall and do not slope toward or break the internal or external surfaces. Included within this report are photos of the zero degree indication signals as displayed on the ultrasonic flaw detector during inspection.

PRESSURE EQUIPMENT										AB-506 INTERVAL						
DISTRICT	AB - OIL & NATURAL GAS					SHELL	TUBE				LPG plant storage vessels					
FACILITY	Armada Gas Plant				MAWT	115		F		GRADE	YEARS			REG		
A#	A0227158		YR	1985	MAWP	250			psi		Equip	PSV	UT			
SERIAL #	27635A				PSV				psi		10					
CRN	C4936.2134				PSV CRN				INSPECTION TYPE							
EQUIP#					SERVICED											
STATUS	IN SERVICE				UNIT	NE YARD				VE	VI	MT	PT	ET	UT	
MANUFACTURER	WESTERN ROCK BIT CO LTD									INSPECTION RESULT:						
DH LSD					L	Ft	OD	9	Ft	NCR-OPERATIONS						
REPAD	UNIQUE ID									NCR-REGULATORY/ADMIN						
<p>no wall inclusions.</p> <p>0 nozzle surfaces (backwall) and the inclusions was clearly evident.</p> <p>do not slope toward or break the internal or external surfaces.</p> <p>mic flaw detector during inspection.</p>										ACTION ITEM RAISED						
										REPAIR REQUIRED						
										SUITABLE FOR SERVICE						X
										RECOMMENDATIONS:						

SIGN OFF	API 510	EXP.	IPV	EXP.	INSPECTOR - PRIMARY	INSPECTOR - REVIEW	CLIENT SIGN OFF
INSPECTED BY	ToddM Mckenzie	97445	2023-12-31	001336	2026-07-13		
REVIEWED BY							

Ultrasonic Report

LSD01-18-017-18W4M

DH-LSD

Jurisdiction #A0227158

Serial #27635A

Ultrasonic Report #:A#0227158_GRADY INSPECTION LTD UT INSP_29AUG2022

Date

2022-08-29

Facility

Armada Gas Plant

Field

Red Deer District

Phone: 403-793-7697

PO Box 1173, Brooks, Alberta, T1R 19B

grady.rustebakke@gmail.com

GRADY

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ULTRASONIC SET			COMPONENT DETAILS				CODE					
EQUIPMENT	CALIBRATION DUE	SERIAL NUMBER	MATERIAL GRADE	SURFACE PREP		TEMP	THICKNESS	CALIBRATION	EVALUATION			
EPOCH 600	2023-02-25	120388107	Carbon Steel	Buffing Wheel		10C	5.5 mm	ASME V	ASME VIII Div 1			
CALIBRATION BLOCK		PROBE							COUPLING		METHOD	
TYPE	SERIAL#	REF dB	SCAN dB	FREQ.	SIZE.	ANGLE	SERIAL #	TYPE	COUPLANT	CABLE	TECHNIQUE	PROCEDURE
10 Step Metric	14-2065	60	66	5 Mhz	0.25 "	0	15B00DU3	Dual	UT-X	6' BNC to Micro	LW Dual	UT01T1R4
IIW Mini	05-8424	32	52	5 Mhz	0.25"	45	19029	P/E	UT-X	6' BNC to Micro	SW Single	UT01T02R3
SCOPE		As requested by Dustin Rumohr an ultrasonic inspection was completed on CML's 80 and 115 (3"/STD Nozzles) previously identified internal corrosion pitting.										
LIMITATIONS		None. Paint was fully removed from areas of interest and surrounding surfaces.										
RESULTS		No corrosion was found with the ultrasonic inspection. Previous indications were determined to be midwall inclusions. Once the external coating was removed the ultrasonic signal sharpened and separation between the ID nozzle surfaces (backwall) and the inclusions was clearly evident. Shearwave UT was performed on the inclusions to confirm they are contained within the pipewall and do not slope toward or break the internal or external surfaces. Included within this report are photos of the zero degree indication signals as displayed on the ultrasonic flaw detector during inspection.										

Technician Name

3 ToddM

Certification Body

CGSB

Certification #

9234

Expiry

2030-12-15

Technician Signature

Client Name

Dustin Rumohr

Client Signature

Company Name

CNRL

Overview Photo

LSD 01-18-017-18W4M
Jur # A0227158
Serial # 27635A

Date	2022-08-29
FACILITY	Armada Gas Plant
FIELD	Red Deer District

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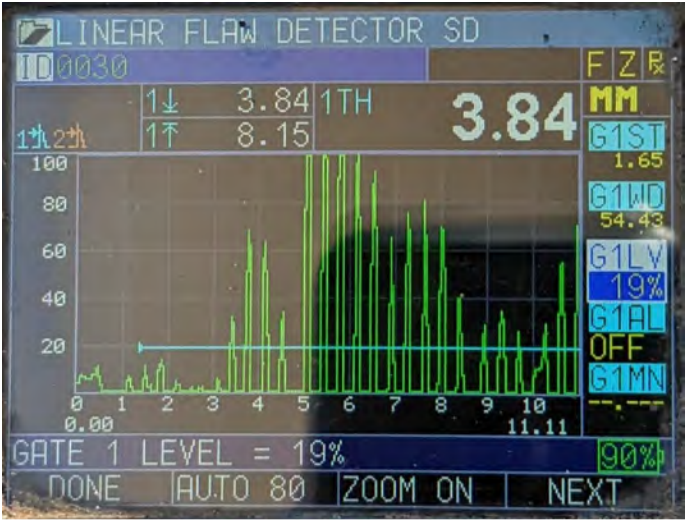
Nameplate



Overview



CML 80 Midwall Inclusion Photo



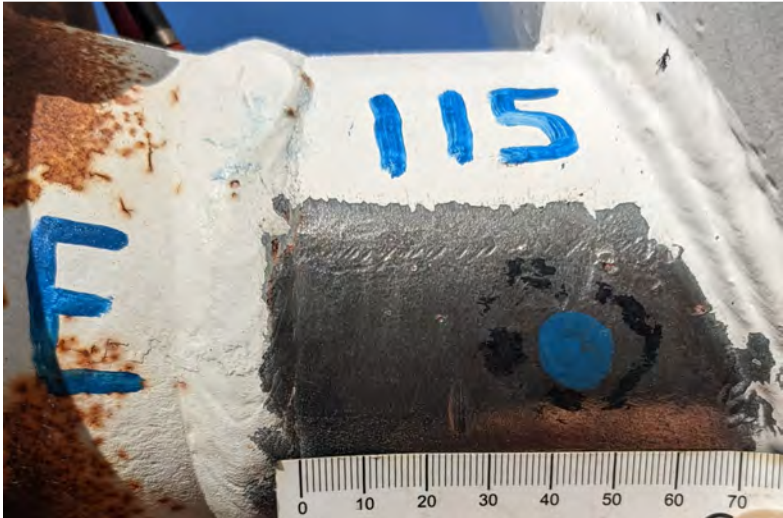
CML 80 UT Signal Photo

Overview Photo

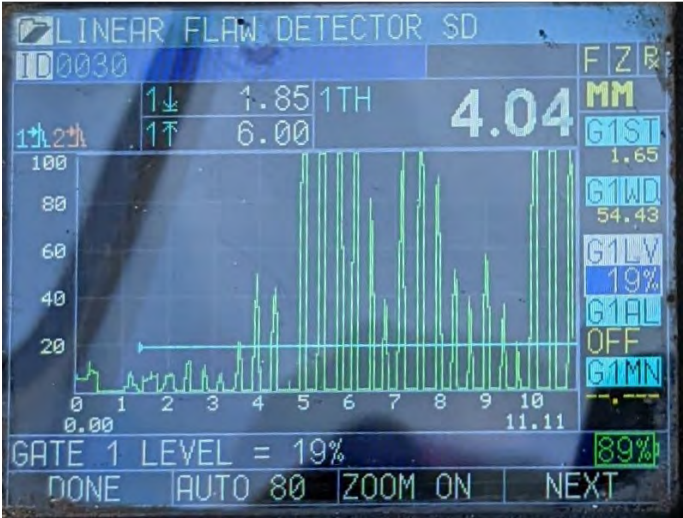
LSD 01-18-017-18W4M
Jur # A0227158
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CML 115 Midwall Inclusion Photo



CML 115 UT Signal Photo



LSD Sign

REPORT # A#0227158_GRADY INSPECTION LTD UT INSP_29AUG2022

LSD 01-18-017-18W4M

FACILITY Armada Gas Plant

DH-LSD

FIELD Red Deer District

Jur # A0227158

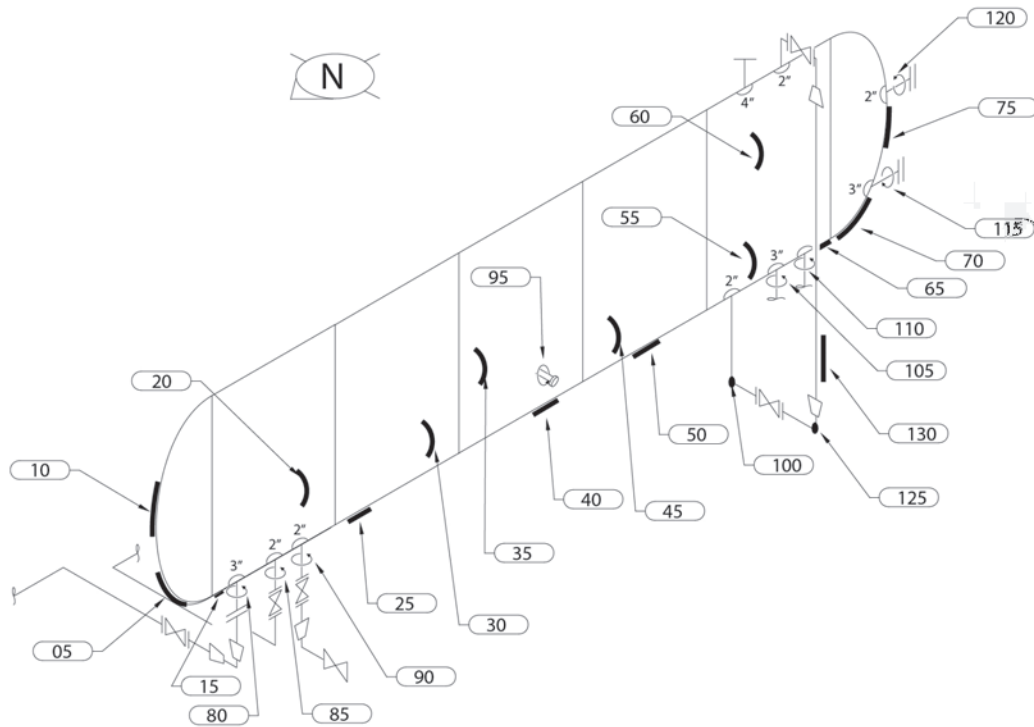
DWG 1

Location:

Phone: 403-793-7697

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rustebakke@gmail.com

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[illegible]

CML	Min	Yrs	Date
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Nominal (mm)	Pipe Tolerance 12% (mm)	Corrosion Allowance (mm)
100	12	10
150	18	15
200	24	20
250	30	25
300	36	30
350	42	35
400	48	40
450	54	45
500	60	50
550	66	55
600	72	60
650	78	65
700	84	70
750	90	75
800	96	80
850	102	85
900	108	90
950	114	95
1000	120	100

API 574 Table 7 Flag Tmin	Pressure Tmin Structural Tmin
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%Nom	10-20	20-30
-UT	30-50	>50

Cor. Rates (mm/yr)	0.025 - 0.25	0.26 - 0.5
	0.501 - 1	>1.0

Calculated Failure (years)	3-5	2-3
	1-2	< 1

REPORT # A#0227158_GRADY INSPECTION LTD UT INSP_29AUG2022
LSD 01-18-017-18W4M FACILITY Armada Gas Plant
DH-LSD FIELD Red Deer District
Jur # A0227158 DWG 1 Location:
Ser # 27635A

Phone: 403-793-7697

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Ser # 27635A			Inspection Dates and Thickness Values (mm)																				% Nom Wall Loss		Corrosion Rates			Rem Life		Insp	
CML#	Nom	CA/Tol	SFlag	STmin	PTmin	> Tmin	Comp Type	Pipe Size	Code	MOP	Baseline			3rd Last		2nd Last		Last		# of Insp	ST	LTn	LTi	Date	Rem Life (yrs)	Next Insp Date	Insp Int (yrs)	Inspection Comments			
											Date	Min	Ave	Date	Min	Ave	Date	Min	Ave												
005	19.6	19.6	19.3		19.3	19.3	Head		UG32HeadElli	250	12/4/1	22.1	22.7			17/11/28	21.8		22/5/2	22.0	22.5	3	-12%				2032-04-29	10.0			
010	19.6	19.6	19.3		19.3	19.3	Head		UG32HeadElli	250	22/5/2	22.5	22.8								1	-15%				2032-04-29	10.0				
015	19.8	19.8	39.0		19.5	19.5	Shell		UG27ShellInt	250	22/5/2	20.4	20.5								1	-3%				2032-04-29	10.0				
020	19.8	19.8	39.0		19.5	19.5	Shell		UG27ShellInt	250	22/5/2	20.1	20.3								1	-2%				2032-04-29	10.0				
025	19.8	19.8	39.0		19.5	19.5	Shell		UG27ShellInt	250	22/5/2	20.4	20.6								1	-3%				2032-04-29	10.0				
030	19.8	19.8	39.0		19.5	19.5	Shell		UG27ShellInt	250	22/5/2	20.2	20.4								1	-2%				2032-04-29	10.0				
035	19.8	19.8	39.0		19.5	19.5	Shell		UG27ShellInt	250	22/5/2	20.1	20.3								1	-2%				2032-04-29	10.0				
040	19.8	19.8	39.0		19.5	19.5	Shell		UG27ShellInt	250	22/5/2	20.1	20.3								1	-2%				2032-04-29	10.0				
045	19.8	19.8	39.0		19.5	19.5	Shell		UG27ShellInt	250	22/5/2	20.2	20.4								1	-2%				2032-04-29	10.0				
050	19.8	19.8	39.0		19.5	19.5	Shell		UG27ShellInt	250	22/5/2	20.3	20.4								1	-3%				2032-04-29	10.0				
055	19.8	19.8	39.0		19.5	19.5	Shell		UG27ShellInt	250	22/5/2	20.1	20.3								1	-2%				2032-04-29	10.0				
060	19.8	19.8	39.0		19.5	19.5	Shell		UG27ShellInt	250	12/4/1	20.5	20.7					22/5/2	20.4	20.6	2	-3%	0.01			2032-04-29	10.0				
065	19.8	19.8	39.0		19.5	19.5	Shell		UG27ShellInt	250	22/5/2	20.1	20.3								1	-2%				2032-04-29	10.0				
070	19.6	19.6	19.3		19.3	19.3	Head		UG32HeadElli	250	12/4/1	21.9	22.4			17/11/28	21.8		22/5/2	21.9	22.5	3	-12%				2032-04-29	10.0			
075	19.6	19.6	19.3		19.3	19.3	Head		UG32HeadElli	250	22/5/2	22.2	22.4								1	-13%				2032-04-29	10.0				
080	5.5			4.8		4.8	Nozzle	3" STD 40--(5.5mm)	UG45Nozzle	250	22/5/2	4.3	6.5					22/8/29	5.2	6.5	2	5%			-15.6	2032-08-26	10.0	Inclusion @ 3.8 mm			
085	3.9			3.4		3.4	Nozzle	2" STD 40--(3.9mm)	UG45Nozzle	250	22/5/2	4.1	4.3								1	-5%				2032-04-29	10.0				
090	3.9			3.4		3.4	Nozzle	2" STD 40--(3.9mm)	UG45Nozzle	250	22/5/2	3.9	4.3								1	0%				2032-04-29	10.0				
095	9.5						Nozzle	18" STD ----(9.5mm)	UG45Nozzle	250	22/5/2	9.3	10.5								1		0.01	3758-03-29		2032-04-29	10.0	assumed nom			
100	3.9	3.4	2.5	1.8	0.4	1.8	Elbow	2" STD 40--(3.9mm)	API570	250	12/4/1	4.1	4.2					22/5/2	3.7	4.1	2	5%	0.04			2032-04-29	10.0				
105	5.5			4.8		4.8	Nozzle	3" STD 40--(5.5mm)	UG45Nozzle	250	22/5/2	5.5	6.5								1	0%				2032-04-29	10.0	Iso pit			
110	6.0			5.3		5.3	Nozzle	4" STD 40--(6mm)	UG45Nozzle	250	22/5/2	6.3	6.8								1	-5%				2032-04-29	10.0				
115	5.5			4.8		4.8	Nozzle	3" STD 40--(5.5mm)	UG45Nozzle	250	22/5/2	4.4	5.7					22/8/29	5.2	5.7	2	5%			-13.6	2032-08-26	10.0	Inclusion @ 4.0 mm			
120	5.2			4.5		4.5	Nozzle	2.5" STD 40--(5.2mm)	UG45Nozzle	250	22/5/2	7.3	8.3								1	-40%				2032-04-29	10.0	corr @ 6:00			
125	5.5	4.8	2.5	1.8	0.4	1.8	Elbow	2" XS 80--(5.5mm)	API570	250	22/5/2	5.3	5.7								1	4%	0.01	2675-08-19		2032-04-29	10.0				
130	8.6	7.5	3.1	2.3	0.7	2.3	Pipe	4" XS 80--(8.6mm)	API570	250	12/4/1	9.0	9.2					22/5/2	9.0	9.3	2	-5%				2032-04-29	10.0				