

V-630

PROPANE ACCUMULATOR

Quality Control Documentation



MANUFACTURED AND CERTIFIED BY



THERMO DESIGN
ENGINEERING LTD.

EDMONTON

ALBERTA

CANADA

UNIT NAME

TAG NUMBER

PROPANE ACCUMULATOR

V-630

CR. NUMBER

SERIAL NUMBER

Ⓐ NUMBER

N-9965-21

16 18



M.A.W.P.

AT TEMP.

M.D.M.T.

AT PRESSURE

260 PSIG

150

-20

260 PSIG

YEAR BUILT

CORR. ALL.

DRAWING NUMBER

1998

0.00 IN

9097-0850-205

DIAMETER

LENGTH

CAPACITY

WEIGHT

42 IN OD

12-0 3/8

126 OINT

3170 LBS

SHELL MATL.

HEAD MATL.

TBSHT. MATL.

COIL MATL.

SA-316-70N

SA-316-70N

SHELL THK.

HEAD MIN. THK.

TBSHT. THK.

COIL THK.

0.375 IN

0.340 IN



TO: THERMO DESIGN ENGINEERING LTD

BOX 5557 STATION L
EDMONTON ALTA
T6C 4E9

Account # 19971

Date: 98/03/25

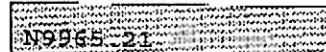
Journal # 18823

Attn: JASON HARGREAVES

Re: THERMO DESIGN ENGINEERING LTD

DESIGN REGISTRATION

C.R.N.



Drawings / Documents	Description		
PROPANE ACCUMULATOR 9097-0850-205 REV 2	MDMT ----- REGISTERED -20 F	MAWT ----- 150 F	MAWP ----- 260 psi
	Note: Vessel has 0" C.A.		
	Code of Compliance: ASME Sec VIII Div 1, 95 Ed., A96.		

Remarks: This design has been registered as noted above. An invoice for survey will follow in the amount of \$ 322.00

CRN issued in accordance with the ACI Policies on Reciprocal Recognition of Design Review for Registration. Alberta issued CRN N9965.2 on March 17, 1998.

cb
Encl:
cc:

Yours truly,

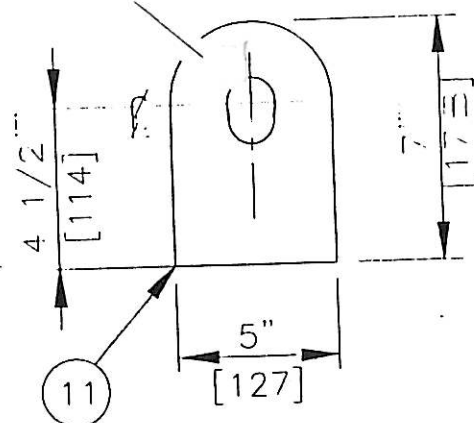
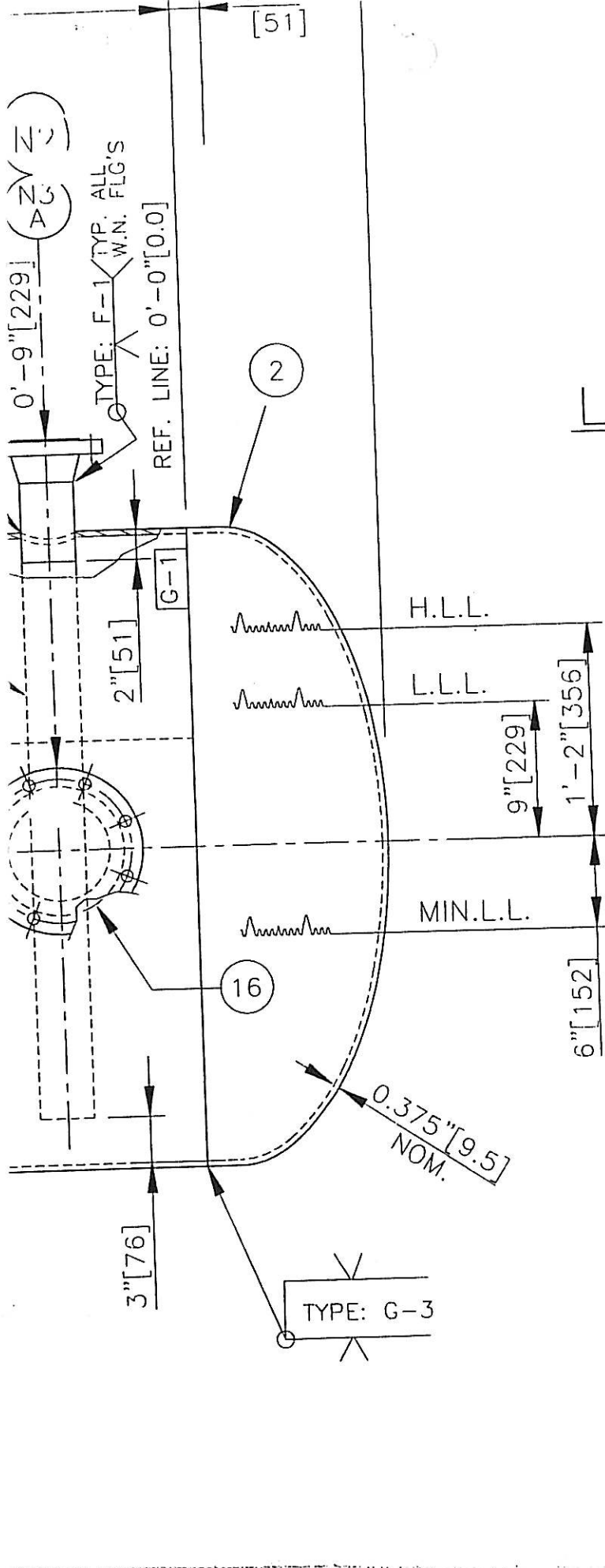
R. TUAZON
Design Surveyor

Ministry of
Municipal Affairs
and Housing

Boiler and Elevator
Safety Branch

3rd Floor
750 Pacific Boulevard South - Unit 300
Vancouver BC V6B 5E7

Telephone: (604) 680-8254
Facsimile: (604) 775-2345



LIFTING LUG DETAIL N.T.S.

ALBERTA BOILERS SAFETY ASSOCIATION		
PROVINCE OF ALBERTA		
SAFETY CODES ACT		
REG. No.	N-9965.2	
DWG. No.	9094-0850-205 Rev. 2	
	Design Press kPa	Design Temp. °C
	1793	-29/66
ACCEPTED		
MAR 17 1998	Signed <i>[Signature]</i>	
Date	DJORDJE SRNIC DESIGN SURVEY ENGINEER	

- (11)
- (N1)
- (C8)
- (C1 A)
- (C4)
- (C7 A)
- (C3)
- (C2)

- 1. []
- 2. []
- 3. []
- 4. []
- 5. []
- 6. []
- 7. []
- 8. []
- 9. []
- 10. []
- 11. []
- 12. []
- 13. []
- 14. []
- 15. []
- 16. []
- 17. []



W
RT-1

MANUFACTURED AND CERTIFIED BY
 **THERMO DESIGN
ENGINEERING LTD.**

EDMONTON

ALBERTA

CANADA

UNIT NAME

TAG NUMBER

PROPANE ACCUMULATOR

V-630

CR. NUMBER

SERIAL NUMBER

(A) NUMBER

N-9965.21

1618

M.A.W.P.

AT TEMP.

M.D.M.T.

AT PRESSURE

260 PSIG.

150°F

-20°F

260 PSIG.

YEAR BUILT

CORR. ALL

DRAWING NUMBER

1998

0.00 IN.

9097-0850-205.

DIAMETER

LENGTH

CAPACITY

WEIGHT

42 IN OD

12-05/S

126 CU FT

3170 LBS.

SHELL MATL.

HEAD MATL.

TBSHT. MATL.

COIL MATL.

SA-516-70N

SA-516-70N
SA-516-70N

SHELL THK.

HEAD MIN. THK.

TBSHT. THK.

COIL THK.

0.375 IN

0.341 IN
0.340 IN



EQUIPMENT STATIC DATA FORM

TAQA NORTH DATA				
EQUIP NO.: 603VS013	RAMS ID TAG NO.: NEW	PRN: N/A	NAT'L BOARD #: N/A	CATEGORY:
PLANT/FIELD: CHINCHAGA GAS PLANT		LSD: C-032-H / 094-H-08	LOCATION: GAS PLANT	
EQUIP. NAME : PROPANE ACCUMULATOR		CLASS : VS	TYPE: ACCUMULATOR	
SERVICE: ☒ Sweet ☐ Sour	H2S: N/A PPM	FLUID: PROPANE	S/D REQT.: ☐ Yes ☐ No ☐ Partial	
OPERATING PRESSURE: 1034 ☒ kPa ☐ PSI		OPERATING TEMPERATURE: 25 ☒ °C ☐ °F		
OPERATING STATUS: ☒ IN SERVICE ☐ Not In Service		M/WAY(16"AND ABOVE): ☐ Yes ☒ No SIZE:		

MANUFACTURING DATA				
MFG.: THERMO DESIGN	DWG. NO.: 90970850205	SERIAL NO.: 1618	YR. BUILT: 1998	STAMP: W
CRN: N9965.21	CODE/DIV.: ASME VIII DIV 1	PARA.: N/S	SUPPORT: ☐ Skirt ☒ Saddles ☐ Nozzles	
MAWP: 1793 ☒ kPa ☐ PSI	@ TEMP: 66 ☒ °C ☐ °F	MDMT: -29 ☒ °C ☐ °F	VOLUME: 126 ☐ M ³ ☒ FT ³	
FLANGE RATING: 150#	PWHT: ☐ Yes ☒ No ☐ N/A	RADIOGRAPHY: ☒ RT1 ☐ RT2 ☐ RT3 ☐ RT4 ☐ Spot ☐ Full ☐ N/A		
SIZE : 1064 ☒ mm. ☐ inch. ☐ ID ☒ OD	LENGTH: 305 ☒ mm. ☐ inch.	HEIGHT: N/A ☐ mm ☐ inch.		
INSULATION TYPE: ☐ Fiberglass ☐ Wool ☐ Low Temp ☐ Asbestos Other: N/A			INSULATION THK: N/A ☐ mm ☐ inch.	
SECTION	MATERIAL	NOMINAL mm	C.A. mm	
SHELL	SA-516-70N	9.5 MM	0	
HEAD	SA-516-70N	8.7 MM / 8.6 MM	0	
COMMENTS: WEIGHT IS 3170 LBS				

TUBING DATA				
MAWP: N/A ☐ kPa ☐ PSI	@ TEMP: N/A ☐ °C ☐ °F	TEMA CLASS: N/A	TYPE: N/A	
TUBE SIZE: N/A mm. ☐ ID ☐ OD	NUMBER (QTY OF TUBES): N/A	GAUGE (BWG): N/A	JOINT: ☐ Welded ☐ Rolled	
SECTION	MATERIAL	NOMINAL mm	C.A. mm	
N/A	N/A	N/A	N/A	

TRAY/PACKING DATA		
TRAY TYPE: N/A	NUMBER (# OF TRAYS): N/A	PACKING TYPE: N/A
MATERIAL: N/A	MANUFACTURER: N/A	

COATING/LINING/CLADDING DATA			
AREA	TYPE	MATERIAL	YR. APPLIED
EXTERNAL:	EPOXY	N/A	N/A
INTERNAL:	N/A	N/A	N/A
LINING:	N/A	N/A	N/A
CLADDING:	N/A	N/A	N/A

PRESSURE RELIEF DEVICES DATA		☐ PSV not located	☐ No PSV
EQUIP. NO.	TAG NO.	SET	CAPACITY
603SVVS013	N/A	1793 ☒ kPa ☐ PSI	3451
N/A	N/A	N/A ☐ kPa ☐ PSI	N/A
N/A	N/A	N/A ☐ kPa ☐ PSI	N/A

FORM U-1A MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS
(Alternative Form for Single Chamber, Completely Shop-Fabricated Vessels Only)
As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1

CTC, Page 1 of 2

1. Manufactured and certified by THERMO DESIGN ENGINEERING LTD., 1624 - 70 AVENUE, EDMONTON, ALBERTA CANADA T6P 1P5
(Name and address of manufacturer)

2. Manufactured for Chauvco Res. Ltd. c/o Tartan Eng. Ltd., 1700, 800 - 6th Avenue S.W., Calgary, AB T2P 3G3
(Name and address of purchaser)

3. Location of installation Chinchaga Gas Plant, British Columbia, LSD: C-32-H/94-H-8
(Name and address)

4. Type Horizontal #1618 N-9965.21 9097-0850-205 / R.2 1998
(Horiz. or vert. tank) (Mfg's serial No.) (CRN) (Drawing no.) (Nat'l Bd. No.) (Year built)

5. The chemical and physical properties of all parts meet the requirements of material specifications of the ASME BOILER AND PRESSURE VESSEL CODE. The design, construction, and workmanship conform to ASME Rules, Section VIII, Division 1
1995
Year

6. Addenda (Date) Code Case Nos. Special Service per UG 120(d)

7. Shell: SA-516-70N 0.375" 0.00" 41.25" ID 12'-0" S/S
Mat'l. (Spec. No., Grade) Nom. Thk. (in.) Corr. Allow. (in.) Diam. I.D. (ft. & in.) Length (overall) (ft. & in.)

8. Seams: Dbl 'V' Full 100 N/A N/A Dbl/Sgl 'V' Full 2
Long. (Welded, Dbl., Sngl., Lap, Butt) R.T. (Spot or Full) Eff. (%) H.T. Temp (F) Time (hr) Girth (welded, Dbl., Sngl., Lap, Butt) R.T. (Spot, Partial, or Full) No. of Courses

9. Heads: (a) Mat'l. SA-516-70N (b) Mat'l. SA-516-70N
(Spec No., Grade) (Spec No., Grade)

	Location (Top, Bottom, Ends)	Minimum Thickness	Corrosion Allowance	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure (Convex or Concave)
(a)	End	0.341"	0.00"			2:1				Concave
(b)	End	0.340"	0.00"			2:1				Concave

If removable, bolts used (describe other fastenings)

N/A

(Mat'l., Spec. No., Gr., Size, No.)

9. MAWP 260 psi at max. temp. 150 ° F
Min. design metal temp. -20 ° F at 260 psi. Hydro., pneu., or comb. test pressure 390 PSI psi.

10. Nozzles, inspection and safety valve openings:

Purpose (Inlet, Outlet, Drain)	No.	Diam. or Size	Type	Mat'l.	Nom. Thk.	Reinforcement Mat'l.	How Attached	Location
N1	1	3"	RFWN	SA-106-B	150#SchXHY	N/A	UW-16.1(c)	Shell
N2	1	3"	RFWN	SA-106-B	150#SchXHY	N/A	UW-16.1(c)	Shell
N3A/B	2	6"	RFWN	SA-106-B	150#SchSTD	SA-516-70N	UW-16.1(c)	Shell
N4	1	4"	RFWN	SA-106-B	150#SchSTD	SA-516-70N	UW-16.1(c)	Shell

11. Supports: Skirt No Lugs No Legs No Other Saddles Attached Welded
(Yes or no) (No.) (No.) (Describe) (Where and how)

12. Remarks: Manufacturer's Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of this report:

(Name of part, item number, Mfg's name and identifying stamp)

42" OD x 12'-0" S/S Propane Accumulator 'V-630'

Capacity: 126 cu.ft.

Impact Test: Exempt per UG-20(f) Registered Dwg.#: 9097-0850-205/R.2 See attached U-4 Form

CERTIFICATE OF SHOP COMPLIANCE

We certify that the statements made in this report are correct and that all details of design, material, construction, and workmanship of this vessel conform to the ASME Code for Pressure Vessels, Section VIII, Division 1. "U" Certificate of Authorization No. 22,145 expires August 22, 19 99.

Date 98-03-21 Co. Name THERMO DESIGN ENGINEERING LTD. Signed Bill Marie
(Manufacturer) (Representative)

CERTIFICATE OF SHOP INSPECTION

Vessel constructed by _____ at _____
I, the undersigned, holding a valid commission issued by The National Board of Boiler and Pressure Vessel Inspectors and the State or Province of AB and employed by Alberta Boilers' Safety Association in Edmonton have inspected the component described in this Manufacturer's Data Report on March 25, 19 98, and state that, to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel in accordance with ASME Code, Section VIII, Division 1. By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date 98-3-25 Signed R. Hojas Commissions 392
(Authorized Inspector) (Nat'l Board (incl. endorsements) State, Prov. and No.)

FORM U-4 MANUFACTURER'S DATA REPORT SUPPLEMENTARY SHEET
As Required by the Provisions of the ASME Code Rules, Section II, Division 1

CTC, Page 2 of 2

Manufactured and certified by THERMO DESIGN ENGINEERING LTD., 1624 - 70 AVENUE, EDMONTON, ALBERTA CANADA T6P 1P5

(Name and address of Manufacturer)

Manufactured for Chauvco Res. Ltd. c/o Tartan Eng. Ltd., 1700, 800 - 6th Avenue S.W., Calgary, AB T2P 3G3

(Name and address of Purchaser)

Location of Installation Chinchaga Gas Plant, British Columbia, LSD: C-32-H/94-H-8

(Name and address)

Type: Horizontal
(Horiz., vert., or sphere)

Propane Accumulator
(Tank separator, heat exch., etc)

#1618

(Mfg's serial No.)

N-9965.21

(CRN)

9097-0850-205/R.2

(Drawing No.)

(Nat'l. Bd. No.)

1998

(Year built)

Data Report Item Number	Remarks									
0 - NOZZLES	C1A/B	2	3/4"	CPLG	SA-105	6000#	N/A	UW-16.1(c)	Shell	
	C2	1	1"	CPLG	SA-105	6000#	N/A	UW-16.1(c)	Shell	
	C3	1	1 1/2"	CPLG	SA-105	6000#	N/A	UW-16.1(c)	Shell	
	C4	1	3/4"	CPLG	SA-105	6000#	N/A	UW-16.1(c)	Shell	
	C5	1	1 1/2"	CPLG	SA-105	6000#	N/A	UW-16.1(c)	Shell	
	C6	1	3/4"	CPLG	SA-105	6000#	N/A	UW-16.1(c)	Shell	
	C7A/B	2	1"	CPLG	SA-105	6000#	N/A	UW-16.1(c)	Shell	
	C8	1	1/2"	CPLG	SA-105	6000#	N/A	UW-16.1(c)	Shell	

Registered Drawing No.: 9097-0850-205 / R.2

PSV: Nozzle C3

Certificate of Authorization: Type U No. 22,145 Expires August 22, 19 99

Date 98.03.25 Name THERMO DESIGN ENGINEERING LTD.
(Manufacturer)

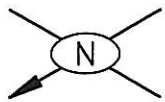
Signed CBilharie
(Representative)

Date 8-3-25 Name R Hufsch
(Authorized Inspector)

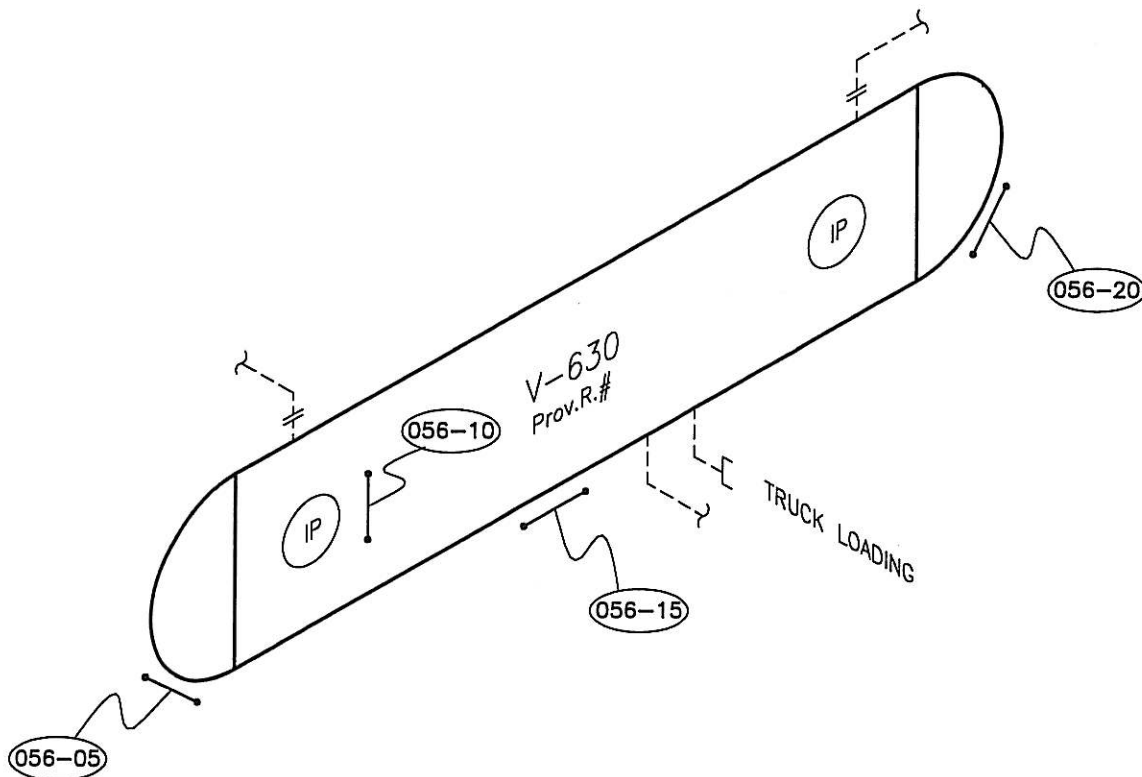
Commission 39R
(Nat'l Board (incl. endorsements) State, Province and No.)



TESTING INC.



P&ID. # _____
REF. # _____



VESSEL DATA

P.E. No. V-630 Serial No. 1618 Prov. Reg. No. A C.R.N. N9965.21
MFR. THERMO DESIGN Code/Div. _____ Para _____ Code Stamp U
Yr. Bld. 1998 Yr. Inst. _____ Size 42"Ø x 12' Service _____ PWHT _____
RT RT-1 Insulated NO

Nominal Thickness & Material

Head: .341" (8.7mm) Mat'l: SA 516 70 C.A.: 0
Head: .340" (8.6mm) SA 516 70N
Shell: .375" (9.5mm) SA 516 70N
Shell: _____
Chan Hd: _____
Chan Sh: _____
Boot Hd: _____
Boot Sh: _____

MAWP Shell Side 260PSI @ Temp. -20/150°F

MAWP Tube Side _____ @ Temp. _____

COMMENTS: _____

Repairs _____
Reason _____
Reason _____

PIONEER NATURAL RESOURCES CANADA INC.
CHINCHAGA GAS PLANT
LSD C-32-H / 94-H-8

PROPANE ACCUMULATOR

TECH.: J.O.	REV.DATE:	DWG DATE: 99/08
CAD: WO	REVISION:	DRAWING: 056

PIONEER NATURAL RESOURCES CANADA INC.
CHINCHAGA GAS PLANT

RIVEST TESTING INC.

Item Desc.: C-32-H/94-H-8 / PROPANE ACCUMULATOR
Equip. No.: V-630 Ser. No.: 1618

Prov. Reg.: N/A

Pt.Desc.: N.HEAD

Point No.: 056-05

Nominal: 8.700 Mths. Rem. To Min. Nom:
Corr. Allowance: 0.000 Min. Cal. Wall Thk.:
Min. Nominal: 8.700

Good For Continued Service: YES
Additional Assessment Of Data: YES
Suggested Max Insp. Interval In Mths.: 12

Survey Dates:

1999-12

Data Readings	1	9.200	____.____
	2	9.200	____.____
	3	9.200	____.____
	4	9.300	____.____
	5	9.400	____.____
	6	9.200	____.____

Data Evaluation

Lowest Reading	:	9.200
Average - Low 3	:	9.200
Thk.Remaining Above Min.	:	0.500
Indv. Short Term Rate (mm/yr)	:	
Short Term Rate (mm/yr)	:	
LongTerm Rate (mm/yr)	:	

Pt.Desc.: N.SIDE SHELL

Point No.: 056-10

Nominal: 9.500 Mths. Rem. To Min. Nom:
Corr. Allowance: 0.000 Min. Cal. Wall Thk.:
Min. Nominal: 9.500

Good For Continued Service: YES
Additional Assessment Of Data: YES
Suggested Max Insp. Interval In Mths.: 12

Survey Dates:

1999-12

Data Readings	1	9.700	____.____
	2	9.700	____.____
	3	9.600	____.____
	4	9.800	____.____
	5	9.700	____.____
	6	9.600	____.____

Data Evaluation

Lowest Reading	:	9.600
Average - Low 3	:	9.633
Thk.Remaining Above Min.	:	0.100
Indv. Short Term Rate (mm/yr)	:	
Short Term Rate (mm/yr)	:	
LongTerm Rate (mm/yr)	:	

PIONEER NATURAL RESOURCES CANADA INC.
CHINCHAGA GAS PLANT

RIVEST TESTING INC.

Item Desc.: C-32-H/94-H-8 / PROPANE ACCUMULATOR
Equip. No.: V-630 Ser. No.: 1618

Prov. Reg.: N/A

Pt.Desc.: CTR.BTM.SHELL

Point No.: 056-15

Nominal: 9.500 Mths. Rem. To Min. Nom:
Corr. Allowance: 0.000 Min. Cal. Wall Thk.:
Min. Nominal: 9.500

Good For Continued Service: YES
Additional Assessment Of Data: YES
Suggested Max Insp. Interval In Mths.: 12

Survey Dates: 1999-12
Data Readings
1 9.700 _____.
2 9.600 _____.
3 9.700 _____.
4 9.600 _____.
5 9.600 _____.
6 9.700 _____.
_____.

Data Evaluation

Lowest Reading : 9.600
Average - Low 3 : 9.600
Thk.Remaining Above Min. : 0.100
Indv. Short Term Rate (mm/yr) :
Short Term Rate (mm/yr) :
LongTerm Rate (mm/yr) :

Pt.Desc.: S.HEAD

Point No.: 056-20

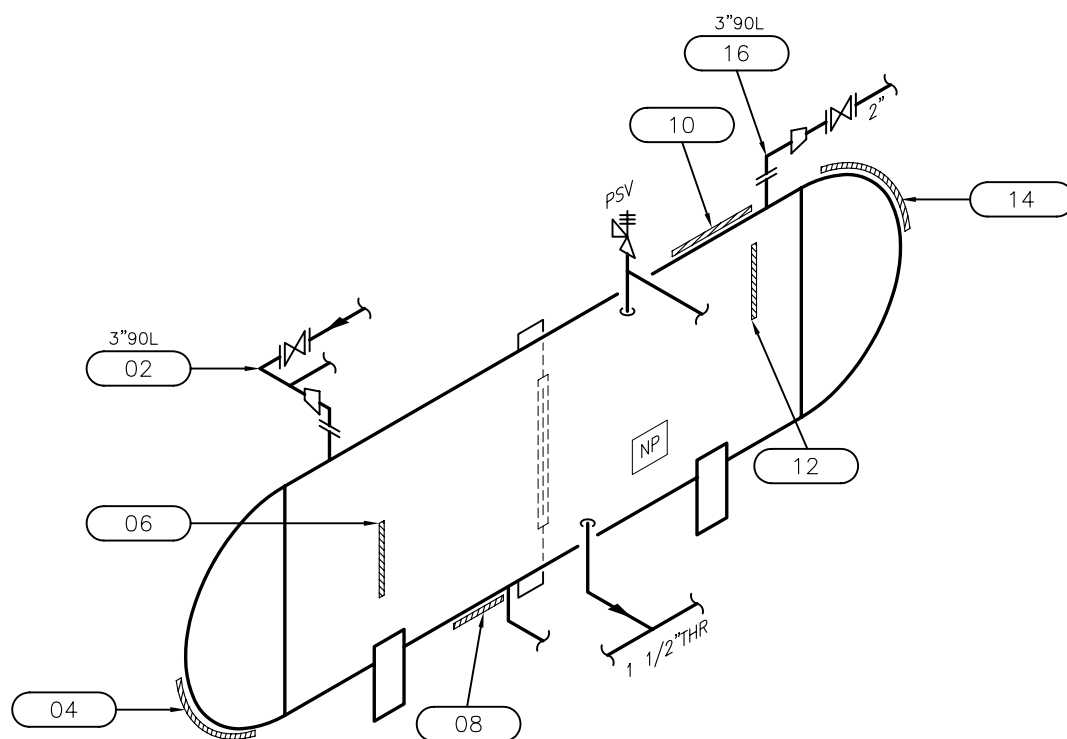
Nominal: 8.700 Mths. Rem. To Min. Nom:
Corr. Allowance: 0.000 Min. Cal. Wall Thk.:
Min. Nominal: 8.700

Good For Continued Service: YES
Additional Assessment Of Data: YES
Suggested Max Insp. Interval In Mths.: 12

Survey Dates: 1999-12
Data Readings
1 9.400 _____.
2 9.400 _____.
3 9.400 _____.
4 9.600 _____.
5 9.700 _____.
6 9.600 _____.
_____.

Data Evaluation

Lowest Reading : 9.400
Average - Low 3 : 9.400
Thk.Remaining Above Min. : 0.700
Indv. Short Term Rate (mm/yr) :
Short Term Rate (mm/yr) :
LongTerm Rate (mm/yr) :



Integrity Testing
SERVICES

P.E. No.: <u>N/S</u>	Yr. Bilt.: <u>1998</u>
OIP# <u>603VS013</u>	Manway: <u>NO</u>
Serial No.: <u>1618</u>	Size: <u>1064mm x 305mm</u>
P.R.N. ① <u>N/S</u>	Service: <u>SWEET</u>
C.R.N.: <u>N9965.21</u>	PWHT: <u>NO</u>
Code/Div.: <u>ASME VIII DIV. 1</u>	RT: <u>1</u>
Para: <u>N/S</u>	Insulated: <u>N/S</u>
C. Stamp: <u>W</u>	N.B. No: <u>N/S</u>
Manufacturer: <u>THERMO DESIGN ENG.</u>	

Design & Materials Data

HEAD	SHELL
Material: <u>SA-516-70N</u>	Material: <u>SA-516-70N</u>
Nom.: <u>8.7mm/8.6mm</u>	Nom.: <u>9.5mm</u>
C.A.: <u>N/S</u>	C.A.: <u>N/S</u>
BOOT HEAD	BOOT SHELL
Material: _____	Material: _____
Nom.: _____	Nom.: _____
C.A.: _____	C.A.: _____
CHANNEL HEAD	CHANNEL SHELL
Material: _____	Material: _____
Nom.: _____	Nom.: _____
C.A.: _____	C.A.: _____
MAWP Shell Side: <u>1793 KPA</u>	⊙ Temp.: <u>66°C</u>
MAWP Tube Side: _____	⊙ Temp.: _____

CLIENT

TAQA NORTH

FACILITY

CHINCHAGA GAS PLANT

LSD C-032-H/094-H-08

ITEM

PROPANE ACCUMULATOR

Comments: LOCATED NORTH EAST OF PROCESS BUILD. OUTSIDE

BY: M.T.

DATE: 2008/04

DWG.# 026

TAQA North

Unit: N-603

FACILITY:	CHINCHAGA GAS PLANT	MANUFACTURER:	THERMO DESIGN ENGINEER
LSD:	C-032-H/094-H-08	DESIGN PRESSURE:	1793 kPa / 260 psi
ITEM DESC.:	PROPANE ACCUMULATOR	DESIGN TEMP.:	66 C / 151 F
EQUIP / OIP#:	603VS013	RECOMMENDED NEXT INSP. DATE:	04/2013
PROV. REG. #:	N/S	RECOMMENDED RETIREMENT DATE:	02/2162
SERIAL #:	1618	REM. LIFE (from last survey 04/2008):	153.90 yrs.
CRN.:	N9965.21	TOTAL CAUTION / ACTION TML:	0

Item # (026)

TML No.: 2 3"90L T-B 150 #

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 5.96 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 5.80 mm.

Pts.	Nom. Thick.	Corr. Allow.	Min. Thick.	B/L Survey Date mm/yyyy	B/L Survey	Prev. Survey Date mm/yyyy	Prev. Survey	Last Survey Date mm/yyyy	Last Survey	Short Term Rate	Long Term Rate	TML Insp. Due	TML Retire. Date	Action/Caution Required Item
2.01	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	6.10	0.000	0.000	04/2013	08/2441	NO
2.02	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	5.80	0.000	0.000	04/2013	08/2341	NO
2.03	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	6.10	0.000	0.000	04/2013	08/2441	NO
2.04	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	5.80	0.000	0.000	04/2013	08/2341	NO
2.05	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	6.10	0.000	0.000	04/2013	08/2441	NO
2.06	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	6.00	0.000	0.000	04/2013	04/2408	NO
2.07	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	5.80	0.000	0.000	04/2013	08/2341	NO

TML No.: 4 BTM HD T-B

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 9.64 mm.

MATERIAL: SA516-70

MINIMUM THICKNESS MEASURED: 9.30 mm.

Pts.	Nom. Thick.	Corr. Allow.	Min. Thick.	B/L Survey Date mm/yyyy	B/L Survey	Prev. Survey Date mm/yyyy	Prev. Survey	Last Survey Date mm/yyyy	Last Survey	Short Term Rate	Long Term Rate	TML Insp. Due	TML Retire. Date	Action/Caution Required Item
4.01	8.70	0.00	8.70	01/1998	8.70	N/A	N/A	04/2008	9.80	0.000	0.000	04/2013	12/2374	NO
4.02	8.70	0.00	8.70	01/1998	8.70	N/A	N/A	04/2008	9.60	0.000	0.000	04/2013	04/2308	NO
4.03	8.70	0.00	8.70	01/1998	8.70	N/A	N/A	04/2008	9.60	0.000	0.000	04/2013	04/2308	NO
4.04	8.70	0.00	8.70	01/1998	8.70	N/A	N/A	04/2008	9.90	0.000	0.000	04/2013	04/2408	NO
4.05	8.70	0.00	8.70	01/1998	8.70	N/A	N/A	04/2008	9.60	0.000	0.000	04/2013	04/2308	NO
4.06	8.70	0.00	8.70	01/1998	8.70	N/A	N/A	04/2008	9.70	0.000	0.000	04/2013	08/2341	NO
4.07	8.70	0.00	8.70	01/1998	8.70	N/A	N/A	04/2008	9.30	0.000	0.000	04/2013	04/2208	NO *

(*) and GREEN Represent 25% of the TMLs, which have the earliest retirement dates.

BLUE (Caution TML) Corrosion Rate greater than 0.250mm/yr. or TML Remaining Life is less than 1.00 year.

RED (Action TML) TML with negative life.

If Baseline Survey Thickness Measurement was not taken at the time of Manufacture, then Nominal Thickness is used as Baseline Thickness.

TAQA North

Unit: N-603

FACILITY:	CHINCHAGA GAS PLANT	MANUFACTURER:	THERMO DESIGN ENGINEER
LSD:	C-032-H/094-H-08	DESIGN PRESSURE:	1793 kPa / 260 psi
ITEM DESC.:	PROPANE ACCUMULATOR	DESIGN TEMP.:	66 C / 151 F
EQUIP / OIP#:	603VS013	RECOMMENDED NEXT INSP. DATE:	04/2013
PROV. REG. #:	N/S	RECOMMENDED RETIREMENT DATE:	02/2162
SERIAL #:	1618	REM. LIFE (from last survey 04/2008):	153.90 yrs.
CRN.:	N9965.21	TOTAL CAUTION / ACTION TML:	0

Item # (026)

TML No.: 6 LOWER SIDE SH

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 9.93 mm.

MATERIAL: SA516-70

MINIMUM THICKNESS MEASURED: 9.90 mm.

Pts.	Nom. Thick.	Corr. Allow.	Min. Thick.	B/L Survey Date mm/yyyy	B/L Survey	Prev. Survey Date mm/yyyy	Prev. Survey	Last Survey Date mm/yyyy	Last Survey	Short Term Rate	Long Term Rate	TML Insp. Due	TML Retire. Date	Action/ Caution Required Item	
6.01	9.50	0.00	9.50	01/1998	9.50	N/A	N/A	04/2008	9.90	0.000	0.000	04/2013	08/2141	NO	*
6.02	9.50	0.00	9.50	01/1998	9.50	N/A	N/A	04/2008	9.90	0.000	0.000	04/2013	08/2141	NO	*
6.03	9.50	0.00	9.50	01/1998	9.50	N/A	N/A	04/2008	9.90	0.000	0.000	04/2013	08/2141	NO	*
6.04	9.50	0.00	9.50	01/1998	9.50	N/A	N/A	04/2008	10.00	0.000	0.000	04/2013	12/2174	NO	*
6.05	9.50	0.00	9.50	01/1998	9.50	N/A	N/A	04/2008	10.00	0.000	0.000	04/2013	12/2174	NO	*
6.06	9.50	0.00	9.50	01/1998	9.50	N/A	N/A	04/2008	9.90	0.000	0.000	04/2013	08/2141	NO	*

TML No.: 8 BTM SH N-S

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 9.97 mm.

MATERIAL: SA516-70

MINIMUM THICKNESS MEASURED: 9.80 mm.

Pts.	Nom. Thick.	Corr. Allow.	Min. Thick.	B/L Survey Date mm/yyyy	B/L Survey	Prev. Survey Date mm/yyyy	Prev. Survey	Last Survey Date mm/yyyy	Last Survey	Short Term Rate	Long Term Rate	TML Insp. Due	TML Retire. Date	Action/ Caution Required Item	
8.01	9.50	0.00	9.50	01/1998	9.50	N/A	N/A	04/2008	9.80	0.000	0.000	04/2013	04/2108	NO	*
8.02	9.50	0.00	9.50	01/1998	9.50	N/A	N/A	04/2008	10.00	0.000	0.000	04/2013	12/2174	NO	*
8.03	9.50	0.00	9.50	01/1998	9.50	N/A	N/A	04/2008	10.10	0.000	0.000	04/2013	04/2208	NO	*
8.04	9.50	0.00	9.50	01/1998	9.50	N/A	N/A	04/2008	10.00	0.000	0.000	04/2013	12/2174	NO	*
8.05	9.50	0.00	9.50	01/1998	9.50	N/A	N/A	04/2008	10.10	0.000	0.000	04/2013	04/2208	NO	*
8.06	9.50	0.00	9.50	01/1998	9.50	N/A	N/A	04/2008	9.80	0.000	0.000	04/2013	04/2108	NO	*

(*) and GREEN Represent 25% of the TMLs, which have the earliest retirement dates.

BLUE (Caution TML) Corrosion Rate greater than 0.250mm/yr. or TML Remaining Life is less than 1.00 year.

RED (Action TML) TML with negative life.

If Baseline Survey Thickness Measurement was not taken at the time of Manufacture, then Nominal Thickness is used as Baseline Thickness.

TAQA North

Unit: N-603

FACILITY:	CHINCHAGA GAS PLANT	MANUFACTURER:	THERMO DESIGN ENGINEER
LSD:	C-032-H/094-H-08	DESIGN PRESSURE:	1793 kPa / 260 psi
ITEM DESC.:	PROPANE ACCUMULATOR	DESIGN TEMP.:	66 C / 151 F
EQUIP / OIP#:	603VS013	RECOMMENDED NEXT INSP. DATE:	04/2013
PROV. REG. #:	N/S	RECOMMENDED RETIREMENT DATE:	02/2162
SERIAL #:	1618	REM. LIFE (from last survey 04/2008):	153.90 yrs.
CRN.:	N9965.21	TOTAL CAUTION / ACTION TML:	0

Item # (026)

TML No.: 10 TOP SH N-S

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 10.55 mm.

MATERIAL: SA516-70

MINIMUM THICKNESS MEASURED: 10.40 mm.

Pts.	Nom. Thick.	Corr. Allow.	Min. Thick.	B/L Survey Date mm/yyyy	B/L Survey	Prev. Survey Date mm/yyyy	Prev. Survey	Last Survey Date mm/yyyy	Last Survey	Short Term Rate	Long Term Rate	TML Insp. Due	TML Retire. Date	Action/Caution Required Item
10.01	9.50	0.00	9.50	01/1998	9.50	N/A	N/A	04/2008	10.80	0.000	0.000	04/2013	08/2441	NO
10.02	9.50	0.00	9.50	01/1998	9.50	N/A	N/A	04/2008	10.50	0.000	0.000	04/2013	08/2341	NO
10.03	9.50	0.00	9.50	01/1998	9.50	N/A	N/A	04/2008	10.40	0.000	0.000	04/2013	04/2308	NO
10.04	9.50	0.00	9.50	01/1998	9.50	N/A	N/A	04/2008	10.40	0.000	0.000	04/2013	04/2308	NO
10.05	9.50	0.00	9.50	01/1998	9.50	N/A	N/A	04/2008	10.60	0.000	0.000	04/2013	12/2374	NO
10.06	9.50	0.00	9.50	01/1998	9.50	N/A	N/A	04/2008	10.60	0.000	0.000	04/2013	12/2374	NO

TML No.: 12 UPPER SIDE SH

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 10.23 mm.

MATERIAL: SA516-70

MINIMUM THICKNESS MEASURED: 10.10 mm.

Pts.	Nom. Thick.	Corr. Allow.	Min. Thick.	B/L Survey Date mm/yyyy	B/L Survey	Prev. Survey Date mm/yyyy	Prev. Survey	Last Survey Date mm/yyyy	Last Survey	Short Term Rate	Long Term Rate	TML Insp. Due	TML Retire. Date	Action/Caution Required Item
12.01	9.50	0.00	9.50	01/1998	9.50	N/A	N/A	04/2008	10.20	0.000	0.000	04/2013	08/2241	NO
12.02	9.50	0.00	9.50	01/1998	9.50	N/A	N/A	04/2008	10.10	0.000	0.000	04/2013	04/2208	NO *
12.03	9.50	0.00	9.50	01/1998	9.50	N/A	N/A	04/2008	10.30	0.000	0.000	04/2013	12/2274	NO
12.04	9.50	0.00	9.50	01/1998	9.50	N/A	N/A	04/2008	10.10	0.000	0.000	04/2013	04/2208	NO *
12.05	9.50	0.00	9.50	01/1998	9.50	N/A	N/A	04/2008	10.30	0.000	0.000	04/2013	12/2274	NO
12.06	9.50	0.00	9.50	01/1998	9.50	N/A	N/A	04/2008	10.40	0.000	0.000	04/2013	04/2308	NO

(*) and GREEN Represent 25% of the TMLs, which have the earliest retirement dates.

BLUE (Caution TML) Corrosion Rate greater than 0.250mm/yr. or TML Remaining Life is less than 1.00 year.

RED (Action TML) TML with negative life.

If Baseline Survey Thickness Measurement was not taken at the time of Manufacture, then Nominal Thickness is used as Baseline Thickness.

TAQA North

Unit: N-603

FACILITY:	CHINCHAGA GAS PLANT	MANUFACTURER:	THERMO DESIGN ENGINEER
LSD:	C-032-H/094-H-08	DESIGN PRESSURE:	1793 kPa / 260 psi
ITEM DESC.:	PROPANE ACCUMULATOR	DESIGN TEMP.:	66 C / 151 F
EQUIP / OIP#:	603VS013	RECOMMENDED NEXT INSP. DATE:	04/2013
PROV. REG. #:	N/S	RECOMMENDED RETIREMENT DATE:	02/2162
SERIAL #:	1618	REM. LIFE (from last survey 04/2008):	153.90 yrs.
CRN.:	N9965.21	TOTAL CAUTION / ACTION TML:	0

Item # (026)

TML No.: 14 TOP HD T-B

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 10.30 mm.

MATERIAL: SA516-70

MINIMUM THICKNESS MEASURED: 9.60 mm.

Pts.	Nom. Thick.	Corr. Allow.	Min. Thick.	B/L Survey Date mm/yyyy	B/L Survey Date mm/yyyy	Prev. Survey Date mm/yyyy	Prev. Survey Date mm/yyyy	Last Survey Date mm/yyyy	Last Survey Date mm/yyyy	Short Term Rate	Long Term Rate	TML Insp. Due	TML Retire. Date	Action/ Caution Required Item
14.01	8.70	0.00	8.70	01/1998	8.70	N/A	N/A	04/2008	10.40	0.000	0.000	04/2013	12/2574	NO
14.02	8.70	0.00	8.70	01/1998	8.70	N/A	N/A	04/2008	10.20	0.000	0.000	04/2013	04/2508	NO
14.03	8.70	0.00	8.70	01/1998	8.70	N/A	N/A	04/2008	10.70	0.000	0.000	04/2013	12/2674	NO
14.04	8.70	0.00	8.70	01/1998	8.70	N/A	N/A	04/2008	10.00	0.000	0.000	04/2013	08/2441	NO
14.05	8.70	0.00	8.70	01/1998	8.70	N/A	N/A	04/2008	10.90	0.000	0.000	04/2013	08/2741	NO
14.06	8.70	0.00	8.70	01/1998	8.70	N/A	N/A	04/2008	10.90	0.000	0.000	04/2013	08/2741	NO
14.07	8.70	0.00	8.70	01/1998	8.70	N/A	N/A	04/2008	9.70	0.000	0.000	04/2013	08/2341	NO
14.08	8.70	0.00	8.70	01/1998	8.70	N/A	N/A	04/2008	9.60	0.000	0.000	04/2013	04/2308	NO

TML No.: 16 3"90L B-T 150

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 5.68 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 5.50 mm.

Pts.	Nom. Thick.	Corr. Allow.	Min. Thick.	B/L Survey Date mm/yyyy	B/L Survey Date mm/yyyy	Prev. Survey Date mm/yyyy	Prev. Survey Date mm/yyyy	Last Survey Date mm/yyyy	Last Survey Date mm/yyyy	Short Term Rate	Long Term Rate	TML Insp. Due	TML Retire. Date	Action/ Caution Required Item
16.01	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	5.70	0.000	0.000	04/2013	04/2308	NO
16.02	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	5.80	0.000	0.000	04/2013	08/2341	NO
16.03	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	5.80	0.000	0.000	04/2013	08/2341	NO
16.04	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	5.70	0.000	0.000	04/2013	04/2308	NO
16.05	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	5.50	0.000	0.000	04/2013	08/2241	NO
16.06	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	5.60	0.000	0.000	04/2013	12/2274	NO

(*) and GREEN Represent 25% of the TMLs, which have the earliest retirement dates.

BLUE (Caution TML) Corrosion Rate greater than 0.250mm/yr. or TML Remaining Life is less than 1.00 year.

RED (Action TML) TML with negative life.

If Baseline Survey Thickness Measurement was not taken at the time of Manufacture, then Nominal Thickness is used as Baseline Thickness.

DETAIL VESSEL AND PIPING INSPECTION REPORT

(Imperial)

GENERAL PRESSURE VESSEL INFORMATION

Company:	Pioneer Natural Resources Canada Inc.	LSD:	BC	C-32-H/94-H-8
Area/Facility:	Chinchaga Gas Plant	Inspection Date	06-Feb-02	Interval: 2 yrs
Vessel Name:	Propane Accumulator	A No:	BC	MTL No: VSL187
Internal Coating Type:		Next External:	2/6/2003	Next Internal: Feb, 2004
Vessel Orientation:	Horizontal	Internal Coating Lining:	0	
Vessel Type:	Horizontal Vessel	Fluid Type:		
Tag No:	V-630	Serial Number:	1618	
Separator Type:	Single Phase	Business Unit:		
Direct Fired Vessel:	N/A	Fired Tube:		Cost Centre:
Current Status:	In Service	Flame Arrester Date Required:		Date
Thermal Insulation:	No	Asbestos:	No	

PRESSURE VESSEL NAMEPLATE INFORMATION

MTL Number:	VSL187	Volume:	126.000 F3	CRN Number:	H-9965-21	Registered:	Yes
Serial Number:	1618	Size:	42.000 in O.D. x 12 ft 0 in	Seam to Seam			
Drawing Number:	9097-0850-205	P & ID Number:					
Shell Material:	SA-516-70N	Bottom	Shell Thickness:	0.375 in			
		Top	Shell Thickness:	0.375 in			
Head Material:	SA-516-70	End	Head Thickness:	0.341 in			
		End	Head Thickness:	0.341 in			
Tube Material:		Tube Size(OD):	In	Tube Thickness:	In		
Tubesheet Material:		Tubesheet Thickness:	In				
Channel Material:		Channel Type:		Channel Thickness:	In		
Design Pressure:	Shell: 260 psi	Operating Pressure:	Shell: psi				
	Tube: psi		Tube: psi				
Design Temperature:	Shell: 150 F	Operating Temperature:	Shell: F				
	Tube: F		Tube: F				
RT (XRay):	RT1	Heat Treatment:	No				
Code Parameters:		Joint Efficiency:					
Manufacturer:	Thermo Design Engineering	Year Built:	1998				
Corrosion Allowance:		Manway:	No				

DETAIL VESSEL AND PIPING INSPECTION REPORT

(Imperial)

GENERAL PRESSURE VESSEL INFORMATION

Company:	Pioneer Natural Resources Canada Inc.	LSD:	BC	C-32-H/94-H-8
Area/Facility:	Chinchaga Gas Plant	Inspection Date	06-Feb-02	Interval: 2 yrs
Vessel Name:	Propane Accumulator	A No:	BC	MTL No: VSL187

VESSEL SHELL / HEADS / PIPING

External / Instrumentation Condition

The external surface of this vessel was noted in good condition. The paint was also in good condition with no evidence of corrosion. The pressure retaining welds were intact and revealed no signs of deterioration or visible cracking. The associated instrumentation appeared to be in good working order.

Internal Condition

No internal access

Nozzle Condition

The nozzles and couplings were painted and leak free. No visible evidence of external corrosion was noted during this inspection.

Flange Condition

The flanges are bolted properly and there was no visible evidence of leakage. The associated gaskets were in place and appeared to be tight.

Internal Piping

Not Applicable

External Piping

The associated pressure welds were intact and revealed no signs of visible deterioration or cracking. The piping was painted with no visible corrosion noted.

Pipe Support Condition

The associated pipe supports were in good condition with no evidence of any mechanical damage or degradation.

Bolting Condition

All associated flange and bolting were intact and showed no evidence of deterioration, visible cracking or process leaks.

Firetube Condition

Not Applicable

Demister Pad Condition

Not Applicable

Anode Condition

Not Applicable

Vessel Support

The skid, saddles and 4 bolts were all noted in good condition.

DETAIL VESSEL AND PIPING INSPECTION REPORT

(Imperial)

GENERAL PRESSURE VESSEL INFORMATION

Company:	Pioneer Natural Resources Canada Inc.	LSD:	BC	C-32-H/94-H-8
Area/Facility:	Chinchaga Gas Plant	Inspection Date	06-Feb-02	Interval: 2 yrs
Vessel Name:	Propane Accumulator	A No:	BC	MTL No: VSL187

VESSEL COATING INSPECTION

Type of Coating

Coating Manufactuer and Type

Location

Coating Condition

VESSEL NONDESTRUCTIVE TESTING

NDE Type		UT Survey		
Location of Test				
Contractors Name		Rivest		Qualifications
Last UT Survey Date		Feb 3, 2002	Interval	2 yrs
Survey By		Next UT Date: Feb 3, 2004		
		MTL Testing Inc.		
Test Results				

VESSEL STATUS

Suitable for Further Service?	Yes	Repairs Required?	No
Owners Representative		Repairs Completed?	
Owners Date		Repairs Completed By	
		Repair Date	

Recommendations

Next external inspection in 3 years
Next PSV servicing in 3 years
Repeat UT Survey in 3 years

Details of Repairs

DETAIL VESSEL AND PIPING INSPECTION REPORT

(Imperial)

GENERAL PRESSURE VESSEL INFORMATION

Company:	Pioneer Natural Resources Canada Inc.	LSD:	BC	C-32-H/94-H-8
Area/Facility:	Chinchaga Gas Plant	Inspection Date	06-Feb-02	Interval: 2 yrs
Vessel Name:	Propane Accumulator	A No:	BC	MTL No: VSL187

PSV DATA

Side	Set Pressure psi	CRN Number	Manufacturer PSV Number	Model Serial Number	Capacity	Size Inches	Set Date
Shellside	260		Farris PNR6302	2850 CE-1699-6-R4	3451 SCFM	1.5 x	Dec/1999

CURRENT VESSEL PROCESS CONDITIONS

LPG

Name (Printed)	Signature	Date
Visual Inspector Paul Gorman API510	<i>Signature for Paul Gorman</i>	February 06, 2002
QA Supervisor: (Chief Inspector)		
QA Administrator:		
ABSA Inspector:		

EQUIPMENT NO: 603VS013

Page of

FACILITY: Chinchaga Gas Plant

PROV. REG. NO:

EQUIPMENT NAME: Propane Accumulator

TAG NO:

SIZE: 1067mm OD x 305mm L/H

MAWP: 1793 kPa @ 66/-29 °C

LSD : C-032-H / 094-H-08

MANWAY ☐ YES ☒ NO

SERVICE:

FLUID: Propane

☐ SOUR ☒ SWEET ☐ CRYOGENIC

SCOPE OF INSPECTION

TYPE OF INSPECTION:

CLEANING:

ACCESS:

☐ PRECOMMISSIONING

☐ AE

☐ MT

☐ RT

☒ GOOD

☐ FULL

☒ INITIAL

☐ ET

☐ MFL

☒ UT

☐ FAIR

☐ PARTIAL

☐ REINSPECTION

☐ LT

☐ PT

☒ VT

☐ INADEQUATE

☒ EXTERNAL

☐ OTHER

PLEASE ADD PAGES AND SKETCHES AS NEEDED (TURN OVER FOR SKETCH)

OBSERVATIONS:
☒ EXTERNAL

1. LADDERS, STAIRWAYS, PLATFORMS AND WALKWAYS ☒

2. FOUNDATIONS AND SUPPORTS ☒

3. NOZZLES ☒

4. GROUNDING CONNECTIONS ☒

5. PROTECTIVE COATINGS AND INSULATION ☒ Epoxy

6. EXTERNAL METAL SURFACES ☒ Threaded pipe

7. FANS AND OTHER ANCILLARY EQUIPMENT ☐ N/A

8. PRESSURE RELIEF DEVICES ☒

9. NAME PLATE ☒

10. ULTRASONIC INSPECTION SURVEY ☒

11. INSPECTION REPORT COMPLETED ☒

12. NON CONFORMANCE COMPLETED ☐ N/A

13. OIP LABEL APPLIED ☒

14. PICTURE ON FILE ☒

COMMENTS

CHECKED BOX INDICATES ACCEPTANCE

RECOMMENDATIONS:

SUITABLE FOR

REMEDIAL ACTION

FURTHER SERVICE: ☒ YES ☐ NO

PRIORITY: ☐ HIGH ☐ MEDIUM ☐ LOW

INSPECTION PERFORMED BY: Mark Tomko

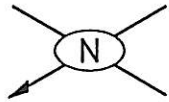
DATE OF INSPECTION 06 04 2008
(DD MONTH YYYY)

FOLLOW-UP INSPECTION REQ'D:

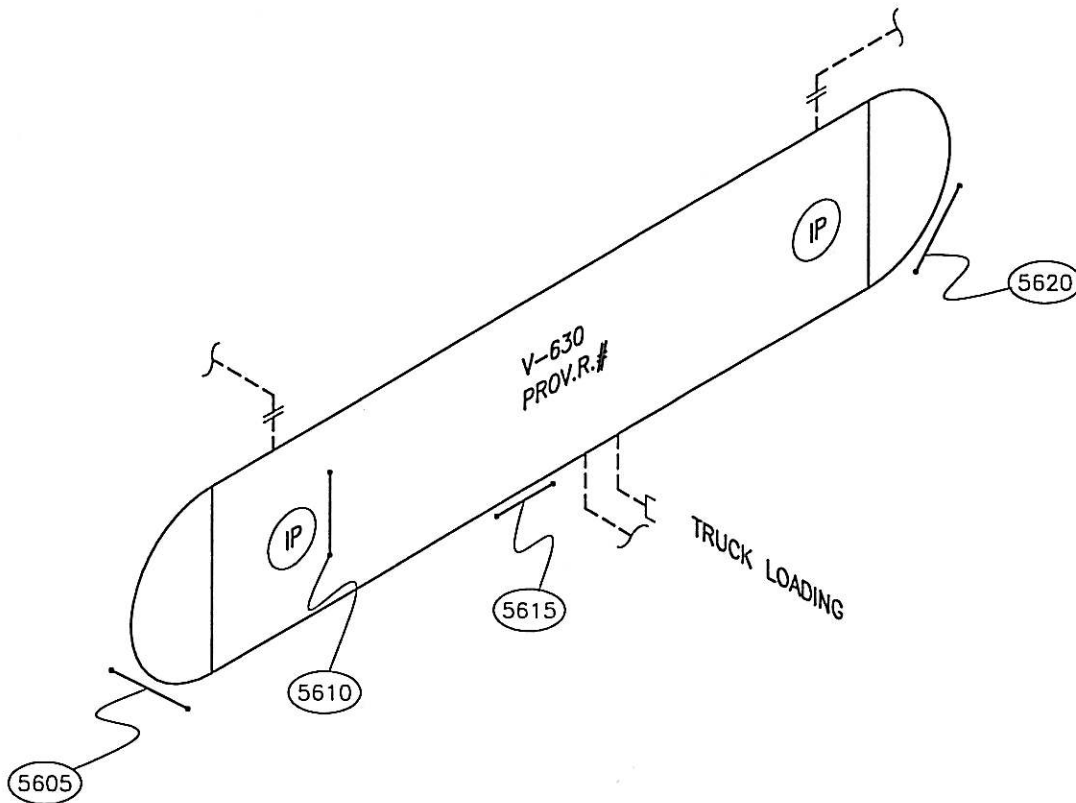
☐ YES ☒ NO

BY DATE:

(DD MONTH YYYY)



P&ID. # _____
REF. # _____



VESSEL DATA

Prov. Reg. No. _____ C.R.N. N 9965.21 P.E. No. V-630 Serial No. 1618
MFR. THERMO DESIGN Code/Div. _____ Para _____ Code Stamp U
Yr. Bld. 1998 Yr. Inst. _____ Size 42"ØX12' Vol.: _____ Service _____ PWHT _____

Nominal Thickness & Material

Head: 8.7mm Mat'l: SA 516-70 C.A.: 0
Head: 8.6mm SA 516-70N
Shell: 9.5mm SA 516-70N C.A.: _____
Shell: _____
Chan Hd: _____ C.A.: _____
Chan Sh: _____
Gas Boot Hd: _____ C.A.: _____
Gas Boot Sh.: _____
Liq. Boot Hd.: _____ C.A.: _____
Liq. Boot Sh.: _____

Insulated NO R.T. 1

Repairs _____
COMMENTS _____

PIONEER NATURAL RESOURCES CANADA INC.
CHINCHAGA GAS PLANT
LSD C-32-H \ 94-H-8

PROPANE ACCUMULATOR

MAWP Shell Side 260psi @ Temp. -20/150°F
MAWP Tube Side _____ @ Temp. _____

TECH.: J.OLIVER	REV.DATE:	DWG DATE: 02/2002
CAD: MKM	REVISION:	DRAWING: 056

Equip No V-630

Serial No 1618

Prov Reg No N/A

Description PROPANE ACCUMULATOR

056 - 005

TML Description: N. HEAD

T Nominal: 8.7

Min Nominal: 8.7

Corr Allowance: N/A

*Data Readings**Data Evaluations*

Months Remaining to T Min: 999
 Min Calc'd Wall Thickness: N/A
 Thick Remain Above T Min: 0.6
 Short Term Corr Rate: N/A
 Long Term Corr Rate: N/A
 Months Remain to LFL: 156
 Lowest Value - Last Reading: 9.3

Comment:

	Dec-99	Feb-02
Point 1	9.2	9.4
Point 2	9.2	9.4
Point 3	9.2	9.4
Point 4	9.3	9.4
Point 5	9.4	9.6
Point 6	9.2	9.3
Point 7		
Point 8		
Point 9		
Point 10		
Point 11		
Point 12		
Average	9.3	9.4
Avg Low 3	9.2	9.4
Lowest	9.2	9.3

056 - 010

TML Description: N. SIDE SHELL

T Nominal: 9.5

Min Nominal: 9.5

Corr Allowance: N/A

*Data Readings**Data Evaluations*

Months Remaining to T Min: 999
 Min Calc'd Wall Thickness: N/A
 Thick Remain Above T Min: 0.2
 Short Term Corr Rate: N/A
 Long Term Corr Rate: N/A
 Months Remain to LFL: 52
 Lowest Value - Last Reading: 9.7

Comment:

	Dec-99	Feb-02
Point 1	9.7	9.8
Point 2	9.7	9.7
Point 3	9.6	9.7
Point 4	9.8	9.8
Point 5	9.7	9.8
Point 6	9.6	9.7
Point 7		
Point 8		
Point 9		
Point 10		
Point 11		
Point 12		
Average	9.7	9.8
Avg Low 3	9.6	9.7
Lowest	9.6	9.7

056 - 015

TML Description: CTR. BTM. SHELL				
T Nominal:		9.5		
Min Nominal:		9.5		
Corr Allowance:		N/A		
Data Readings				
Data Evaluations			Dec-99	Feb-02
		Point 1	9.7	9.7
		Point 2	9.6	9.7
		Point 3	9.7	9.7
		Point 4	9.6	9.6
		Point 5	9.6	9.7
		Point 6	9.7	9.7
		Point 7		
		Point 8		
		Point 9		
		Point 10		
		Point 11		
		Point 12		
Comment:		Average	9.7	9.7
		Avg Low 3	9.6	9.7
		Lowest	9.6	9.6

056 - 020

TML Description: S. HEAD				
T Nominal:		8.7		
Min Nominal:		8.7		
Corr Allowance:		N/A		
Data Readings				
Data Evaluations			Dec-99	Feb-02
		Point 1	9.4	9.4
		Point 2	9.4	9.4
		Point 3	9.4	9.5
		Point 4	9.6	9.8
		Point 5	9.7	9.7
		Point 6	9.6	9.6
		Point 7		
		Point 8		
		Point 9		
		Point 10		
		Point 11		
		Point 12		
Comment:		Average	9.5	9.6
		Avg Low 3	9.4	9.4
		Lowest	9.4	9.4

RAM#	434018		EQUIP STATIC RECORD		JOB#	1-2968	
Unique OUP #: <u>603VS013</u>		Old OUP #: _____		LSD: _____		C-032-H/094-H-08	
PLANT / FIELD: <u>Chinchaga Gas Plant</u>		Down Hole Location: _____		RENTAL: _____			
EQUIPMENT NAME: <u>Propane Accumulator</u>		Unique # of Compressor this equipment is related to: _____					
VESSEL STATUS: <u>Active</u>		PRIMARY LOCATION: <u>Gas Plant</u>		Vessel Car-Sealed Out? _____			
PHYSICAL LOCATION: _____				YEAR INSTALLED: _____			
SERVICE: <u>Sweet</u>		H ₂ S _____		PROCESS FLUID: <u>LPG</u>		CYCLIC: _____	
MANUFACTURER: <u>Thermo Design Engineering Ltd.</u>		DWG.# <u>90970850205/R.2</u>		S N: <u>1618</u>			
PRN _____ for VESSEL or SHELL		CRN <u>N9965.21</u>		YR. BUILT <u>1998</u>			
NB: _____		CODE/DIV. _____		ASME Sec. VIII Div. 1		PARA. _____	
				STAMP <u>U</u>			
<u>SHELL-TANK</u>		RADIOGRAPHY: <u>RT1</u>		JOINT EFF. <u>100%</u>		PWHT: <u>Not Stated</u>	
MAWP <u>1793</u> kPa		AT <u>66</u> °C		MDMT <u>-29</u> °C		AT _____ kPa	
DIA. OD <u>1066.8</u> mm		LENGTH: <u>3657.6</u> mm		HEIGHT: _____ mm		VOLUME: _____ m ³	
<u>SECTION</u>		<u>MATERIAL</u>		<u>NOMINAL THICKNESS</u>		<u>C.A.</u>	
Shell		SA-516-70N		9.525 mm		_____ mm	
Top Head		SA-516-70N		8.661 mm		_____ mm	
Bottom Head		SA-516-70N		8.636 mm		_____ mm	
				_____ mm		_____ mm	
				_____ mm		_____ mm	
				_____ mm		_____ mm	
				_____ mm		_____ mm	
<u>Heat Exchangers, Tubing, Channel, Line Heater coil</u>							
PRN _____		CRN _____		RADIOGRAPHY: _____			
MAWP _____ kPa		AT _____ °C		MDMT _____ °C		AT _____ kPa	
S N: _____							
CODE/DIV. _____		PARA. _____		STAMP _____		TUBE/TUBE SHEET _____	
TEMA CLASS _____							
DIA. _____ mm		LENGTH: _____ mm		TUBE SIZE _____ mm		# of Tubes _____	
<u>SECTION</u>		<u>MATERIAL</u>		<u>NOMINAL THICKNESS</u>		<u>C.A.</u>	
				_____ mm		_____ mm	
				_____ mm		_____ mm	
				_____ mm		_____ mm	
				_____ mm		_____ mm	
<u>TUBING:</u> PRN _____ CRN _____ TEMA CLASS _____ TYPE _____ S N: _____							
MAWP _____ kPa		AT _____ °C		TUBE SIZE _____ mm		GAUGE, BWG _____	
TUBE/TUBE SHEET JT. _____							
# of Tubes _____		<u>MATERIAL</u>		<u>NOMINAL THICKNESS</u>		<u>C.A.</u>	
				_____ mm		_____ mm	
<u>COIL:</u> PRN _____ CRN _____ COIL NAME: _____ HP, LP, FG, HS							
MAWP _____ kPa		AT _____ °C		TUBE SIZE _____ mm		S N: _____	
# of Tubes _____		<u>MATERIAL</u>		<u>NOMINAL THICKNESS</u>		<u>C.A.</u>	
				_____ mm		_____ mm	

RAM#	434018	EQUIP STATIC RECORD		JOB#	1-2968
Unique OUP #:	603VS013	Old OUP #:		LSD:	C-032-H/094-H-08

TANK M/WAY OD FLANGE DIMENSIONS: _____ x _____ mm OR IF M/WAY IS ROUND, DIA. IS: _____ mm

TK. HEATED: _____ TYPE OF HEAT: _____ TK. SKIDDED or PORTABLE: _____ GAS BLANKET: _____ DOUBLE WALL: _____

TK. CONSTRUCTION: _____ TANK DYKED: _____ DYKE MATERIAL: _____ Leak Tag#: _____

DYKE LINED: _____ TYPE of LINER: _____ Leak Test Co. _____ Leak Test Date _____

DYKE SHAPE: _____ mm Width: _____ mm Height: _____ mm

DYKE VOLUME: _____ m³ TK. BASE SITTING ON: _____ BETWEEN TK. AND BASE: _____

TANKS INSIDE DYKE: _____

P&ID #: _____ SHUT DOWN: _____

OPERATING PRESSURE: **1034** kPa OPERATING TEMP. **25** °C YEAR PUT IN SERVICE: _____

VESSEL CONNECTIONS: NPT _____ FLANGE Yes LARGEST CONNECTION _____ mm INSPECTION PORT: **None**

FLANGE ANSI: **150** FLG. FACE: _____ SIZE of INSPECTION PORT: _____ mm

VESSEL ORIENTATION: **Horizontal** TYPE OF VESSEL SUPPORT: **Saddle** IS BOTTLE (VB) BLOCKED: _____

TRAY(VT): _____ # of TRAYS _____ MAT'L _____ MFG. _____

PACKING(VK): _____ EXT. INSULATED: _____ Full or Partially covered? _____

INSULATION TYPE: _____ CLADDING: _____

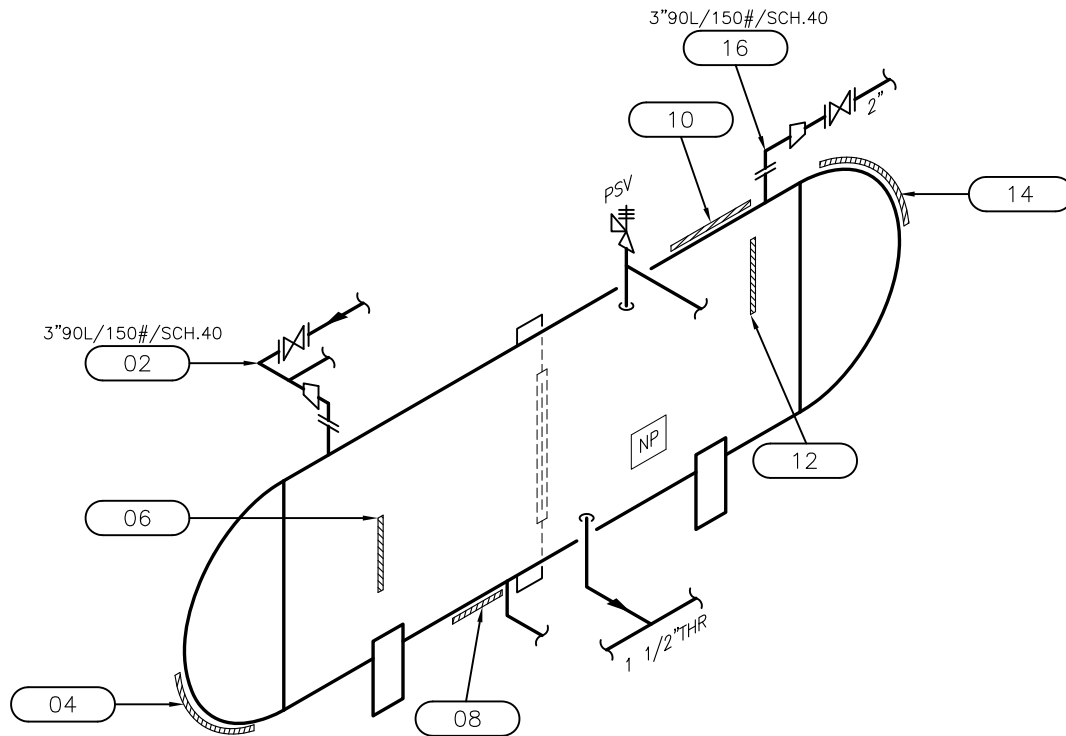
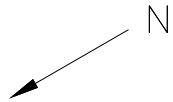
TYPE of EXT. INSULATION: _____ EXT. INSULATION THICKNESS: _____ mm CUI Susceptible: _____

EXT. COATING: **Epoxy** INTERNAL COATING: _____ INTER. LINING: _____

PRESSURE RELIEF DATA

PSV OUP#	SET PRESSURE	units	CODE: SV, SR, ST, SL or ESD PROTECTS - TANK, SHELL, TUBE (HA or HT), HP coil, LP coil, FG coil, HS coil (heat string coil in line heater), PL, PP, Channel A or B in HP
603SVVS013	1793	kPa	Shell
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	

ITS PRINT NAME: <u>Murray Angus MacGregor</u>	ITS SIGNATURE:
DATE: data collected - yyyy-mm-dd <u>2014-Oct-18</u>	



☐ Column ☐ Cooler ☐ Exchanger ☐ Furnace ☐ Heater ☐ Plate Exchanger ☐ Reboiler ☒ Vessel ☐ Other							Client:, District:, LSD:, Etc.:		
Description:		PROPANE ACCUMULATOR					TAQA NORTH CHINCHAGA GAS PLANT C-032-H/094-H-08		
P.R.N. No.:		N/S	C.R.N.:		N9965.21				
Equipment No.: OIP		603VS013	N.B. No.:						
Serial No.:		1618	Other:						
HEAD Material:		SA-516-70N	Nom.:	8.661mm	C.A.:	0	Tech.: A.L.N. Date: 10/2014 ITS Job No.: 1-2968(I) DWG No.: 026		
HEAD Material:		SA-516-70N	Nom.:	8.636mm					
SHELL Material:		SA-516-70N	Nom.:	9.525mm	C.A.:	0			
SHELL Material:			Nom.:						
MAWP Shell Side:		1793 KPA	@Temp.:	66°C/-29°C					

TQA North

Unit: N-603

FACILITY:	CHINCHAGA GAS PLANT	MANUFACTURER:	THERMO DESIGN ENGINEER
LSD:	C-032-H/094-H-08	DESIGN PRESSURE:	1793 kPa / 260 psi
ITEM DESC.:	PROPANE ACCUMULATOR	DESIGN TEMP.:	66 C / 151 F
EQUIP / OIP#:	603VS013		
PROV. REG. #:	N/S	VESSEL CORROSION ALLOWANCE:	
SERIAL #:	1618		
CRN.:	N9965.21	TOTAL CAUTION / ACTION TML:	46

Item # (026)

TML No.: 2 3"90L T-B 150 #

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 5.59 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 5.40 mm.

Pts.	Nom. Thick. mm	CA + Steel Mfg.Tol. mm	Nom. -CA -Toll. mm	B/L Survey Thick. mm	Prev. Survey Thick. mm	Last Survey Thick. mm	Short Term CR mm/yr	Long Term CR mm/yr	Rem. Half Life yr	Future UT Reading mm/yy	Action/Caution Required Item
				01/1998	04/2008	10/2014					
2.01	5.49	0.69	4.80	5.49	6.10	5.90	0.0305	0.0000	18.05	.	NO
2.02	5.49	0.69	4.80	5.49	5.80	5.70	0.0152	0.0000	29.53	.	NO
2.03	5.49	0.69	4.80	5.49	6.10	5.50	0.0914	0.0000	3.83	.	CAUTION
2.04	5.49	0.69	4.80	5.49	5.80	5.60	0.0305	0.0000	13.13	.	CAUTION
2.05	5.49	0.69	4.80	5.49	6.10	5.60	0.0762	0.0000	5.25	.	CAUTION
2.06	5.49	0.69	4.80	5.49	6.00	5.40	0.0914	0.0051	3.28	.	CAUTION *
2.07	5.49	0.69	4.80	5.49	5.80	5.40	0.0610	0.0051	4.92	.	CAUTION

TML No.: 4 BTM HD T-B

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 9.13 mm.

MATERIAL: SA51670N

MINIMUM THICKNESS MEASURED: 9.00 mm.

Pts.	Nom. Thick. mm	CA + Steel Mfg.Tol. mm	Nom. -CA -Toll. mm	B/L Survey Thick. mm	Prev. Survey Thick. mm	Last Survey Thick. mm	Short Term CR mm/yr	Long Term CR mm/yr	Rem. Half Life yr	Future UT Reading mm/yy	Action/Caution Required Item
				01/1998	04/2008	10/2014					
4.01	8.64	0.25	8.39	8.64	9.80	9.40	0.0610	0.0000	8.29	.	CAUTION
4.02	8.64	0.25	8.39	8.64	9.60	9.00	0.0914	0.0000	3.34	.	CAUTION *
4.03	8.64	0.25	8.39	8.64	9.60	9.10	0.0762	0.0000	4.66	.	CAUTION
4.04	8.64	0.25	8.39	8.64	9.90	9.10	0.1219	0.0000	2.91	.	CAUTION *
4.05	8.64	0.25	8.39	8.64	9.60	9.10	0.0762	0.0000	4.66	.	CAUTION
4.06	8.64	0.25	8.39	8.64	9.70	9.10	0.0914	0.0000	3.88	.	CAUTION
4.07	8.64	0.25	8.39	8.64	9.30	9.10	0.0305	0.0000	11.65	.	CAUTION

If Baseline (B/L) Survey Thickness Measurement was not taken at the time of Manufacture, then Nominal Thickness is used as Baseline Thickness.
Minimum Thickness is calculated

Design Minimum Thickness = Nom. Thick. - CA - Manufacturing Steel Tolerance.

Manufacturing Tolerance of pipe and forged fittings is + or -12.5% (May or may not apply dependent upon the Client's Owner-User Integrity Management System).

Manufacturing Tolerance of plate is + or - 0.25mm (0.010") (May or may not apply dependent upon the Client's Owner-User Integrity Management System).

(*) and GREEN Represent 25% of the last thickness readings, which have the shortest remaining half life.

BLUE (Caution TML Point) - If Corrosion Rate exceed a 0.250mm / 0.009 in. per yr. or Half Life is less than 15 years.

RED (Action TML Point) - If Remaining Half Life is 0 and Last Survey Thickness is below Nominal-CA-Tolerance Thickness.

CA - Corrosion Allowance, CR - Corrosion Rate (Brown if CR >= 0.500mm/yr.).

Calculated T-Min. Thickness - Using UPipe Mathematics.

TAQA North

Unit: N-603

FACILITY:	CHINCHAGA GAS PLANT	MANUFACTURER:	THERMO DESIGN ENGINEER
LSD:	C-032-H/094-H-08	DESIGN PRESSURE:	1793 kPa / 260 psi
ITEM DESC.:	PROPANE ACCUMULATOR	DESIGN TEMP.:	66 C / 151 F
EQUIP / OIP#:	603VS013	VESSEL CORROSION ALLOWANCE:	
PROV. REG. #:	N/S	TOTAL CAUTION / ACTION TML:	
SERIAL #:	1618	46	
CRN.:	N9965.21		

Item # (026)

TML No.: 6 LOWER SIDE SH

DATE BUILT: 01/1998 AVERAGE THICKNESS MEASURED: 9.62 mm.
MATERIAL: SA51670N MINIMUM THICKNESS MEASURED: 9.50 mm.

Pts.	Nom. Thick. mm	CA + Steel Mfg.Tol. mm	Nom. -CA -Toll. mm	B/L Survey Thick. mm	Prev. Survey Thick. mm	Last Survey Thick. mm	Short Term CR mm/yr	Long Term CR mm/yr	Rem. Half Life yr	Future UT Reading mm/yy	Action/Caution Required Item
				01/1998	04/2008	10/2014					
6.01	9.53	0.25	9.28	9.53	9.90	9.80	0.0152	0.0000	17.06	.	NO
6.02	9.53	0.25	9.28	9.53	9.90	9.60	0.0457	0.0000	3.50	.	CAUTION
6.03	9.53	0.25	9.28	9.53	9.90	9.50	0.0610	0.0025	1.81	.	CAUTION *
6.04	9.53	0.25	9.28	9.53	10.00	9.60	0.0610	0.0000	2.63	.	CAUTION *
6.05	9.53	0.25	9.28	9.53	10.00	9.60	0.0610	0.0000	2.63	.	CAUTION *
6.06	9.53	0.25	9.28	9.53	9.90	9.60	0.0457	0.0000	3.50	.	CAUTION

TML No.: 8 BTM SH N-S

DATE BUILT: 01/1998 AVERAGE THICKNESS MEASURED: 9.60 mm.
MATERIAL: SA51670N MINIMUM THICKNESS MEASURED: 9.60 mm.

Pts.	Nom. Thick. mm	CA + Steel Mfg.Tol. mm	Nom. -CA -Toll. mm	B/L Survey Thick. mm	Prev. Survey Thick. mm	Last Survey Thick. mm	Short Term CR mm/yr	Long Term CR mm/yr	Rem. Half Life yr	Future UT Reading mm/yy	Action/Caution Required Item
				01/1998	04/2008	10/2014					
8.01	9.53	0.25	9.28	9.53	9.80	9.60	0.0305	0.0000	5.25	.	CAUTION
8.02	9.53	0.25	9.28	9.53	10.00	9.60	0.0610	0.0000	2.63	.	CAUTION *
8.03	9.53	0.25	9.28	9.53	10.10	9.60	0.0762	0.0000	2.10	.	CAUTION *
8.04	9.53	0.25	9.28	9.53	10.00	9.60	0.0610	0.0000	2.63	.	CAUTION *
8.05	9.53	0.25	9.28	9.53	10.10	9.60	0.0762	0.0000	2.10	.	CAUTION *
8.06	9.53	0.25	9.28	9.53	9.80	9.60	0.0305	0.0000	5.25	.	CAUTION

If Baseline (B/L) Survey Thickness Measurement was not taken at the time of Manufacture, then Nominal Thickness is used as Baseline Thickness.
Minimum Thickness is calculated

Design Minimum Thickness = Nom. Thick. - CA - Manufacturing Steel Tolerance.

Manufacturing Tolerance of pipe and forged fittings is + or -12.5% (May or may not apply dependent upon the Client's Owner-User Integrity Management System).

Manufacturing Tolerance of plate is + or - 0.25mm (0.010") (May or may not apply dependent upon the Client's Owner-User Integrity Management System).

(*) and GREEN Represent 25% of the last thickness readings, which have the shortest remaining half life.

BLUE (Caution TML Point) - If Corrosion Rate exceed a 0.250mm / 0.009 in. per yr. or Half Life is less than 15 years.

RED (Action TML Point) - If Remaining Half Life is 0 and Last Survey Thickness is below Nominal-CA-Tolerance Thickness.

CA - Corrosion Allowance, CR - Corrosion Rate (Brown if CR >= 0.500mm/yr.).

Calculated T-Min. Thickness - Using UPipe Mathematics.

TAQA North

Unit: N-603

FACILITY:	CHINCHAGA GAS PLANT	MANUFACTURER:	THERMO DESIGN ENGINEER
LSD:	C-032-H/094-H-08	DESIGN PRESSURE:	1793 kPa / 260 psi
ITEM DESC.:	PROPANE ACCUMULATOR	DESIGN TEMP.:	66 C / 151 F
EQUIP / OIP#:	603VS013	VESSEL CORROSION ALLOWANCE:	
PROV. REG. #:	N/S	TOTAL CAUTION / ACTION TML:	
SERIAL #:	1618	46	
CRN.:	N9965.21		

Item # (026)

TML No.: 10 TOP SH N-S

DATE BUILT: 01/1998 AVERAGE THICKNESS MEASURED: 10.18 mm.

MATERIAL: SA51670N MINIMUM THICKNESS MEASURED: 10.10 mm.

Pts.	Nom. Thick. mm	CA + Steel Mfg.Tol. mm	Nom. -CA -Toll. mm	B/L Survey Thick. mm	Prev. Survey Thick. mm	Last Survey Thick. mm	Short Term CR mm/yr	Long Term CR mm/yr	Rem. Half Life yr	Future UT Reading mm/yy	Action/Caution Required Item
				01/1998	04/2008	10/2014					
10.01	9.53	0.25	9.28	9.53	10.80	10.30	0.0762	0.0000	6.70	.	CAUTION
10.02	9.53	0.25	9.28	9.53	10.50	10.20	0.0457	0.0000	10.06	.	CAUTION
10.03	9.53	0.25	9.28	9.53	10.40	10.10	0.0457	0.0000	8.97	.	CAUTION
10.04	9.53	0.25	9.28	9.53	10.40	10.10	0.0457	0.0000	8.97	.	CAUTION
10.05	9.53	0.25	9.28	9.53	10.60	10.10	0.0762	0.0000	5.38	.	CAUTION
10.06	9.53	0.25	9.28	9.53	10.60	10.30	0.0457	0.0000	11.16	.	CAUTION

TML No.: 12 UPPER SIDE SH

DATE BUILT: 01/1998 AVERAGE THICKNESS MEASURED: 9.97 mm.

MATERIAL: SA51670N MINIMUM THICKNESS MEASURED: 9.90 mm.

Pts.	Nom. Thick. mm	CA + Steel Mfg.Tol. mm	Nom. -CA -Toll. mm	B/L Survey Thick. mm	Prev. Survey Thick. mm	Last Survey Thick. mm	Short Term CR mm/yr	Long Term CR mm/yr	Rem. Half Life yr	Future UT Reading mm/yy	Action/Caution Required Item
				01/1998	04/2008	10/2014					
12.01	9.53	0.25	9.28	9.53	10.20	10.00	0.0305	0.0000	11.81	.	CAUTION
12.02	9.53	0.25	9.28	9.53	10.10	9.90	0.0305	0.0000	10.17	.	CAUTION
12.03	9.53	0.25	9.28	9.53	10.30	10.00	0.0457	0.0000	7.88	.	CAUTION
12.04	9.53	0.25	9.28	9.53	10.10	10.00	0.0152	0.0000	23.62	.	NO
12.05	9.53	0.25	9.28	9.53	10.30	9.90	0.0610	0.0000	5.09	.	CAUTION
12.06	9.53	0.25	9.28	9.53	10.40	10.00	0.0610	0.0000	5.91	.	CAUTION

If Baseline (B/L) Survey Thickness Measurement was not taken at the time of Manufacture, then Nominal Thickness is used as Baseline Thickness.
Minimum Thickness is calculated

Design Minimum Thickness = Nom. Thick. - CA - Manufacturing Steel Tolerance.

Manufacturing Tolerance of pipe and forged fittings is + or -12.5% (May or may not apply dependent upon the Client's Owner-User Integrity Management System).

Manufacturing Tolerance of plate is + or - 0.25mm (0.010") (May or may not apply dependent upon the Client's Owner-User Integrity Management System).

(*) and GREEN Represent 25% of the last thickness readings, which have the shortest remaining half life.

BLUE (Caution TML Point) - If Corrosion Rate exceed a 0.250mm / 0.009 in. per yr. or Half Life is less than 15 years.

RED (Action TML Point) - If Remaining Half Life is 0 and Last Survey Thickness is below Nominal-CA-Tolerance Thickness.

CA - Corrosion Allowance, CR - Corrosion Rate (Brown if CR >= 0.500mm/yr.).

Calculated T-Min. Thickness - Using UPIPE Mathematics.

TAQA North

Unit: N-603

FACILITY:	CHINCHAGA GAS PLANT	MANUFACTURER:	THERMO DESIGN ENGINEER
LSD:	C-032-H/094-H-08	DESIGN PRESSURE:	1793 kPa / 260 psi
ITEM DESC.:	PROPANE ACCUMULATOR	DESIGN TEMP.:	66 C / 151 F
EQUIP / OIP#:	603VS013	VESSEL CORROSION ALLOWANCE:	
PROV. REG. #:	N/S	TOTAL CAUTION / ACTION TML:	
SERIAL #:	1618	46	
CRN.:	N9965.21		

Item # (026)

TML No.: 14 TOP HD T-B

DATE BUILT: 01/1998 AVERAGE THICKNESS MEASURED: 9.61 mm.

MATERIAL: SA51670N MINIMUM THICKNESS MEASURED: 9.50 mm.

Pts.	Nom. Thick. mm	CA + Steel Mfg.Tol. mm	Nom. -CA -Toll. mm	B/L Survey Thick. mm	Prev. Survey Thick. mm	Last Survey Thick. mm	Short Term CR mm/yr	Long Term CR mm/yr	Rem. Half Life yr	Future UT Reading mm/yy	Action/Caution Required Item
				01/1998	04/2008	10/2014					
14.01	8.66	0.25	8.41	8.66	10.40	9.50	0.1372	0.0000	3.98	.	CAUTION
14.02	8.66	0.25	8.41	8.66	10.20	9.70	0.0762	0.0000	8.47	.	CAUTION
14.03	8.66	0.25	8.41	8.66	10.70	9.70	0.1524	0.0000	4.23	.	CAUTION
14.04	8.66	0.25	8.41	8.66	10.00	9.60	0.0610	0.0000	9.76	.	CAUTION
14.05	8.66	0.25	8.41	8.66	10.90	9.60	0.1981	0.0000	3.01	.	CAUTION *
14.06	8.66	0.25	8.41	8.66	10.90	9.70	0.1829	0.0000	3.53	.	CAUTION
14.07	8.66	0.25	8.41	8.66	9.70	9.60	0.0152	0.0000	39.04	.	NO
14.08	8.66	0.25	8.41	8.66	9.60	9.50	0.0152	0.0000	35.76	.	NO

TML No.: 16 3"90L B-T 150 #

DATE BUILT: 01/1998 AVERAGE THICKNESS MEASURED: 5.33 mm.

MATERIAL: MINIMUM THICKNESS MEASURED: 5.30 mm.

Pts.	Nom. Thick. mm	CA + Steel Mfg.Tol. mm	Nom. -CA -Toll. mm	B/L Survey Thick. mm	Prev. Survey Thick. mm	Last Survey Thick. mm	Short Term CR mm/yr	Long Term CR mm/yr	Rem. Half Life yr	Future UT Reading mm/yy	Action/Caution Required Item
				01/1998	04/2008	10/2014					
16.01	5.49	0.69	4.80	5.49	5.70	5.50	0.0305	0.0000	11.49	.	CAUTION
16.02	5.49	0.69	4.80	5.49	5.80	5.30	0.0762	0.0102	3.28	.	CAUTION *
16.03	5.49	0.69	4.80	5.49	5.80	5.30	0.0762	0.0102	3.28	.	CAUTION *
16.04	5.49	0.69	4.80	5.49	5.70	5.30	0.0610	0.0102	4.10	.	CAUTION
16.05	5.49	0.69	4.80	5.49	5.50	5.30	0.0305	0.0102	8.20	.	CAUTION
16.06	5.49	0.69	4.80	5.49	5.60	5.30	0.0457	0.0102	5.47	.	CAUTION

If Baseline (B/L) Survey Thickness Measurement was not taken at the time of Manufacture, then Nominal Thickness is used as Baseline Thickness.
Minimum Thickness is calculated

Design Minimum Thickness = Nom. Thick. - CA - Manufacturing Steel Tolerance.

Manufacturing Tolerance of pipe and forged fittings is + or -12.5% (May or may not apply dependent upon the Client's Owner-User Integrity Management System).

Manufacturing Tolerance of plate is + or - 0.25mm (0.010") (May or may not apply dependent upon the Client's Owner-User Integrity Management System).

(*) and GREEN Represent 25% of the last thickness readings, which have the shortest remaining half life.

BLUE (Caution TML Point) - If Corrosion Rate exceed a 0.250mm / 0.009 in. per yr. or Half Life is less than 15 years.

RED (Action TML Point) - If Remaining Half Life is 0 and Last Survey Thickness is below Nominal-CA-Tolerance Thickness.

CA - Corrosion Allowance, CR - Corrosion Rate (Brown if CR >= 0.500mm/yr.).

Calculated T-Min. Thickness - Using UPipe Mathematics.

EQUIPMENT EXTERNAL INSPECTION REPORT

Customer:	TAQA North	ITS Job No.:	1-2968
District:	North Area	Date:	18-Oct-2014
Facility:	Chinchaga Gas Plant	LSD:	C-032-H/094-H-08
Equip. Description:	Propane Accumulator	Serial No.:	1618
Equip./OIP No.:	603VS013	PRN:	Not Applicable
Equip. Type: ☐ Column ☐ Cooler ☐ Exchanger ☐ Furnace ☐ Heater ☐ Plate Exchanger ☐ Reboiler ☒ Vessel ☐ Other:			

Remedial Action	Service	Associated Components	Shell
☒ No Action Required	☒ Sweet ☐ Sour	☒ Y ☐ N: Name Plate Secure	☒ Good Condition
☐ Paint/Coating Repairs	Access and Coverage	☒ Y ☐ N: Name Plate Legible	☐ External Corrosion
☐ Insulation Repairs	☒ External Inspection	External Grounding	☐ Pitting: (max depth)
☐ PSV Service Required	☐ Part. External Inspection	☐ Direct ☒ Indirect ☐ N	☐ Scale
☐ Further Assessment Required	☐ Internal Inspection (VI) NDE Examination	☐ Y ☐ N ☒ NA: Ladders/ Handrail/ Walkway/ Grating in safe condition?	☐ Blistered
☐ Condition Damage	☒ UT		☐ Mechanical Damage
☐ Does not comply with applicable code/safe operating requirement.	☐ MT	☐ See Attached Pictures	☐ Deformation/Distortion
☐ Repairs Required	☐ PT	☐ Excessive Vibration	☐ Condensation/Sweating
☐ See Comments	☐ RT	☒ Y ☐ N ☐ NA: Pressure Gauge within MAWP	☐ No Access
	☐ BH		☐ No Access Insulated
Status	☐ Other	☐ Y ☐ N ☒ NA: Temp. Gauge within MDMT	☒ Weld(s) in Good Condition
☒ Operational; ☐ Idle;	☐ See Comments	☒ Y ☐ N Attached Piping and Instrumentation in Good Condition	☐ Weld(s) Corroded
☐ Shut In;		☐ See Comments	☐ Weld(s) Poor Quality
☐ Surplus/Boneyard;			☐ Weld(s) Cracked
☐ Other:			☐ See Comments

Head (1)	Head (2)	Nozzles
☐ Top ☒ North ☐ West	☐ Bottom ☒ South ☐ East	☒ RF ☐ RTJ ☒ NPT
☐ Flat ☐ FLG ☒ ELL ☐ ECC ☐ HEMI	☐ Flat ☐ FLG ☒ ELL ☐ ECC ☐ HEMI	☒ Good Condition
☐ Quick Actuating Closure	☐ Quick Actuating Closure	☒ Fasteners Engaged
☒ Good Condition	☒ Good Condition	☒ Repad Weep Holes Clear
☐ External Corrosion	☐ External Corrosion	☐ Nozzles are Gusseted
☐ Pitting: (max depth)	☐ Pitting: (max depth)	☐ External Corrosion
☐ Scale	☐ Scale	☐ Leaking/Weeping
☐ Blistered	☐ Blistered	☐ Damaged/Cracked
☐ Mechanical Damage	☐ Mechanical Damage	☐ Bolts Missing/Loose
☐ Deformation/Distortion	☐ Deformation/Distortion	☐ Deflection/Distortion
☐ Condensation/Sweating	☐ Condensation/Sweating	☐ Partial Internal Inspection
☐ No Access	☐ No Access	☐ No Access Insulated
☐ No Access Insulated	☐ No Access Insulated	☒ Weld(s) in Good Condition
☐ No Access Ice Build Up	☐ No Access Ice Build Up	☐ Weld(s) Corroded
☐ External Protection Only	☐ External Protection Only	☐ Weld(s) Poor Quality
☐ See Comments	☐ See Comments	☐ Weld(s) Cracked
		☐ See Comments

External Surface	Supports	Associated Piping	PRD 1	PRD 2
☒ Good Condition	☒ Good Condition	☒ Good Condition	Location: above vessel	Location: Not Applicable
☒ Painted ☒ Full ☐ Part.	☒ Anchor Bolts Secure	☐ Corrosion	PSV Tag No.: 603SVVS013	PSV Tag No.: Not Applicable
☐ Coated ☐ Full ☐ Part.	☐ Welded to Skid	☐ Pitting: (max depth)	☒ Service Date within Interval	☐ Service Date within Interval
☐ Insulated ☐ Full ☐ Part.	☐ Supported by Nozzle(s)	☐ Bolts Missing/ Loose/ Damaged	☒ Set Pressure within MAWP	☐ Set Pressure within MAWP
☐ Insulation Damaged	☐ Piping Supported	☐ Short Threaded	☒ Safety Seal Intact	☐ Safety Seal Intact
☐ Penetration Seals Broken	☒ Expansion Slots	☐ Connections Leaking	☒ Service Seal Intact	☐ Service Seal Intact
☐ Corrosion Under Insulation (CUI)	☐ Bolts Missing/ Loose/ Damaged	☐ Piping and Valves Supported	☒ Current Service Tag Attached	☐ Current Service Tag Attached
☐ Visible Moisture Contamination	☐ Short Threaded	☐ Piping Deflected/ Distorted	☐ PSV inlet Gusseted	☐ PSV inlet Gusseted
☐ Paint Deterioration	☐ Deflected/Distorted	☐ No Access Insulated	☐ Inlet Block Valve	☐ Inlet Block Valve
☐ Coating Deterioration	☐ Poor Insulation	☐ See Comments	Locked Open ☐ Y ☐ N	Locked Open ☐ Y ☐ N
☐ Fireproofing Cracked	☐ Fire Proofing Cracked		Sealed Open ☐ Y ☐ N	Sealed Open ☐ Y ☐ N
☐ External Protection Only	☒ Vessel is level		☐ Outlet Block Valve	☐ Outlet Block Valve
☐ See Comments	☐ See Comments		Locked Open ☐ Y ☐ N	Locked Open ☐ Y ☐ N
			Sealed Open ☐ Y ☐ N	Sealed Open ☐ Y ☐ N
			☐ See Comments	☐ See Comments

Observations:
Equipment in ☒ **Good**, ☐ **Fair**, ☐ **Poor Condition**
Good: No concerns found (may still have recommendations)

Fair: Minor issues found that do not impair the "fitness for service" of the equipment, (paint deterioration, general external surface corrosion - no measurable metal loss, not mounted to skid, etc.)

Poor: Equipment had moderate to major concerns found (equipment is damaged, severe external corrosion noted, cracked or broken component, etc.)

☒ **Based on API 510 Visual External Inspection this vessel is fit for service**
(this piece of equipment meets the Jurisdictional requirements)

Sight glass is clear and free of fouling.

Recommendations:

None

Non-Conformance Conditions and Corrective Actions:

Note: Reference any and all Non-Conformance Report (NCR) numbers and Corrective Action Report (CAR) numbers.

None

Recommended Inspection Intervals:

Recommended Maximum Inspection Interval:	60	Months	PRD 1 Recommended Service Interval:	60	Months	PRD 2 Recommended Service Interval:	Not Applicable	Months
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External Inspection Performed By:

Print Name:

Murray Angus MacGregor

Certification No.:

ABSA IPV PESL: 000622

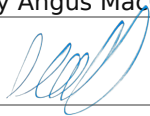
API 510: 40801

API 653: 48515

PEI Class 2: 158

CWB Level 2: 8501

Signature:



Report Reviewed:


Initial

Chief Inspector /
Client
Representative:

Name (Print)

Signature

Date: