



TAQA NORTH DATA				
EQUIP NO.: 603VS016	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 : GLYCOL FLASH SEPARATOR		CLASS : VS	TYPE: SEPARATOR	
SERVICE: <input checked="" type="checkbox"/> Sweet <input type="checkbox"/> Sour	H2S: N/A PPM	FLUID: GLYCOL	S/D REQT.: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Partial	
OPERATING PRESSURE: 159 <input checked="" type="checkbox"/> kPa <input type="checkbox"/> PSI		OPERATING TEMPERATURE: 85 <input checked="" type="checkbox"/> °C <input type="checkbox"/> °F		
OPERATING STATUS: <input checked="" type="checkbox"/> IN SERVICE <input type="checkbox"/> Not In Service		M/WAY(16"AND ABOVE): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No SIZE: 4"		

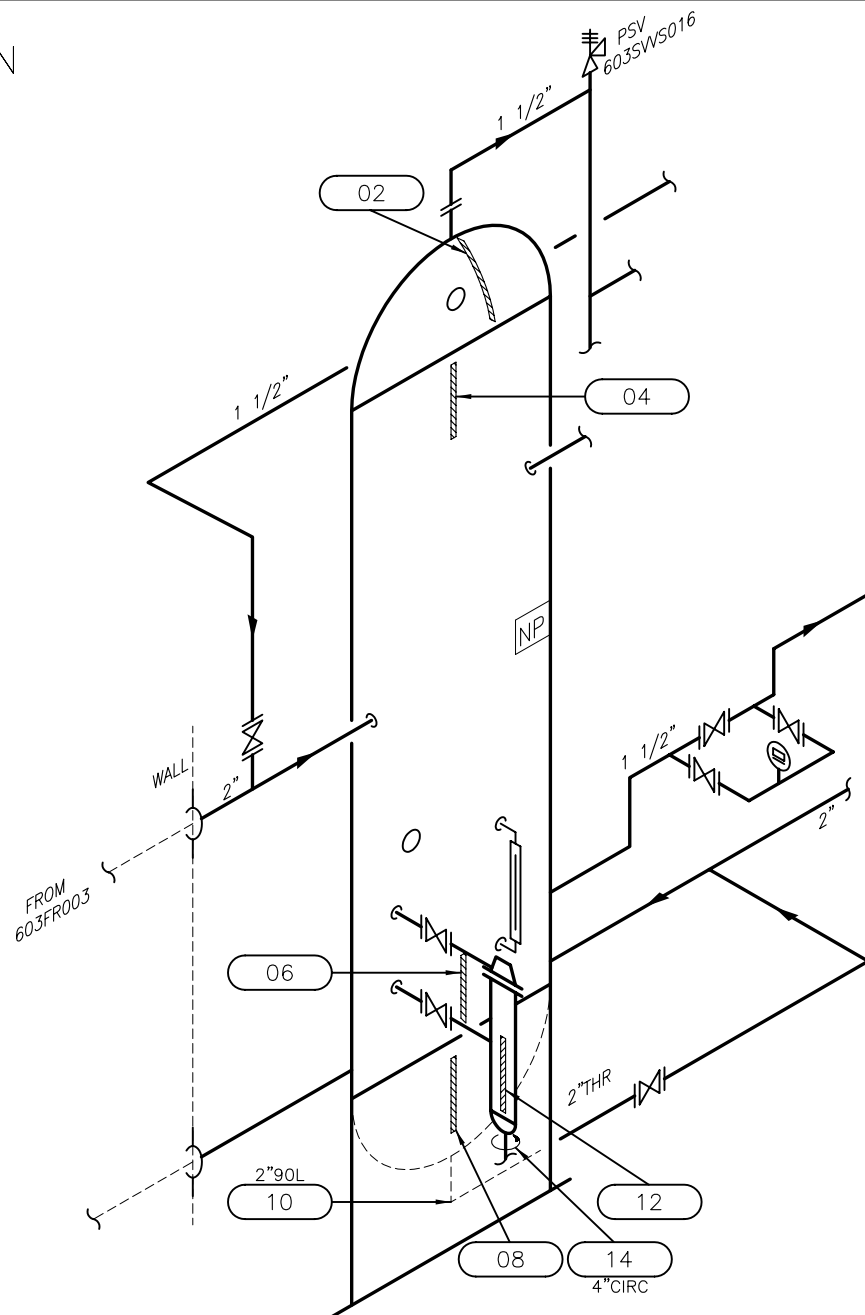
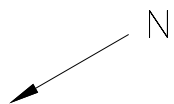
MANUFACTURING DATA				
MFG.: THERMO ENG	DWG. NO.: 01086VES001	SERIAL NO.: 1899	YR. BUILT: 2001	STAMP: W
CRN: P6946.21	CODE/DIV.: N/A	PARA.: N/A	SUPPORT: <input checked="" type="checkbox"/> Skirt <input type="checkbox"/> Saddles <input type="checkbox"/> Nozzles	
MAWP: 1207 <input checked="" type="checkbox"/> kPa <input type="checkbox"/> PSI	@ TEMP: 93 <input checked="" type="checkbox"/> °C <input type="checkbox"/> °F	MDMT: -29 <input checked="" type="checkbox"/> °C <input type="checkbox"/> °F	VOLUME: 19.6 <input type="checkbox"/> M³ <input checked="" type="checkbox"/> FT³	
FLANGE RATING: N/A	PWHT: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	RADIOGRAPHY: <input type="checkbox"/> RT1 <input checked="" type="checkbox"/> RT2 <input type="checkbox"/> RT3 <input type="checkbox"/> RT4	<input type="checkbox"/> Spot <input type="checkbox"/> Full <input type="checkbox"/> N/A	
SIZE : 610 <input checked="" type="checkbox"/> mm. <input type="checkbox"/> inch.	<input type="checkbox"/> ID <input checked="" type="checkbox"/> OD	LENGTH: N/A <input type="checkbox"/> mm. <input type="checkbox"/> inch.	HEIGHT: 1829 <input checked="" type="checkbox"/> mm <input type="checkbox"/> inch.	
INSULATION TYPE: <input type="checkbox"/> Fiberglass <input type="checkbox"/> Wool <input type="checkbox"/> Low Temp <input type="checkbox"/> Asbestos Other: N/A			INSULATION THK: N/A <input type="checkbox"/> mm <input type="checkbox"/> inch.	
SECTION	MATERIAL	NOMINAL mm	C.A. mm	
SHELL	SA-106-B	9.5 MM	1.6 MM	
HEAD	SA-516-70N	7.9 MM	1.6 MM	
COMMENTS:				

TUBING DATA				
MAWP: 1034 <input checked="" type="checkbox"/> kPa <input type="checkbox"/> PSI	@ TEMP: 177 <input checked="" type="checkbox"/> °C <input type="checkbox"/> °F	TEMA CLASS: N/A	TYPE: N/A	
TUBE SIZE: N/A mm. <input type="checkbox"/> ID <input type="checkbox"/> OD	NUMBER (QTY OF TUBES): N/A	GAUGE (BWG): 14	JOINT: <input checked="" type="checkbox"/> Welded <input type="checkbox"/> Rolled	
SECTION	MATERIAL	NOMINAL mm	C.A. mm	
COIL	SA-179	14BWG	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		<input type="checkbox"/> PSV not located	<input type="checkbox"/> No PSV
EQUIP. NO.	TAG NO.	SET	CAPACITY
603SVVS016 (SHELL)	N/A	1207 <input checked="" type="checkbox"/> kPa <input type="checkbox"/> PSI	1017 <input checked="" type="checkbox"/> SCFM <input type="checkbox"/> LB/hr. <input type="checkbox"/> GAL/min.
N/A	N/A	N/A <input type="checkbox"/> kPa <input type="checkbox"/> PSI	N/A <input type="checkbox"/> SCFM <input type="checkbox"/> LB/hr. <input type="checkbox"/> GAL/min.
N/A	N/A	N/A <input type="checkbox"/> kPa <input type="checkbox"/> PSI	N/A <input type="checkbox"/> SCFM <input type="checkbox"/> LB/hr. <input type="checkbox"/> GAL/min.



**Integrity Testing**  
SERVICES

P.E. No.:	N/S	Yr. Bit.:	2001
OIP#	603VS016	Manway:	NO
Serial No.:	1899	Size:	610mm x 1829mm
P.R.N. (A)	N/S	Service:	SWEET
C.R.N.:	P6946.21	PWHT:	NO
Code/Div.:	N/S	RT:	2
Para:	N/S	Insulated:	N/S
C. Stamp:	W	N.B. No:	N/S
Manufacturer:	THERMO ENG.		

#### Design & Materials Data

HEAD	SHELL
Material: SA-516-70N	Material: SA-106-B
Nom.: 7.9mm	Nom.: 9.5mm
C.A.: 1.6mm	C.A.: 1.6mm
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: 1207 KPA	⊗ Temp.: 93°C
MAWP Tube Side: _____	⊗ Temp.: _____

CLIENT

TAQA NORTH

FACILITY

CHINCHAGA GAS PLANT

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

ITEM

GLYCOL FLASH SEPARATOR

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

BY: M.T.

DATE: 2008/04

DWG.# 036

## TAQA North

Unit: N-603

FACILITY:	CHINCHAGA GAS PLANT	MANUFACTURER:	THERMO DESIGN ENGINEER
LSD:	C-032-H/094-H-08	DESIGN PRESSURE:	1207 kPa / 175 psi
ITEM DESC.:	GLYCOL FLASH SEPARATOR	DESIGN TEMP.:	93 C / 199 F
EQUIP / OIP#:	603VS016	RECOMMENDED NEXT INSP. DATE:	09/2006
PROV. REG. #:	N/S	RECOMMENDED RETIREMENT DATE:	07/2134
SERIAL #:	1899	REM. LIFE (from last survey 04/2008):	126.30 yrs.
CRN.:	P6946.21	TOTAL CAUTION / ACTION TML:	6

### Item # (036)

#### TML No.: 2 TOP HD T-B

DATE BUILT: 01/2001

AVERAGE THICKNESS MEASURED: 9.67 mm.

MATERIAL: SA516-70

MINIMUM THICKNESS MEASURED: 9.50 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	7.90	1.60	6.30	01/2001	7.90	N/A	N/A	04/2008	9.60	0.000	0.000	04/2013	04/3108	NO
2.02	7.90	1.60	6.30	01/2001	7.90	N/A	N/A	04/2008	9.70	0.000	0.000	04/2013	08/3141	NO
2.03	7.90	1.60	6.30	01/2001	7.90	N/A	N/A	04/2008	9.50	0.000	0.000	04/2013	12/3074	NO
2.04	7.90	1.60	6.30	01/2001	7.90	N/A	N/A	04/2008	9.60	0.000	0.000	04/2013	04/3108	NO
2.05	7.90	1.60	6.30	01/2001	7.90	N/A	N/A	04/2008	9.80	0.000	0.000	04/2013	12/3174	NO
2.06	7.90	1.60	6.30	01/2001	7.90	N/A	N/A	04/2008	9.80	0.000	0.000	04/2013	12/3174	NO

#### TML No.: 4 TOP SH T-B

DATE BUILT: 01/2001

AVERAGE THICKNESS MEASURED: 10.48 mm.

MATERIAL: SA106-B

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
4.01	9.50	1.60	7.90	01/2001	9.50	N/A	N/A	04/2008	10.50	0.000	0.000	04/2013	12/2874	NO
4.02	9.50	1.60	7.90	01/2001	9.50	N/A	N/A	04/2008	10.50	0.000	0.000	04/2013	12/2874	NO
4.03	9.50	1.60	7.90	01/2001	9.50	N/A	N/A	04/2008	10.40	0.000	0.000	04/2013	08/2841	NO
4.04	9.50	1.60	7.90	01/2001	9.50	N/A	N/A	04/2008	10.40	0.000	0.000	04/2013	08/2841	NO
4.05	9.50	1.60	7.90	01/2001	9.50	N/A	N/A	04/2008	10.60	0.000	0.000	04/2013	04/2908	NO
4.06	9.50	1.60	7.90	01/2001	9.50	N/A	N/A	04/2008	10.50	0.000	0.000	04/2013	12/2874	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:	1207 kPa / 175 psi
ITEM DESC.:	GLYCOL FLASH SEPARATOR	DESIGN TEMP.:	93 C / 199 F
EQUIP / OIP#:	603VS016	RECOMMENDED NEXT INSP. DATE:	09/2006
PROV. REG. #:	N/S	RECOMMENDED RETIREMENT DATE:	07/2134
SERIAL #:	1899	REM. LIFE (from last survey 04/2008):	126.30 yrs.
CRN.:	P6946.21	TOTAL CAUTION / ACTION TML:	6

### Item # (036)

#### TML No.: 6 BTM SH T-B

DATE BUILT: 01/2001

AVERAGE THICKNESS MEASURED: 10.55 mm.

MATERIAL: SA106-B

MINIMUM THICKNESS MEASURED: 10.30 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
6.01	9.50	1.60	7.90	01/2001	9.50	N/A	N/A	04/2008	10.30	0.000	0.000	04/2013	04/2808	NO
6.02	9.50	1.60	7.90	01/2001	9.50	N/A	N/A	04/2008	10.40	0.000	0.000	04/2013	08/2841	NO
6.03	9.50	1.60	7.90	01/2001	9.50	N/A	N/A	04/2008	10.50	0.000	0.000	04/2013	12/2874	NO
6.04	9.50	1.60	7.90	01/2001	9.50	N/A	N/A	04/2008	10.70	0.000	0.000	04/2013	08/2941	NO
6.05	9.50	1.60	7.90	01/2001	9.50	N/A	N/A	04/2008	10.90	0.000	0.000	04/2013	04/3008	NO
6.06	9.50	1.60	7.90	01/2001	9.50	N/A	N/A	04/2008	10.50	0.000	0.000	04/2013	12/2874	NO

#### TML No.: 8 BTM HD T-B

DATE BUILT: 01/2001

AVERAGE THICKNESS MEASURED: 9.40 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 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
8.01	7.90	1.60	6.30	01/2001	7.90	N/A	N/A	04/2008	9.40	0.000	0.000	04/2013	08/3041	NO
8.02	7.90	1.60	6.30	01/2001	7.90	N/A	N/A	04/2008	9.30	0.000	0.000	04/2013	04/3008	NO
8.03	7.90	1.60	6.30	01/2001	7.90	N/A	N/A	04/2008	9.50	0.000	0.000	04/2013	12/3074	NO
8.04	7.90	1.60	6.30	01/2001	7.90	N/A	N/A	04/2008	9.30	0.000	0.000	04/2013	04/3008	NO
8.05	7.90	1.60	6.30	01/2001	7.90	N/A	N/A	04/2008	9.40	0.000	0.000	04/2013	08/3041	NO
8.06	7.90	1.60	6.30	01/2001	7.90	N/A	N/A	04/2008	9.50	0.000	0.000	04/2013	12/3074	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.

## **CALCULATE PRESSURE VESSEL TMIN or DESIGN PRESSURE**

FACILITY: Chinchaga Gas Plant--32-H/94-H-8  
DESCRIPTION: Glycol Flash Separator  
ITEM NO.: #036  
TML: #10  
MATERIAL: NS-USE SA234-WPB  
PRN #: SN-1899--603VS016  
RT: 2  
TYPE: 2" 90° Elbow

### **PRESSURE VESSEL TMIN CALCS (Cylindrical shells INSIDE RADIUS)**

$t = PR/SE - 0.6P$  Minimum Required Thickness, inches

P=	175	Design Pressure, psi
R=	0.887	INSIDE Radius of shell, inches
S=	17100	Maximum Allowable Stress, psi
E=	1.00	Joint Efficiency

T= 100°F

t=	0.009	inches, per ASME Sect 8 UG-27(c)1
t=	0.23	mm

$$t = 0.009" + C/A \text{ NS } 0.0625" = 0.0715"$$

## TAQA North

Unit: N-603

FACILITY:	CHINCHAGA GAS PLANT	MANUFACTURER:	THERMO DESIGN ENGINEER
LSD:	C-032-H/094-H-08	DESIGN PRESSURE:	1207 kPa / 175 psi
ITEM DESC.:	GLYCOL FLASH SEPARATOR	DESIGN TEMP.:	93 C / 199 F
EQUIP / OIP#:	603VS016	RECOMMENDED NEXT INSP. DATE:	09/2006
PROV. REG. #:	N/S	RECOMMENDED RETIREMENT DATE:	07/2134
SERIAL #:	1899	REM. LIFE (from last survey 04/2008):	126.30 yrs.
CRN.:	P6946.21	TOTAL CAUTION / ACTION TML:	6

### Item # (036)

**TML No.: 10 2"90L T-B**

DATE BUILT: 01/2001

AVERAGE THICKNESS MEASURED: 7.48 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 7.30 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
10.01	8.70	1.10	7.60	01/2001	8.70	N/A	N/A	04/2008	7.40	0.000	0.178	02/2007	02/2007	ACTION *
10.02	8.70	1.10	7.60	01/2001	8.70	N/A	N/A	04/2008	7.30	0.000	0.193	09/2006	09/2006	ACTION *
10.03	8.70	1.10	7.60	01/2001	8.70	N/A	N/A	04/2008	7.50	0.000	0.165	08/2007	08/2007	ACTION *
10.04	8.70	1.10	7.60	01/2001	8.70	N/A	N/A	04/2008	7.50	0.000	0.165	08/2007	08/2007	ACTION *
10.05	8.70	1.10	7.60	01/2001	8.70	N/A	N/A	04/2008	7.60	0.000	0.152	04/2008	04/2008	CAUTION *
10.06	8.70	1.10	7.60	01/2001	8.70	N/A	N/A	04/2008	7.60	0.000	0.152	04/2008	04/2008	CAUTION *

**TML No.: 12 4" BOTTLE T-B**

DATE BUILT: 01/2001

AVERAGE THICKNESS MEASURED: 6.30 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 6.20 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
12.01	6.00	0.70	5.30	01/2001	6.00	N/A	N/A	04/2008	6.30	0.000	0.000	04/2013	08/2341	NO *
12.02	6.00	0.70	5.30	01/2001	6.00	N/A	N/A	04/2008	6.30	0.000	0.000	04/2013	08/2341	NO *
12.03	6.00	0.70	5.30	01/2001	6.00	N/A	N/A	04/2008	6.30	0.000	0.000	04/2013	08/2341	NO *
12.04	6.00	0.70	5.30	01/2001	6.00	N/A	N/A	04/2008	6.20	0.000	0.000	04/2013	04/2308	NO *
12.05	6.00	0.70	5.30	01/2001	6.00	N/A	N/A	04/2008	6.50	0.000	0.000	04/2013	04/2408	NO
12.06	6.00	0.70	5.30	01/2001	6.00	N/A	N/A	04/2008	6.20	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:	1207 kPa / 175 psi
ITEM DESC.:	GLYCOL FLASH SEPARATOR	DESIGN TEMP.:	93 C / 199 F
EQUIP / OIP#:	603VS016	RECOMMENDED NEXT INSP. DATE:	09/2006
PROV. REG. #:	N/S	RECOMMENDED RETIREMENT DATE:	07/2134
SERIAL #:	1899	REM. LIFE (from last survey 04/2008):	126.30 yrs.
CRN.:	P6946.21	TOTAL CAUTION / ACTION TML:	6

### Item # (036)

TML No.: 14 4"CIRC T-B

DATE BUILT: 01/2001

AVERAGE THICKNESS MEASURED: 6.60 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 6.30 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
14.01	6.00	0.70	5.30	01/2001	6.00	N/A	N/A	04/2008	6.90	0.000	0.000	04/2013	08/2541	NO
14.02	6.00	0.70	5.30	01/2001	6.00	N/A	N/A	04/2008	6.60	0.000	0.000	04/2013	08/2441	NO
14.03	6.00	0.70	5.30	01/2001	6.00	N/A	N/A	04/2008	6.30	0.000	0.000	04/2013	08/2341	NO *
14.04	6.00	0.70	5.30	01/2001	6.00	N/A	N/A	04/2008	6.60	0.000	0.000	04/2013	08/2441	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.

**EQUIPMENT NO: 603VS016**

Page of

FACILITY: Chinchaga Gas Plant

PROV. REG. NO:

EQUIPMENT NAME: Glycol Flash Separator

TAG NO:

SIZE: 610mm OD x L/H 1829mm MAWP: 1207 kPa @ 93/-29 °C

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

MANWAY ☐ YES ☒ NO

SERVICE:

FLUID: Glycol

☐ 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 ☐ N/A

7. FANS AND OTHER ANCILLARY EQUIPMENT ☐ N/A

8. PRESSURE RELIEF DEVICES ☐ No PSV on shell side

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 08 04 2008  
(DD MONTH YYYY)

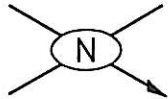
FOLLOW-UP INSPECTION REQ'D:

☒ YES ☐ NO

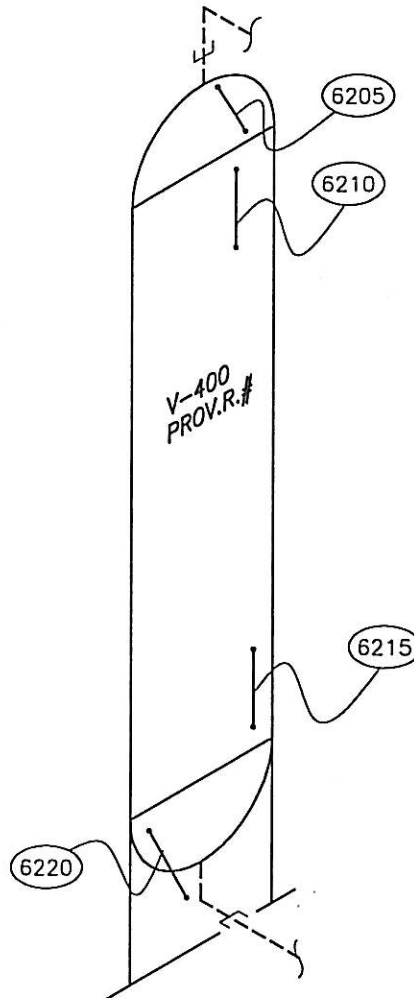
BY DATE:

(DD MONTH YYYY)





P&ID. # \_\_\_\_\_  
REF. # \_\_\_\_\_



## VESSEL DATA

Prov. Reg. No. N/S C.R.N. P 6942.21 P.E. No. V-400 Serial No. 1899  
MFR. THERMO DESIGN Code/Div. \_\_\_\_\_ Para \_\_\_\_\_ Code Stamp U  
Yr. Bld. 2001 Yr. Inst. \_\_\_\_\_ Size 24"ØX6' S/S Vol.: \_\_\_\_\_ Service \_\_\_\_\_ PWHT \_\_\_\_\_

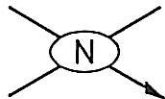
### Nominal Thickness & Material

Head:	<u>7.9mm</u>	Mat'l:	<u>SA 516-70</u>	C.A.:	<u>1.6mm</u>	Insulated	<u>NO</u>	R.T.	<u>2</u>
Head:	_____		_____		_____	Repairs	_____		_____
Shell:	<u>9.5mm</u>		<u>SA 106 B</u>	C.A.:	_____	COMMENTS	_____		_____
Shell:	_____		_____		_____				
Chan Hd:	_____		_____	C.A.:	_____				
Chan Sh:	_____		_____		_____				
Gas Boot Hd:	_____		_____	C.A.:	_____				
Gas Boot Sh.:	_____		_____		_____				
Liq. Boot Hd.:	_____		_____	C.A.:	_____				
Liq Boot Sh.:	_____		_____		_____				
MAWP Shell Side	<u>175psi</u>	@ Temp.	<u>-20/200°F</u>						
MAWP Tube Side	_____	@ Temp.	_____						

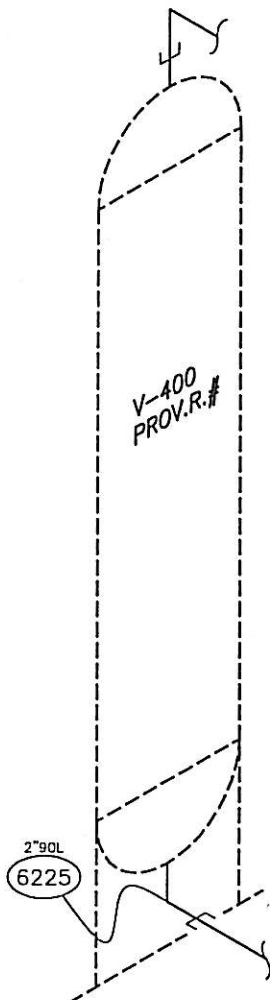
PIONEER NATURAL RESOURCES CANADA INC.  
CHINCHAGA GAS PLANT  
LSD C-32-H \ 94-H-8

### GLYCOL FLASH SEPARATOR

TECH.: J.OLIVER	REV.DATE:	DWG DATE: 02/2002
CAD: MKM	REVISION:	DRAWING: 062



P&ID. # \_\_\_\_\_  
REF. # \_\_\_\_\_



## PIPING DATA

T.M.L.	SIZE	MAT'L	FLG. RATING	PROC.	LINE #	SPEC.	SCH.	NOM. THK.	CORR.ALL		MIN. THK.	CAL. THK.	CODE
									* ASTM	** DESIGN			
6225	2"						160	8.7mm	*	1.6mm	6.0mm		

COMMENTS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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

GLYCOL FLASH SEPARATOR PIPING

TECH.: J.OLIVER	REV.DATE:	DWG DATE: 02/2002
CAD:	REVISION:	DRAWING: 062A

Equip No V-400

Serial No 1899

Prov Reg No N/A

Description GLYCOL FLASH SEPARATOR

062 - 005

TML Description: TOP HEAD

T Nominal: 7.9

Min Nominal: 6.3

Corr Allowance: 1.6

*Data Readings**Data Evaluations*

Months Remaining to T Min: 999  
 Min Calc'd Wall Thickness: N/A  
 Thick Remain Above T Min: 3.1  
 Short Term Corr Rate: N/A  
 Long Term Corr Rate: N/A  
 Months Remain to LFL: N/A  
 Lowest Value - Last Reading: 9.4

Comment:

	Feb-02
Point 1	10.0
Point 2	9.5
Point 3	9.4
Point 4	9.5
Point 5	9.6
Point 6	9.9
Point 7	
Point 8	
Point 9	
Point 10	
Point 11	
Point 12	
Average	9.7
Avg Low 3	9.5
Lowest	9.4

062 - 010

TML Description: TOP SHELL

T Nominal: 9.5

Min Nominal: 7.9

Corr Allowance: 1.6

*Data Readings**Data Evaluations*

Months Remaining to T Min: 999  
 Min Calc'd Wall Thickness: N/A  
 Thick Remain Above T Min: 2.4  
 Short Term Corr Rate: N/A  
 Long Term Corr Rate: N/A  
 Months Remain to LFL: N/A  
 Lowest Value - Last Reading: 10.3

Comment:

	Feb-02
Point 1	10.5
Point 2	10.4
Point 3	10.4
Point 4	10.3
Point 5	10.3
Point 6	10.3
Point 7	
Point 8	
Point 9	
Point 10	
Point 11	
Point 12	
Average	10.4
Avg Low 3	10.3
Lowest	10.3

062 - 015

TML Description: BTM. SHELL		
T Nominal:	9.5	
Min Nominal:	7.9	
Corr Allowance:	1.6	
<i>Data Readings</i>		
<i>Data Evaluations</i>		Feb-02
	Point 1	9.9
	Point 2	10.2
	Point 3	10.3
	Point 4	10.3
	Point 5	10.6
	Point 6	10.3
	Point 7	
	Point 8	
	Point 9	
	Point 10	
	Point 11	
Comment:	Point 12	
	Average	10.3
	Avg Low 3	10.1
	Lowest	9.9

062 - 020

TML Description: BTM. HEAD		
T Nominal:	7.9	
Min Nominal:	6.3	
Corr Allowance:	1.6	
<i>Data Readings</i>		
<i>Data Evaluations</i>		Feb-02
	Point 1	9.4
	Point 2	9.4
	Point 3	9.2
	Point 4	9.3
	Point 5	9.3
	Point 6	9.3
	Point 7	
	Point 8	
	Point 9	
	Point 10	
	Point 11	
Comment:	Point 12	
	Average	9.3
	Avg Low 3	9.3
	Lowest	9.2

TML Description: 2" 90' L T-B		
T Nominal: 8.7		
Min Nominal: 7.1		
Corr Allowance: 1.6		
<i>Data Readings</i>		
<i>Data Evaluations</i>		Feb-02
Months Remaining to T Min:	999	Point 1 7.9
Min Calc'd Wall Thickness:	N/A	Point 2 8.5
Thick Remain Above T Min:	0.8	Point 3 8.2
Short Term Corr Rate:	N/A	Point 4 8.0
Long Term Corr Rate:	N/A	Point 5 8.0
Months Remain to LFL:	N/A	Point 6
Lowest Value - Last Reading:	7.9	Point 7
Comment:		Point 8
		Point 9
		Point 10
		Point 11
		Point 12
		Average 8.1
		Avg Low 3 8.0
		Lowest 7.9



RAM#	<b>434021</b>	<b>EQUIP STATIC RECORD</b>		JOB#	<b>1-2968</b>
Unique OUP #:	<b>603VS016</b>	Old OUP #:		LSD:	<b>C-032-H/094-H-08</b>

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: \_\_\_\_\_ m<sup>3</sup> TK. BASE SITTING ON: \_\_\_\_\_ BETWEEN TK. AND BASE: \_\_\_\_\_

TANKS INSIDE DYKE: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

P&ID #: \_\_\_\_\_ SHUT DOWN: \_\_\_\_\_

OPERATING PRESSURE: **159** kPa OPERATING TEMP. **85** °C YEAR PUT IN SERVICE: \_\_\_\_\_

VESSEL CONNECTIONS: NPT \_\_\_\_\_ FLANGE \_\_\_\_\_ LARGEST CONNECTION \_\_\_\_\_ mm INSPECTION PORT: **None**

FLANGE ANSI: \_\_\_\_\_ FLG. FACE: \_\_\_\_\_ SIZE of INSPECTION PORT: \_\_\_\_\_ mm

VESSEL ORIENTATION: **Vertical** TYPE OF VESSEL SUPPORT: **Skirt** 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: \_\_\_\_\_

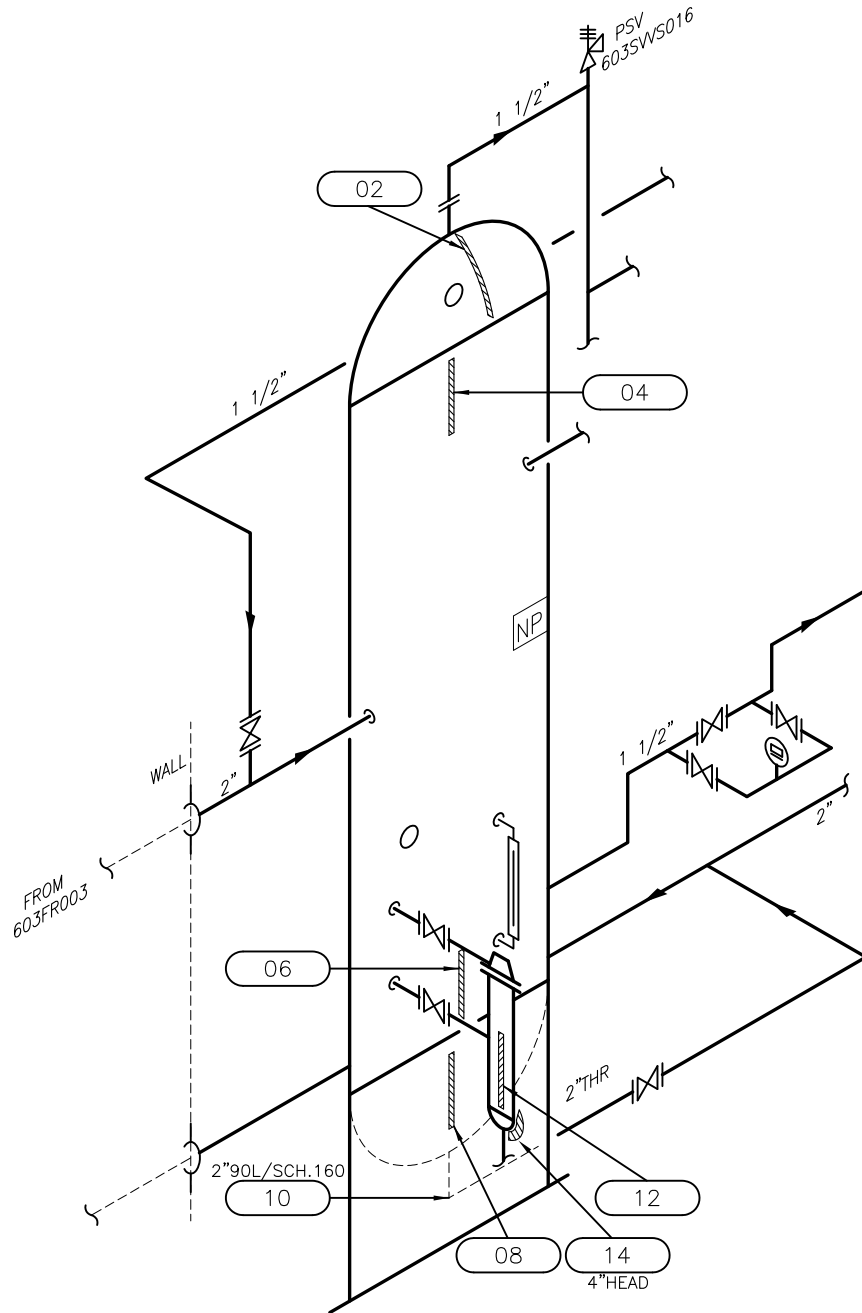
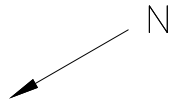
  

**PRESSURE RELIEF DATA**

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
<b>603SVFR003A</b>	<b>69</b>	kPa	<b>Coil</b>
<b>603SVVS016</b>	<b>1207</b>	kPa	<b>Shell</b>
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	

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



<input type="checkbox"/> Column <input type="checkbox"/> Cooler <input type="checkbox"/> Exchanger <input type="checkbox"/> Furnace <input type="checkbox"/> Heater <input type="checkbox"/> Plate Exchanger <input type="checkbox"/> Reboiler <input checked="" type="checkbox"/> Vessel <input type="checkbox"/> Other							Client:, District:, LSD:, Etc.:		
Description:		GLYCOL FLASH SEPARATOR					TAQA NORTH CHINCHAGA GAS PLANT C-032-H/094-H-08		
P.R.N. No.:		N/S		C.R.N.:	P6946.21				
Equipment No.:		OIP 603VS016	N.B. No.:						
Serial No.:		1899	Other:						
HEAD Material:		SA-516-70N	Nom.:	7.938mm	C.A.:	1.588mm			
HEAD Material:			Nom.:				Tech.: A.L.N.      Date: 10/2014 ITS Job No.: 1-2968(I)      DWG No.: 036		
SHELL Material:		SA-106-B	Nom.:	9.525mm	C.A.:	1.588mm			
SHELL Material:			Nom.:						
MAWP Shell Side:		1207 KPA	@Temp.:	93°C/-29°C					



## TAQA North

Unit: N-603

FACILITY:	CHINCHAGA GAS PLANT	MANUFACTURER:	THERMO DESIGN ENGINEER
LSD:	C-032-H/094-H-08	DESIGN PRESSURE:	1207 kPa / 175 psi
ITEM DESC.:	GLYCOL FLASH SEPARATOR	DESIGN TEMP.:	93 C / 199 F
EQUIP / OIP#:	603VS016		
PROV. REG. #:	N/S	VESSEL CORROSION ALLOWANCE:	1.59 mm.
SERIAL #:	1899		
CRN.:	P6946.21	TOTAL CAUTION / ACTION TML:	4

### Item # (036)

#### COMMENTS:

2014/10 - LIMITED SCANNING DUE TO HEAT.

- TML 10 - AS PER TAQA NORTH PRESSURE PIPING PROCEDURE THE MINIMUM WALL REQUIRED IS 2.54MM FOR A 2" COMPONENT WITH 150# FLANGE RATING FOR THE TUBE SIDE. BY WILL RETTMAN.

#### TML No.: 2 TOP HD T-B

DATE BUILT: 01/2001

AVERAGE THICKNESS MEASURED: 9.57 mm.

MATERIAL: SA51670N

MINIMUM THICKNESS MEASURED: 9.40 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-yyyy mm.	Action/Caution Required Item
				01/2001	04/2008	10/2014					
2.01	7.94	1.84	6.10	7.94	9.60	9.40	0.0305	0.0000	54.14	.	NO
2.02	7.94	1.84	6.10	7.94	9.70	9.80	0.0000	0.0000	100.00	.	NO
2.03	7.94	1.84	6.10	7.94	9.50	9.40	0.0152	0.0000	100.00	.	NO
2.04	7.94	1.84	6.10	7.94	9.60	9.40	0.0305	0.0000	54.14	.	NO
2.05	7.94	1.84	6.10	7.94	9.80	9.60	0.0305	0.0000	57.42	.	NO
2.06	7.94	1.84	6.10	7.94	9.80	9.80	0.0000	0.0000	100.00	.	NO

#### TML No.: 4 TOP SH T-B

DATE BUILT: 01/2001

AVERAGE THICKNESS MEASURED: 10.38 mm.

MATERIAL: SA106-B

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-yyyy mm.	Action/Caution Required Item
				01/2001	04/2008	10/2014					
4.01	9.53	2.78	6.75	9.53	10.50	10.40	0.0152	0.0000	100.00	.	NO
4.02	9.53	2.78	6.75	9.53	10.50	10.50	0.0000	0.0000	100.00	.	NO
4.03	9.53	2.78	6.75	9.53	10.40	10.50	0.0000	0.0000	100.00	.	NO
4.04	9.53	2.78	6.75	9.53	10.40	10.20	0.0305	0.0000	56.60	.	NO
4.05	9.53	2.78	6.75	9.53	10.60	10.60	0.0000	0.0000	100.00	.	NO
4.06	9.53	2.78	6.75	9.53	10.50	10.10	0.0610	0.0000	27.48	.	NO

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 &gt;= 0.500mm or 0.019in/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:	1207 kPa / 175 psi
ITEM DESC.:	GLYCOL FLASH SEPARATOR	DESIGN TEMP.:	93 C / 199 F
EQUIP / OIP#:	603VS016		
PROV. REG. #:	N/S	VESSEL CORROSION ALLOWANCE:	1.59 mm.
SERIAL #:	1899		
CRN.:	P6946.21	TOTAL CAUTION / ACTION TML:	4

### Item # (036)

#### COMMENTS:

2014/10 - LIMITED SCANNING DUE TO HEAT.

- TML 10 - AS PER TAQA NORTH PRESSURE PIPING PROCEDURE THE MINIMUM WALL REQUIRED IS 2.54MM FOR A 2" COMPONENT WITH 150# FLANGE RATING FOR THE TUBE SIDE. BY WILL RETTMAN.

#### TML No.: 6 BTM SH T-B

DATE BUILT: 01/2001

AVERAGE THICKNESS MEASURED: 10.48 mm.

MATERIAL: SA106-B

MINIMUM THICKNESS MEASURED: 10.00 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-yyyy mm.	Action/Caution Required Item
				01/2001	04/2008	10/2014					
6.01	9.53	2.78	6.75	9.53	10.30	10.00	0.0457	0.0000	35.54	.	NO
6.02	9.53	2.78	6.75	9.53	10.40	10.40	0.0000	0.0000	100.00	.	NO
6.03	9.53	2.78	6.75	9.53	10.50	10.50	0.0000	0.0000	100.00	.	NO
6.04	9.53	2.78	6.75	9.53	10.70	10.40	0.0457	0.0000	39.92	.	NO
6.05	9.53	2.78	6.75	9.53	10.90	10.80	0.0152	0.0000	100.00	.	NO
6.06	9.53	2.78	6.75	9.53	10.50	10.80	0.0000	0.0000	100.00	.	NO

#### TML No.: 8 BTM HD T-B

DATE BUILT: 01/2001

AVERAGE THICKNESS MEASURED: 9.28 mm.

MATERIAL: SA51670N

MINIMUM THICKNESS MEASURED: 9.10 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-yyyy mm.	Action/Caution Required Item
				01/2001	04/2008	10/2014					
8.01	7.94	1.84	6.10	7.94	9.40	9.40	0.0000	0.0000	100.00	.	NO
8.02	7.94	1.84	6.10	7.94	9.30	9.30	0.0000	0.0000	100.00	.	NO
8.03	7.94	1.84	6.10	7.94	9.50	9.20	0.0457	0.0000	33.90	.	NO
8.04	7.94	1.84	6.10	7.94	9.30	9.20	0.0152	0.0000	100.00	.	NO
8.05	7.94	1.84	6.10	7.94	9.40	9.10	0.0457	0.0000	32.81	.	NO
8.06	7.94	1.84	6.10	7.94	9.50	9.50	0.0000	0.0000	100.00	.	NO

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 &gt;= 0.500mm or 0.019in/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:	1207 kPa / 175 psi
ITEM DESC.:	GLYCOL FLASH SEPARATOR	DESIGN TEMP.:	93 C / 199 F
EQUIP / OIP#:	603VS016		
PROV. REG. #:	N/S	VESSEL CORROSION ALLOWANCE:	1.59 mm.
SERIAL #:	1899		
CRN.:	P6946.21	TOTAL CAUTION / ACTION TML:	4

### Item # (036)

#### COMMENTS:

2014/10 - LIMITED SCANNING DUE TO HEAT.

- TML 10 - AS PER TAQA NORTH PRESSURE PIPING PROCEDURE THE MINIMUM WALL REQUIRED IS 2.54MM FOR A 2" COMPONENT WITH 150# FLANGE RATING FOR THE TUBE SIDE. BY WILL RETTMAN.

#### TML No.: 10 2"90L T-B

DATE BUILT: 01/2001

AVERAGE THICKNESS MEASURED: 6.93 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 5.90 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-yyyy mm.	Action/Caution Required Item
				01/2001	04/2008	10/2014					
10.01	8.71	6.17	2.54	8.71	7.40	7.10	0.0457	0.1168	19.52	.	NO *
10.02	8.71	6.17	2.54	8.71	7.30	6.90	0.0610	0.1321	16.51	.	NO *
10.03	8.71	6.17	2.54	8.71	7.50	5.90	0.2464	0.2032	6.82	.	CAUTION *
10.04	8.71	6.17	2.54	8.71	7.50	7.10	0.0610	0.1168	19.52	.	NO *
10.05	8.71	6.17	2.54	8.71	7.60	7.20	0.0610	0.1092	21.34	.	NO *
10.06	8.71	6.17	2.54	8.71	7.60	7.40	0.0305	0.0940	25.86	.	NO *

#### TML No.: 12 4" BOTTLE T-B

DATE BUILT: 01/2001

AVERAGE THICKNESS MEASURED: 6.22 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 6.10 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-yyyy mm.	Action/Caution Required Item
				01/2001	04/2008	10/2014					
12.01	6.02	0.75	5.27	6.02	6.30	6.20	0.0152	0.0000	30.51	.	NO
12.02	6.02	0.75	5.27	6.02	6.30	6.20	0.0152	0.0000	30.51	.	NO
12.03	6.02	0.75	5.27	6.02	6.30	6.20	0.0152	0.0000	30.51	.	NO
12.04	6.02	0.75	5.27	6.02	6.20	6.10	0.0152	0.0000	27.23	.	NO *
12.05	6.02	0.75	5.27	6.02	6.50	6.40	0.0152	0.0000	37.08	.	NO
12.06	6.02	0.75	5.27	6.02	6.20	6.20	0.0000	0.0000	100.00	.	NO

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 &gt;= 0.500mm or 0.019in/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:	1207 kPa / 175 psi
ITEM DESC.:	GLYCOL FLASH SEPARATOR	DESIGN TEMP.:	93 C / 199 F
EQUIP / OIP#:	603VS016		
PROV. REG. #:	N/S	VESSEL CORROSION ALLOWANCE:	1.59 mm.
SERIAL #:	1899		
CRN.:	P6946.21	TOTAL CAUTION / ACTION TML:	4

### Item # (036)

#### COMMENTS:

2014/10 - LIMITED SCANNING DUE TO HEAT.

- TML 10 - AS PER TAQA NORTH PRESSURE PIPING PROCEDURE THE MINIMUM WALL REQUIRED IS 2.54MM FOR A 2" COMPONENT WITH 150# FLANGE RATING FOR THE TUBE SIDE. BY WILL RETTMAN.

**TML No.: 14 4"HEAD N-S**

DATE BUILT: 01/2001

AVERAGE THICKNESS MEASURED: 6.03 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 5.50 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-yyyymm.	Action/Caution Required Item
				<b>01/2001</b>	<b>04/2008</b>	<b>10/2014</b>					
14.01	6.02	0.75	5.27	6.02	6.90	6.50	0.0610	0.0000	10.09	.	CAUTION *
14.02	6.02	0.75	5.27	6.02	6.60	5.50	0.1676	0.0381	0.69	.	CAUTION *
14.03	6.02	0.75	5.27	6.02	6.30	5.50	0.1219	0.0381	0.95	.	CAUTION *
14.04	6.02	0.75	5.27	6.02	6.60	6.60	0.0000	0.0000	100.00	.	NO

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 or 0.019in/yr.).

Calculated T-Min. Thickness - Using UPipe Mathematics.

## EQUIPMENT EXTERNAL INSPECTION REPORT

<b>Customer:</b>	TAQA North	<b>ITS Job No.:</b>	1-2968
<b>District:</b>	North Area	<b>Date:</b>	18-Oct-2014
<b>Facility:</b>	Chinchaga Gas Plant	<b>LSD:</b>	C-032-H/094-H-08
<b>Equip. Description:</b>	Glycol Flash Separator	<b>Serial No.:</b>	1899
<b>Equip./OIP No.:</b>	603VS016	<b>PRN:</b>	Not Applicable
<b>Equip. Type:</b> <input type="checkbox"/> Column <input type="checkbox"/> Cooler <input type="checkbox"/> Exchanger <input type="checkbox"/> Furnace <input type="checkbox"/> Heater <input type="checkbox"/> Plate Exchanger <input type="checkbox"/> Reboiler <input checked="" type="checkbox"/> Vessel <input type="checkbox"/> Other:			

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

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

External Surface	Supports	Associated Piping	PRD 1	PRD 2
<input checked="" type="checkbox"/> Good Condition	<input checked="" type="checkbox"/> Good Condition	<input checked="" type="checkbox"/> Good Condition	Location: Outlet piping	Location: Above reboiler 603FR003A
<input checked="" type="checkbox"/> Painted <input checked="" type="checkbox"/> Full <input type="checkbox"/> Part.	<input checked="" type="checkbox"/> Anchor Bolts Secure	<input type="checkbox"/> Corrosion	PSV Tag No.: 603SVVS016	PSV Tag No.: 603SVFR003A
<input type="checkbox"/> Coated <input type="checkbox"/> Full <input type="checkbox"/> Part.	<input type="checkbox"/> Welded to Skid	<input type="checkbox"/> Pitting: (max depth)	<input checked="" type="checkbox"/> Service Date within Interval	<input checked="" type="checkbox"/> Service Date within Interval
<input type="checkbox"/> Insulated <input type="checkbox"/> Full <input type="checkbox"/> Part.	<input type="checkbox"/> Supported by Nozzle(s)	<input type="checkbox"/> Bolts Missing/ Loose/ Damaged	<input checked="" type="checkbox"/> Set Pressure within MAWP	<input checked="" type="checkbox"/> Set Pressure within MAWP
<input type="checkbox"/> Insulation Damaged	<input type="checkbox"/> Piping Supported	<input type="checkbox"/> Short Threaded	<input checked="" type="checkbox"/> Safety Seal Intact	<input checked="" type="checkbox"/> Safety Seal Intact
<input type="checkbox"/> Penetration Seals Broken	<input type="checkbox"/> Expansion Slots	<input type="checkbox"/> Valves leaking	<input checked="" type="checkbox"/> Service Seal Intact	<input checked="" type="checkbox"/> Service Seal Intact
<input type="checkbox"/> Corrosion Under Insulation (CUI)	<input type="checkbox"/> Bolts Missing/ Loose/ Damaged	<input type="checkbox"/> Connections Leaking	<input checked="" type="checkbox"/> Current Service Tag Attached	<input checked="" type="checkbox"/> Current Service Tag Attached
<input type="checkbox"/> Visible Moisture Contamination	<input type="checkbox"/> Short Threaded	<input checked="" type="checkbox"/> Piping and Valves Supported	<input type="checkbox"/> PSV inlet Gusseted	<input type="checkbox"/> PSV inlet Gusseted
<input type="checkbox"/> Paint Deterioration	<input type="checkbox"/> Deflected/Distorted	<input type="checkbox"/> Piping Deflected/ Distorted	<input type="checkbox"/> Inlet Block Valve	<input type="checkbox"/> Inlet Block Valve
<input type="checkbox"/> Coating Deterioration	<input type="checkbox"/> Poor Insulation	<input type="checkbox"/> No Access Insulated	Locked Open <input type="checkbox"/> Y <input type="checkbox"/> N	Locked Open <input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> Fireproofing Cracked	<input type="checkbox"/> Fire Proofing Cracked	<input type="checkbox"/> See Comments	Sealed Open <input type="checkbox"/> Y <input type="checkbox"/> N	Sealed Open <input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> External Protection Only	<input checked="" type="checkbox"/> Vessel is level		<input type="checkbox"/> Outlet Block Valve	<input type="checkbox"/> Outlet Block Valve
<input type="checkbox"/> See Comments	<input type="checkbox"/> See Comments		Locked Open <input type="checkbox"/> Y <input type="checkbox"/> N	Locked Open <input type="checkbox"/> Y <input type="checkbox"/> N
			Sealed Open <input type="checkbox"/> Y <input type="checkbox"/> N	Sealed Open <input type="checkbox"/> Y <input type="checkbox"/> N
			<input checked="" type="checkbox"/> See Comments	<input checked="" type="checkbox"/> See Comments

**Observations:**
**Equipment in ☒ Good, ☐ Fair, or ☐ 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)

No access to PSV due to height. PSV information was taken from TAQA records.  
The coil side is protected by the reboiler PSV.

**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
--	----	--------	-------------------------------------	----	--------	-------------------------------------	----------------	--------

External Inspection Performed By:

Print Name:

Murray Angus MacGregor

Certification No.:

ABSA IPV PESL: 000622

API 510: 40801

API 653: 48515

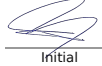
PEI Class 2: 158

CWB Level 2: 8501

Signature:



Report Reviewed:

  
Initial

Chief Inspector /  
Client  
Representative:

Name (Print)

Signature

Date: