

C97-7953-D576-4

CERT. FAB : - BF
DATE CERT. : - 2-5-98
CHK'D. BY : -
DATE : 22-Jan-1998
INPUT BY : bobv

GLITSCH

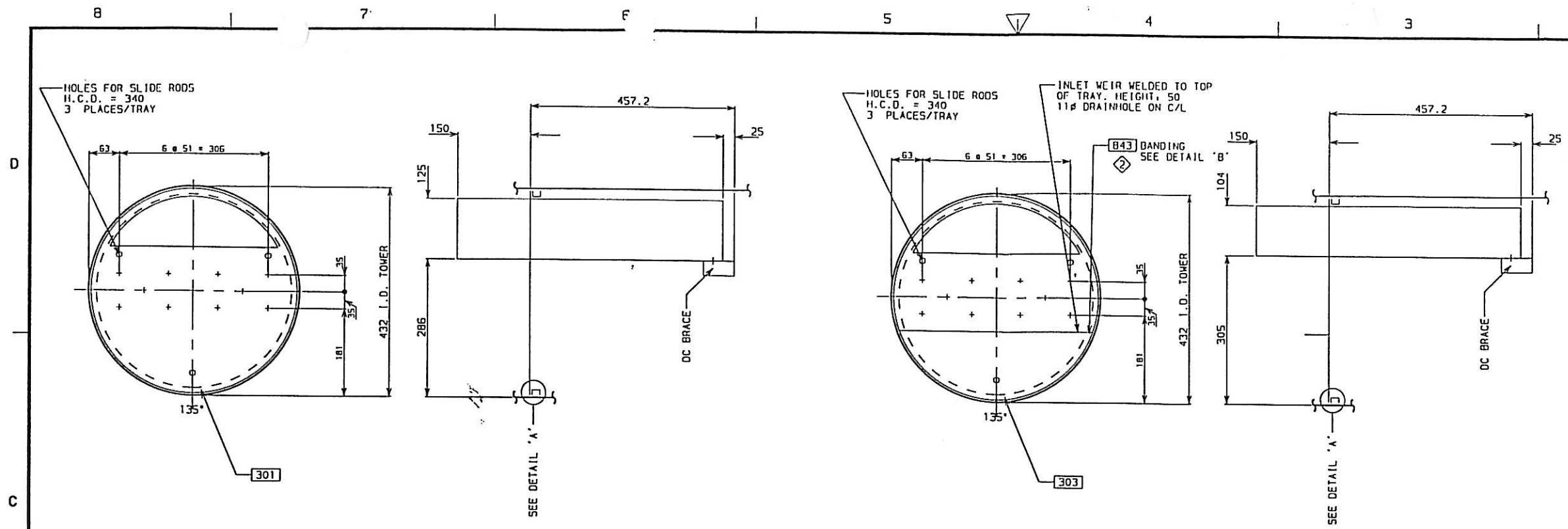


ORDER NO: 5320
JOB NO: 17-7953-TDE-12
DRAWING NO: C97-7953-D576

NO.	DESCRIPTION OF REVISION	CHANGED BY / DATE	SHIPPING INSTRUCTION
①	REV'D LGTH'S OF 805 & 806, ADDED 842, REV'D QTY V-1'S	B08V 02/09/98	
②			
③			
④			
⑤			
⑥			

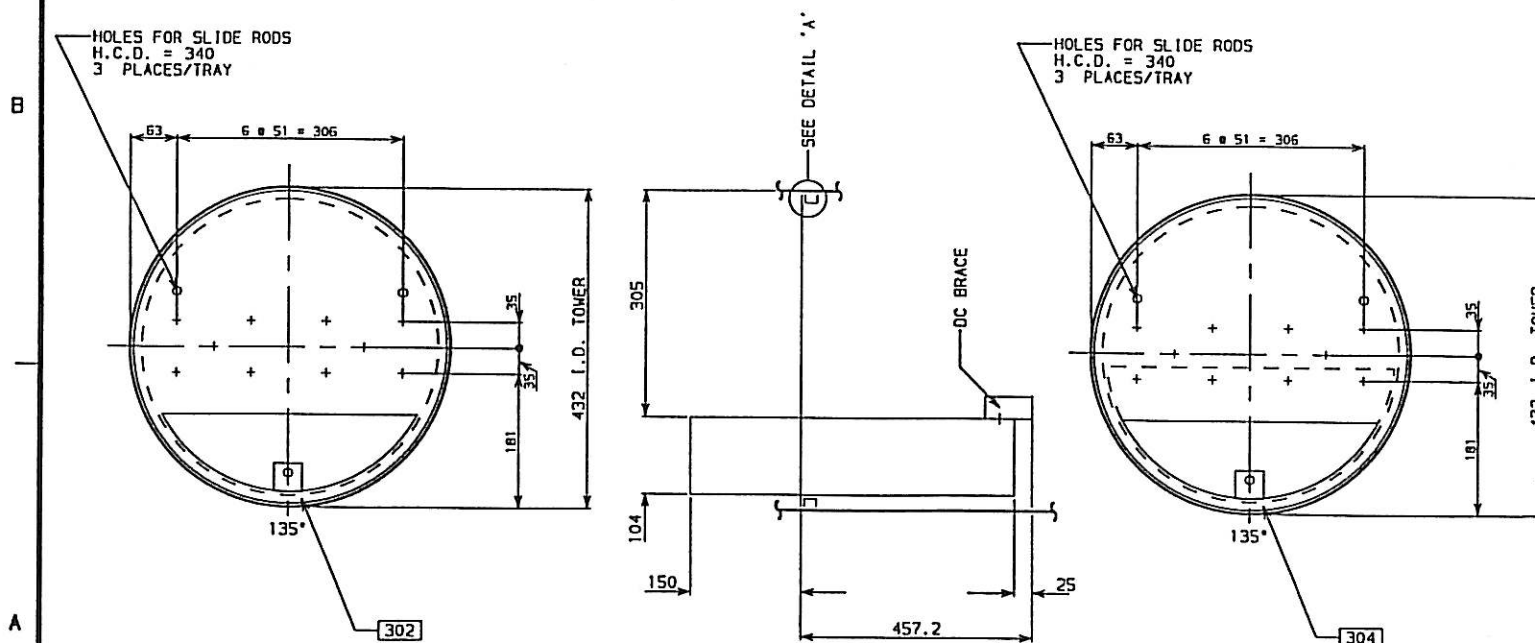
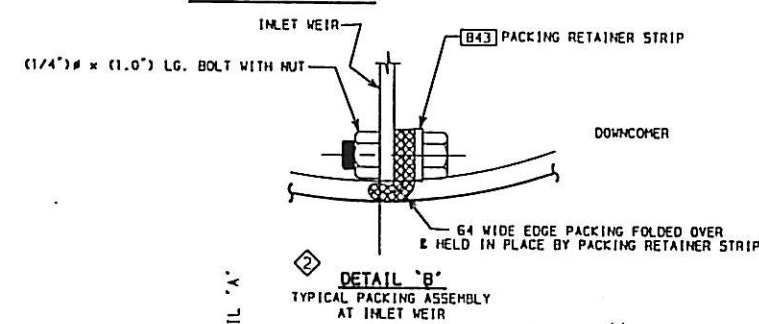
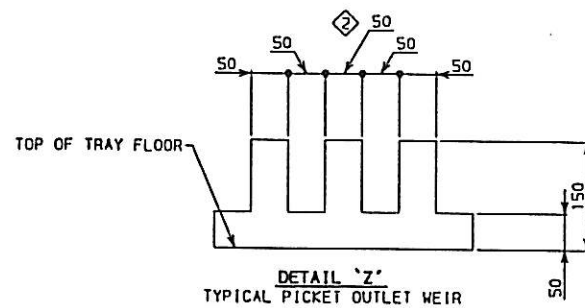
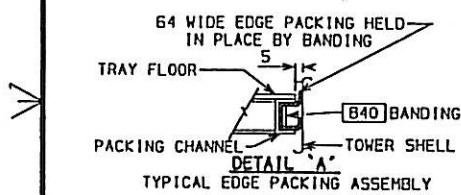
PARTS LIST

[illegible]

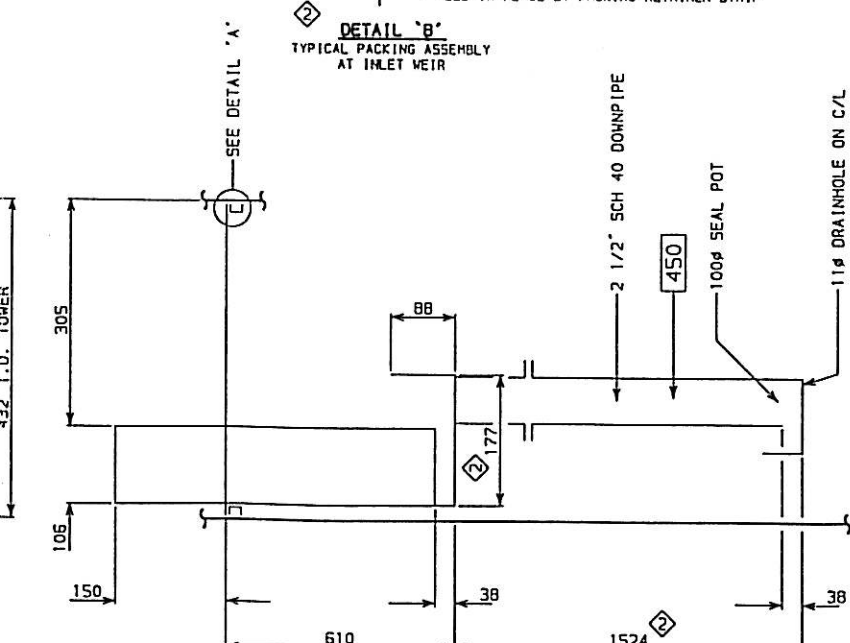


PLAN & SECTION VIEW
ODD TRAYS # 3-17

PLAN & SECTION VIEW
TRAY # 1



PLAN & SECTION VIEW
EVEN TRAYS # 2-16



PLAN & SECTION VIEW
TRAY # 18

GENERAL NOTES & INFORMATION

1. TRAYS TO BE INSTALLED OR REMOVED WITH MEN WORKING ON VESSEL FLANGED JOINTS.
2. TRAYS ARE NUMBERED FROM TOP TO BOTTOM.
3. ALL THREADED PARTS WILL BE AMERICAN STANDARD UNIFIED NATIONAL COARSE THREAD SERIES.
4. GLITSCH TO FURNISH THE FOLLOWING SPARES:
BOLTING 5 X
HARDWARE 5 X
PART NOS. ARE SHOWN THIS NO.
5. ALL GAUGE MATERIAL IS PURCHASED TO THE MANUFACTURER'S STANDARD GAUGE.
6. DIMENSIONS ARE GIVEN IN MILLIMETERS.
7. TRAYS ARE TO BE ASSEMBLED INTO BUNDLES IN GLITSCH SHOP PRIOR TO SHIPPING.
8. TO ENSURE THE BEST OPERATION IT IS RECOMMENDED THAT THESE TRAYS BE INSTALLED WITH THE TOWER IN THE UPRIGHT POSITION.

- VESSEL FABRICATORS NOTES:
- A. OUT OF ROUNDNESS NOT TO EXCEED PLUS OR MINUS 3 ON DIAMETER.
 - B. ALL LONGITUDINAL AND GIRTH SEAM WELDS ARE TO BE GROUND FLUSH ON INSIDE OF VESSEL WHERE TRAYS MUST PASS DURING INSTALLATION.
 - C. ALL NOZZLE CONNECTIONS ARE TO BE FLUSH WITH INSIDE OF VESSEL SHELL WHERE TRAY EDGES MUST PASS DURING INSTALLATION.
 - D. ALL FLANGED CONNECTIONS ON TOWER SHELL MUST BE CHECKED AFTER WELDING TO SEE THAT SHRINKAGE HAS NOT MADE THE INSTALLATION OF THE TRAYS IMPOSSIBLE. (3 mm ON DIAMETER MAX.)
 - E. IF VESSEL IS FABRICATED FROM PIPE THE WALL THICKNESS MUST NOT BE LESS THAN 87.5X OF NOMINAL THICKNESS.
 - F. REMOVE ALL WELD SPLATTER FROM SHELL ON INSIDE OF TOWER.

LIST OF MATERIAL		
DESCRIPTION	GAUGE	MATERIAL ANALYSIS
TRAY FLOORS	10 GA.	C.S.
PACKING CHANNELS	14 GA.	1-4105
DOWNCOMERS	10 GA.	C.S.
WEIRS (INLET)	10 GA.	C.S.
WEIRS (OUTLET)	10 GA.	C.S.
BANDING	14 GA.	1-4105
SEAL PAN	10 GA.	C.S.
SPACERS	0.50	C.S.
ANGLE SPACERS	1/4"	C.S.
LIFTING LUGS	1/4"	C.S.
SLIDE RODS	1/2"	C.S.
SUPPORT LUGS		C.S.
O.C. BRACES	10 GA.	C.S.
EDGE PACKING	1/8"	TEFLON IMPREGNATED THERMOGLASS

TRAY WASHERS	14 & 12 GA.	C.S.
BOLTS	1/4" & 3/8"	C.S.
NUTS (REMOVABLE)	1/4" & 3/8" & 1/2"	C.S.
NUTS (WELDED)	3/8" & 1/2"	C.S.

FOOTRESTS	3/8"	BY OTHERS
WELD ROD (TRAY PARTS)		F-308L

UNIT	TYPE	QUAN.	TRAY	STOCK NO.	GAUGE	MATERIAL
V-1		11		1916	1.52	1-410

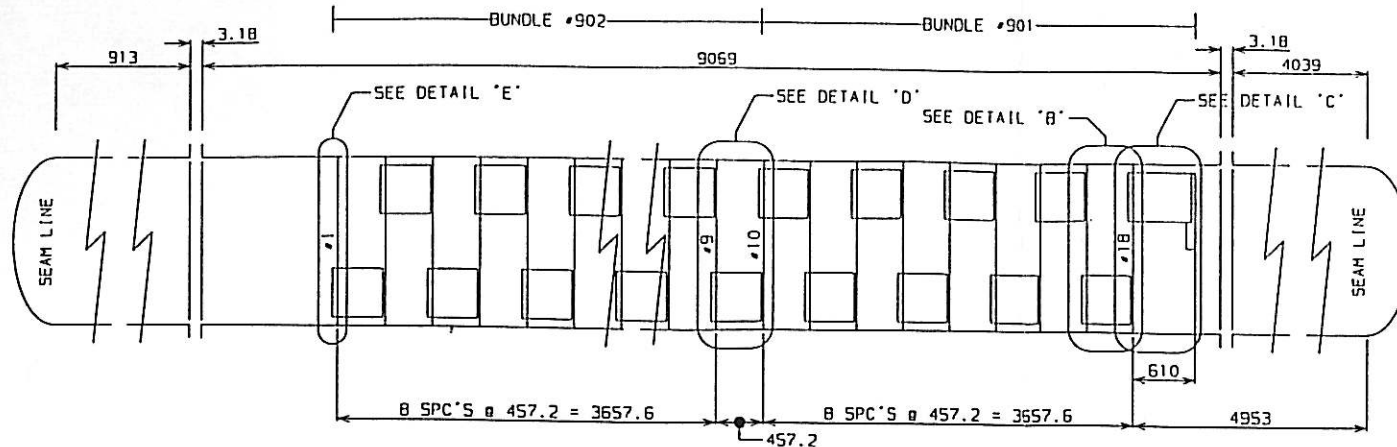
TRAY DESIGN DATA		BALLAST UNIT SYMBOLS	
ITEM	SIDE DOWNCOMER	V-1 UNITS ARE SHOWN THUS: +	
D.C. AREA (TOP)	0.27	0.025	
NET OUTLET WEIR	7.87"	200	

EQUIPMENT DESCRIPTION (FURNISHED BY GLITSCH)			
QUAN.	ITEM	DESCRIPTION	REMARKS
18		CARTRIDGE TRAYS	AS SHOWN

DESCRIPTION OF REVISION		CHG. BY/DATE
REV'D DOWNCOMER SIZE, ADDED ORIENTATION		BOBV 02/04/98
ADDED DETAIL 'B', REV'D NOTE, REV'D DIM'S PER DETAILING		BOBV 02/09/98
REV'D LENGTH OF DOWNPIPE (FURNAS 1524) PER CUST. MARKED PRINT DATED FEB 12/98		BOBV 02/16/98

CUSTOMER'S IDENTIFICATION	
PURCHASED BY:	THERMO DESIGN ENGINEERING LTD.
SPEC. NUMBER:	
ULTIMATE USER:	CHAUVOO RESOURCES
REFINERY SITE:	
UNIT NAME:	REFRIGERATION PLANT
VESSEL NAME:	STABILIZER
REFERENCE:	VESSEL NUMBER:
GLITSCH JOB NO. 17-7953-TDE-12/5320	GLITSCH ORDER NO.:

GLITSCH CANADA LTD.	
DRAWN	bobv
CHECK	
PROCESS	
ISSUE	REV
CERT	REV
APVD FOR MFG	
TITLE	CARTRIDGE BALLAST CRT-901
TOWER ID	432(17.00')
PRODUCT CODE	
DWG. NO.	C97-7953-D576
SCALE	1:5
SHT	1 OF 5 SHEETS

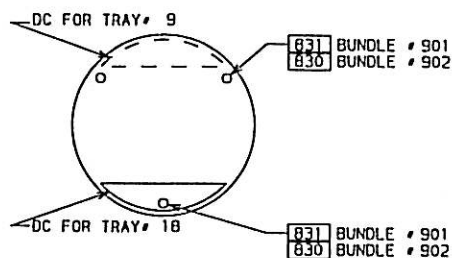


ELEVATION AND ASSEMBLY SCHEMATIC

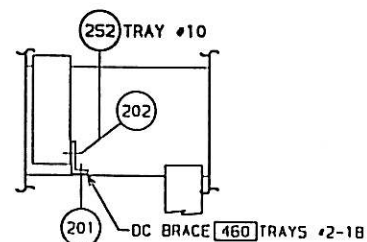
SPACERS USED PER TRAY

SPACERS USED ABOVE TRAY #		SPACER #1		SPACER #2	
QTY	PART #	QTY	PART #	QTY	PART #
3	809				

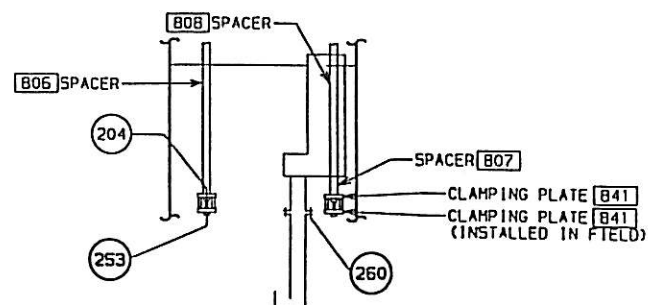
SEE DETAILS BELOW FOR SPACERS USED ABOVE & BELOW BUNDLES



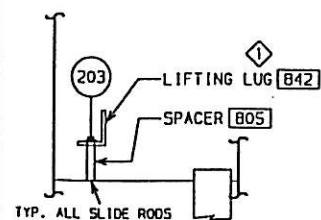
DETAIL "A"
SLIDE RODS USED IN BUNDLES



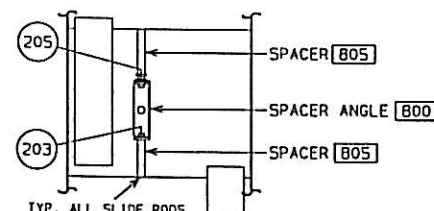
DETAIL "B"
TYP. CONNECTION BETWEEN TRAYS



DETAIL "C"
S/R TERMINATION BELOW BUNDLE # 901



DETAIL "E"
S/R TERMINATION ABOVE BUNDLE # 902

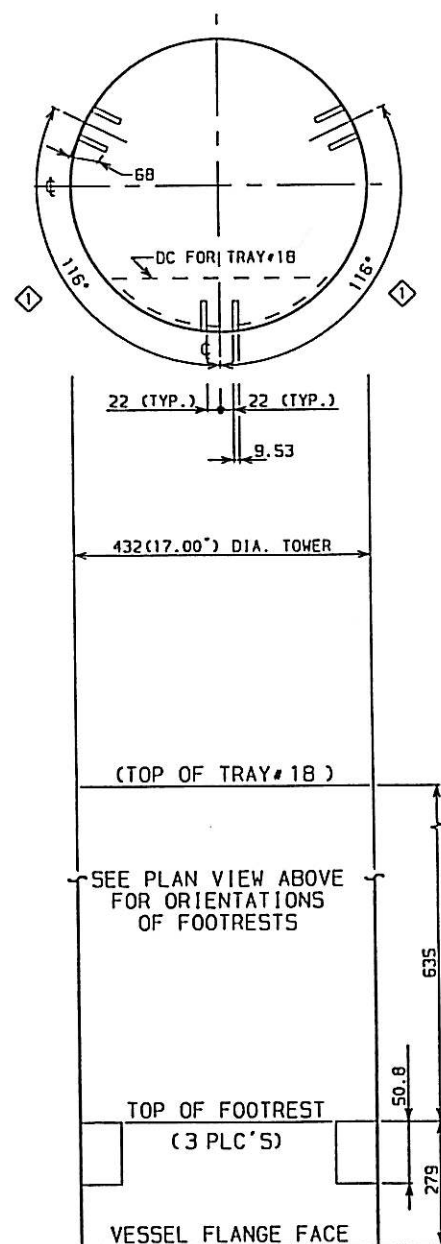


DETAIL "D"
CONNECTION BETWEEN
BUNDLE # 901 AND BUNDLE # 902

HARDWARE ASSEMBLY CHART	
ASSY#	HARDWARE REQUIRED
201	3/8" DIA X 1" BOLT 3/8" TRAY WASHER 3/8" REMOVABLE NUT
202	3/8" DIA X 1" BOLT 3/8" TRAY WASHER 3/8" NUT (WELDED)
203	1/2" REMOVABLE NUT 1/2" TRAY WASHER
204	1/2" REMOVABLE NUT
205	1/2" NUT & WELDED WASHERS
ASSEMBLIES LISTED ABOVE ARE ASSEMBLED IN GLITSCH SHOP	
ASSEMBLIES LISTED BELOW REQUIRE FIELD ASSEMBLY	
252	3/8" DIA X 1" BOLT 3/8" TRAY WASHER 3/8" NUT (WELDED)
253	1/2" REMOVABLE NUT 1/2" TRAY WASHER
260	3/8" DIA X 1" BOLT 3/8" TRAY WASHER 3/8" NUT (WELDED)

DESCRIPTION OF REVISION		CHK BY/DATE
ADDED LIFTING LUG (842) TO DETAIL "E"		BOBV 02/09/98
CUSTOMER'S IDENTIFICATION		
PURCHASED BY: THERMO DESIGN ENGINEERING LTD.		
SPEC. NUMBER:		
ULTIMATE USER: CHAUVED RESOURCES		
REFINERY SITE:		
UNIT NAME: REFRIGERATION PLANT		
VESSEL NAME: STABILIZER		VESSEL NUMBER:
REFERENCE:		
GLITSCH JOB NO. 17-7953-TDE-12/5320		
GLITSCH TOWER INTERNALS AND OTHER EQUIPMENT CREATED BY GLITSCH ARE COVERED BY U.S. AND FOREIGN PATENTS AND OTHER U.S. AND FOREIGN PATENT PENDING. THE INFORMATION OR DATA CONTAINED HEREIN IS PROPRIETARY TO GLITSCH, INC. AND IS NOT TO BE COPIED, REPRODUCED, DISCLOSED, OR DISCLOSED TO OTHERS, IN WHOLE OR IN PART, WITHOUT THE WRITTEN CONSENT OF GLITSCH, INC.		
GLITSCH CANADA LTD.		
DRAWN	bobv	
CHECK		
PROCESS		
ISSUE	REV	TOWER ID 432(17.00')
CERT	REV	PRODUCT CODE
APVD FOR MFG	REV	DWG. NO. C97-7953-D576
SCALE	NONE	SHT 2 OF 5 SHEETS

WED FEB 4 1998 - 14:56 - BOBY



NOTE:
ALL PARTS SHOWN ARE FURN. NEW BY OTHERS.

INSTALLATION NOTES FOR TOWER ATTACHMENTS
1. TOWER ATTACHMENTS ARE TO BE WELDED SECURELY TO TOWER SHELL.

NO.	DESCRIPTION OF REVISION	DATE BY/DATE
1	REV'D LOCATION OF SUPPORT BARS	BOBY 02/04/98

CUSTOMER'S IDENTIFICATION	
PURCHASED BY: THERMO DESIGN ENGINEERING LTD.	
SPEC. NUMBER:	
ULTIMATE USER: CHAUVOO RESOURCES	
REFINERY SITE:	
UNIT NAME: REFRIGERATION PLANT	
VESSEL NAME: STABILIZER	VESSEL NUMBER:
REFERENCE:	
GLITSCH JOB NO: 17-7953-TDE-12/5320	
GLITSCH TOWER ATTACHMENTS AND OTHER EQUIPMENT CREATED BY GLITSCH ARE COVERED BY U.S. AND FOREIGN PATENTS AND OTHER U.S. AND FOREIGN PATENTS PENDING. THE INFORMATION OR DATA CONTAINED HEREIN IS PROPRIETARY TO GLITSCH, INC. AND IS NOT TO BE COPIED, REPRODUCED, DUPLICATED, OR REREPRODUCED IN ANY MANNER, IN WHOLE OR IN PART, WITHOUT THE PRIOR WRITTEN CONSENT OF GLITSCH, INC.	

DRAWN		TITLE	
bobv		TOWER ATTACHMENTS	
CHECK			
PROCESS			
ISSUE	REV	TOWER ID 432 (17.00')	PRODUCT CODE
CERT BY	REV	DWG. NO: 97-7953-D576	REV
2-5-98		SCALE	NONE
REV		SHT	3 OF 5 SHEETS
2-10-98			

C97-79--D576-5

CERT. FAB : B.F.
DATE CERT. : 2-5-98
CHK'D. BY : -
DATE : 22-Jan-1998
INPUT BY : bobv

NO.	DESCRIPTION OF REVISION	CHANGED BY / DATE	SHIPPING INSTRUCTION
①	REV'D MAT'L NAME FOR EDGE PACKING	BOBV 02/11/98	
②			
③			
④			
⑤			

HARDWARE LIST														
PART NO.	DESCRIPTION	MAT'L.	THK. (GA.)	TOTALS			BUNDLE #901	BUNDLE #902						
				GROSS	SPARES	NET								
	ITEMS LISTED BELOW TO	BE ASSEMBLED	IN GL	TSCH	SHOP									
	1/4" NUT (REMOVABLE)	C.S.		18		18	9	9						
	1/4" DIA. X 1" BOLT	C.S.		18		18	9	9						
	3/8" NUT (REMOVABLE)	C.S.		16		16	8	8						
	3/8" DIA. X 1" BOLT	C.S.		32		32	16	16						
	3/8" TRAY WASHER	C.S.	10 GA.	32		32	16	16						
	1/2" NUT (REMOVABLE)	C.S.		9		6	3	3						
	1/2" TRAY WASHER	C.S.	10 GA.	6		9	6	3						
	2 1/2" EDGE PACKING	TEFLON IMPREGNATED THERMOGLASS	3.18	27.2		27.2	13.6	13.6				LIN.M.		
	ITEMS LISTED BELOW TO	BE SHIPPED LOOSE AND INSTALLED BY												
	3/8" DIA. X 1" BOLT	C.S.		6	1	5	4	1						
	3/8" TRAY WASHER	C.S.	10 GA.	6	1	5	4	1						
	1/2" NUT (REMOVABLE)	C.S.		7	1	6	3	3						
	1/2" TRAY WASHER	C.S.	10 GA.	7	1	6	3	3						
	ITEMS LISTED BELOW TO	BE WELDED AND INSTALLED IN	GLITSCH	SHOP										
	1/2" NUT WELDED BETWEEN	C.S.		3		3	-	3						
	TWO 1/2" TRAY WASHERS	C.S.	10 GA.	6		6	-	6						
	3/8" NUT (WELDED)	C.S.		21		21	12	9						



TO: THERMO DESIGN ENGINEERING LTD
BOX 5557 STATION L
EDMONTON ALTA
T6C 4E9

Account # 19971

Date: 98/03/18
Journal # 18764

Attn: JASON HARGREAVES
Re: THERMO DESIGN ENGINEERING LTD

DESIGN REGISTRATION

C.R.N.



Drawings / Documents	Description			
		MDMT	MAWT	MAWP
FEED/BTMS EXCHANGER 9097-0850-214 REV 1 REGISTERED	Shellside	-20 F	250 F	245 psi
	Tubeside	-20 F	250 F	245 psi
	Heat transfer area = 41 sq. ft.			
	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 \$ 174.00

CRN issued in accordance with the ACI Policies on Reciprocal Recognition of Design Review for Registration, Alberta issued CRN L0310.2 on Feb. 26, 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) 660-6254
Facsimile: (604) 775-2345

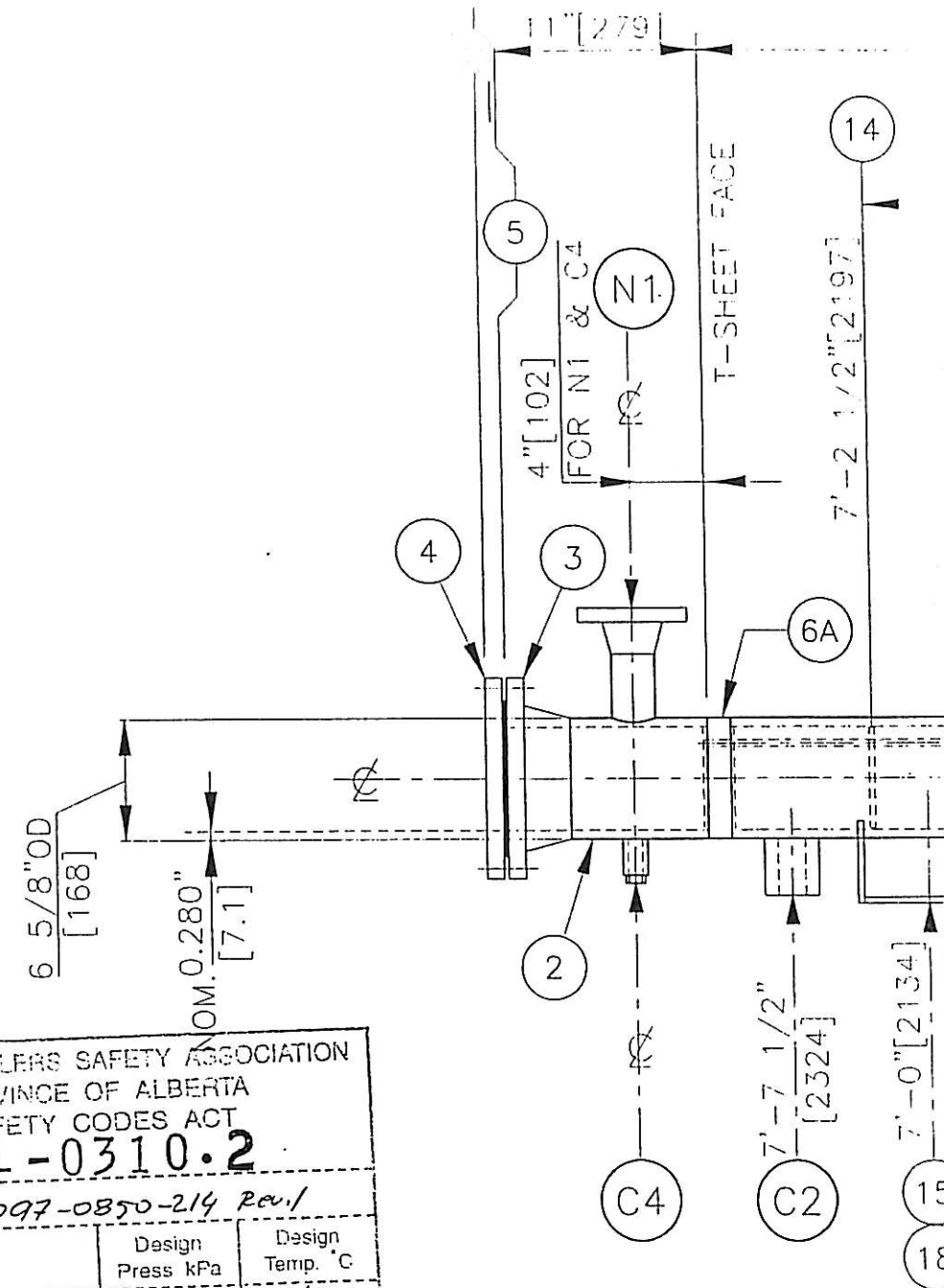
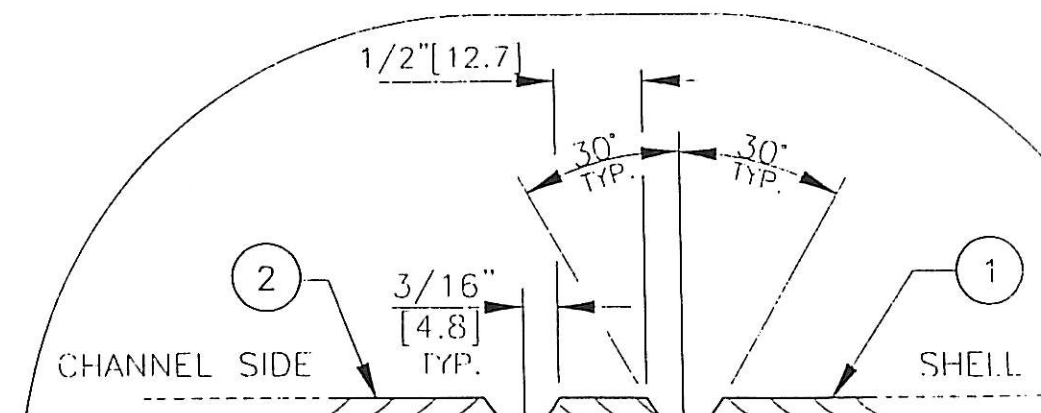
ALBERTA BOILERS SAFETY ASSOCIATION
 PROVINCE OF ALBERTA
 SAFETY CODES ACT

REG. No. **L-0310.2**

DWG. No. **9097-0850-214 Rev.1**

	Design Press kPa	Design Temp. °C
SHELL & TUBE SIDE	168.9	29/121

ACCEPTED
 FEB 26 1998
 Date Signed *[Signature]*
 DUORDE CHNIC
 DESIGN SURVEY ENGINEER



ALBERTA BOILERS SAFETY ASSOCIATION
PROVINCE OF ALBERTA
SAFETY CODES ACT

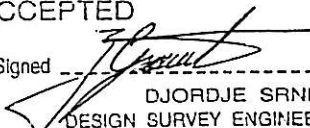
REG. No. **L-0311.2**

DWG. No. **9097-0850-215 SHR. 1 & 2 Rev. 0**

Design Press kPa	Design Temp. °C
1689	29/121

ACCEPTED

FEB 10 1998
Date

Signed 
DJORDJE SRNIC
DESIGN SURVEY ENGINEER



NOZZLE SCHE						
MARK	SIZE	QTY	TYPE	RATING	SCH	
N1	6" 150		RFWN	150#	40	C
N2	2" 50	1	RFWN	150#	80	C
N3	2" 50	1	RFWN	150#	160	C
N4	2" 50	1	RFWN	150#	160	C
C1	1 1/2" 40	1	CPLG	6000#		
C2	1 1/2" 40	1	CPLG	6000#	160	C
C3 A/B	1 1/2" 40	2	CPLG	6000#		C
C4 A/B	1" 25	2	LONG CPLG	6000#		C
C5 A/B	3/4" 20	2	LONG CPLG	6000#		C
C6	3/4" 20	1	LONG CPLG	6000#		C
C7	3/4" 20	1	LONG CPLG	6000#		C
C8	1 1/2" 40	1	CPLG	6000#		C
C9	1 1/2" 40	1	CPLG	6000#		C

GENERAL NOTES:

- DESIGN & CONSTRUCTION IN ACCORDANCE WITH
- DESIGN PRESSURE: 245 PSIG @ 250°F [168
- HYDROSTATIC TEST: 367.5 PSIG [2534 kPa]
- CORROSION ALLOWANCE: 1/16" [1.59 mm]
- POST WELD HEAT TREATMENT: NONE
- RADIOGRAPHY: SPOT; UW-11(j)(5)(b).
- MINIMUM DESIGN METAL TEMPERATURE: -20
- (MID): EXEMPT PER UG 20(f).
- USE "IDL" WPS# 3612 (IDL 1, IDL 3, IDL

DWG Name: T:\PROJECT\ALBERTA\CTC\VESSEL\V-710AR0.DWG Updated By: Darius



TAQA NORTH DATA				
EQUIP NO.: 603VT002	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 : CONDENSATE STABILIZER TOWER		CLASS : VT	TYPE: TOWER	
SERVICE: ☒ Sweet ☐ Sour	H2S: PPM	FLUID: CONDENSATE/GLYCOL	S/D REQT.: ☐ Yes ☐ No ☐ Partial	
OPERATING PRESSURE: N/A ☐ kPa ☐ PSI		OPERATING TEMPERATURE: 21 ☒ °C ☐ °F		
OPERATING STATUS: ☒ IN SERVICE ☐ Not In Service		M/WAY(16"AND ABOVE): ☐ Yes ☒ No SIZE: 6"		

MANUFACTURING DATA				
MFG.: THERMO DESIGN	DWG. NO.: 9097-0850-215	SERIAL NO.: 1629	YR. BUILT: 1998	STAMP: U,W
CRN: L0311.21	CODE/DIV.: ASME VIII DIV 1	PARA.: N/A	SUPPORT: ☒ Skirt ☐ Saddles ☐ Nozzles	
MAWP: 1689 ☒ kPa ☐ PSI	@ TEMP: 121 ☒ °C ☐ °F	MDMT: -29 ☒ °C ☐ °F	VOLUME: 74 ☐ M³ ☒ FT³	
FLANGE RATING: 150#	PWHT: ☐ Yes ☒ No ☐ N/A	RADIOGRAPHY: ☐ RT1 ☒ RT2 ☐ RT3 ☐ RT4	☐ Spot ☐ Full ☐ N/A	
SIZE : 457 ☒ mm. ☐ inch.	☐ ID ☒ OD	LENGTH: N/A ☐ mm. ☐ inch.	HEIGHT: 14021 ☒ mm ☐ inch.	
INSULATION TYPE: ☐ Fiberglass ☒ Wool ☐ Low Temp ☐ Asbestos Other:			INSULATION THK: 40 ☒ mm ☐ inch.	
SECTION	MATERIAL	NOMINAL mm	C.A. mm	
SHELL	SA-106-B	9.5 MM / 12.7 MM	1.6 MM	
HEAD	SA-516-70N	8.6 MM / 11.9 MM	1.6 MM	
COMMENTS:				

TUBING DATA				
MAWP: N/A ☐ kPa ☐ PSI	@ TEMP: N/A ☐ °C ☐ °F	TEMA CLASS: N/A	TYPE: N/A	
TUBE SIZE: PRD 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:	STAINLESS STEEL	N/A	N/A

PRESSURE RELIEF DEVICES DATA		☐ PSV not located	☐ No PSV
EQUIP. NO.	TAG NO.	SET	CAPACITY
603SVVT002	N/A	1689 ☒ kPa ☐ PSI	824
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, PG. 1 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 Vertical #1629 L-0311.21 9097-0850-215/Rev.1 1998
(Horiz. or vert. tank) (Mfg's serial No.) (CRN) (Drawing no.) (Nat'l Bd. No.) (Year built)
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

to 1996
Addenda (Date) Code Case Nos. Special Service per UG 120(d)
i. Shell: SA-106-B .375/5 0.0625" 17.25/17" ID 46'-0" S/S
Mat'l. (Spec. No., Grade) Nom. Thk. (in.) Corr. Allow. (in.) Diam. I.D. (ft. & in.) Length (overall) (ft. & in.)

Seams: Sml's Pipe N/A 100 N/A N/A Sgl"V" CS:Spot 3
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

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)	Top	0.340"	0.0625"			2:1				Concave
(b)	Bottom	0.470"	0.0625"			2:1				Concave

If removable, bolts used (describe other fastenings)

N/A

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

3. MAWP 245 psi at max. temp. 250 ° F
Min. design metal temp. -20 ° F at 245 psi. Hydro., pneu., or comb. test pressure 367.5 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	6"	RFWN	SA-333-6	150#Sch.40	N/A	UW-16.1(c)	Shell
N2	1	2"	RFWN	SA-106-B	150#Sch.80	N/A	UW-16.1(c)	Head
N3	1	2"	RFWN	SA-106-B	150#Sch.160	N/A	UW-16.1(c)	Shell
N4	1	2"	RFWN	SA-106-B	150#Sch.160	N/A	UW-16.1(c)	Shell

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

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)

18"OD x 46'-0" S/S, Condensate Stabilizer Tower "V-710"

Capacity: 74 Cu Ft.

Impact Test: Exempt Per UG-20 (f)

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 98.03.19 Co. Name THERMO DESIGN ENGINEERING LTD. Signed Bill Lane
(Manufacturer) (Representative)

CERTIFICATE OF SHOP INSPECTION

Vessel constructed by THERMO DESIGN ENGINEERING LTD. at EDMONTON, ALBERTA CANADA T6P 1P5
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 19, 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.

Dated 98-3-19 Signed L. Hafors Commissions 397
(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 ' Division 1

CTC, PG. 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: Vertical

(Horiz., vert., or sphere)

Stabilizer Tower

(Tank separator, heat exch., etc)

#1629

(Mfg's serial No.)

L-0311.21

(CRN)

9097-0850-215/Rev.1

(Drawing No.)

(Nat'l. Bd. No.)

1998

(Year built)

**Data Report
Item Number**

Remarks

0 - Nozzles

C1	1	1 1/2"	CPLG	SA-105	6000#	N/A	UW-16.1(c)	Shell
C2	1	1 1/2"	CPLG	SA-333-6	6000#Sch.160	N/A	UW-16.1(c)	Head
C3A/B	2	1 1/2"	CPLG	SA-105	6000#	N/A	UW-16.1(c)	Shell
C4A/B	2	1"	LG CPLG	SA-105	6000#	N/A	UW-16.1(c)	Shell
C5A/B	2	3/4"	LG CPLG	SA-105	6000#	N/A	UW-16.1(c)	Shell
C6	1	3/4"	LG CPLG	SA-105	6000#	N/A	UW-16.1(c)	Shell
C7	1	3/4"	LG CPLG	SA-105	6000#	N/A	UW-16.1(c)	Shell
C8	1	1 1/2"	CPLG	SA-105	6000#	N/A	UW-16.1(c)	Shell
C9	1	1 1/2"	CPLG	SA-105	6000#	N/A	UW-16.1(c)	Shell

2 - Remarks

2 Sets of Break Flanges: 1) SA-105N, 18"Diameter - 150# Sch.STD
2) SA-105N, 18"Diameter - 150# Sch.XHY

Registered Drawing No.: 9097-0850-215/Rev.0 (Sheet 1 & 2), Alberta & B.C.

PSV: Cplg.C8

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

Date 98.03.19 Name THERMO DESIGN ENGINEERING LTD.

(Manufacturer)

Signed CBilraine

(Representative)

Date 98.3.19

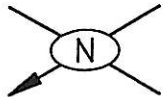
Name L. Hajas

(Authorized Inspector)

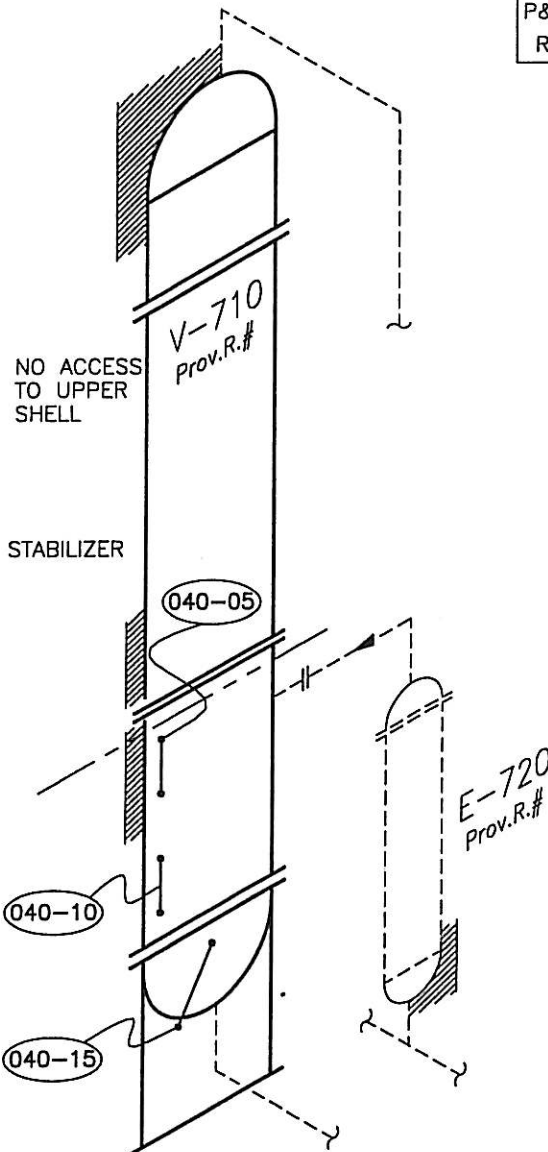
Commission

398

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



P&ID. # _____
REF. # _____



VESSEL DATA

P.E. No. V-710 Serial No. 1629 Prov. Reg. No. A C.R.N. L0311.21
MFR. THERMO DESIGN Code/Div. _____ Para _____ Code Stamp _____
Yr. Bld. 1998 Yr. Inst. _____ Size 18"Ø x 46' Service _____ PWHT _____
RT RT-2 Insulated YES

Nominal Thickness & Material

Head: .340" (8.6mm) Mat'l: SA 516 70N C.A. .0625" (1.6mm) Reason _____
Head: .470" (11.9mm) SA 516 70N Reason _____
Shell: .375" (9.5mm) SA 160 B .0625" (1.6mm)
Shell: .500" (12.7mm) SA 106 B

Chan Hd: _____
Chan Sh: _____
Boot Hd: _____
Boot Sh: _____

MAWP Shell Side 245PSI @ Temp. -20/250°F

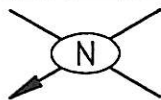
MAWP Tube Side _____ @ Temp. _____

COMMENTS: _____

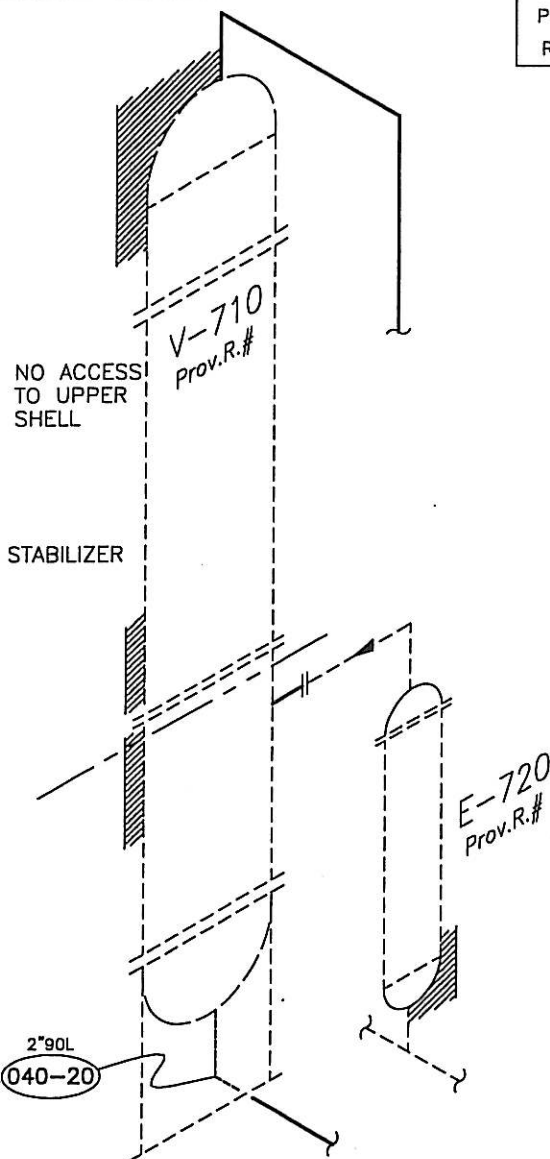
PIONEER NATURAL RESOURCES CANADA INC.
CHINCHAGA GAS PLANT
LSD C-32-H \ 94-H-8

STABILIZER

TECH.: <u>J.O.</u>	REV. DATE: _____	DWG DATE: <u>99/12</u>
CAD: <u>WO</u>	REVISION: _____	DRAWING: <u>040</u>



P&ID # _____
REF. # _____



PIPING DATA

THICKNESS MEASUREMENT LOCATION:	SIZE	PROC.	LINE #	SPEC.	SCH.	NOM.THK.	API * CORR. ALLW. ** CALCULATED CORR.ALLW.	MIN.THK.	CAL.THK.	FLG. RATING
040-20	2"				160	8.7mm	ASTM	7.6mm		

COMMENTS: _____

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

STABILIZER PIPING

TECH.: JO REV.DATE: DWG.DATE: 99/12
CAD: WO REVISION: DRAWING: 040A

Item Desc.: C-32-H/94-H-8 / STABILIZER

Equip. No.: V-710

Ser. No.: 1629

Prov. Reg.: N/A

Pt.Desc.: UPPER SHELL BELOW ROOF

Point No.: 040-05

Nominal: 12.700 Mths. Rem. To Min. Nom:

Corr. Allowance: 1.600 Min. Cal. Wall Thk.:

Min. Nominal: 11.100

Good For Continued Service: YES

Additional Assessment Of Data: YES

Suggested Max Insp. Interval In Mths.: 12

Survey Dates: 1999-12

Data Readings 1 12.500 ____.

2 12.600 ____.

3 12.500 ____.

4 12.600 ____.

5 12.700 ____.

6 12.600 ____.

Data Evaluation

Lowest Reading : 12.500

Average - Low 3 : 12.533

Thk.Remaining Above Min. : 1.400

Indv. Short Term Rate (mm/yr) :

Short Term Rate (mm/yr) :

LongTerm Rate (mm/yr) :

Item Desc.: C-32-H/94-H-8 / STABILIZER

Equip. No.: V-710

Ser. No.: 1629

Prov. Reg.: N/A

Pt.Desc.: BTM.SHELL

Point No.: 040-10

Nominal: 11.900

Mths. Rem. To Min. Nom:

Good For Continued Service: YES

Corr. Allowance: 1.600

Min. Cal. Wall Thk.:

Additional Assessment Of Data: YES

Min. Nominal: 10.300

Suggested Max Insp. Interval In Mths.: 12

Survey Dates:

1999-12

Data Readings

1	12.500	_____
2	12.500	_____
3	12.500	_____
4	12.500	_____
5	12.500	_____
6	12.500	_____
7	12.500	_____
8	12.400	_____
9	12.500	_____
10	12.600	_____
11	12.700	_____
12	12.600	_____

Data Evaluation

Lowest Reading : 12.400

Average - Low 3 : 12.467

Thk.Remaining Above Min. : 2.100

Indv. Short Term Rate (mm/yr) :

Short Term Rate (mm/yr) :

LongTerm Rate (mm/yr) :

Item Desc.: C-32-H/94-H-8 / STABILIZER

Equip. No.: V-710

Ser. No.: 1629

Prov. Reg.: N/A

Pt.Desc.: BTM.HEAD

Point No.: 040-15

Nominal: 11.900 Mths. Rem. To Min. Nom:

Corr. Allowance: 1.600 Min. Cal. Wall Thk.:

Min. Nominal: 10.300

Good For Continued Service: YES

Additional Assessment Of Data: YES

Suggested Max Insp. Interval In Mths.: 12

Survey Dates: 1999-12

Data Readings	1	12.800	_____
	2	12.800	_____
	3	12.600	_____
	4	12.700	_____
	5	12.400	_____

Data Evaluation

Lowest Reading : 12.400

Average - Low 3 : 12.567

Thk.Remaining Above Min. : 2.100

Indv. Short Term Rate (mm/yr) :

Short Term Rate (mm/yr) :

LongTerm Rate (mm/yr) :

Pt.Desc.: PIPING - 2"90L T-B

Point No.: 040-20

Nominal: 8.700 Mths. Rem. To Min. Nom:

Corr. Allowance: 2.700 Min. Cal. Wall Thk.:

Min. Nominal: 6.000

Good For Continued Service: YES

Additional Assessment Of Data: YES

Suggested Max Insp. Interval In Mths.: 12

Survey Dates: 1999-12

Data Readings	1	7.600	_____
	2	7.200	_____
	3	7.300	_____
	4	7.200	_____
	5	7.800	_____

Data Evaluation

Lowest Reading : 7.200

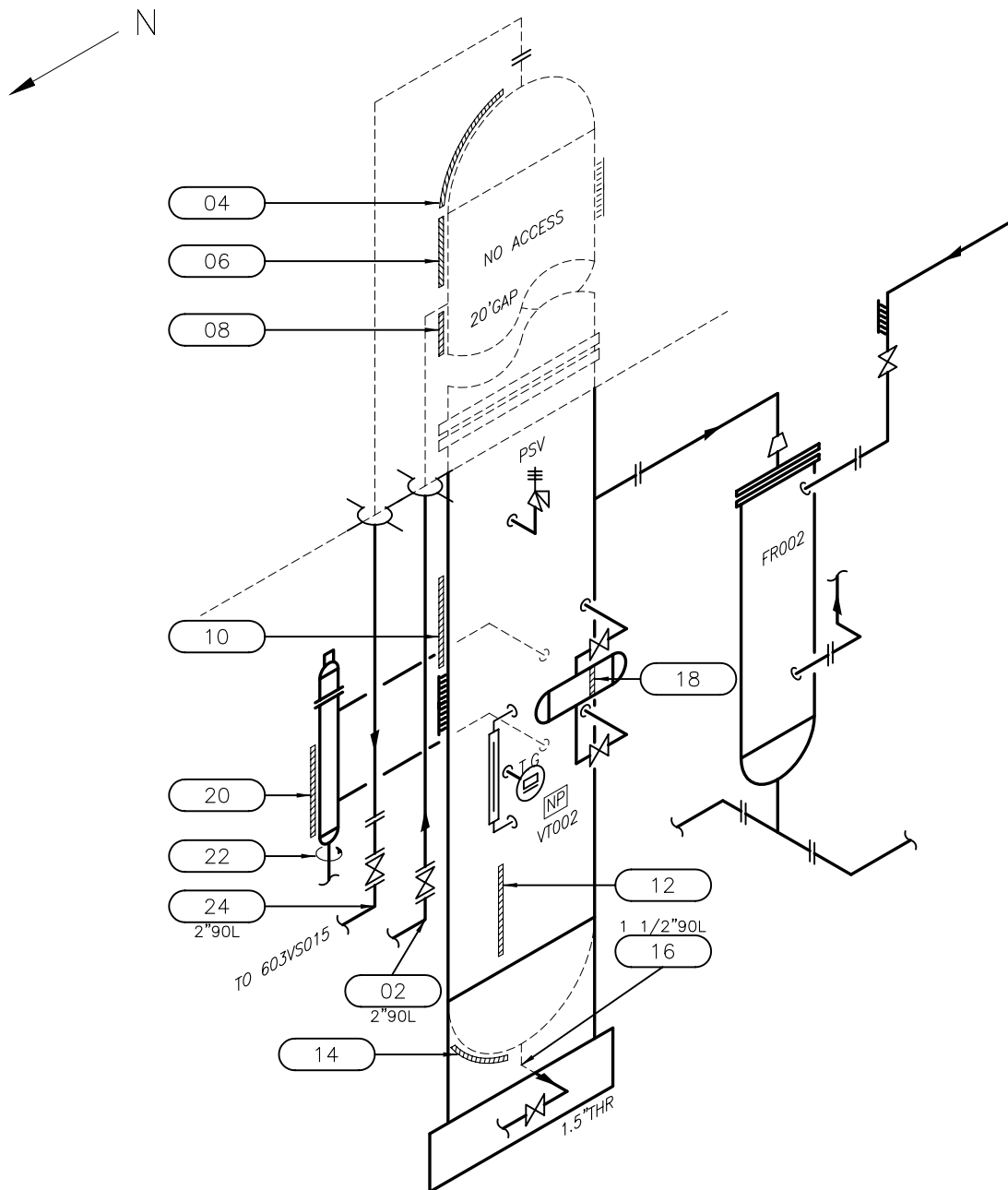
Average - Low 3 : 7.233

Thk.Remaining Above Min. : 1.200

Indv. Short Term Rate (mm/yr) :

Short Term Rate (mm/yr) :

LongTerm Rate (mm/yr) :



Integrity Testing
SERVICES

P.E. No.: N/S Yr. Bit.: 1998
 OIP# 603VT002 Manway: NO
 Serial No.: 1629 Size: 457mm x 14021mm
 P.R.N. ① N/S Service: SWEET
 C.R.N.: L0311.21 PWHT: NO
 Code/Div.: ASME VIII DIV. 1 RT: 2
 Para: N/S Insulated: WOOL
 C. Stamp: U,W N.B. No: N/S
 Manufacturer: THERMO DESIGN LTD,

Design & Materials Data

HEAD	SHELL
Material: <u>SA-516-70N</u>	Material: <u>SA-106-B</u>
Nom.: <u>8.6mm/11.9mm</u>	Nom.: <u>9.5mm/12.7mm</u>
C.A.: <u>1.6mm</u>	C.A.: <u>1.6mm</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>1689 KPA</u>	② Temp.: <u>121°C</u>
MAWP Tube Side: _____	② Temp.: _____

CLIENT

TAQA NORTH

FACILITY

CHINCHAGA GAS PLANT

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

ITEM

CONDENSATE STABILIZER TOWER

Comments: _____

BY: M.T.

DATE: 2008/04

DWG.# 030

TAQA North

Unit: N-603

FACILITY:	CHINCHAGA GAS PLANT	MANUFACTURER:	THERMO DESIGN ENGINEER
LSD:	C-032-H/094-H-08	DESIGN PRESSURE:	1689 kPa / 245 psi
ITEM DESC.:	CONDENSATE STABILIZER TOWER	DESIGN TEMP.:	121 C / 250 F
EQUIP / OIP#:	603VT002	RECOMMENDED NEXT INSP. DATE:	02/2005
PROV. REG. #:	N/S	RECOMMENDED RETIREMENT DATE:	01/2023
SERIAL #:	1629	REM. LIFE (from last survey 04/2008):	14.80 yrs.
CRN.:	L0311.21	TOTAL CAUTION / ACTION TML:	2

Item # (030)

COMMENTS:

2008/04 - READING BETWEEN TML 2.02 AND 2.03 @ NIPPLE.
NO ACCESS TO TML#4, TML#6 AND TML#8.

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

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 4.05 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 3.90 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
2.01	3.90	0.50	3.40	01/1998	3.90	N/A	N/A	04/2008	4.50	0.000	0.000	04/2013	12/2374	NO
2.02	3.90	0.50	3.40	01/1998	3.90	N/A	N/A	04/2008	3.90	0.000	0.000	04/2013	12/2174	NO
2.03	3.90	0.50	3.40	01/1998	3.90	N/A	N/A	04/2008	3.90	0.000	0.000	04/2013	12/2174	NO
2.04	3.90	0.50	3.40	01/1998	3.90	N/A	N/A	04/2008	3.90	0.000	0.000	04/2013	12/2174	NO

TML No.: 10 BELOW ROOF SH

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 12.44 mm.

MATERIAL: SA106-B

MINIMUM THICKNESS MEASURED: 12.20 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
10.01	12.70	1.60	11.10	01/1998	12.70	N/A	N/A	04/2008	12.20	0.000	0.048	04/2013	01/2031	NO *
10.02	12.70	1.60	11.10	01/1998	12.70	N/A	N/A	04/2008	12.30	0.000	0.038	04/2013	10/2039	NO *
10.03	12.70	1.60	11.10	01/1998	12.70	N/A	N/A	04/2008	12.50	0.000	0.020	04/2013	03/2077	NO
10.04	12.70	1.60	11.10	01/1998	12.70	N/A	N/A	04/2008	12.40	0.000	0.030	04/2013	12/2050	NO *
10.05	12.70	1.60	11.10	01/1998	12.70	N/A	N/A	04/2008	12.70	0.000	0.000	04/2013	08/2541	NO
10.06	12.70	1.60	11.10	01/1998	12.70	N/A	N/A	04/2008	12.40	0.000	0.030	04/2013	12/2050	NO *
10.07	12.70	1.60	11.10	01/1998	12.70	N/A	N/A	04/2008	12.50	0.000	0.020	04/2013	03/2077	NO
10.08	12.70	1.60	11.10	01/1998	12.70	N/A	N/A	04/2008	12.50	0.000	0.020	04/2013	03/2077	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:	1689 kPa / 245 psi
ITEM DESC.:	CONDENSATE STABILIZER TOWER	DESIGN TEMP.:	121 C / 250 F
EQUIP / OIP#:	603VT002	RECOMMENDED NEXT INSP. DATE:	02/2005
PROV. REG. #:	N/S	RECOMMENDED RETIREMENT DATE:	01/2023
SERIAL #:	1629	REM. LIFE (from last survey 04/2008):	14.80 yrs.
CRN.:	L0311.21	TOTAL CAUTION / ACTION TML:	2

Item # (030)

COMMENTS:

2008/04 - READING BETWEEN TML 2.02 AND 2.03 @ NIPPLE.
NO ACCESS TO TML#4, TML#6 AND TML#8.

TML No.: 12 BTM SH T-B

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 12.58 mm.

MATERIAL: SA106-B

MINIMUM THICKNESS MEASURED: 12.40 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	12.70	1.60	11.10	01/1998	12.70	N/A	N/A	04/2008	12.40	0.000	0.030	04/2013	12/2050	NO *
12.02	12.70	1.60	11.10	01/1998	12.70	N/A	N/A	04/2008	12.60	0.000	0.010	04/2013	11/2155	NO
12.03	12.70	1.60	11.10	01/1998	12.70	N/A	N/A	04/2008	12.60	0.000	0.010	04/2013	11/2155	NO
12.04	12.70	1.60	11.10	01/1998	12.70	N/A	N/A	04/2008	12.60	0.000	0.010	04/2013	11/2155	NO
12.05	12.70	1.60	11.10	01/1998	12.70	N/A	N/A	04/2008	12.80	0.000	0.000	04/2013	12/2574	NO
12.06	12.70	1.60	11.10	01/1998	12.70	N/A	N/A	04/2008	12.60	0.000	0.010	04/2013	11/2155	NO
12.07	12.70	1.60	11.10	01/1998	12.70	N/A	N/A	04/2008	12.60	0.000	0.010	04/2013	11/2155	NO
12.08	12.70	1.60	11.10	01/1998	12.70	N/A	N/A	04/2008	12.40	0.000	0.030	04/2013	12/2050	NO *
12.09	12.70	1.60	11.10	01/1998	12.70	N/A	N/A	04/2008	12.50	0.000	0.020	04/2013	03/2077	NO
12.10	12.70	1.60	11.10	01/1998	12.70	N/A	N/A	04/2008	12.60	0.000	0.010	04/2013	11/2155	NO
12.11	12.70	1.60	11.10	01/1998	12.70	N/A	N/A	04/2008	12.50	0.000	0.020	04/2013	03/2077	NO
12.12	12.70	1.60	11.10	01/1998	12.70	N/A	N/A	04/2008	12.70	0.000	0.000	04/2013	08/2541	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:	1689 kPa / 245 psi
ITEM DESC.:	CONDENSATE STABILIZER TOWER	DESIGN TEMP.:	121 C / 250 F
EQUIP / OIP#:	603VT002	RECOMMENDED NEXT INSP. DATE:	02/2005
PROV. REG. #:	N/S	RECOMMENDED RETIREMENT DATE:	01/2023
SERIAL #:	1629	REM. LIFE (from last survey 04/2008):	14.80 yrs.
CRN.:	L0311.21	TOTAL CAUTION / ACTION TML:	2

Item # (030)

COMMENTS:

2008/04 - READING BETWEEN TML 2.02 AND 2.03 @ NIPPLE.
NO ACCESS TO TML#4, TML#6 AND TML#8.

TML No.: 14 BTM HD T-B

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 12.55 mm.

MATERIAL: SA516-70

MINIMUM THICKNESS MEASURED: 12.40 mm.

Pts.	Nom. Thick.	Corr. Allow.	Min. Thick.	B/L Survey Date	B/L Survey Date	Prev. Survey Date	Prev. Survey Date	Last Survey Date	Last Survey Date	Short Term Rate	Long Term Rate	TML Insp. Due	TML Retire. Date	Action/Caution Required Item
				mm/yyyy	mm/yyyy	mm/yyyy	mm/yyyy	mm/yyyy	mm/yyyy					
14.01	11.90	1.60	10.30	01/1998	11.90	N/A	N/A	04/2008	12.80	0.000	0.000	04/2013	08/2841	NO
14.02	11.90	1.60	10.30	01/1998	11.90	N/A	N/A	04/2008	12.70	0.000	0.000	04/2013	04/2808	NO
14.03	11.90	1.60	10.30	01/1998	11.90	N/A	N/A	04/2008	12.50	0.000	0.000	04/2013	08/2741	NO
14.04	11.90	1.60	10.30	01/1998	11.90	N/A	N/A	04/2008	12.40	0.000	0.000	04/2013	04/2708	NO
14.05	11.90	1.60	10.30	01/1998	11.90	N/A	N/A	04/2008	12.40	0.000	0.000	04/2013	04/2708	NO
14.06	11.90	1.60	10.30	01/1998	11.90	N/A	N/A	04/2008	12.50	0.000	0.000	04/2013	08/2741	NO

TML No.: 16 1.5"90L T-B

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 6.75 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 6.60 mm.

Pts.	Nom. Thick.	Corr. Allow.	Min. Thick.	B/L Survey Date	B/L Survey Date	Prev. Survey Date	Prev. Survey Date	Last Survey Date	Last Survey Date	Short Term Rate	Long Term Rate	TML Insp. Due	TML Retire. Date	Action/Caution Required Item
				mm/yyyy	mm/yyyy	mm/yyyy	mm/yyyy	mm/yyyy	mm/yyyy					
16.01	7.10	0.90	6.20	01/1998	7.10	N/A	N/A	04/2008	6.60	0.000	0.048	05/2012	07/2016	NO *
16.02	7.10	0.90	6.20	01/1998	7.10	N/A	N/A	04/2008	6.90	0.000	0.020	04/2013	09/2042	NO *
16.03	7.10	0.90	6.20	01/1998	7.10	N/A	N/A	04/2008	6.70	0.000	0.038	04/2013	05/2021	NO *
16.04	7.10	0.90	6.20	01/1998	7.10	N/A	N/A	04/2008	6.80	0.000	0.030	04/2013	12/2027	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:	1689 kPa / 245 psi
ITEM DESC.:	CONDENSATE STABILIZER TOWER	DESIGN TEMP.:	121 C / 250 F
EQUIP / OIP#:	603VT002	RECOMMENDED NEXT INSP. DATE:	02/2005
PROV. REG. #:	N/S	RECOMMENDED RETIREMENT DATE:	01/2023
SERIAL #:	1629	REM. LIFE (from last survey 04/2008):	14.80 yrs.
CRN.:	L0311.21	TOTAL CAUTION / ACTION TML:	2

Item # (030)

COMMENTS:

2008/04 - READING BETWEEN TML 2.02 AND 2.03 @ NIPPLE.
NO ACCESS TO TML#4, TML#6 AND TML#8.

TML No.: 18 4" SH SWITCH T-B

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 6.25 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 6.00 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
18.01	6.00	0.70	5.30	01/1998	6.00	N/A	N/A	04/2008	6.50	0.000	0.000	04/2013	04/2408	NO
18.02	6.00	0.70	5.30	01/1998	6.00	N/A	N/A	04/2008	6.40	0.000	0.000	04/2013	12/2374	NO
18.03	6.00	0.70	5.30	01/1998	6.00	N/A	N/A	04/2008	6.50	0.000	0.000	04/2013	04/2408	NO
18.04	6.00	0.70	5.30	01/1998	6.00	N/A	N/A	04/2008	6.10	0.000	0.000	04/2013	12/2274	NO
18.05	6.00	0.70	5.30	01/1998	6.00	N/A	N/A	04/2008	6.00	0.000	0.000	04/2013	08/2241	NO
18.06	6.00	0.70	5.30	01/1998	6.00	N/A	N/A	04/2008	6.00	0.000	0.000	04/2013	08/2241	NO

TML No.: 20 4"FLOAT BTM SH

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 6.47 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 6.40 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
20.01	6.00	0.70	5.30	01/1998	6.00	N/A	N/A	04/2008	6.50	0.000	0.000	04/2013	04/2408	NO
20.02	6.00	0.70	5.30	01/1998	6.00	N/A	N/A	04/2008	6.50	0.000	0.000	04/2013	04/2408	NO
20.03	6.00	0.70	5.30	01/1998	6.00	N/A	N/A	04/2008	6.50	0.000	0.000	04/2013	04/2408	NO
20.04	6.00	0.70	5.30	01/1998	6.00	N/A	N/A	04/2008	6.50	0.000	0.000	04/2013	04/2408	NO
20.05	6.00	0.70	5.30	01/1998	6.00	N/A	N/A	04/2008	6.40	0.000	0.000	04/2013	12/2374	NO
20.06	6.00	0.70	5.30	01/1998	6.00	N/A	N/A	04/2008	6.40	0.000	0.000	04/2013	12/2374	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 C-32-H/94-H-8
DESCRIPTION: 4" Float
ITEM NO.: #030
TML: #22
MATERIAL: NS-USE SA234-WPB
PRN #: SN-1629--603VT002
RT: 2
TYPE: Bottom Head

FORMED ELLIPSODIAL HEADS, PRESSURE ON CONCAVE SIDE (INSIDE DIAMETER)

$t = PD/2SE - 0.2P$ Minimum Required Thickness, inches

P=	245	Design Pressure, psi
D=	3.9	INSIDE Diameter head skirt, inches
S=	17100	Maximum Allowable Stress, psi
*E=	1.00	Joint Efficiency

t=	0.028	inches, per ASME Sect 8 UG-32(d)
t=	0.71	mm

$$t = 0.028" + C/A \ 0.0625" = 0.0905"$$

TAQA North

Unit: N-603

FACILITY:	CHINCHAGA GAS PLANT	MANUFACTURER:	THERMO DESIGN ENGINEER
LSD:	C-032-H/094-H-08	DESIGN PRESSURE:	1689 kPa / 245 psi
ITEM DESC.:	CONDENSATE STABILIZER TOWER	DESIGN TEMP.:	121 C / 250 F
EQUIP / OIP#:	603VT002	RECOMMENDED NEXT INSP. DATE:	02/2005
PROV. REG. #:	N/S	RECOMMENDED RETIREMENT DATE:	01/2023
SERIAL #:	1629	REM. LIFE (from last survey 04/2008):	14.80 yrs.
CRN.:	L0311.21	TOTAL CAUTION / ACTION TML:	2

Item # (030)

COMMENTS:

2008/04 - READING BETWEEN TML 2.02 AND 2.03 @ NIPPLE.
NO ACCESS TO TML#4, TML#6 AND TML#8.

TML No.: 22 4"FLOAT BTM HD

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 5.63 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 5.00 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
22.01	6.00	0.70	5.30	01/1998	6.00	N/A	N/A	04/2008	6.70	0.000	0.000	04/2013	12/2474	NO
22.02	6.00	0.70	5.30	01/1998	6.00	N/A	N/A	04/2008	5.60	0.000	0.038	03/2012	02/2016	NO *
22.03	6.00	0.70	5.30	01/1998	6.00	N/A	N/A	04/2008	5.20	0.000	0.079	12/2006	12/2006	ACTION *
22.04	6.00	0.70	5.30	01/1998	6.00	N/A	N/A	04/2008	5.00	0.000	0.097	02/2005	02/2005	ACTION *

TML No.: 24 2"90L T-B 150

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 3.66 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 3.50 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
24.01	3.90	0.50	3.40	01/1998	3.90	N/A	N/A	04/2008	3.90	0.000	0.000	04/2013	12/2174	NO
24.02	3.90	0.50	3.40	01/1998	3.90	N/A	N/A	04/2008	3.60	0.000	0.030	07/2011	10/2014	NO *
24.03	3.90	0.50	3.40	01/1998	3.90	N/A	N/A	04/2008	3.50	0.000	0.038	07/2009	11/2010	NO *
24.04	3.90	0.50	3.40	01/1998	3.90	N/A	N/A	04/2008	3.60	0.000	0.030	07/2011	10/2014	NO *
24.05	3.90	0.50	3.40	01/1998	3.90	N/A	N/A	04/2008	3.70	0.000	0.020	04/2013	01/2023	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 TOWER AND PIPING INSPECTION REPORT

(Imperial)

GENERAL TOWER 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:	Condensate Stabilizer Tower	A No:	BC	MTL No: TWR211
Internal Coating Type:		Next External:	2/6/2003	Next Internal: Feb, 2004
Vessel Orientation:	Vertical	Internal Coating Lining:	0	
Vessel Type:	Tower	Fluid Type:		
Tag No:	V-710	Serial Number:	1629	
Separator Type:		Business Unit:		
Direct Fired Vessel:	N/A	Fired Tube:		Cost Centre:
Current Status:	In Service	Flame Arrester Date Required:		Date
Thermal Insulation:	Yes	Asbestos:	No	

TOWER NAMEPLATE INFORMATION

MTL Number:	TWR211	Volume:	74.000 F3	CRN Number:	L-0311.21	Registered:	No
Serial Number:	1629			Size:	18.000 in O.D.	x	46 ft 0 in Seam to Seam
Drawing Number:	9097-0850-215			P & ID Number:			
Shell Material:	SA-106-B			Bottom	Shell Thickness:	0.500	In
				Top	Shell Thickness:	0.375	In
Head Material:	SA-516-70N			Bottom	Head Thickness:	0.470	In
				Top	Head Thickness:	0.340	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: 245 psi			Operating Pressure:	Shell: psi		
	Tube: psi				Tube: psi		
Design Temperature:	Shell: 250 F			Operating Temperature:	Shell: F		
	Tube: F				Tube: F		
RT (XRay):	RT2			Heat Treatment:	No		
Code Parameters:				Joint Efficiency:			
Manufacturer:	Thermo Design Engineering			Year Built:	1998		
Corrosion Allowance:	0.063			Manway:	No		

DETAIL TOWER AND PIPING INSPECTION REPORT

(Imperial)

GENERAL TOWER 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:	Condensate Stabilizer Tower	A No:	BC	MTL No: TWR211

TOWER SHELL / HEADS / PIPING

External / Instrumentation Condition

The external surface of this vessel was insulated and cladded. The vessel was also painted with slight heat chalking and roof penetrations. There was no visible evidence of corrosion. The associated instrumentation appeared to be in good working order.

Internal Condition

No internal access

Nozzle Condition

The nozzle assemblies were painted with some minor paint chips. There was no evidence of corrosion or physical damage.

Flange Condition

The flanges and NPT connection were noted in good condition with some minor NPT leaks noted on gauge glass, ISO valves and unions.

Internal Piping

Not Applicable

External Piping

The external piping was insulated and painted. There was no visible evidence of corrosion.

Pipe Support Condition

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

Bolting Condition

The associated bolting and gaskets were in place and appeared to be tight.

Firetube Condition

Not Applicable

Demister Pad Condition

Not Applicable

Anode Condition

Not Applicable

Vessel Support

The skid base, base ring, skirt and bolts were all noted in good condition with no mechanical distortion.

DETAIL TOWER AND PIPING INSPECTION REPORT

(Imperial)

GENERAL TOWER 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:	Condensate Stabilizer Tower	A No:	BC	MTL No: TWR211

TOWER COATING INSPECTION

Type of Coating

Coating Manufactuer and Type

Location

Coating Condition

TOWER NONDESTRUCTIVE TESTING

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

TOWER STATUS

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

Recommendations

Consider internal inspection on bottom shell and remove top head next turnaround or in 3 years
Service PSV in 3 years
Repeat UT Survey in 3 years

Details of Repairs

DETAIL TOWER AND PIPING INSPECTION REPORT

(Imperial)

GENERAL TOWER 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:	Condensate Stabilizer Tower	A No:	BC	MTL No: TWR211

PSV DATA

Side	Set Pressure psi	CRN Number	Manufacturer PSV Number	Model Serial Number	Capacity	Size Inches	Set Date
Shellside	245		Farris PNR7101	2741-U/SP CE-326747-1-KD	891 SCFM	1.5 x	Dec/1999

CURRENT TOWER PROCESS CONDITIONS

Sweet Gas	Sweet Condensate
-----------	------------------

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

EQUIPMENT NO: 603VT002

Page of

FACILITY: Chinchaga Gas Plant

PROV. REG. NO:

EQUIPMENT NAME: Condensate Stabilizer Tower

TAG NO:

SIZE: 457mm OD x L/H 14021mm MAWP: 1689 kPa @ 121/-29 °C

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

MANWAY ☐ YES ☒ NO

SERVICE:

FLUID: Condensate / 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 ☒ Directly grounded at the skirt

5. PROTECTIVE COATINGS AND INSULATION ☒

6. EXTERNAL METAL SURFACES ☐ N/A

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 07 04 2008
(DD MONTH YYYY)

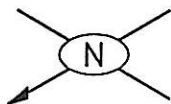
FOLLOW-UP INSPECTION REQ'D:

☒ YES ☐ NO

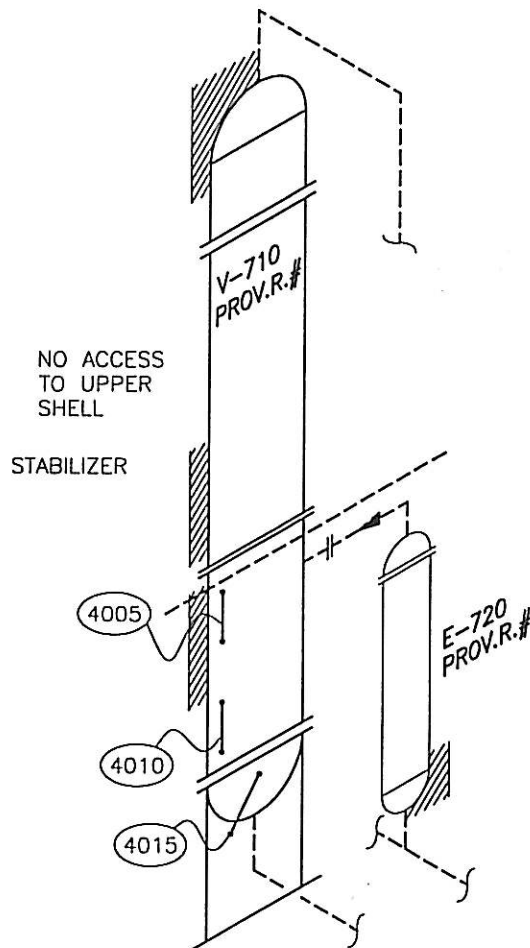
BY DATE:

(DD MONTH YYYY)

030



P&ID. # _____
REF. # _____



VESSEL DATA

Prov. Reg. No. _____ C.R.N. L 0311.21 P.E. No. V-710 Serial No. 1629
MFR. THERMO DESIGN Code/Div. _____ Para _____ Code Stamp _____
Yr. Bld. 1998 Yr. Inst. _____ Size 18"ØX46' Vol.: _____ Service _____ PWHT _____

Nominal Thickness & Material

Head: 8.6mm Mat'l: SA 516-70N C.A.: 1.6mm
Head: 11.9mm SA 516-70N
Shell: 9.5mm SA 106 B C.A.: 1.6mm
Shell: 12.7mm SA 106 B

Insulated YES R.T. 2

Repairs _____
COMMENTS _____

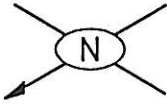
Chan Hd: _____ C.A.: _____
Chan Sh: _____
Gas Boot Hd: _____ C.A.: _____
Gas Boot Sh.: _____
Liq. Boot Hd.: _____ C.A.: _____
Liq Boot Sh.: _____

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

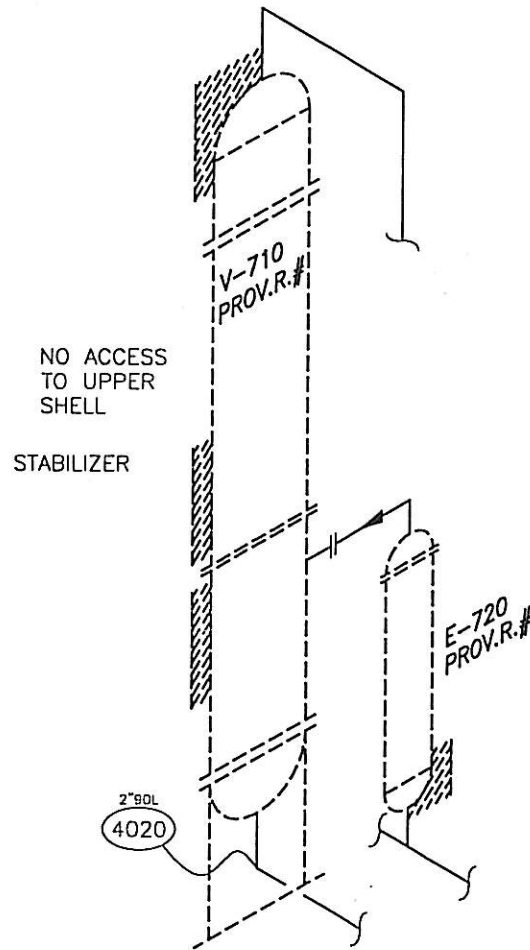
MAWP Shell Side 245psi @ Temp. -20/250°F
MAWP Tube Side _____ @ Temp. _____

STABILIZER

TECH.: J.OLIVER	REV.DATE:	DWG DATE: 02/2002
CAD: MKM	REVISION:	DRAWING: 040



P&ID. # _____
REF. # _____



PIPING DATA

TML	SIZE	MAT'L	FLG. RATING	PROC.	LINE #	SPEC.	SCH.	CORR.ALL				CAL. THK.	CODE
								NOM.	** DESIGN	MIN.			
4020	2"						160	8.7mm	ASTM	7.6mm			

COMMENTS: _____

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

STABILIZER PIPING

TECH.: J.OLIVER	REV.DATE:	DWG DATE: 02/2002
CAD: MKM	REVISION:	DRAWING: 040A

Equip No V-710

Serial No 1629

Prov Reg No N/A

Description STABILIZER

040 - 005

TML Description: UPPER SHELL BELOW ROOF

T Nominal: 12.7

Min Nominal: 11.1

Corr Allowance: 1.6

*Data Readings**Data Evaluations*

Months Remaining to T Min: 338
 Min Calc'd Wall Thickness: N/A
 Thick Remain Above T Min: 1.3
 Short Term Corr Rate: N/A
 Long Term Corr Rate: N/A
 Months Remain to LFL: N/A
 Lowest Value - Last Reading: 12.4

Comment:

	Dec-99	Feb-02
Point 1	12.5	12.5
Point 2	12.6	12.6
Point 3	12.5	12.4
Point 4	12.6	12.6
Point 5	12.7	12.7
Point 6	12.6	12.6
Point 7		
Point 8		
Point 9		
Point 10		
Point 11		
Point 12		
Average	12.6	12.6
Avg Low 3	12.5	12.5
Lowest	12.5	12.4

040 - 010

TML Description: BTM. SHELL

T Nominal: 11.9

Min Nominal: 10.3

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: 2.2
 Short Term Corr Rate: N/A
 Long Term Corr Rate: N/A
 Months Remain to LFL: 156
 Lowest Value - Last Reading: 12.5

Comment:

	Dec-99	Feb-02
Point 1	12.5	12.6
Point 2	12.5	12.6
Point 3	12.5	12.6
Point 4	12.5	12.5
Point 5	12.5	12.5
Point 6	12.5	12.6
Point 7	12.5	12.6
Point 8	12.4	12.5
Point 9	12.5	12.6
Point 10	12.6	12.6
Point 11	12.7	12.6
Point 12	12.6	12.6
Average	12.5	12.6
Avg Low 3	12.5	12.5
Lowest	12.4	12.5

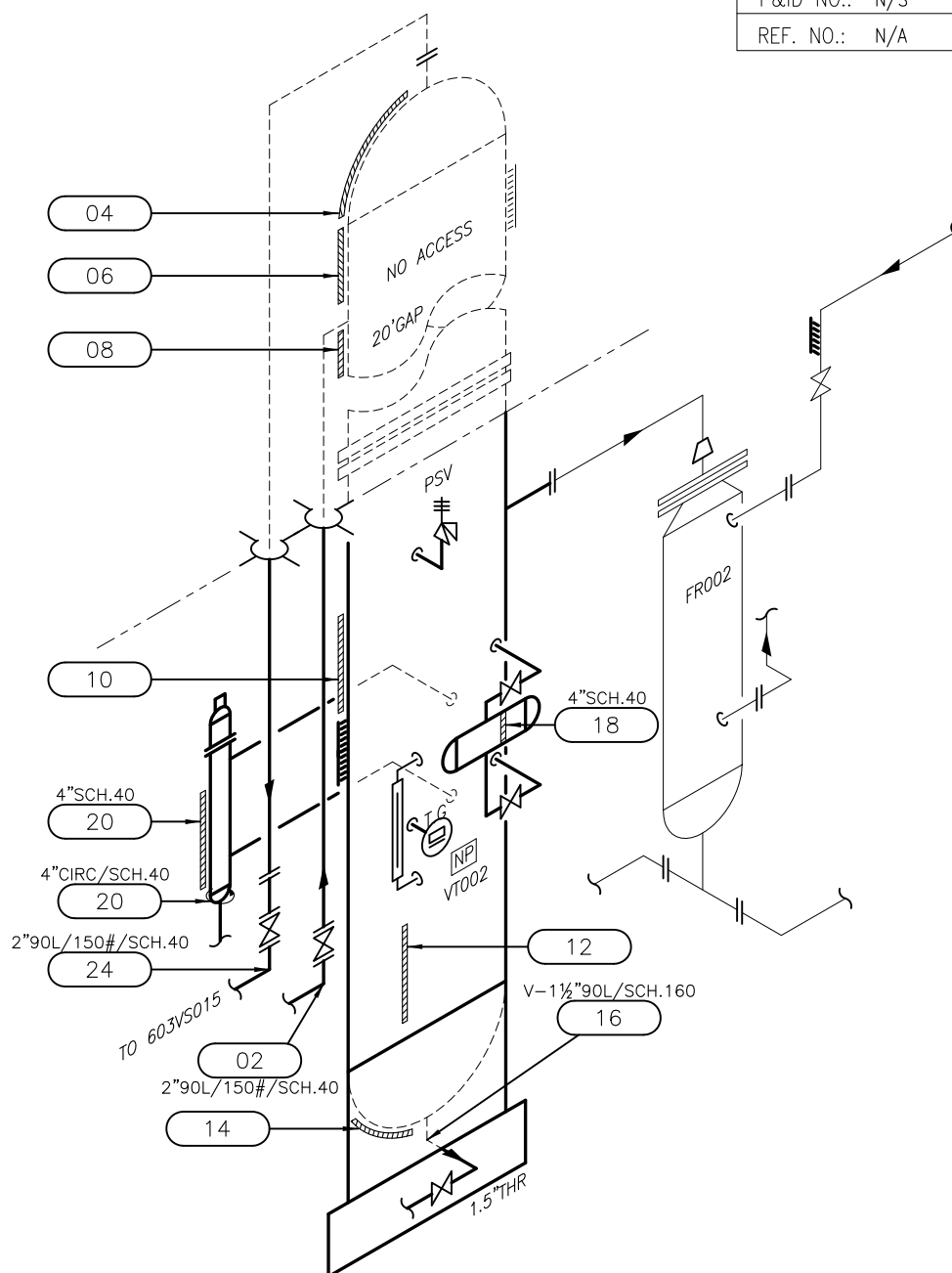
TML Description: BTM. HEAD			
T Nominal: 11.9			
Min Nominal: 10.3			
Corr Allowance: 1.6			
<i>Data Readings</i>			
<i>Data Evaluations</i>		Dec-99	Feb-02
Months Remaining to T Min:	999	Point 1	12.8 12.9
Min Calc'd Wall Thickness:	N/A	Point 2	12.8 12.8
Thick Remain Above T Min:	2.2	Point 3	12.6 12.7
Short Term Corr Rate:	N/A	Point 4	12.7 12.7
Long Term Corr Rate:	N/A	Point 5	12.4 12.5
Months Remain to LFL:	156	Point 6	
Lowest Value - Last Reading:	12.5	Point 7	
Comment:		Point 8	
		Point 9	
		Point 10	
		Point 11	
		Point 12	
		Average	12.7 12.7
		Avg Low 3	12.6 12.6
		Lowest	12.4 12.5

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>		Dec-99	Feb-02
Months Remaining to T Min:	N/A	Point 1	7.6 7.3
Min Calc'd Wall Thickness:	N/A	Point 2	7.2 7.1
Thick Remain Above T Min:	N/A	Point 3	7.3 7.3
Short Term Corr Rate:	N/A	Point 4	7.2 7.6
Long Term Corr Rate:	N/A	Point 5	7.8 7.9
Months Remain to LFL:	N/A	Point 6	
Lowest Value - Last Reading:	7.1	Point 7	
Comment:		Point 8	
		Point 9	
		Point 10	
		Point 11	
		Point 12	
		Average	7.4 7.4
		Avg Low 3	7.2 7.2
		Lowest	7.2 7.1

RAM#	433821	EQUIP STATIC RECORD	JOB#	1-4012
Unique OUP #:	603VT002	Old OUP #:	LSD: C-032-H/094-H-08	
PLANT / FIELD:	Chinchaga Gas Plant	Down Hole Location:	RENTAL: No	
EQUIPMENT NAME:	Condensate Stabilizer Tower	Unique # of Compressor this equipment is related to:		
VESSEL STATUS:	Active	PRIMARY LOCATION:	Plant Site	Vessel Car-Sealed Out?
PHYSICAL LOCATION:	Refrigeration Building		YEAR INSTALLED:	
SERVICE:	Sweet	H ₂ S	PROCESS FLUID:	Natural Gas, Wet
			CYCLIC:	
MANUFACTURER:	Thermo Design Engineering Ltd.	DWG.#	9097-850-215 Rev.1	S N:
PRN	for VESSEL or SHELL	CRN	L-0311.21	YR. BUILT
NB:		CODE/DIV.	ASME VIII DIV.1	STAMP
		PARA.		U
SHELL-TANK				
RADIOGRAPHY:		RT2	JOINT EFF.	100%
PWHT:		Not Stated		
MAWP	1689 kPa	AT	121 °C	MDMT
				-29 °C
AT	1689 kPa			
DIA. ID	431.8 mm	LENGTH:		HEIGHT:
				14020.8 mm
VOLUME:				
m ³				
Shell Longitudinal Seam Present				
Pipe				
<u>SECTION</u>	<u>MATERIAL</u>	<u>NOMINAL THICKNESS</u>	<u>C.A.</u>	
Top Head	SA-516-70N	8.64 mm	1.59 mm	
Btm Head	SA-516-70N	11.94 mm	1.59 mm	
Shell	SA-106-B	9.53 mm	1.59 mm	
Shell	SA-106-B	12.70 mm	1.59 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	

P&ID NO.: N/S

REF. NO.: N/A



U1A ON FILE

P.E. NO.: N/S OUP#: 603VT002
 PROV. REG. NO.: N/S C.R.N.: L0311.21
 SERIAL NO.: 1629 N.B. NO.: N/S

Code/Div.: ASME VIII DIV.1 Size: 431.8mm ID X 14020.8mm
 Radiography: RT-2 Service: SWEET
 Insulated: YES PWHT: N/S
 Year Built: 1998 Manway: NO Size: N/A
 Manufacturer: THERMO DESIGN ENGINEERING LTD.

Design & Materials Data

HEAD
 Mat'l: (TOP) SA-516-70N Nom.: 8.64mm C.A.: 1.59mm
 Mat'l: (BTM) SA-516-70N Nom.: 11.94mm C.A.: 1.59mm

SHELL
 Mat'l: SA-106-B Nom.: 9.53mm C.A.: 1.59mm
 Mat'l: SA-106-B Nom.: 12.70mm C.A.: 1.59mm

BOOT
 Head Mat'l: Nom.: C.A.:
 Shell Mat'l: Nom.: C.A.:

CHANNEL
 Mat'l: Nom.: C.A.:

MAWP Shell Side: 1689 KPA @ Temp.: 121°C/-29°C
 MAWP Tube Side: @ Temp.:

CLIENT	TAQA NORTH	
FACILITY	CHINCHAGA GAS PLANT	
	LSD C-032-H/ 094-H-08	
ITEM	CONDENSATE STABILIZER TOWER	
TECH/CAD: C.R.E./F.Y.C.	DATE: 07/2018	DWG. No.: 030

CLIENT: **TAQA North**
FACILITY: Chinchaga Gas Plant
UNIT/AREA:
LSD: C-032-H/094-H-08
DESCRIPTION: Condensate Stabilizer Tower

PROV. REG. #: Not Stated
SERIAL #: 1629
OIP NO.: 603VT002

Description: 2" 90L B-T 150#

CML: 030-02

NOM. THICK.: 3.91 mm
MILL. TOL.: ASTM
CA: Not Stated
MIN. NOM.: 3.42 mm

MATERIAL:
MINIMUM THICKNESS MEASURED: 3.80 mm
AVERAGE THICKNESS MEASURED: 3.88 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY		Short Term mm/yr	Long Term mm/yr	Rem. Half Life
	04/07/08	07/09/18			
1	4.50	3.90	0.0585	0.0000	4.10
2	3.90	3.90	0.0000	0.0000	100.00
3	Nipple	Nipple	0.0000	0.0000	
4	3.90	3.90	0.0000	0.0000	100.00
5	3.90	3.80	0.0097	0.0000	19.59

Description: TOP HEAD

CML: 030-04

COMMENTS:
2008/2018 - NO ACCESS.

Description: ABOVE ROOF TOP SHELL

CML: 030-06

COMMENTS:
2008/2018 - NO ACCESS.

Description: ABOVE ROOF LOWER SHELL

CML: 030-08

COMMENTS:
2008/2018 - NO ACCESS.

CLIENT: **TAQA North**
FACILITY: Chinchaga Gas Plant
UNIT/AREA:
LSD: C-032-H/094-H-08
DESCRIPTION: Condensate Stabilizer Tower

PROV. REG. #: Not Stated
SERIAL #: 1629
OIP NO.: 603VT002

Description: BELOW ROOF SHELL
CML: 030-10

NOM. THICK.: 12.70 mm
MILL. TOL.: ASTM
CA: 1.60 mm
MIN. NOM.: 9.51 mm

MATERIAL: SA-106-B
MINIMUM THICKNESS MEASURED: **12.60 mm**
AVERAGE THICKNESS MEASURED: 12.69 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY		Short Term mm/yr	Long Term mm/yr	Rem. Half Life
	04/07/08	07/09/18			
1	12.20	12.90	0.0000	0.0000	100.00
2	12.30	12.60	0.0000	0.0000	100.00
3	12.50	12.60	0.0000	0.0000	100.00
4	12.40	12.70	0.0000	0.0000	100.00
5	12.70	12.70	0.0000	0.0000	100.00
6	12.40	12.70	0.0000	0.0000	100.00
7	12.50	12.60	0.0000	0.0000	100.00
8	12.50	12.70	0.0000	0.0000	100.00

Description: BOTTOM SHELL T-B
CML: 030-12

NOM. THICK.: 12.70 mm
MILL. TOL.: ASTM
CA: 1.60 mm
MIN. NOM.: 9.51 mm

MATERIAL: SA-106-B
MINIMUM THICKNESS MEASURED: **12.60 mm**
AVERAGE THICKNESS MEASURED: 12.68 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY		Short Term mm/yr	Long Term mm/yr	Rem. Half Life
	04/07/08	07/09/18			
1	12.40	12.60	0.0000	0.0000	100.00
2	12.60	12.60	0.0000	0.0000	100.00
3	12.60	12.60	0.0000	0.0000	100.00
4	12.60	12.70	0.0000	0.0000	100.00
5	12.80	12.70	0.0097	0.0000	100.00
6	12.60	12.80	0.0000	0.0000	100.00
7	12.60	12.70	0.0000	0.0000	100.00
8	12.40	12.70	0.0000	0.0000	100.00
9	12.50	12.70	0.0000	0.0000	100.00
10	12.60	12.70	0.0000	0.0000	100.00
11	12.50	12.70	0.0000	0.0000	100.00
12	12.70	12.70	0.0000	0.0000	100.00

CLIENT: **TAQA North**
FACILITY: Chinchaga Gas Plant
UNIT/AREA:
LSD: C-032-H/094-H-08
DESCRIPTION: Condensate Stabilizer Tower

PROV. REG. #: Not Stated
SERIAL #: 1629
OIP NO.: 603VT002

Description: BOTTOM HEAD T-B
CML: 030-14

NOM. THICK.: 11.94 mm
MILL. TOL.: 0.254 mm
CA: 1.59 mm
MIN. NOM.: 10.10 mm

MATERIAL: SA-516-70N
MINIMUM THICKNESS MEASURED: **12.60 mm**
AVERAGE THICKNESS MEASURED: 12.67 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY		Short Term mm/yr	Long Term mm/yr	Rem. Half Life
	04/07/08	07/09/18			
1	12.80	12.60	0.0195	0.0000	64.10
2	12.70	12.70	0.0000	0.0000	100.00
3	12.50	12.70	0.0000	0.0000	100.00
4	12.40	12.70	0.0000	0.0000	100.00
5	12.40	12.70	0.0000	0.0000	100.00
6	12.50	12.60	0.0000	0.0000	100.00

Description: 1 1/2" 90L NOZZLE T-B 150#
CML: 030-16

NOM. THICK.: 7.14 mm
MILL. TOL.: ASTM
CA: 1.60 mm
MIN. NOM.: 4.65 mm

MATERIAL: SA-333-6
MINIMUM THICKNESS MEASURED: **7.10 mm**
AVERAGE THICKNESS MEASURED: 7.10 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY		Short Term mm/yr	Long Term mm/yr	Rem. Half Life
	04/07/08	07/09/18			
1	6.60	7.10	0.0000	0.0000	100.00
2	6.90	7.10	0.0000	0.0000	100.00
3	6.70	7.10	0.0000	0.0000	100.00
4	6.80	7.10	0.0000	0.0000	100.00

CLIENT: **TAQA North**
FACILITY: Chinchaga Gas Plant
UNIT/AREA:
LSD: C-032-H/094-H-08
DESCRIPTION: Condensate Stabilizer Tower

PROV. REG. #: Not Stated
SERIAL #: 1629
OIP NO.: 603VT002

Description: 4" FLOAT SHELL T-B
CML: 030-18

NOM. THICK.: 6.02 mm
MILL. TOL.: ASTM
CA: Not Stated
MIN. NOM.: 5.27 mm

MATERIAL:
MINIMUM THICKNESS MEASURED: **6.00 mm**
AVERAGE THICKNESS MEASURED: 6.28 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY		Short Term mm/yr	Long Term mm/yr	Rem. Half Life
	04/07/08	07/09/18			
1	6.50	6.50	0.0000	0.0000	100.00
2	6.40	6.50	0.0000	0.0000	100.00
3	6.50	6.40	0.0097	0.0000	58.25
4	6.10	6.30	0.0000	0.0000	100.00
5	6.00	6.00	0.0000	0.0000	100.00
6	6.00	6.00	0.0000	0.0000	100.00

Description: 4" FLOAT LOWER SHELL
CML: 030-20

NOM. THICK.: 6.02 mm
MILL. TOL.: ASTM
CA: Not Stated
MIN. NOM.: 5.27 mm

MATERIAL:
MINIMUM THICKNESS MEASURED: **6.30 mm**
AVERAGE THICKNESS MEASURED: 6.40 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY		Short Term mm/yr	Long Term mm/yr	Rem. Half Life
	04/07/08	07/09/18			
1	6.50	6.50	0.0000	0.0000	100.00
2	6.50	6.50	0.0000	0.0000	100.00
3	6.50	6.40	0.0097	0.0000	58.25
4	6.50	6.40	0.0097	0.0000	58.25
5	6.40	6.30	0.0097	0.0000	53.09
6	6.40	6.30	0.0097	0.0000	53.09

CLIENT: **TAQA North**
FACILITY: Chinchaga Gas Plant
UNIT/AREA:
LSD: C-032-H/094-H-08
DESCRIPTION: Condensate Stabilizer Tower

PROV. REG. #: Not Stated
SERIAL #: 1629
OIP NO.: 603VT002

Description: 4" FLOAT BOTTOM HEAD

CML: 030-22

NOM. THICK.: 6.02 mm
MILL. TOL.: ASTM
CA: Not Stated
MIN. NOM.: 5.27 mm

MATERIAL:
MINIMUM THICKNESS MEASURED: **5.50 mm**
AVERAGE THICKNESS MEASURED: 5.50 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY		Short Term mm/yr	Long Term mm/yr	Rem. Half Life
	04/07/08	07/09/18			
1	6.70	5.50	0.1170	0.0000	0.98
2	5.60	5.50	0.0097	0.0000	11.86
3	5.20	5.50	0.0000	0.0000	100.00
4	5.00	5.50	0.0000	0.0000	100.00

COMMENTS:
2018/07 - NO CORROSION.

Description: 2" 90L T-B 150#

CML: 030-24

NOM. THICK.: 3.91 mm
MILL. TOL.: ASTM
CA: Not Stated
MIN. NOM.: 3.42 mm

MATERIAL:
MINIMUM THICKNESS MEASURED: **4.30 mm**
AVERAGE THICKNESS MEASURED: 4.47 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY		Short Term mm/yr	Long Term mm/yr	Rem. Half Life
	04/07/08	07/09/18			
1	3.90	4.40	0.0000	0.0000	100.00
2	3.60	4.30	0.0000	0.0000	100.00
3	3.50	4.70	0.0000	0.0000	100.00

COMMENTS:
2018/07 - SUSPECTED SPOOL CHANGE.

EQUIPMENT EXTERNAL INSPECTION REPORT

Customer:	TAQA North	ITS Job No.:	1-4012
District:	North Area	Date:	09-Jul-2018
Facility:	Chinchaga Gas Plant	LSD:	C-032-H/094-H-08
Equip. Description:	Condensate Stabilizer Tower	Serial No.:	1629
Equip./OIP No.:	603VT002	PRN:	Not Stated
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)	☒ Y ☐ N ☐ NA: Ladders/	☐ Blistered
☐ Condition Damage	NDE Examination	Handrail/ Walkway/ Grating in safe condition?	☐ Mechanical Damage
☐ Does not comply with applicable code/safe operating requirement.	☒ UT	☐ See Attached Pictures	☐ Deformation/Distortion
☐ Repairs Required	☐ MT	☐ Excessive Vibration	☐ Condensation/Sweating
☐ See Comments	☐ PT	☒ Y ☐ N ☐ NA: Pressure Gauge within MAWP	☐ No Access
	☐ RT		☒ No Access Insulated
	☐ BH		☐ No Access Ice Build Up
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; ☐ New Install;		☐ 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 ☐ Other	☐ Flat ☐ FLG ☒ ELL ☐ ECC ☐ HEMI ☐ Other	☐ Good Condition
☐ Quick Open Closure	☐ Quick Open Closure	☒ Fasteners Engaged
☐ Quick Actuating Closure	☐ Quick Actuating Closure	☐ Repad Weep Holes Clear
☐ Good Condition	☒ Good Condition	☐ Nozzles are Gusseted
☐ External Corrosion	☐ External Corrosion	☐ External Corrosion
☐ Pitting: (max depth)	☐ Pitting: (max depth)	☐ Leaking/Weeping
☐ Scale	☐ Scale	☐ Damaged/Cracked
☐ Blistered	☐ Blistered	☐ Bolts Missing/Loose
☐ Mechanical Damage	☐ Mechanical Damage	☐ Deflection/Distortion
☐ Deformation/Distortion	☐ Deformation/Distortion	☐ Partial Internal Inspection
☐ Condensation/Sweating	☐ Condensation/Sweating	☒ No Access Insulated
☒ No Access	☐ No Access	☐ Weld(s) in Good Condition
☐ No Access Insulated	☐ No Access Insulated	☐ Weld(s) Corroded
☐ No Access Ice Build Up	☐ No Access Ice Build Up	☐ Weld(s) Poor Quality
☐ External Protection Only	☐ External Protection Only	☐ Weld(s) Cracked
☐ See Comments	☐ See Comments	☐ See Comments

External Surface	Supports	Associated Piping	PRD 1	PRD 2
☒ Good Condition	☒ Good Condition	☒ Good Condition	Location: Shell	Location: Not Applicable
☐ Painted ☐ Full ☐ Part.	☒ Anchor Bolts Secure	☐ Corrosion	PSV Tag No.: 603SVVT002	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 Bolting	☒ 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 Bolting	☐ 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**, **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 based on the information available at the time of the inspection.)

- Limited inspection due to external insulation and heights. No inspection access above the roof-line.
- Vessel is in good condition.
- Insulation is in good condition.

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 Not Applicable Service Interval:	Months
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External Inspection Performed By:

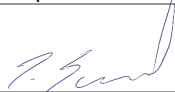
Print Name: Christopher Russell Earl

Certification No.:

ABSA IPV PESL: 000782

API 510: 45377

Signature:



Report Reviewed:



Initial

Chief Inspector /
Client
Representative:

Name (Print)

Signature

Date: