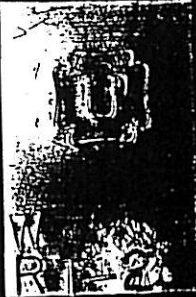


V-330

DE-ETHANIZER TOWER

Quality Control Documentation

TDE THERMO DESIGN ENGINEERING LTD.				TRAVEL SHEET		REV.3 APR.24/97 BY: D.C.S.	
AUTHORIZED INSPECTOR TO BE GIVEN TRAVEL SHEET PRIOR TO CONSTRUCTION SO THAT HE CAN INDICATE HOLD POINTS. HOLD POINTS ESTABLISHED <i>LH98-1-15</i>						(A) NUMBER	
VESSEL TITLE <i>16"ODX40'-0" S/S. DEETHANIZER TOWER</i>		SERIAL NUMBER <i>#1615</i>	TAG NO. <i>V-330</i>	A.I. HOLD POINTS	C.R. NUMBER	JOB CODE <i>CTC.</i>	
					DATE, FUNCTION COMPLETED AND INSPECTORS INITIALS		
NO.	FUNCTION	COMMENTS			T. D. E.	AUTHORIZED INSPECTOR	
1	APPROVED DRAWINGS				<i>98.01.15</i> (S)	<i>LH98-3-24</i>	
2	MAT. CHECKED AGAINST DWG.				<i>98.01.15</i> (S)	<i>LH98-2-3</i>	
3	MILL TEST CHECKED				<i>98.01.15</i> (S)	<i>LH98-3-24</i>	
4	IMPACT TESTS				—		
5	VESSEL LAYOUT				<i>98.01.15</i> (S)		
6	FIT UP	SHELL & HEADS			<i>98.01.15</i> (S)		
7		NOZZL'S & FITTINGS			<i>98.01.15</i> (S)		
8	INTERNAL INSPECTION	<i>LH98-1-30 Top & 2' from the bottom</i>		X	<i>98.01.30</i> (S)	<i>LH98-1-30</i>	
9	WELD SIZE				<i>98.02.03</i> (S)		
10	WELDERS I.D.				<i>98.02.03</i> (S)	<i>LH98-2-3</i>	
11	RADIOGRAPHS	SPOT			<i>98.02.03</i> (S)	<i>LH98-2-3</i>	
	OTHER N.D.E.				—		
13	RELEASE FOR P.W.H.T.	NONE			—		
14	P.W.H.T. CHART CHECKED				—		
15	EXTERNAL INSPECTION				<i>98.02.03</i> (S)	<i>LH98-2-3</i>	
16	HYDROSTATIC TEST	450 PSIG.		X	<i>98.02.03</i> (S)	<i>LH98-2-3</i>	
17	HYDRO GAUGES	<i>TH-112, 113.</i>			<i>98.02.03</i> (S)		
18	DATA REPORT				<i>98.03.24</i> (S)	<i>LH98-3-24</i>	
19	NAME PLATES				<i>98.03.24</i> (S)	<i>LH98-3-24</i>	
RT-PROGRESS <i>XS-1</i>							
PART		SPECIFICATION	HEAT NO.	THK.			
SHELL	✓ 1	SA 106 B	J732161	16" SCH 30	✓		
	2	SA 106 B	J729090	16" SCH 40	✓		
HEADS	✓ 3	SA 516-70N	62465-29336	0.336"	✓		
	✓ 4	SA 516-70N	21375-9436162	0.441"	✓		
NOZZES	5	SA 105 N	RFWN	16-300#			
	6	SA 105 N	RFWN	16-300#			
NOZZLES	✓ N1A	SA 333-6	8254 C	6" SCH 40			
	✓ N1B	SA 333-6	8254 C	6" SCH 40			
	✓ N1C	SA 333-6	8254 C	6" SCH 40			
	✓ N1D	SA 333-6	8254 C	6" SCH 40			
	✓ N2	SA 333-6	60159	2" SCH 160			
	✓ N3	SA 333-6	60159	2" SCH 160			
	✓ N4	SA 333-6	60159	2" SCH 160			
	N5	SA 333-6	8254 C	6" SCH 40			
	✓ C2	SA 333-6	713060	1 1/2" SCH 160			



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

EDMONTON ALBERTA CANADA

UNIT NAME		TAG NUMBER	
DETHANIZER TOWER		V-330	
CR. NUMBER	SERIAL NUMBER	Ⓐ NUMBER	
E-030721	1615		
M.A.W.P.	AT TEMP.	M.D.M.T.	AT PRESSURE
350 PSIG	350	-20 F	300 PSIG
YEAR BUILT	CORR. ALL.	DRAWING NUMBER	
1998	1.000 IN	9097-0850-202	
DIAMETER	LENGTH	CAPACITY	WEIGHT
16 IN OD	4'-0.00	6100 FT	6100 LBS
SHELL MATL.	HEAD MATL.	TBSHT. MATL.	COIL MATL.
SA-106-B	SA-316-01		
SHELL THK.	HEAD MIN. THK.	TBSHT. THK.	COIL THK.
0.375 IN	0.375 IN		
0.500 IN	0.500 IN		

CTC

W
RT-2

MANUFACTURED AND CERTIFIED BY

THERMO DESIGN
ENGINEERING LTD.

EDMONTON

ALBERTA

CANADA

UNIT NAME

TAG NUMBER

DEETHANIZER TOWER

V-330.

CR. NUMBER

SERIAL NUMBER

① NUMBER

L-0307.21

#1615

M.A.W.P.

AT TEMP.

M.D.M.T.

AT PRESSURE

300 PSIG.

300°F

-20°F

300 PSIG.

YEAR BUILT

CORR. ALL

DRAWING NUMBER

1998

0.0625 IN

9097-0850-202

DIAMETER

LENGTH

CAPACITY

WEIGHT

16 IN OD

40-08/S

51 CU FT

6100 LBS

SHELL MATL.

HEAD MATL.

TBSHT. MATL.

COIL MATL.

SA-106-B

SA-516-70N

SA-516-70N

SHELL THK.

HEAD MIN. THK.

TBSHT. THK.

COIL THK.

0.375 IN
0.500 IN0.336 IN
0.441 IN



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

Account # 19971

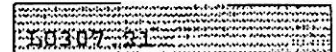
Date: 98/03/12

Journal # 18734

Attn: JASON HARGREAVES
Re: THERMO DESIGN ENGINEERING LTD

DESIGN REGISTRATION

C.R.N.



Drawings / Documents	Description		
DEETHANIZER TOWER 9097-0850-202 REV 0 (Sheets 1 & 2)	REGISTERED	MDMT ----- -20 F	MAWT ----- 300 F MAWP ----- 300 psi
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 \$ 225.00

CRN issued in accordance with the ACI Policies on Reciprocal Recognition of Design Review for Registration. Alberta issued CRN L0307.2 on Feb. 9, 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

ELEVATION VIEW

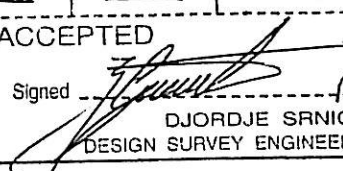
SCALE: 1:20

NOTE:

based on TDE calculations,
Radiography shall be RT-2
according to UW-11(a)(5)(b).

Feb. 09, 1998.



ALBERTA BOILERS SAFETY ASSOCIATION PROVINCE OF ALBERTA SAFETY CODES ACT			
REG. No.	L-0307.2 AS NOTED		
DWG. No.	9097-0850-202 SH. 1 of 2 Rev. C		
	Design Press kPa	Design Temp. °C	
	2069	-29/149	
ACCEPTED			
FEB 09 1998	Signed		
Date	DJORDJE SRNIC DESIGN SURVEY ENGINEER		

NOZZLE SCHEDULE

QTY	TYPE	RATING	SCH	*	PROJ	MAT'L ITEM#	SERVICE
4	RFWN	300#	40	C	8"[203]	12,13,14,15	FILL/DUMP/INSP. c/w BLIND
1	RFWN	300#	160	C	SHOWN	16,17	GAS OUTLET
1	RFWN	300#	160	C	SHOWN	16,17,18	CONDENSATE INLET
1	RFWN	300#	160	C	8"[203]	16,17	OUTLET - TO REBOILER
1	RFWN	300#	40	C	11"[279]	12,13	INLET - FROM REBOILER
1	CPLG	6000#		C		22	LPG PRODUCT
1	CPLG	6000#	160	C		19,20,21	DRAIN
2	CPLG	6000#		C		22	LC
2	LONG CPLG	6000#		C		23	LSH
2	LONG CPLG	6000#		C		24	LG
1	LONG CPLG	6000#		C		24	TI
1	LONG CPLG	6000#		C		24	PI
1	CPLG	6000#		C		22	PSV

* - METHOD OF ATTACHMENT PER UW-16.1

NOTES:

CONSTRUCTION IN ACCORDANCE WITH ASME CODE, SECTION VIII, DIV.I,
1995 EDITION, 1996 ADDENDA.

PRESSURE: 300 PSIG @ 300°F [2069 kPa @ 149°C].

HYDRO TEST: 450 PSIG [3103 kPa].

WELD JOINT: 1/16" [1.59 mm].

HEAT TREATMENT: NONE.

WELD: SPOT.

DESIGN METAL TEMPERATURE: -20°F [-29°C].

WELD PER UG-20(f).

WPS#: 861.2 (TDE-1, TDE-3, TDE-4, TDE-14).

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TAQA NORTH DATA					
EQUIP NO.: 603VT001		RAMS ID TAG NO.: NEW		PRN: N/A	
PLANT/FIELD: CHINCHAGA GAS PLANT		LSD: C-032-H / 094-H-08		LOCATION: GAS PLANT	
EQUIP. NAME : DE-ETHANIZER TOWER			CLASS : VT		TYPE: TOWER
SERVICE: ☒ Sweet ☐ Sour	H2S: N/A	PPM	FLUID: NGL,LPG,PROPANE	S/D REQT.: ☐ Yes ☐ No ☐ Partial	
OPERATING PRESSURE: 925 ☒ kPa ☐ PSI		OPERATING TEMPERATURE: 52 ☒ °C ☐ °F			
OPERATING STATUS: ☒ IN SERVICE ☐ Not In Service			M/WAY(16"AND ABOVE): ☐ Yes ☒ No SIZE: 8"		

MANUFACTURING DATA					
MFG.: THERMO DESIGN LTD		DWG. NO.: 9097-0850-202		SERIAL NO.: 1615	
YR. BUILT: 1998		STAMP: U,W			
CRN: L0307.21	CODE/DIV.: ASME VIII DIV 1		PARA.: N/A		SUPPORT: ☒ Skirt ☐ Saddles ☐ Nozzles ☐ N/A
MAWP: 2068 ☒ kPa ☐ PSI	@ TEMP: 149 ☒ °C ☐ °F	MDMT: -29 ☒ °C ☐ °F	VOLUME: 51 ☐ M ³ ☒ FT ³		
FLANGE RATING: 150/300/600	PWHT: ☐ Yes ☒ No	RADIOGRAPHY: ☐ RT1 ☒ RT2 ☐ RT3 ☐ RT4 ☐ Spot ☐ Full ☐ N/A			
SIZE : 406 ☒ mm. ☐ inch. ☐ ID ☒ OD	LENGTH: N/A ☐ mm. ☐ inch.	HEIGHT: 12192 ☒ 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	8.5 MM / 11.2 MM		1.6 MM	
COMMENTS:					

TUBING DATA					
MAWP: N/A ☐ kPa ☐ PSI		@ TEMP: N/A ☐ °C ☐ °F		TEMA CLASS: N/A	
TYPE: N/A		NUMBER (QTY OF TUBES): N/A			
TUBE SIZE: N/A mm. ☐ ID ☐ OD	GAUGE (BWG): N/A		JOINT: ☐ Welded ☐ Rolled		
SECTION	MATERIAL	NOMINAL mm		C.A. mm	
N/A	N/A	N/A		N/A	
N/A	N/A	N/A		N/A	
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	CAP UNITS/OTHER	
603SVVT001	N/A	1965 ☒ kPa ☐ PSI	2366	☒ SCFM ☐ LB/hr. ☐ GAL/min.	
N/A	N/A	N/A ☐ kPa ☐ PSI	N/A	☐ SCFM ☐ LB/hr. ☐ GAL/min.	
N/A	N/A	N/A ☐ kPa ☐ PSI	N/A	☐ SCFM ☐ LB/hr. ☐ GAL/min.	

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 #1615 L-0307.21 9097-0850-202/Rev.0 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" 15.25/15"ID 40'-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 4
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	0.336"	0.0625"			2:1				Concave
(b)	Bottom	0.441"	0.0625"			2:1				Concave

If removable, bolts used (describe other fastenings) N/A
(Mat'l., Spec. No., Gr., Size, No.)

MAWP 300 psi at max. temp. 300 ° F
Min. design metal temp. -20 ° F at 300 psi. Hydro., pneu., or comb. test pressure 450 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
N1A-D	4	6"	RFWN	SA-333-6	300#Sch.40	N/A	UW-16.1(c)	Shell
N2	1	2"	RFWN	SA-333-6	300#Sch.160	N/A	UW-16.1(c)	Head
N3	1	2"	RFWN	SA-333-6	300#Sch.160	N/A	UW-16.1(c)	Shell
N4	1	2"	RFWN	SA-333-6	300#Sch.160	N/A	UW-16.1(c)	Shell

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

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

(Name of part, item number, Mfg's name and identifying stamp)
16"OD x 40'-0" S/S, Deethanizer Tower "V-330"
Capacity: 51 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 98-03-23 Co. Name THERMO DESIGN ENGINEERING LTD. Signed [Signature]
(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 24, 19 98, and state that, to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel in accordance with ASME Code, Section VIII, Division 1. By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.
Date 98-3-24 Signed [Signature] Commissions 39R
(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 VIII, Division 1

CTC, PG. 2 OF 2

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

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

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

4. Type: Vertical Tower #1615
(Horiz., vert., or sphere) (Tank separator, heat exch., etc) (Mfg's serial No.)

L-0307.21 9097-0850-202/Rev.0 1998
(CRN) (Drawing No.) (Nat'l. Bd. No.) (Year built)

Data Report Item Number	Remarks								
10 - Nozzles	N5	1	6"	RFWN	SA-333-6	300#Sch. 40	N/A	UW-16.1(c)	Shell
	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

12 - Remarks Registered Drawing No.: 9097-0850-202/Rev.0 (Sheet 1 & 2) for Alberta & B.C.

PSV: Coupling C8

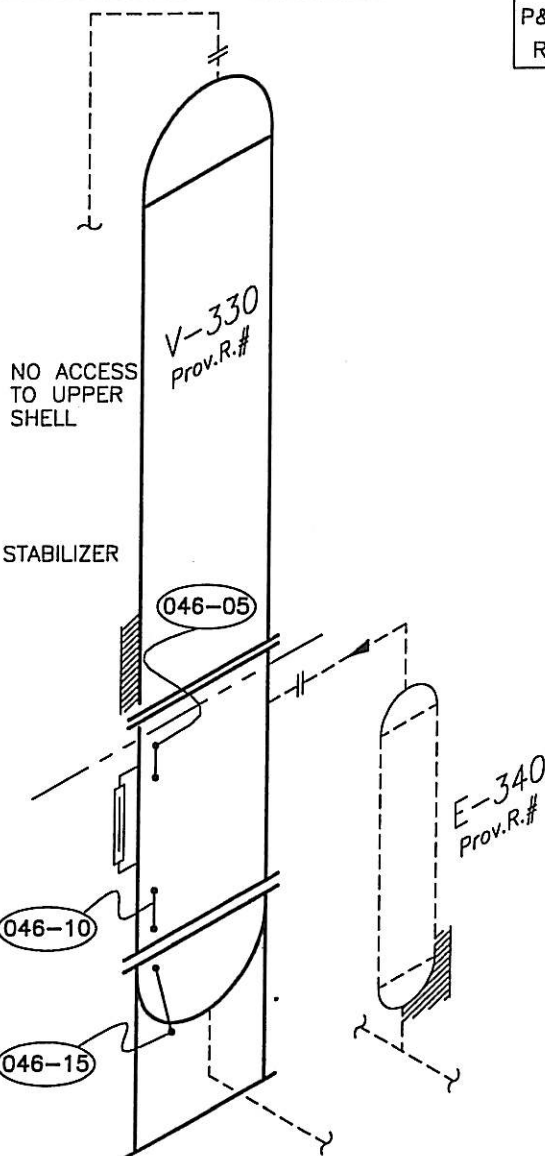
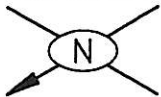
Certificate of Authorization: Type U No. 22,145 Expires August 22, 19 99

Date 98.03.23 Name THERMO DESIGN ENGINEERING LTD. Signed Bismar
(Manufacturer) (Representative)

Date 98-3-24 Name R. Hajos Commission 39R
(Authorized Inspector) (Nat'l Board (incl. endorsements) State, Province and No.)



TESTING INC.

P&ID. # _____
REF. # _____

VESSEL DATA

P.E. No. V-330 Serial No. 1615 Prov. Reg. No. A C.R.N. L0397.21
MFR. THERMO DESIGN Code/Div. _____ Para _____ Code Stamp _____
Yr. Blt. 1998 Yr. Inst. _____ Size _____ Service _____ PWHT _____
RT RT-2 Insulated YES

Nominal Thickness & Material

Head: .336" (8.5mm) Mat'l: SA 516 70 C.A. .0625" (1.6mm) Reason _____
Head: .441" (11.2mm) SA 516 70 Reason _____
Shell: .375" (9.5mm) SA 106 B .0625" (1.6mm)
Shell: .500" (12.7mm) SA 106 B

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

MAWP Shell Side 300PSI @ Temp. -20/300°F

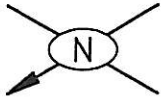
MAWP Tube Side _____ @ Temp. _____

COMMENTS: _____

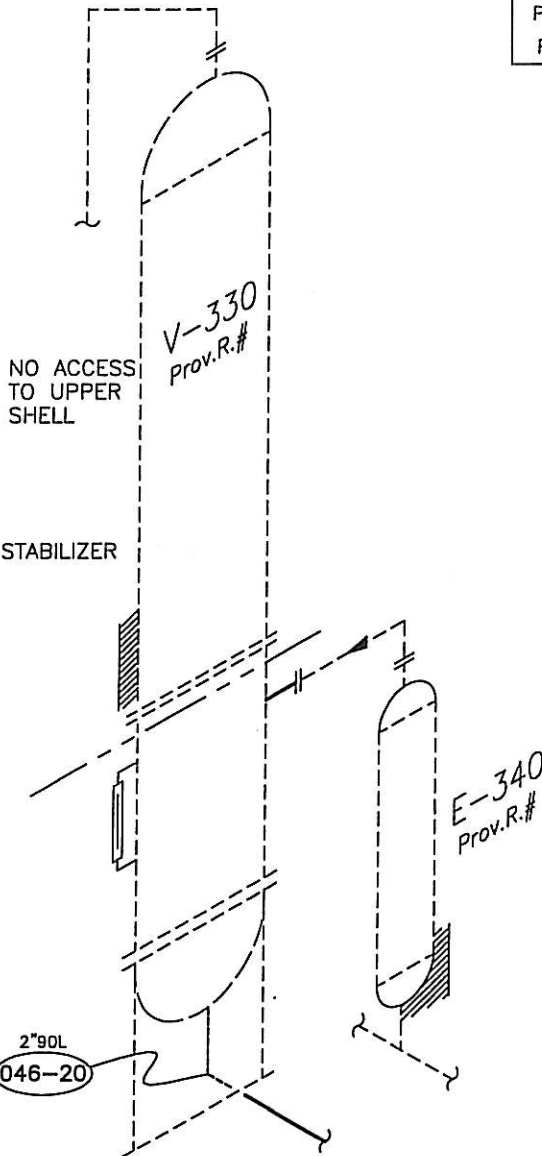
PIONEER NATURAL RESOURCES CANADA INC.
CHINCHAGA GAS PLANT
LSD C-32-H / 94-H-8

DEETHANIZER

TECH.: J.O.	REV. DATE:	DWG DATE: 99/08
CAD: WO	REVISION:	DRAWING: 046



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
046-20	2"				160	8.7mm	ASTM	7.6mm		

COMMENTS: _____

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

DEETHANIZER PIPING

TECH.: JO	REV.DATE:	DWG.DATE: 99/12
CAD: WO	REVISION:	DRAWING: 046A

PIONEER NATURAL RESOURCES CANADA INC.
CHINCHAGA GAS PLANT

RIVEST TESTING INC.

Item Desc.: C-32-H/94-H-8 / DE-ETHANIZER

Equip. No.: V-330

Ser. No.: 1615

Prov. Reg.: N/A

Pt.Desc.: UPPER SHELL BELOW ROOF

Point No.: 046-05

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	12.800	____.____
	2	13.000	____.____
	3	12.900	____.____
	4	12.700	____.____
	5	13.000	____.____
	6	13.000	____.____

Data Evaluation

Lowest Reading : 12.700

Average - Low 3 : 12.800

Thk.Remaining Above Min. : 1.600

Indv. Short Term Rate (mm/yr) :

Short Term Rate (mm/yr) :

LongTerm Rate (mm/yr) :

Item Desc.: C-32-H/94-H-8 / DE-ETHANIZER

Equip. No.: V-330

Ser. No.: 1615

Prov. Reg.: N/A

Pt.Desc.: BTM.SHELL

Point No.: 046-10

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	13.100	____.____
	2	13.000	____.____
	3	13.000	____.____
	4	13.100	____.____
	5	13.100	____.____
	6	13.100	____.____
	7	13.300	____.____
	8	13.000	____.____
	9	13.100	____.____
	10	13.300	____.____
	11	13.200	____.____
	12	13.200	____.____

Data Evaluation

Lowest Reading : 13.000

Average - Low 3 : 13.000

Thk.Remaining Above Min. : 1.900

Indv. Short Term Rate (mm/yr) :

Short Term Rate (mm/yr) :

LongTerm Rate (mm/yr) :

Item Desc.: C-32-H/94-H-8 / DE-ETHANIZER

Equip. No.: V-330

Ser. No.: 1615

Prov. Reg.: N/A

Pt.Desc.: BTM.HEAD

Point No.: 046-15

Nominal: 11.200 Mths. Rem. To Min. Nom:

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

Min. Nominal: 9.600

Good For Continued Service: YES

Additional Assessment Of Data: YES

Suggested Max Insp. Interval In Mths.: 12

Survey Dates: 1999-12

Data Readings	1	12.300	____.
	2	12.200	____.
	3	12.200	____.
	4	11.800	____.

Data Evaluation

Lowest Reading : 11.800

Average - Low 3 : 12.067

Thk.Remaining Above Min. : 2.200

Indv. Short Term Rate (mm/yr) :

Short Term Rate (mm/yr) :

LongTerm Rate (mm/yr) :

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

Point No.: 046-20

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	8.500	____.
	2	7.400	____.
	3	7.300	____.
	4	7.300	____.
	5	7.600	____.

Data Evaluation

Lowest Reading : 7.300

Average - Low 3 : 7.333

Thk.Remaining Above Min. : 1.300

Indv. Short Term Rate (mm/yr) :

Short Term Rate (mm/yr) :

LongTerm Rate (mm/yr) :

TAQA North

Unit: N-603

FACILITY:	CHINCHAGA GAS PLANT	MANUFACTURER:	THERMO DESIGN ENGINEER
LSD:	C-032-H/094-H-08	DESIGN PRESSURE:	2068 kPa / 300 psi
ITEM DESC.:	DEETHANIZER TOWER	DESIGN TEMP.:	149 C / 300 F
EQUIP / OIP#:	603VT001	RECOMMENDED NEXT INSP. DATE:	12/2009
PROV. REG. #:	N/S	RECOMMENDED RETIREMENT DATE:	02/2018
SERIAL #:	1615	REM. LIFE (from last survey 04/2008):	9.80 yrs.
CRN.:	L0307.21	TOTAL CAUTION / ACTION TML:	0

Item # (023)

COMMENTS:

2008/04 - NO ACCESS TO TML#4, TML#6 AND TML#8.

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

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 4.90 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 4.90 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	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	4.90	0.000	0.058	02/2009	12/2009	NO *
2.02	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	4.90	0.000	0.058	02/2009	12/2009	NO *
2.03	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	4.90	0.000	0.058	02/2009	12/2009	NO *
2.04	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	4.90	0.000	0.058	02/2009	12/2009	NO *
2.05	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	4.90	0.000	0.058	02/2009	12/2009	NO *

TML No.: 10 BELOW ROOF SH

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 12.87 mm.

MATERIAL: SA106-B

MINIMUM THICKNESS MEASURED: 12.70 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	12.70	0.000	0.000	04/2013	08/2541	NO
10.02	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
10.03	12.70	1.60	11.10	01/1998	12.70	N/A	N/A	04/2008	13.00	0.000	0.000	04/2013	08/2641	NO
10.04	12.70	1.60	11.10	01/1998	12.70	N/A	N/A	04/2008	13.00	0.000	0.000	04/2013	08/2641	NO
10.05	12.70	1.60	11.10	01/1998	12.70	N/A	N/A	04/2008	13.00	0.000	0.000	04/2013	08/2641	NO
10.06	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

(*) 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:	2068 kPa / 300 psi
ITEM DESC.:	DEETHANIZER TOWER	DESIGN TEMP.:	149 C / 300 F
EQUIP / OIP#:	603VT001	RECOMMENDED NEXT INSP. DATE:	12/2009
PROV. REG. #:	N/S	RECOMMENDED RETIREMENT DATE:	02/2018
SERIAL #:	1615	REM. LIFE (from last survey 04/2008):	9.80 yrs.
CRN.:	L0307.21	TOTAL CAUTION / ACTION TML:	0

Item # (023)

COMMENTS:

2008/04 - NO ACCESS TO TML#4, TML#6 AND TML#8.

TML No.: 12 BTM SH T-B

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 13.18 mm.

MATERIAL: SA106-B

MINIMUM THICKNESS MEASURED: 12.90 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
12.01	12.70	1.60	11.10	01/1998	12.70	N/A	N/A	04/2008	12.90	0.000	0.000	04/2013	04/2608	NO
12.02	12.70	1.60	11.10	01/1998	12.70	N/A	N/A	04/2008	12.90	0.000	0.000	04/2013	04/2608	NO
12.03	12.70	1.60	11.10	01/1998	12.70	N/A	N/A	04/2008	13.30	0.000	0.000	04/2013	08/2741	NO
12.04	12.70	1.60	11.10	01/1998	12.70	N/A	N/A	04/2008	13.30	0.000	0.000	04/2013	08/2741	NO
12.05	12.70	1.60	11.10	01/1998	12.70	N/A	N/A	04/2008	13.20	0.000	0.000	04/2013	04/2708	NO
12.06	12.70	1.60	11.10	01/1998	12.70	N/A	N/A	04/2008	13.20	0.000	0.000	04/2013	04/2708	NO
12.07	12.70	1.60	11.10	01/1998	12.70	N/A	N/A	04/2008	13.40	0.000	0.000	04/2013	12/2774	NO
12.08	12.70	1.60	11.10	01/1998	12.70	N/A	N/A	04/2008	13.20	0.000	0.000	04/2013	04/2708	NO

TML No.: 14 BTM HD T-B

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 12.25 mm.

MATERIAL: SA516-70

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
14.01	11.20	1.60	9.60	01/1998	11.20	N/A	N/A	04/2008	12.20	0.000	0.000	04/2013	12/2874	NO
14.02	11.20	1.60	9.60	01/1998	11.20	N/A	N/A	04/2008	12.30	0.000	0.000	04/2013	04/2908	NO
14.03	11.20	1.60	9.60	01/1998	11.20	N/A	N/A	04/2008	12.20	0.000	0.000	04/2013	12/2874	NO
14.04	11.20	1.60	9.60	01/1998	11.20	N/A	N/A	04/2008	12.30	0.000	0.000	04/2013	04/2908	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:	2068 kPa / 300 psi
ITEM DESC.:	DEETHANIZER TOWER	DESIGN TEMP.:	149 C / 300 F
EQUIP / OIP#:	603VT001	RECOMMENDED NEXT INSP. DATE:	12/2009
PROV. REG. #:	N/S	RECOMMENDED RETIREMENT DATE:	02/2018
SERIAL #:	1615	REM. LIFE (from last survey 04/2008):	9.80 yrs.
CRN.:	L0307.21	TOTAL CAUTION / ACTION TML:	0

Item # (023)

COMMENTS:

2008/04 - NO ACCESS TO TML#4, TML#6 AND TML#8.

TML No.: 16 1.5"90L DRAIN

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 7.04 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 6.90 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
16.01	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
16.02	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	7.10	0.000	0.000	04/2013	04/2308	NO
16.04	7.10	0.90	6.20	01/1998	7.10	N/A	N/A	04/2008	7.10	0.000	0.000	04/2013	04/2308	NO
16.05	7.10	0.90	6.20	01/1998	7.10	N/A	N/A	04/2008	7.20	0.000	0.000	04/2013	08/2341	NO

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

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 6.77 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 6.30 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
18.01	6.00	0.70	5.30	01/1998	6.00	N/A	N/A	04/2008	6.90	0.000	0.000	04/2013	08/2541	NO
18.02	6.00	0.70	5.30	01/1998	6.00	N/A	N/A	04/2008	7.10	0.000	0.000	04/2013	04/2608	NO
18.03	6.00	0.70	5.30	01/1998	6.00	N/A	N/A	04/2008	7.00	0.000	0.000	04/2013	12/2574	NO
18.04	6.00	0.70	5.30	01/1998	6.00	N/A	N/A	04/2008	6.90	0.000	0.000	04/2013	08/2541	NO
18.05	6.00	0.70	5.30	01/1998	6.00	N/A	N/A	04/2008	6.30	0.000	0.000	04/2013	08/2341	NO
18.06	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.

TAQA North

Unit: N-603

FACILITY:	CHINCHAGA GAS PLANT	MANUFACTURER:	THERMO DESIGN ENGINEER
LSD:	C-032-H/094-H-08	DESIGN PRESSURE:	2068 kPa / 300 psi
ITEM DESC.:	DEETHANIZER TOWER	DESIGN TEMP.:	149 C / 300 F
EQUIP / OIP#:	603VT001	RECOMMENDED NEXT INSP. DATE:	12/2009
PROV. REG. #:	N/S	RECOMMENDED RETIREMENT DATE:	02/2018
SERIAL #:	1615	REM. LIFE (from last survey 04/2008):	9.80 yrs.
CRN.:	L0307.21	TOTAL CAUTION / ACTION TML:	0

Item # (023)

COMMENTS:

2008/04 - NO ACCESS TO TML#4, TML#6 AND TML#8.

TML No.: 20 4"FLOAT B/S 300#

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 5.73 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 5.70 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	5.80	0.000	0.020	04/2013	11/2032	NO *
20.02	6.00	0.70	5.30	01/1998	6.00	N/A	N/A	04/2008	5.70	0.000	0.030	04/2013	05/2021	NO *
20.03	6.00	0.70	5.30	01/1998	6.00	N/A	N/A	04/2008	5.70	0.000	0.030	04/2013	05/2021	NO *
20.04	6.00	0.70	5.30	01/1998	6.00	N/A	N/A	04/2008	5.70	0.000	0.030	04/2013	05/2021	NO *
20.05	6.00	0.70	5.30	01/1998	6.00	N/A	N/A	04/2008	5.70	0.000	0.030	04/2013	05/2021	NO *
20.06	6.00	0.70	5.30	01/1998	6.00	N/A	N/A	04/2008	5.80	0.000	0.020	04/2013	11/2032	NO *

TML No.: 22 4"FLOAT B/H 300#

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 6.05 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 5.60 mm.

Pts.	Nom. Thick.	Corr. Allow.	Min. Thick.	B/L Survey Date mm/yyyy	B/L Survey Date mm/yyyy	Prev. Survey Date mm/yyyy	Prev. Survey Date mm/yyyy	Last Survey Date mm/yyyy	Last Survey Date mm/yyyy	Short Term Rate	Long Term Rate	TML Insp. Due	TML Retire. Date	Action/Caution Required Item
22.01	6.00	0.70	5.30	01/1998	6.00	N/A	N/A	04/2008	6.30	0.000	0.000	04/2013	08/2341	NO
22.02	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
22.03	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 *
22.04	6.00	0.70	5.30	01/1998	6.00	N/A	N/A	04/2008	5.80	0.000	0.020	04/2013	11/2032	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:	2068 kPa / 300 psi
ITEM DESC.:	DEETHANIZER TOWER	DESIGN TEMP.:	149 C / 300 F
EQUIP / OIP#:	603VT001	RECOMMENDED NEXT INSP. DATE:	12/2009
PROV. REG. #:	N/S	RECOMMENDED RETIREMENT DATE:	02/2018
SERIAL #:	1615	REM. LIFE (from last survey 04/2008):	9.80 yrs.
CRN.:	L0307.21	TOTAL CAUTION / ACTION TML:	0

Item # (023)

COMMENTS:

2008/04 - NO ACCESS TO TML#4, TML#6 AND TML#8.

TML No.: 24 2"90L I/L 300

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 3.94 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 3.90 mm.

Pts.	Nom. Thick.	Corr. Allow.	Min. Thick.	B/L Survey Date mm/yyyy	B/L Survey	Prev. Survey Date mm/yyyy	Prev. Survey	Last Survey Date mm/yyyy	Last Survey	Short Term Rate	Long Term Rate	TML Insp. Due	TML Retire. Date	Action/Caution Required Item
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	3.90	0.000	0.000	04/2013	12/2174	NO
24.03	3.90	0.50	3.40	01/1998	3.90	N/A	N/A	04/2008	4.00	0.000	0.000	04/2013	04/2208	NO
24.04	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
24.05	3.90	0.50	3.40	01/1998	3.90	N/A	N/A	04/2008	4.00	0.000	0.000	04/2013	04/2208	NO

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

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

RED (Action TML) TML with negative life.

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

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:	De-Ethanizer Tower	A No:	BC	MTL No: TWR186
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-330	Serial Number:	1615	
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:	TWR186	Volume:	51.000 F3	CRN Number:	L-0307-21	Registered:	Yes
Serial Number:	1615	Size:	16.000 in O.D.	x	40 ft	0 in	Seam to Seam
Drawing Number:	9097-0850-202	P & ID Number:					
Shell Material:	SA-106-B	Bottom	Shell Thickness:	0.500	In		
		Top	Shell Thickness:	0.375	In		
Head Material:	SA-516-70	Bottom	Head Thickness:	0.441	In		
		Top	Head Thickness:	0.336	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: 300 psi	Operating Pressure:	Shell: psi				
	Tube: psi		Tube: psi				
Design Temperature:	Shell: 300 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:	De-Ethanizer Tower	A No:	BC	MTL No: TWR186

TOWER SHELL / HEADS / PIPING

External / Instrumentation Condition

The vessel was insulated and cladded. The projection inside building was painted and outside building was frozen. The pressure retainin welds were intact and revealed no signs of deterioration or visible cracking. The associated instrumentaion appears to be in good working order.

Internal Condition

No internal access

Nozzle Condition

The exposed nozzles were painted and appeared to be in good condition. No evidence of external corrosion was noted during this inspection.

Flange Condition

The flanges and NPT painted connections appeared to be in good condition with no signs of corrosion. The associated gaskets and bolting were in place and appeared to be tight.

Internal Piping

Not Applicable

External Piping

The C2 riser piping was peeling to bare metal. There was also some surface rust noted but no evidence of corrosion. The piping was painted and insulated and both types were noted in good condition.

Pipe Support Condition

All of the supports are in place, secure and functioning properly.

Bolting Condition

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

Firetube Condition

Not Applicable

Demister Pad Condition

Not Applicable

Anode Condition

Not Applicable

Vessel Support

The skid base, tower skirt assembly and 12 bolts were all noted in good condition.

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:	De-Ethanizer Tower	A No:	BC	MTL No: TWR186

TOWER COATING INSPECTION

Type of Coating

Coating Manufacturer 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

Perform internal inspection next turnaround in 3 years
Repeat UT Survey in 3 years
Next PSV servicing 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:	De-Ethanizer Tower	A No:	BC	MTL No: TWR186

PSV DATA

Side	Set Pressure psi	CRN Number	Manufacturer PSV Number	Model Serial Number	Capacity	Size Inches	Set Date
Tubeside	285		Mercer PNR3302	81-28621111 56608	2366 SCFM	1.5 x	Dec/1999

CURRENT TOWER PROCESS CONDITIONS

Sweet Gas	LPG
-----------	-----

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

EQUIPMENT NO: 603VT001

Page of

FACILITY: Chinchaga Gas Plant

PROV. REG. NO:

EQUIPMENT NAME: De-ethanizer Tower

TAG NO:

SIZE: 406mm OD x L/H 12192mm MAWP: 2068 kPa @ 149/-29 °C

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

MANWAY ☐ YES ☒ NO

SERVICE:

FLUID: N.G.L. / Propane / L.P.G.

☐ 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 to skirt

5. PROTECTIVE COATINGS AND INSULATION ☒

6. EXTERNAL METAL SURFACES ☐ N/A

7. FANS AND OTHER ANCILLARY EQUIPMENT ☐ Ruffneck heater 8' high on north side of vessel

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: Half of vessel is inside of process building & the other half is above the roofline.

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 2007
(DD MONTH YYYY)

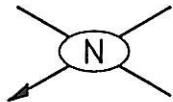
FOLLOW-UP INSPECTION REQ'D:

☐ YES ☒ NO

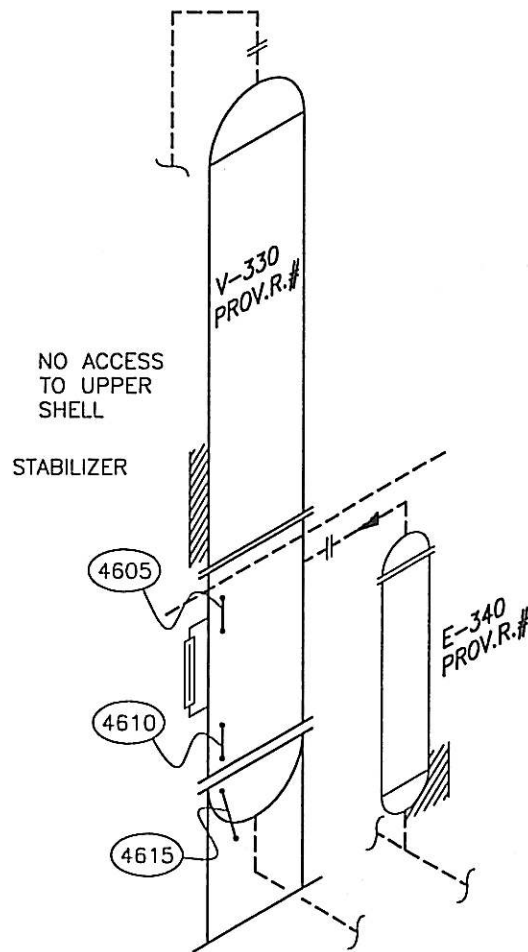
BY DATE:

(DD MONTH YYYY)

023



P&ID. # _____
REF. # _____



VESSEL DATA

Prov. Reg. No. _____ C.R.N. L 0397.21 P.E. No. V-330 Serial No. 1615
MFR. THERMO DESIGN Code/Div. _____ Para _____ Code Stamp _____
Yr. Bld. 1998 Yr. Inst. _____ Size _____ Vol.: _____ Service _____ PWHT _____

Nominal Thickness & Material

Head: 8.5mm Mat'l: SA 516-70 C.A.: 1.6mm
Head: 11.2mm SA 516-70
Shell: 9.5mm SA 106 B C.A.: 1.6mm
Shell: 12.7mm SA 106 B

Insulated YES R.T. 2

Repairs _____
COMMENTS _____

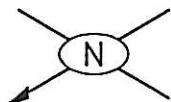
Chan Hd: _____ C.A.: _____
Chan Sh: _____
Gas Boot Hd: _____ C.A.: _____
Gas Boot Sh.: _____
Liq. Boot Hd.: _____ C.A.: _____
Liq. Boot Sh.: _____

MAWP Shell Side 300psi @ Temp. -20/300°F
MAWP Tube Side _____ @ Temp. _____

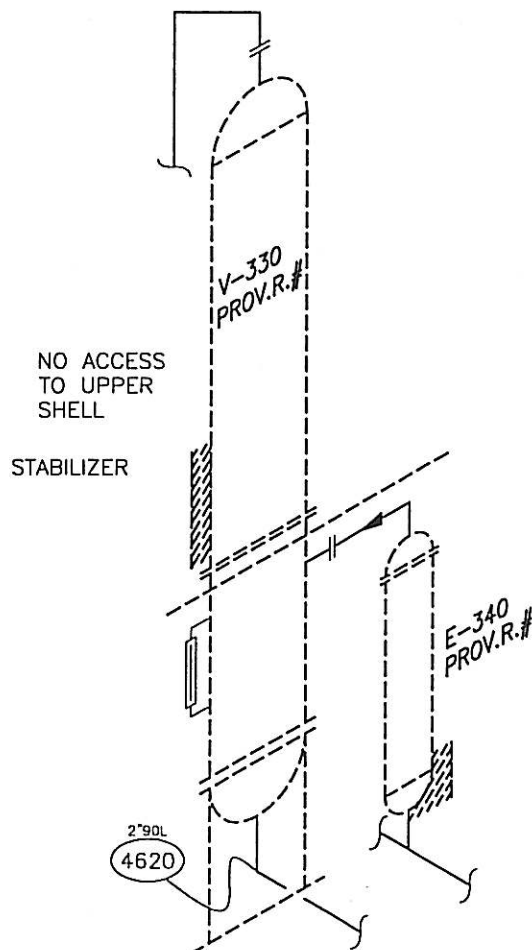
PIONEER NATURAL RESOURCES CANADA INC.
CHINCHAGA GAS PLANT
LSD C-32-H \ 94-H-8

DE-ETHANIZER

TECH.: J.OLIVER	REV.DATE:	DWG DATE: 02/2002
CAD: MKM	REVISION:	DRAWING: 046



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
									** DESIGN	*** CALC.			
4620	2"						160	8.7mm	ASTM		7.6mm		

COMMENTS: _____

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

DE-ETHANIZER PIPING

TECH.: J.OLIVER	REV.DATE:	DWG DATE: 02/2002
CAD: MKM	REVISION:	DRAWING: 046A

Equip No V-330

Serial No 1615

Prov Reg No N/A

Description DEETHANIZER

046 - 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: 999
 Min Calc'd Wall Thickness: N/A
 Thick Remain Above T Min: 1.7
 Short Term Corr Rate: N/A
 Long Term Corr Rate: N/A
 Months Remain to LFL: 26
 Lowest Value - Last Reading: 12.8

Comment:

	Dec-99	Feb-02
Point 1	12.8	13.0
Point 2	13.0	12.8
Point 3	12.9	12.9
Point 4	12.7	12.9
Point 5	13.0	13.0
Point 6	13.0	13.0
Point 7		
Point 8		
Point 9		
Point 10		
Point 11		
Point 12		
Average	12.9	12.9
Avg Low 3	12.8	12.9
Lowest	12.7	12.8

046 - 010

TML Description: BTM. SHELL

T Nominal: 12.7

Min Nominal: 11.1

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: 1.9
 Short Term Corr Rate: N/A
 Long Term Corr Rate: N/A
 Months Remain to LFL: N/A
 Lowest Value - Last Reading: 13.0

Comment:

	Dec-99	Feb-02
Point 1	13.1	13.1
Point 2	13.0	13.1
Point 3	13.0	13.0
Point 4	13.1	13.1
Point 5	13.1	13.1
Point 6	13.1	13.2
Point 7	13.3	13.4
Point 8	13.0	13.2
Point 9	13.1	13.3
Point 10	13.3	13.4
Point 11	13.2	13.5
Point 12	13.2	13.4
Average	13.1	13.2
Avg Low 3	13.0	13.1
Lowest	13.0	13.0

TML Description: BTM. HEAD			
T Nominal: 11.2			
Min Nominal: 9.6			
Corr Allowance: 1.6			
<i>Data Readings</i>			
<i>Data Evaluations</i>		Dec-99	Feb-02
Months Remaining to T Min: 999		Point 1	12.3 12.2
Min Calc'd Wall Thickness: N/A		Point 2	12.2 12.2
Thick Remain Above T Min: 2.3		Point 3	12.2 12.3
Short Term Corr Rate: N/A		Point 4	11.8 11.9
Long Term Corr Rate: N/A		Point 5	
Months Remain to LFL: 182		Point 6	
Lowest Value - Last Reading: 11.9		Point 7	
Comment:		Point 8	
		Point 9	
		Point 10	
		Point 11	
		Point 12	
		Average	12.1 12.2
		Avg Low 3	12.1 12.1
		Lowest	11.8 11.9

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: 999		Point 1	8.5 7.8
Min Calc'd Wall Thickness: N/A		Point 2	7.4 7.5
Thick Remain Above T Min: 0.2		Point 3	7.3 7.3
Short Term Corr Rate: N/A		Point 4	7.3 7.3
Long Term Corr Rate: N/A		Point 5	7.6 7.5
Months Remain to LFL: N/A		Point 6	
Lowest Value - Last Reading: 7.3		Point 7	
Comment:		Point 8	
		Point 9	
		Point 10	
		Point 11	
		Point 12	
		Average	7.6 7.5
		Avg Low 3	7.3 7.4
		Lowest	7.3 7.3

RAM#		433817		EQUIP STATIC RECORD				JOB#		2636	
Unique OUP #:		603VT001		Old OUP #:				LSD:		C-032-H/094-H-08	
PLANT / FIELD:		Chinchaga Gas Plant		Down Hole Location:				RENTAL:			
EQUIPMENT NAME:		De-Ethanizer Tower		Unique # of Compressor this equipment is related to:							
VESSEL STATUS:		Active		PRIMARY LOCATION:		Gas plant		Vessel Car-Sealed Out?			
PHYSICAL LOCATION:						YEAR INSTALLED:					
SERVICE:		Sweet		H2S		PROCESS FLUID:		LPG		CYCLIC:	
MANUFACTURER:		Thermo Design Engineering Ltd.		DWG.#		9097-0850-202		S N:		1615	
PRN		for VESSEL or SHELL		CRN		L0307.21		YR. BUILT		1998	
NB:		CODE/DIV.		ASME VIII DIV.1		PARA.		STAMP		U	
SHELL-TANK				RADIOGRAPHY:		RT2		JOINT EFF.		PWHT:	
MAWP		2068 kPa		AT		149 °C		MDMT		-29 °C	
DIA. OD		406.4 mm		LENGTH:		mm		HEIGHT:		12192.0 mm	
VOLUME:		m³									
SECTION		MATERIAL		NOMINAL THICKNESS		C.A.					
Shell		SA-106-B		9.525		mm		1.588		mm	
Head 1		SA-516-70N		8.534		mm		1.588		mm	
Head 2		SA-516-70N		11.201		mm		1.588		mm	
						mm				mm	
						mm				mm	
						mm				mm	
						mm				mm	
Heat Exchangers, Tubing, Channel, Line Heater coil											
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				TUBE SIZE		mm		# of Tubes			
SECTION		MATERIAL		NOMINAL THICKNESS		C.A.					
						mm				mm	
						mm				mm	
						mm				mm	
						mm				mm	
TUBING: PRN CRN TEMA CLASS TYPE S N:											
MAWP		kPa		AT		°C		TUBE SIZE		mm	
GAUGE,BWG				TUBE/TUBE SHEET JT.							
# of Tubes		MATERIAL		NOMINAL THICKNESS		C.A.					
						mm				mm	
COIL: PRN CRN COIL NAME: HP, LP, FG, HS											
MAWP		kPa		AT		°C		TUBE SIZE		mm	
S N:				TUBE SIZE		mm		S N:			
# of Tubes		MATERIAL		NOMINAL THICKNESS		C.A.					
						mm				mm	

RAM# 433817		EQUIP STATIC RECORD		JOB# 2636	
Unique OUP #: 603VT001		Old OUP #:		LSD: C-032-H/094-H-08	
TANK M/WAY OD FLANGE DIMENSIONS: X mm OR IF M/WAY IS ROUND, DIA. IS: mm					
TK. HEATED: TYPE OF HEAT: TK. SKIDDED or PORTABLE: GAS BLANKET: DOUBLE WALL:					
TK. CONSTRUCTION: TANK DYKED: DYKE MATERIAL: Leak Tag#:					
DYKE LINED: TYPE of LINER: Leak Test Co. Leak Test Date					
DYKE SHAPE: mm Width: mm Height: mm					
DYKE VOLUME: m³ TK. BASE SITTING ON: BETWEEN TK. AND BASE:					
TANKS INSIDE DYKE:					
P&ID #: SHUT DOWN: Partial					
OPERATING PRESSURE: 800 kPa OPERATING TEMP. 73 °C YEAR PUT IN SERVICE:					
VESSEL CONNECTIONS: NPT FLANGE LARGEST CONNECTION mm INSPECTION PORT: None					
FLANGE ANSI: FLG. FACE: SIZE of INSPECTION PORT: 219.1 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: 40.0 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	
603SVVT001		1965	kPa	Shell	
			kPa		
			kPa		
			kPa		
			kPa		
			kPa		
			kPa		
			kPa		
			kPa		
			kPa		
			kPa		
			kPa		
			kPa		
			kPa		
			kPa		
ITS PRINT NAME:		Erwin D. Pederson		ITS SIGNATURE: Erwin Pederson	
				DATE: data collected - yyyy-mm-dd 2014-May-05	

EQUIPMENT EXTERNAL INSPECTION REPORT

Customer:	TAQA North	ITS Job No.:	2636
District:	North Area	Date:	23-Mar-2014
Facility:	Chinchaga Gas Plant	LSD:	C-032-H/094-H-08
Equip. Description:	De-Ethanizer Tower	Serial No.:	1615
Equip./OIP No.:	603VT001	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	☐ Top ☐ Bottom
☒ Paint/Coating Repairs	Access and Coverage	☒ Y ☐ N: Name Plate Legible	☐ Good Condition
☐ Insulation Repairs	☒ External Inspection	External Grounding	☐ External Corrosion
☐ PSV Service Required	☐ Part. External Inspection	☒ Direct ☐ Indirect ☐ N	☐ Pitting: (max depth)
☐ Further Assessment Required	NDE Examination	☒ Y ☐ N ☐ NA: Ladders/ Handrail/ Walkway/ Grating in safe condition?	☐ Scale
☐ Condition Damage	☐ MT		☐ Blistered
☐ Does not comply with applicable code/safe operating requirement.	☐ UT		☐ Mechanical Damage
☐ Repairs Required	☐ RT	☒ See Attached Pictures	☐ Deformation/Distortion
☐ See Comments	☐ BH	☐ Excessive Vibration	☐ Condensation/Sweating
	☐ PT	☒ Y ☐ N ☐ NA: Pressure Gauge within MAWP	☒ No Access Insulated
	☐ Other		☐ No Access Ice Build Up
Status	☐ See Comments	☐ Y ☒ N ☐ NA: Temp. Gauge within MDMT	☐ Weld(s) in Good Condition
☒ Operational; ☐ Idle;		☒ Y ☐ N Attached Piping and Instrumentation in Good Condition	☐ Weld(s) Corroded
☐ Shut In;		☐ See Comments	☐ Weld(s) Poor Quality
☐ Surplus/Boneyard;			☐ Weld(s) Cracked
☐ Other:			☐ See Comments

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

External Surface	Supports	Associated Piping	PRD 1	PRD 2
☐ Good Condition	☒ Good Condition	☐ Good Condition	Location: VESSEL	Location: Not Applicable
☒ Painted ☐ Full ☒ Part.	☒ Anchor Bolts Secure	☒ Corrosion	PSV Tag No.: 603SVVT001	PSV Tag No.: Not Applicable
☐ Coated ☐ Full ☐ Part.		☐ Pitting: (max depth)	☒ Service Date within Interval	☐ Service Date within Interval
☒ Insulated ☒ Full ☐ Part.	☐ Welded to Skid	☐ Bolts Missing/ Loose/ Damaged	☒ Set Pressure within MAWP	☐ Set Pressure within MAWP
☐ Insulation Damaged	☐ Supported by Nozzle(s)	☐ Short Threaded	☒ Safety Seal Intact	☐ Safety Seal Intact
☐ Penetration Seals Broken	☐ Piping Supported	☐ Valves leaking	☐ Service Seal Intact	☐ Service Seal Intact
☐ Corrosion Under Insulation (CUI)	☐ Expansion Slots	☐ Connections Leaking	☒ Current Service Tag Attached	☐ Current Service Tag Attached
☐ Visible Moisture Contamination	☐ Bolts Missing/ Loose/ Damaged		☐ PSV inlet Gusseted	☐ PSV inlet Gusseted
☒ Paint Deterioration	☐ Short Threaded	☒ Piping and Valves Supported	☐ Inlet Block Valve	☐ Inlet Block Valve
☐ Coating Deterioration	☐ Deflected/Distorted	☐ Piping Deflected/ Distorted	Locked Open ☐ Y ☐ N	Locked Open ☐ Y ☐ N
☐ Fireproofing Cracked	☐ Poor Insulation		Sealed Open ☐ Y ☐ N	Sealed Open ☐ Y ☐ N
	☐ Fire Proofing Cracked	☒ No Access Insulated	☐ Outlet Block Valve	☐ Outlet Block Valve
☐ External Protection Only	☒ Vessel is level	☒ See Comments	Locked Open ☐ Y ☐ N	Locked Open ☐ Y ☐ N
	☐ See Comments		Sealed Open ☐ Y ☐ N	Sealed Open ☐ Y ☐ N
☒ See Comments			☐ See Comments	☐ See Comments

Observations:

☒ Vessel in Good Condition

☐ Based on API 510 Visual External Inspection this vessel is fit for service

- PAINT DETERIORATION ON BOTTOM HEAD AND DRAIN NOZZLE - SURFACE CORROSION.
- THE "C2 OVERHEAD" LINE COMING DOWN FROM THE ROOF LINE AND HAS TML 24 AS THE ELBOW, THIS LINE HAS EXTERNAL CORROSION - SURFACE IS ROUGH.

Recommendations:

- Paint.

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:	40	Months	PRD 2 Not Applicable	Months
--	----	--------	-------------------------------------	----	--------	----------------------	--------

Pictures:



Photo 1: BOTTOM HEAD



Photo 2: BOTTOM HEAD



Photo 3: TEMPERATURE GAUGE

External Inspection Performed By:

Print Name:

Erwin D. Pederson

Certification No.:

ABSA IPV PESL:

000406

API 510: 33075

API 570: 28183

PEI Class 2: 154

Signature:

Erwin Pederson

Report Reviewed:

[Signature]
Initial

Chief Inspector /
Client
Representative:

Name (Print)

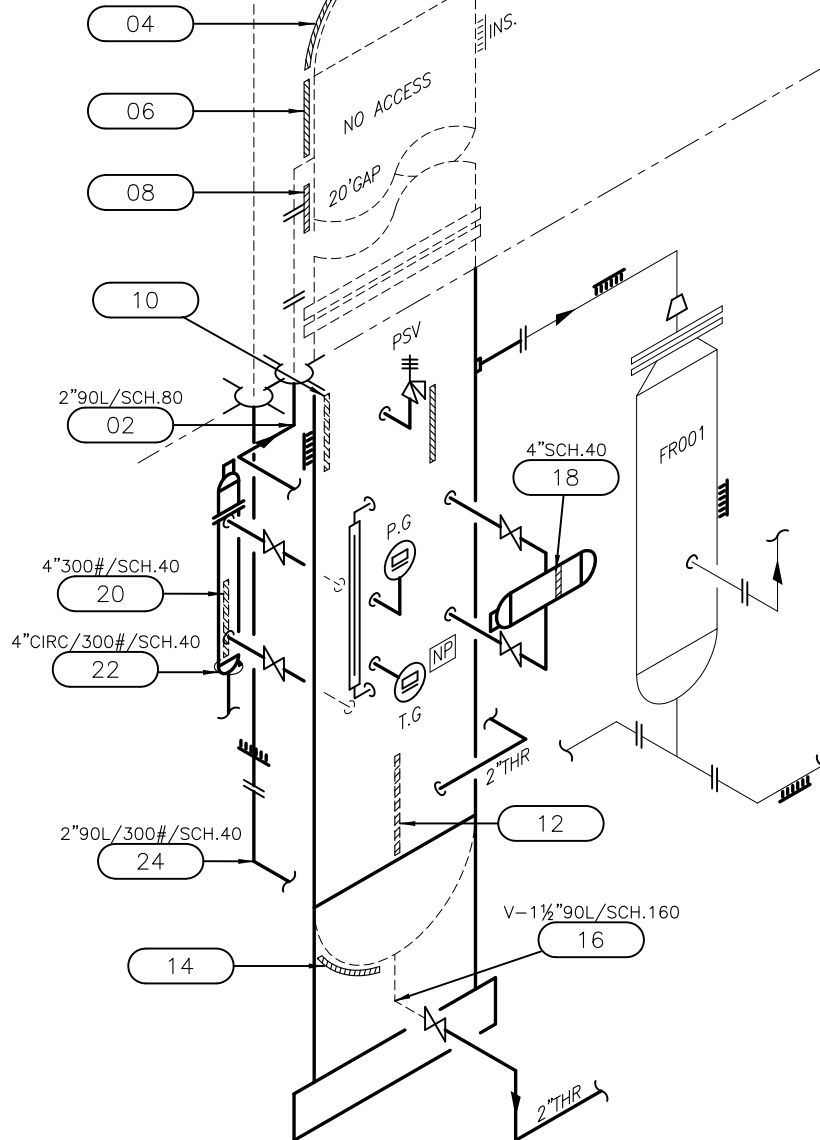
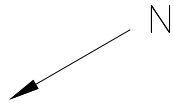
Signature

Date:

RAM#	433817	EQUIP STATIC RECORD	JOB#	1-4012
Unique OUP #:	603VT001	Old OUP #:	LSD: C-032-H/094-H-08	
PLANT / FIELD:	Chinchaga Gas Plant	Down Hole Location:	RENTAL:	
EQUIPMENT NAME:	De-Ethanizer Tower	Unique # of Compressor this equipment is related to:		
VESSEL STATUS:	Active	PRIMARY LOCATION:	Gas plant	Vessel Car-Sealed Out?
PHYSICAL LOCATION:	Refrigeration Building		YEAR INSTALLED:	
SERVICE:	Sweet	H ₂ S	PROCESS FLUID:	LPG
CYCLIC:				
MANUFACTURER:	Thermo Design Engineering Ltd.	DWG.#	9097-0850-202	S N:
PRN	for VESSEL or SHELL	CRN	L0307.21	YR. BUILT
NB:	CODE/DIV. ASME VIII DIV.1	PARA.	STAMP U	
SHELL-TANK				
RADIOGRAPHY:		RT2	JOINT EFF.	PWHT:
MAWP	2068 kPa	AT	149 °C	MDMT
				-29 °C
AT	2068 kPa			
DIA. ID	381.0 mm	LENGTH:	mm	HEIGHT:
				12192.0 mm
VOLUME:	m ³			
Shell Longitudinal Seam Present _____ Pipe _____				
<u>SECTION</u>	<u>MATERIAL</u>	<u>NOMINAL THICKNESS</u>	<u>C.A.</u>	
Shell	SA-106-B	9.53 mm	1.59 mm	
Head 1	SA-516-70N	8.53 mm	1.59 mm	
Head 2	SA-516-70N	11.20 mm	1.59 mm	
		mm	mm	
		mm	mm	
		mm	mm	
		mm	mm	
Heat Exchangers, Tubing, Channel, Line Heater coil				
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	
TUBING: 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	
COIL: 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
PROV. REG. NO.: N/S
SERIAL NO.: 1615

OUP#: 603VT001
C.R.N.: L0307.21
N.B. NO.: N/S

Code/Div.: ASME VIII DIV.1
Radiography: RT-2
Insulated: YES
Year Built: 1998
Manufacturer: THERMO DESIGN ENGINEERING LTD.

Size: 381mm ID X 12192mm S/S
Service: SWEET
PWHT: N/S
Manway: NO
Size: N/A

Design & Materials Data

HEAD
Mat'l: SA-516-70N Nom.: 8.53mm C.A.: 1.59mm
Mat'l: SA-516-70N Nom.: 11.20mm C.A.: 1.59mm

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

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

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

MAWP Shell Side: 2068 KPA @ Temp.: 149°C/-29°C
MAWP Tube Side: @ Temp.:

CLIENT	TAQA NORTH	
FACILITY	CHINCHAGA GAS PLANT	
	LSD C-032-H/ 094-H-08	
ITEM	DE-ETHANIZER TOWER	
TECH/CAD: C.R.E./F.Y.C.	DATE: 07/2018	DWG. No.: 023

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

PROV. REG. #: Not Stated
SERIAL #: 1615
OIP NO.: 603VT001

Description: **2" 90L B-T**

CML: **023-02**

NOM. THICK.: 5.54 mm
MILL. TOL.: ASTM
CA: Not Stated
MIN. NOM.: 4.85 mm

MATERIAL:
MINIMUM THICKNESS MEASURED: **4.30 mm**
AVERAGE THICKNESS MEASURED: 4.38 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	4.90	4.50	0.0390	0.0000	0.00
2	4.90	4.40	0.0487	0.0000	0.00
3	4.90	4.30	0.0585	0.0000	0.00
4	4.90	4.40	0.0487	0.0000	0.00
5	4.90	4.30	0.0585	0.0000	0.00

Description: **TOP HEAD**

CML: **023-04**

COMMENTS:
2008/2018 - NO ACCESS.

Description: **ABOVE ROOF TOP SHELL**

CML: **023-06**

COMMENTS:
2008/2018 - NO ACCESS.

Description: **ABOVE ROOF LOWER SHELL**

CML: **023-08**

COMMENTS:
2008/2018 - NO ACCESS.

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

PROV. REG. #: Not Stated
SERIAL #: 1615
OIP NO.: 603VT001

Description: BELOW ROOF SHELL
CML: 023-10

NOM. THICK.: 9.53 mm
MILL. TOL.: ASTM
CA: 1.59 mm
MIN. NOM.: 6.75 mm

MATERIAL: SA-106-B
MINIMUM THICKNESS MEASURED: **12.80 mm**
AVERAGE THICKNESS MEASURED: 12.92 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	12.70	12.80	0.0000	0.0000	100.00
2	12.70	12.90	0.0000	0.0000	100.00
3	13.00	12.90	0.0097	0.0000	100.00
4	13.00	12.90	0.0097	0.0000	100.00
5	13.00	13.00	0.0000	0.0000	100.00
6	12.80	13.00	0.0000	0.0000	100.00

Description: BOTTOM SHELL T-B
CML: 023-12

NOM. THICK.: 9.53 mm
MILL. TOL.: ASTM
CA: 1.59 mm
MIN. NOM.: 6.75 mm

MATERIAL: SA-106-B
MINIMUM THICKNESS MEASURED: **13.00 mm**
AVERAGE THICKNESS MEASURED: 13.33 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	12.90	13.00	0.0000	0.0000	100.00
2	12.90	13.20	0.0000	0.0000	100.00
3	13.30	13.20	0.0097	0.0000	100.00
4	13.30	13.20	0.0097	0.0000	100.00
5	13.20	13.30	0.0000	0.0000	100.00
6	13.20	13.40	0.0000	0.0000	100.00
7	13.40	13.60	0.0000	0.0000	100.00
8	13.20	13.70	0.0000	0.0000	100.00

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

PROV. REG. #: Not Stated
SERIAL #: 1615
OIP NO.: 603VT001

Description: BOTTOM HEAD T-B
CML: 023-14

NOM. THICK.: 11.20 mm
MILL. TOL.: 0.254 mm
CA: 1.59 mm
MIN. NOM.: 9.36 mm

MATERIAL: SA-516-70N
MINIMUM THICKNESS MEASURED: **12.30 mm**
AVERAGE THICKNESS MEASURED: 12.30 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	12.30	0.0000	0.0000	100.00
2	12.30	12.30	0.0000	0.0000	100.00
3	12.20	12.30	0.0000	0.0000	100.00
4	12.30	12.30	0.0000	0.0000	100.00

Description: 1 1/2" 90L DRAIN NOZZLE
CML: 023-16

NOM. THICK.: 7.14 mm
MILL. TOL.: ASTM
CA: 1.59 mm
MIN. NOM.: 4.66 mm

MATERIAL: SA-333-6
MINIMUM THICKNESS MEASURED: **7.30 mm**
AVERAGE THICKNESS MEASURED: 7.40 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	6.90	7.30	0.0000	0.0000	100.00
2	6.90	7.40	0.0000	0.0000	100.00
3	7.10	7.40	0.0000	0.0000	100.00
4	7.10	7.40	0.0000	0.0000	100.00
5	7.20	7.50	0.0000	0.0000	100.00

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

PROV. REG. #: Not Stated
SERIAL #: 1615
OIP NO.: 603VT001

Description: 4" FLOAT SHELL T-B
CML: 023-18

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

MATERIAL:
MINIMUM THICKNESS MEASURED: **6.60 mm**
AVERAGE THICKNESS MEASURED: 6.77 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	6.90	6.90	0.0000	0.0000	100.00
2	7.10	6.80	0.0292	0.0000	26.20
3	7.00	6.70	0.0292	0.0000	24.49
4	6.90	6.90	0.0000	0.0000	100.00
5	6.30	6.70	0.0000	0.0000	100.00
6	6.40	6.60	0.0000	0.0000	100.00

Description: 4" FLOAT LOWER SHELL 300#
CML: 023-20

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

MATERIAL:
MINIMUM THICKNESS MEASURED: **5.70 mm**
AVERAGE THICKNESS MEASURED: 5.77 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	5.80	5.80	0.0000	0.0000	100.00
2	5.70	5.80	0.0000	0.0000	100.00
3	5.70	5.80	0.0000	0.0000	100.00
4	5.70	5.80	0.0000	0.0000	100.00
5	5.70	5.70	0.0000	0.0000	100.00
6	5.80	5.70	0.0097	0.0000	22.16

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

PROV. REG. #: Not Stated
SERIAL #: 1615
OIP NO.: 603VT001

Description: 4" FLOAT BOTTOM HEAD 300#

CML: 023-22

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

MATERIAL:
MINIMUM THICKNESS MEASURED: **5.70 mm**
AVERAGE THICKNESS MEASURED: 5.85 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	6.30	5.90	0.0390	0.0000	8.08
2	6.50	5.90	0.0585	0.0000	5.38
3	5.60	5.90	0.0000	0.0000	100.00
4	5.80	5.70	0.0097	0.0000	22.16

Description: 2" 90L INLET 300#

CML: 023-24

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

MATERIAL:
MINIMUM THICKNESS MEASURED: **4.10 mm**
AVERAGE THICKNESS MEASURED: 4.34 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	4.10	0.0000	0.0000	100.00
2	3.90	4.30	0.0000	0.0000	100.00
3	4.00	4.30	0.0000	0.0000	100.00
4	3.90	4.50	0.0000	0.0000	100.00
5	4.00	4.50	0.0000	0.0000	100.00

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:	De-Ethanizer Tower	Serial No.:	1615
Equip./OIP No.:	603VT001	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	☐ Y ☒ N ☐ NA: Temp. Gauge within MDMT	☐ No Access Ice Build Up
	☐ Other		☐ 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.: 603SVVT001	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 access to the vessel due to heights and external insulation. No access to the vessel 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:
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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: