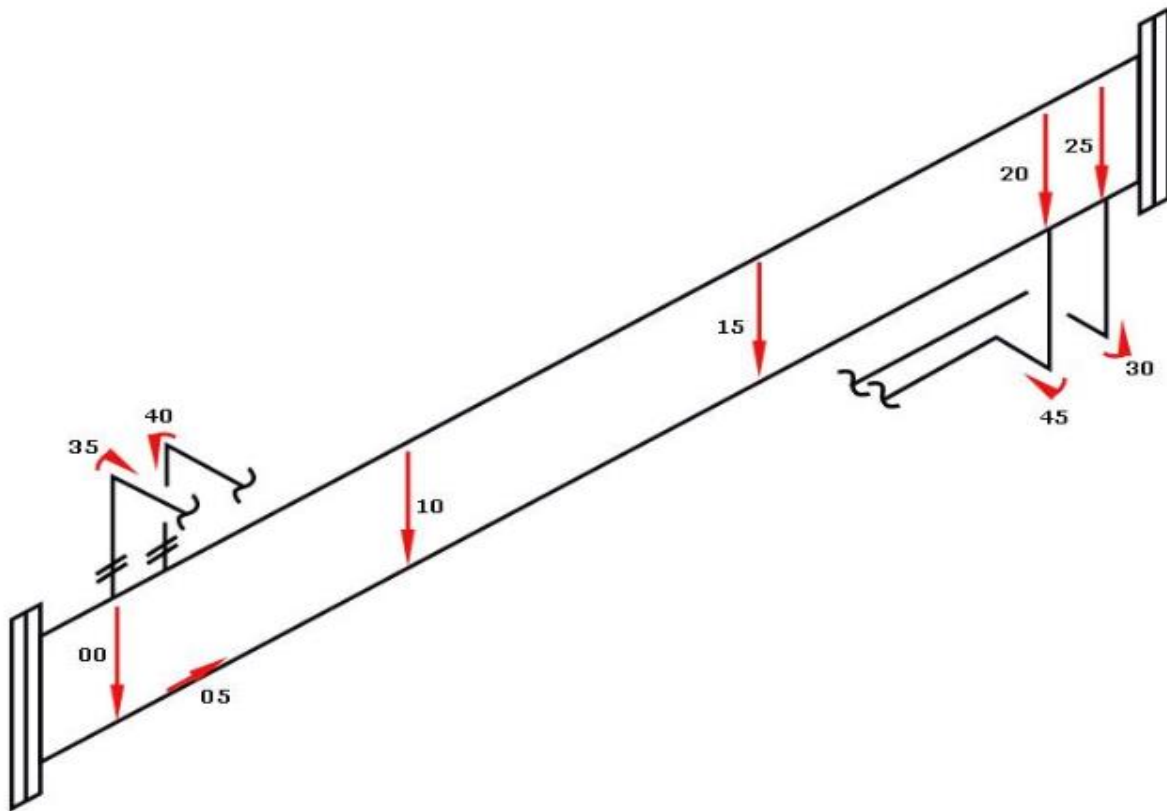




Location Name:	ANSELL	LSD:	07-27-051-19W5
Jur #:	A0626024	Equipment/Tag No.	66197561
Equipment Description:	EXCHANGER		
Manufacturer:	CALHEX INDUSTRIES		
Serial Number:	12-0779	CRN:	V9688.21
Shell MAWP:	2758	KPA	Shell Design Temp: 70 °C
Tube MAWP:	2758	KPA	Tube Design Temp: 73 °C
Shell Material:	SA-333-6	Head Material:	SA-350-LF2
Shell Thickness:	12.70	mm	Head Thickness: 69.95 mm
Corrosion Allowance:	1.5875	mm	Date Built: 2012
Size:	609.6	mm	Pipe / Rolled Plate:
RT:	2	Streamline Report #:	STL-19-0246-DMS 105

NOTES: No readings taken in 2019 for CMLs 50-55 as shown on drawing.







Ultrasonic Corrosion Survey

*All values are in millimeters unless otherwise stated.

Survey Name: Husky Energy

Date: JUNE 16 2019

Streamline Report #: STL-19-0246-DMS 105

Inspector: DYLAN SUNDQUIST

LSD: 07-27-051-19W5	Area: ANSELL	Location: GAS PLANT
Jur #: A0626024	Tag Number: 66197561	Vessel Name: EXCHANGER
CRN: V9688.21	Year Built: 2012	Serial Number: 12-0779
RT: 2	Vessel CA: 1.588 mm	Manufacturer: CALHEX INDUSTRIES
	Shell MAWP: 2758 KPA	Tube MAWP: 2758 KPA
	MAWT: 70 °C	MAWT: 73 °C
		Pipe/Plate

CML Description	Baseline	Flange ANSI:	Material: SA-333-6
00 SHELL	2014 2019	CA Nominal	T Min
Shape: Cylindrical	Min 13.39 13.46	1.588 12.700	STCR mm/yr 0.000
OD: 609.6	Avg 13.56 13.54		LTCR mm/yr 0.000
Spec: ASME VIII Div.1	Comments:		Remaining Life:
			Retirement Date:

CML Description	Baseline	Flange ANSI:	Material: SA-333-6
05 SHELL	2014 2019	CA Nominal	T Min
Shape: Cylindrical	Min 12.80 13.21	1.588 12.700	STCR mm/yr 0.000
OD: 609.6	Avg 13.44 13.31		LTCR mm/yr 0.000
Spec: ASME VIII Div.1	Comments:		Remaining Life:
			Retirement Date:

CML Description	Baseline	Flange ANSI:	Material: SA-333-6
10 SHELL	2014 2019	CA Nominal	T Min
Shape: Cylindrical	Min 13.77 13.92	1.588 12.700	STCR mm/yr 0.000
OD: 609.6	Avg 14.05 14.22		LTCR mm/yr 0.000
Spec: ASME VIII Div.1	Comments:		Remaining Life:
			Retirement Date:

CML Description	Baseline	Flange ANSI:	Material: SA-333-6
15 SHELL	2014 2019	CA Nominal	T Min
Shape: Cylindrical	Min 13.44 13.34	1.588 12.700	STCR mm/yr 0.021
OD: 609.6	Avg 13.67 13.64		LTCR mm/yr 0.000
Spec: ASME VIII Div.1	Comments:		Remaining Life:
			Retirement Date:



Ultrasonic Corrosion Survey

*All values are in millimeters unless otherwise stated.

Survey Name: Husky Energy

Date: JUNE 16 2019

Streamline Report #: STL-19-0246-DMS 105

Inspector: DYLAN SUNDQUIST

LSD: 07-27-051-19W5	Area: ANSELL	Location: GAS PLANT
Jur #: A0626024	Tag Number: 66197561	Vessel Name: EXCHANGER
CRN: V9688.21	Year Built: 2012	Serial Number: 12-0779
RT: 2	Vessel CA: 1.588 mm	Manufacturer: CALHEX INDUSTRIES
	Shell MAWP: 2758 KPA	Tube MAWP: 2758 KPA
	MAWT: 70 °C	MAWT: 73 °C
		Pipe/Plate 0

CML Description	Baseline	Flange ANSI:	Material: SA-333-6
20 SHELL	2014 2019	CA Nominal	T Min
Shape: Cylindrical	Min 13.41 12.88	1.588 12.700	STCR mm/yr 0.106
OD: 609.6	Avg 13.56 13.11		LTCR mm/yr 0.000
Spec: ASME VIII Div.1	Comments:		Remaining Life:
			Retirement Date:

CML Description	Baseline	Flange ANSI:	Material: SA-333-6
25 SHELL	2014 2019	CA Nominal	T Min
Shape: Cylindrical	Min 12.90 13.23	1.588 12.700	STCR mm/yr 0.000
OD: 609.6	Avg 13.06 13.44		LTCR mm/yr 0.000
Spec: ASME VIII Div.1	Comments:		Remaining Life:
			Retirement Date:

CML Description	Baseline	Flange ANSI:	Material: SA-234-WPB
30 PIPING	2014 2019	CA Nominal	T Min
Shape: 90° Elbow	Min 7.70 7.54	1.022 8.179	STCR mm/yr 0.031
OD: 219.075	Avg 8.13 7.67		LTCR mm/yr 0.091
Spec: ASME B31.3	Comments: ASSUMED NOMINAL		Remaining Life:
			Retirement Date:

CML Description	Baseline	Flange ANSI:	Material: SA-234-WPB
35 PIPING	2014 2019	CA Nominal	T Min
Shape: 90° Elbow	Min 7.77 7.67	1.022 8.179	STCR mm/yr 0.020
OD: 219.075	Avg 8.18 7.98		LTCR mm/yr 0.073
Spec: ASME B31.3	Comments: ASSUMED NOMINAL		Remaining Life:
			Retirement Date:



Ultrasonic Corrosion Survey

*All values are in millimeters unless otherwise stated.

Survey Name: Husky Energy

Date: JUNE 16 2019

Streamline Report #: STL-19-0246-DMS 105

Inspector: DYLAN SUNDQUIST

LSD: 07-27-051-19W5	Area: ANSELL	Location: GAS PLANT
Jur #: A0626024	Tag Number: 66197561	Vessel Name: EXCHANGER
CRN: V9688.21	Year Built: 2012	Serial Number: 12-0779
RT: 2	Vessel CA: 1.588 mm	Manufacturer: CALHEX INDUSTRIES
	Shell MAWP: 2758 KPA	Tube MAWP: 2758 KPA
	MAWT: 70 °C	MAWT: 73 °C
		Pipe/Plate 0

CML Description	Baseline	Flange ANSI:	Material: SA-234-WPB
40 PIPING	2014 2019	CA Nominal	T Min STCR mm/yr LTCR mm/yr
Shape: 90° Elbow	Min 8.00 8.64	1.022 8.179	0.000 0.000
OD: 219.075	Avg 8.38 8.76		Remaining Life:
Spec: ASME B31.3	Comments: ASSUMED NOMINAL		Retirement Date:

CML Description	Baseline	Flange ANSI:	Material: SA-234-WPB
45 PIPING	2014 2019	CA Nominal	T Min STCR mm/yr LTCR mm/yr
Shape: 90° Elbow	Min 7.82 8.03	1.022 8.179	0.000 0.022
OD: 219.075	Avg 8.26 8.13		Remaining Life:
Spec: ASME B31.3	Comments: ASSUMED NOMINAL		Retirement Date:

FORM U-1 MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS (2010)
As Required by the Provisions of the ASME Boiler and Pressure Vessel Code Rules, Section VIII, Division 1

* CORRECTED

A 626024

1. Manufactured and certified by **CALHEX INDUSTRIES LTD. 9515 48TH STREET S.E., CALGARY, ALBERTA, CANADA T2C 2R1**
(Name and address of Manufacturer)

2. Manufactured for **Husky Oil Operations Ltd. 707 - 8th Avenue S.W. Calgary, AB T2P 1H5**
(Name and address of Purchaser)

3. Location of installation **Husky Oil Ansell Gas Plant Edson, AB LSD# - 07-27-051-19-W5M**
(Name and address)

4. Type **Horizontal** **Heat Exchanger** **12-0779**
(Horizontal, vertical, or sphere) (Tank, separator, jkt vessel, heat exh., etc.) (Manufacturer's serial number)

V9688.21 **12-0779-S Rev. 0 & T Rev. 0** **2012**
(CRN) (Drawing No.) (National Board Number.) (Year Built)

5. ASME Code, Section VIII, Div. 1 **2010 & 2011** **2714**
[Edition and Addenda (date)] (Code Case Number) [Special Service per UG-120(d)]

Items 6-11 incl. to be completed for single wall vessels, jackets of jacketed vessels, shell of heat exchangers, or chamber of multi-chamber vessels.

6. Shell (a) Number of course(s): **2** (b) Overall length (ft & in.): **47' - 8.750"**

Course(s)			Material		Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B, & C)			Heat Treatment	
No.	Diameter, in.	Length (ft & in.)	Spec./Grade or Type		Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time
1	23"	39' - 8.750"	SA333-6		0.500"	0.0625"	S	None	1.0	7/1	Spot *	0.70	-	-
1	23"	8' - 0"	SA333-6		0.500"	0.0625"	S	None	1.0	7/1	Spot *	0.70	-	-

7. Heads: (a) (b)
(Material spec. number, grade or type) (H.T. - time & temp.) (Material spec. number, grade or type) (H.T. - time & temp.)

	Location (Top, Bottom, Ends)	Thickness		Radius		Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure		Category A		
		Min.	Corr.	Crown	Knuckle					Convex	Concave	Type	Full, Spot, None	Eff.
(a)														
(b)														

If removable, bolts used (describe other fastening)

(Material spec. number, grade, size, number)

8. Type of jacket Jacket closure (Describe as ogee and weld, bar, etc)

If bar, give dimensions

If bolted, describe or sketch.

9. MAWP **400** **15** psi at max. temp. **163** **163** °F Min. design metal temp. **-49** °F at **400** psi.
(Internal) (External) (Internal) (External)

10. Impact test **No, exempt per UCS-66(a)(c)(d)(g), Fig. UCS-66 Note (c) & UCS-67(a)2.** at test temperature of **-** °F.

(Indicate yes or no and the component(s) impact tested)

11. Hydro, pneu., or comb test pressure **520 psi** Proof test **-**

Items 12 and 13 to be completed for tube sections.

12. Tubesheet: **SA516-70N** **23"** **1.5625"** **0.125"** **Welded**
[Stationary (material spec. no)] [Diameter, (subject to press.)] (Nominal thickness) (Corr. Allow.) [Attachment (welded or bolted)]

[Floating (material spec. no.)] (Diameter) (Nominal thickness) (Corr. Allow.) (Attachment)

13. Tubes **SA179 **** **0.750"** **16 BWG** **440** **Straight**
(Material spec. no., grade or type) (O.D.) (Nominal thickness) (Number) [Type (straight or U)]

Items 14-18 incl. to be completed for inner chambers of jacketed vessels or channels of heat exchangers.

14. Shell: (a) No. of course(s) **2** (b) Overall length (ft & in.): **2' - 10"**

Course(s)			Material		Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B, & C)			Heat Treatment	
No.	Diameter	Length	Spec./Grade or Type		Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time
2	23"	1' - 5"	SA333-6		0.500"	0.0625"	S	None	1.0	1/7	Spot *	0.70	-	-

15. Heads: (a) **SA350-LF2 CL.1** (b) **SA350-LF2 CL.1**
(Material spec. number, grade or type) (H.T. - Time & Temp.) (Material spec. number, grade or type) (H.T. - Time & Temp.)

	Location (Top, Bottom, Ends)	Thickness		Radius		Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure		Category A		
		Min.	Corr.	Crown	Knuckle					Convex	Concave	Type	Full, Spot, None	Eff.
(a)	End	2.75"	0.0625"						36"					
(b)	End	2.75"	0.0625"						36"					

If removable, bolts used (describe other fastening)

(24) 1.50" x 9.250" Lg. SA193-B7 UNC Studs / (48) 1.50" SA194-2H UNC Nuts

(Material spec. number, grade, size, number)

FORM U-1 (Back)

16. MAWP 400 15 psi at max. temp. 158 158 °F Min. design metal temp. -49 °F at 400 Psi
 (Internal) (External) (Internal) (External)
17. Impact test No, exempt UCS-66(a)(c)(d)(g), Fig. UCS-66 Note (c) & UCS-67(a)2. at test temperature of - °F.
 (Indicate yes or no and the component(s) impact tested)
18. Hydro., pneu., or comb. test press. 520 psi Proof test -
19. Nozzles, inspection, and safety valve openings:

Purpose (Inlet, Outlet, Drain, etc.)	No.	Diameter or Size	Flange Type	Material		Nozzle Thickness		Reinforcement Material	Attachment Detail		Location (Insp. Open.)
				Nozzle	Flange	Nom.	Corr.		Nozzle	Flange	
Shellside Inlet	1	8" 300 CL	RFWN	SA333-6	SA350-LF2 CL.1	0.500"	0.0625"	SA516-70N	UW16.1c	BW	Shell Top
Shellside Outlet	1	8" 300 CL	RFWN	SA333-6	SA350-LF2 CL.1	0.500"	0.0625"	SA516-70N	UW16.1c	BW	Shell Bottom
Tubeside Inlet	1	8" 300 CL	RFWN	SA333-6	SA350-LF2 CL.1	0.500"	0.0625"	SA516-70N	UW16.1c	BW	Channel Bottom
Tubeside Outlet	1	8" 300 CL	RFWN	SA333-6	SA350-LF2 CL.1	0.500"	0.0625"	SA516-70N	UW16.1c	BW	Channel Top
T.I.	4	1"	CPLG	SA350-LF2 CL.1	-	6000 CL	0.0625"	-	UW16.1a	-	Inlets/Outlets
P.I.	4	¾"	CPLG	SA350-LF2 CL.1	-	6000 CL	0.0625"	-	UW16.1a	-	Inlets/Outlets
Vent	1	1"	CPLG	SA350-LF2 CL.1	-	6000 CL	0.0625"	-	UW16.1a	-	Channel Top
Drain	1	1"	CPLG	SA350-LF2 CL.1	-	6000 CL	0.0625"	-	UW16.1a	-	Channel Bottom

20. Supports: Skirt No Lugs 4 Legs n/a Other Saddles Attached Welded to Shell & Channel Covers
 (Yes/no) (Number) (Number) (Describe) (Where and how)

21. Manufacturer's Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report:
 (list the name of part, item number, Manufacturer's name and identifying number):

22. Remarks: (2) 24" 300 CL RFWN Channel Flanges – SA350-LF2 CL.1

SAFETY VALVES: P.S.V. on piping per UG-125 (g) to be installed by owner. CUBIC CAPACITY: 123.04 cu. ft.

SURFACE AREA: 4146.9 sq. ft.

SERVICE: Inlet Gas Heat Exchanger * RT2 – Spot per UW-11(a)5(b). ** Tube Length – 48' – 0" Lg.

ITEM #: E-102B Constructed to Drawing # 12-0779–S Rev. 1 & T Rev. 0.

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 BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1.

U Certificate of Authorization Number 33238 Expires April 22, 20 14
 Date OCT 02 2013 Name Calhex Industries Ltd. Signed [Signature]
 (Manufacturer) (Representative)

CERTIFICATE OF SHOP INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of ALBERTA and employed by ABSA of CALGARY, AB, CANADA have inspected the pressure vessel described in this Manufacturer's Data Report on December 14, 2012, and state that, to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel in accordance with ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1. By signing this certificate neither the Inspector nor his/her employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his/her 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 OCT 03 2013 Signed [Signature] Commissions AB 145 NB 12375 A, B, N
 (Authorized Inspector) (National Board (incl. endorsements), State, Province, and number)

CERTIFICATE OF FIELD ASSEMBLY COMPLIANCE

We certify that the statements on this report are correct and that the field assembly construction of all parts of this vessel conforms with the requirements of ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1.

U Certificate of Authorization Number _____ Expires _____, 20____
 Date _____ Name _____ Signed _____
 (Assembler) (Representative)

CERTIFICATE OF FIELD ASSEMBLY INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of _____ and employed by _____ of _____ have compared the statements in this Manufacturer's Data Report with the described pressure vessel and state that parts referred to as data items not included in the certificate of shop inspection, have been inspected by me and to the best of my knowledge and belief, the Manufacturer has constructed and assembled this pressure vessel in accordance with ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1. The described vessel was inspected and subjected to a hydrostatic test of _____ psi. By signing this certificate neither the Inspector nor his/her employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his/her 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 _____ Signed _____ Commissions _____
 (Authorized Inspector) (National Board (incl. endorsements), State, Province and number.)