

### Heat Exchanger Specification Sheet

1	Company:												
2	Location: Doe Creek Sour Gas Plant 13-24-80-15 W6M												
3	Service: Debutanizer Reboiler					Our Reference: Q14-0394 Rev #0							
4	Item No: E-6410					Your Reference:							
5	Date: 10/09/14		Rev No:			Job No:							
6	Size	19 / 30	-240	in	Type	BKU	Hor	Connected in	1 parallel	1 series			
7	Surf/unit(eff.)	816		ft <sup>2</sup>	Shells/unit	1			Surf/shell (eff.)	816 ft <sup>2</sup>			
8	<b>PERFORMANCE OF ONE UNIT</b>												
9	Fluid allocation	Shell Side					Tube Side						
10	Fluid name	C3 plus Liquids					Therminol 55						
11	Fluid quantity, Total	lb/h					26497		77579				
12	Vapor (In/Out)	lb/h		0	24022	0	0						
13	Liquid	lb/h		26497	2475	77579	77579						
14	Noncondensable	lb/h		0	0	0	0						
15													
16	Temperature (In/Out)	°F		273.97	288.08	380	320						
17	Dew / Bubble point	°F			288.08								
18	Density	Vapor/Liquid		lb/ft <sup>3</sup>	1.935 / 31.423	1.931 / 31.739	/ 47.921	/ 49.364					
19	Viscosity	cp		0.0099 / 0.099	0.01 / 0.1015	/ 0.8403	/ 1.2154						
20	Molecular wt, Vap			74.21	75.63								
21	Molecular wt, NC												
22	Specific heat	BTU/(lb F)		0.5609 / 0.7346	0.5655 / 0.7317	/ 0.6215	/ 0.5913						
23	Thermal conductivity	BTU/(ft h F)		0.015 / 0.04	0.015 / 0.04	/ 0.061	/ 0.063						
24	Latent heat	BTU/lb		107.5	107.5								
25	Pressure (abs)	psi		159	158.65	63.54	57.62						
26	Velocity	ft/s			1.6	4.74							
27	Pressure drop, allow./calc.	psi		1	0.35	6	5.92						
28	Fouling resist. (min)	ft <sup>2</sup> h F/BTU			0.001	0.001	0.0013	0.0013	0.0013	Ao based			
29	Heat exchanged	2823901	BTU/h		MTD corrected			56.99	°F				
30	Transfer rate, Service	60.72	Dirty	99.38	Clean	128.57	BTU/(h ft <sup>2</sup> F)						
31	<b>CONSTRUCTION OF ONE SHELL</b>					<b>Sketch</b>							
32		Shell Side			Tube Side								
33	Design/vac/test pressure:g	psi	260/	/	260/	/							
34	Design temperature	°F	450		500								
35	Number passes per shell		1		4								
36	Corrosion allowance	in	0.0625		0.0625								
37	Connections	In	in	2	4/300 ANSI	1	4/300 ANSI						
38	Size/rating	Out	2	6/300 ANSI	1	4/300 ANSI							
39	Nominal	Intermediate	/300 ANSI		/300 ANSI								
40	Tube No.	102	OD	0.75	Tks-Avg	0.083	in				Length	240	in
41	Tube type	Plain	#/in	Material	SA-179 K01200	Tube pattern	90						
42	Shell	SA-515 70	ID	19.375	OD	20	in	Shell cover	SA-515 70				
43	Channel or bonnet	SA-515 70				Channel cover	-						
44	Tubesheet-stationary	SA-516 70				Tubesheet-floating	-						
45	Floating head cover	-				Impingement protection	None						
46	Baffle-crossing	SA-36 K02600	Type	Unbaffled	Cut(%d)	Spacing: c/c		in					
47	Baffle-long	-	Seal type			Inlet		in					
48	Supports-tube	U-bend		Type									
49	Bypass seal	Tube-tubesheet joint			Exp.								
50	Expansion joint	Type			None								
51	RhoV2-Inlet nozzle	55	Bundle entrance		0	Bundle exit		0	lb/(ft s <sup>2</sup> )				
52	Gaskets - Shell side	Flat Metal Jacket Fibe		Tube Side		Flat Metal Jacket Fibe							
53	Floating head	-											
54	Code requirements	ASME Code Sec VIII Div 1					TEMA class	C - general service					
55	Weight/Shell	6572.2	Filled with water		13853.7	Bundle	2731.8	lb					
56	Remarks												
57													
58													

## **SECTION 7.0 PUMP SUMMARY**

### 7.1 P-6450/P-6460 De-Butanizer Reflux Pumps

Clyde Union Model; VLK 1.5 x 2 x 8A/1, Centrifugal Pump

10 HP 460/3/60 XP, 3550 RPM motor.

Rated Capacity: 410 l/min. @ 345 kPa Dif,

Note:

- Witnessed Testing is not included

## **SECTION 8.0 ELECTRICAL**

Electrical is not included however an option can be provided.

## **SECTION 9.0 Instrumentation**

See Instrument List in Attachment #10

## **SECTION 10.0 Drawings**

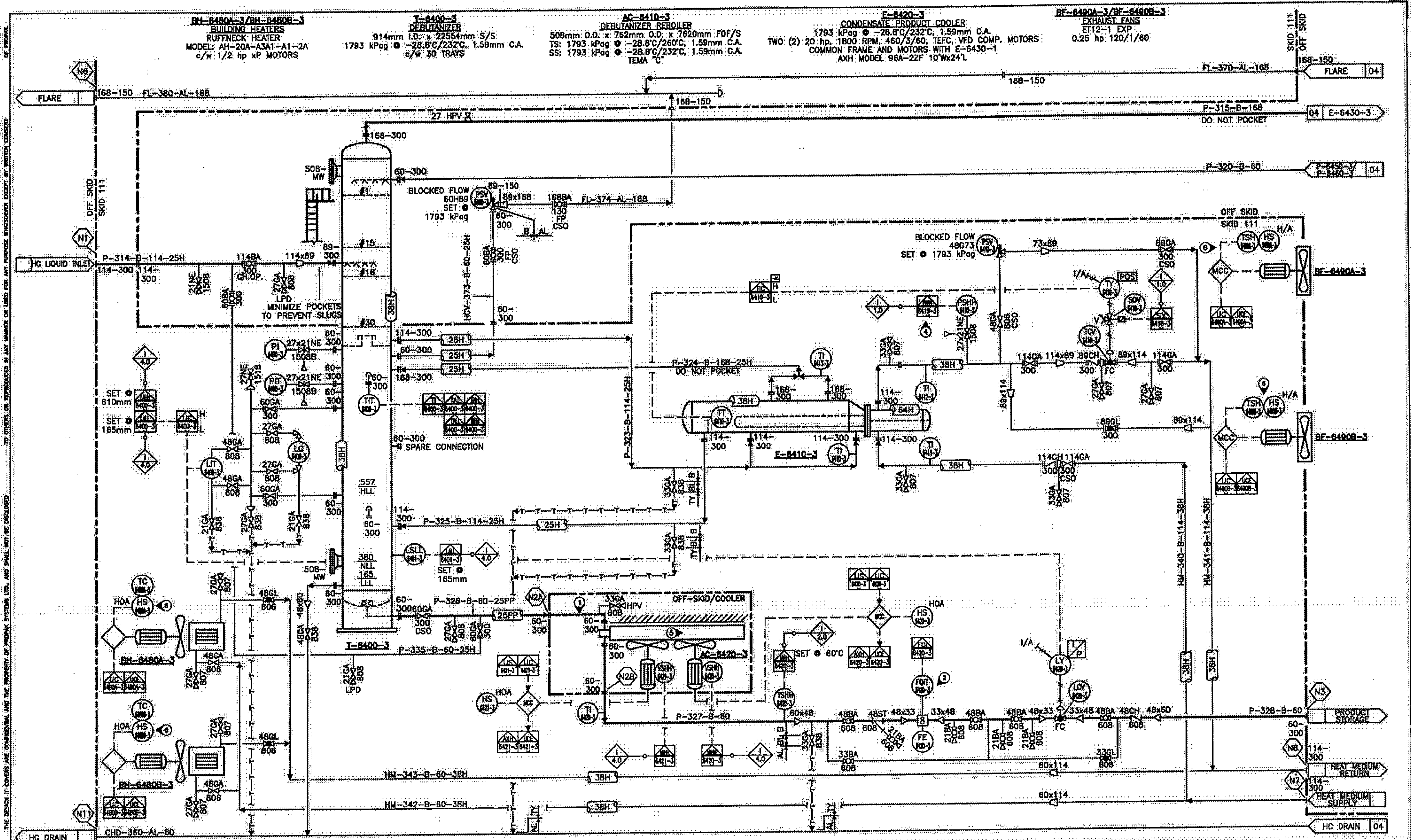


INSTRUMENTATION LIST - Q14-0394

DOE CREEK

DEBUTANIZER PACKAGE

REV	A									
DATE	21-May-14									
REV #	TAG #	MFS #	RANGE	ENG UNIT	SET POINT	INSTRUMENT TYPE	MANUFACTURER	MODEL #	COMMENTS	
0	PCV/PY/SOV-6401-3	4	-	-	-	Pressure Control Valve	FISHER	657-D Control Valve, I2P-100 Transducer, ASCO EF8320G202 SOLENOID VALVE		
0	PCV/PY/SOV-6402-3	4	-	-	-	Pressure Control Valve	FISHER	657-D Control Valve, I2P-100 Transducer, ASCO EF8320G202 SOLENOID VALVE		
<b>Miscellaneous</b>										
0	VSHH-6420-3	3	-	-	-	Vibration Switch	MURPHY	VS-2EX		
0	VSHH-6421-3	3	-	-	-	Vibration Switch	MURPHY	VS-2EX		



1. OFF SKID SPOOLS TO/FROM AIR COOLER SHALL BE SUPPLIED AND INSTALLED BY CUSTOMER. 2. ALLOW 20 PIPE DIA. UP AND 5 PIPE DIA. DOWNS STREAM. 3. ALL NE VALVES TO BE CONNECTED DIRECTLY TO G. TSH AND HS SUPPLIED BY OTHERS.		PIPING/EQUIPMENT TO: (3 OUTLET VALVES). 4. PSET IS 20% LESS THAN T-6400-3 OPERATING PRESSURE. 5. INSTALLER TO ENSURE ADEQUATE DRAINAGE UNDER AIR COOLER TO PREVENT POOLING.		APPROVED DATE: 11/10/09 BY: C. PU CHECKED:		DRAWN DATE: 11/10/09 BY:		DOE CREEK SOUR GAS PLANT BU-6400-3 DEBUTANIZER SKID MECHANICAL FLOWSHEET		PROPAK 440 East Lake Road, Airdrie, Alberta Canada T4A 2J8	
GENERAL NOTES DATE: 2014/10/06 09:25 AM C:\QUOTES\14\DWG\Q140394\FLW\MPS-Q140394-100-03.DWG.RU		GENERAL NOTES No. ISSUED WITH BID		REVISION No. BY DATE CND ENG		PROJECT DATE SCALE		DWA No.: D-MFS-Q140394-100 SHT. 3 OF 4 REV. A			