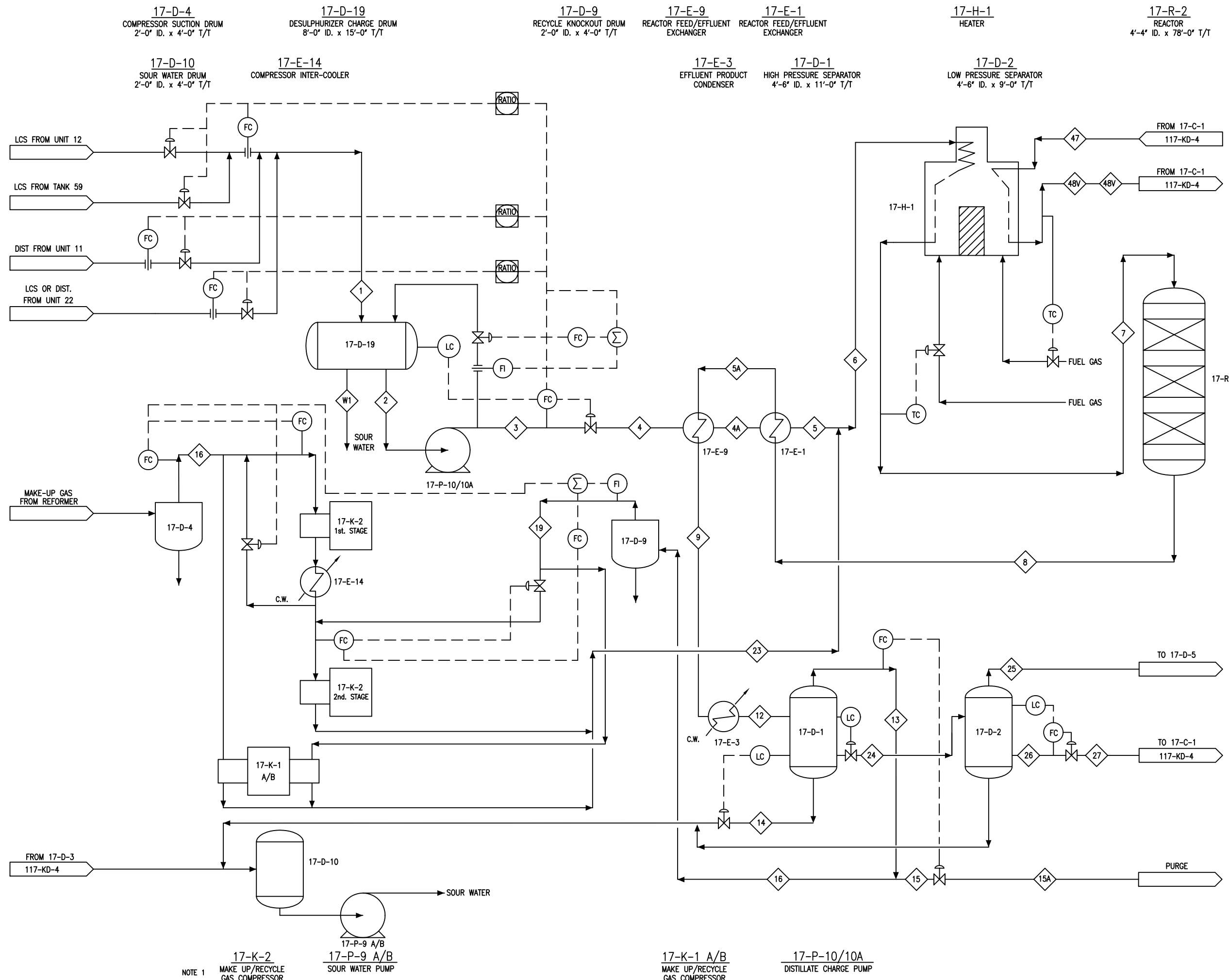


GENERAL NOTES

1. MAKE-UP / RECYCLE GAS COMPRESSOR 17-K-2 IS SPARED BY COMPRESSORS 17-K-1A/B.
2. SEE 117-KD-5 FOR STREAM FLOWS AND CONDITIONS.



B1	MAR.97	DDS MINI-REVAMP FOR DESIGN INCLUDING PHASE 1 PHA	PG		
B	DEC.96	DDS MINI-REVAMP FOR DESIGN EXCLUDING PHA	PG	AVKS	JM
A1	NOV.96	ISSUE FOR APPROVAL - DDS MINI-REVAMP	PG	AVKS	RP
2		DELETED			
1		ISSUED FOR REVIEW			
REVISION	DATE	DESCRIPTION	DRAWN BY	CHK'D BY	APP'D BY



TITLE PROCESS FLOW DIAGRAM DISTILLATE DESULPHURIZING (DDS) UNIT 17		DEPARTMENT AREA NO. CLASS NO. PROJ. NO. 10548.0005 DATE SCALE NONE DWG. NO. 117-KD-3 REV. B1	
DRAWN BY WM	CHECKED OR DRAFT K.KWOK	SECTION NO. APPROVED BY	REV.

NOTE 1
 17-K-2
 MAKE UP/RECYCLE GAS COMPRESSOR
 17-P-9 A/B
 SOUR WATER PUMP

17-K-1 A/B
 MAKE UP/RECYCLE GAS COMPRESSOR
 17-P-10/10A
 DISTILLATE CHARGE PUMP

17-E-8
STRIPPER FEED EXCHANGER

17-E-4 A/B/C
STRIPPER FEED EXCHANGER

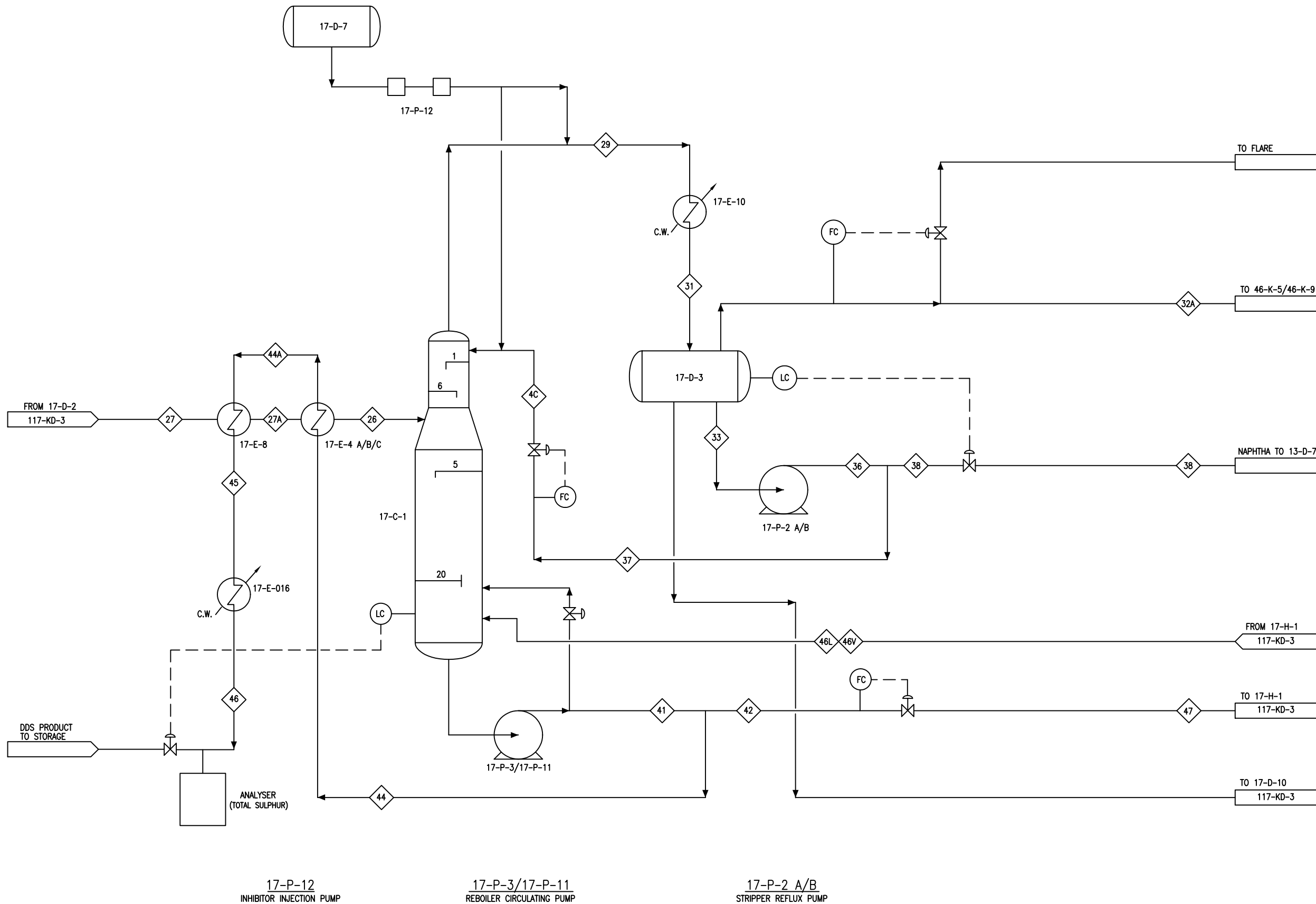
17-E-016
DISTILLATE PRODUCT COOLER

17-D-7
INHIBITOR INJECTION TANK
1'-6" ID. x 5'-0" T/T

17-C-1
STRIPPER COLUMN

17-E-10
STRIPPER CONDENSER

17-D-3
STRIPPER RECEIVER
3'-0" ID. x 8'-0" T/T



GENERAL NOTES

1. SEE 117-KD-5 FOR STREAM FLOWS AND CONDITIONS.

B1	MAR.97	DDS MINI-REVAMP FOR DESIGN INCLUDING PHASE 1 PHA	PG		
B	DEC.96	DDS MINI-REVAMP FOR DESIGN EXCLUDING PHA	PG	AVKS	JM
A1	NOV.96	ISSUE FOR APPROVAL - DDS MINI-REVAMP	PG	AVKS	RP
2		DELETED			
1		ISSUED FOR REVIEW			
REVISION	DATE	DESCRIPTION	DRAWN BY	CHK'D BY	APP'D BY



TITLE		DEPARTMENT	
PROCESS FLOW DIAGRAM			
DISTILLATE DESULPHURIZING (DDS)			
UNIT 17			
AREA NO.		CLASS NO.	
PRJ. NO. 10548.0005		DATE	
SCALE NONE		REV. NO.	
DRAWN BY WM		CHECKED BY K.KWOK	
SECTION NO.		APPROVED BY	
117-KD-4		B1	

STREAM STREAM NO:	DDS FEED 2 SOR/EOR	17-E-1 SHELL SIDE OUT 5 SOR/EOR	17-H-1 FEED 6 SOR/EOR	REACTOR INLET 7 SOR/EOR	REACTOR OUTLET 8 SOR/EOR	17-E-1/9 OUTLET 9 SOR/EOR	D-1 INLET 12 SOR/EOR	PURGE GAS FROM D-1 15 SOR/EOR	MAKEUP GAS 18 SOR/EOR
BPSD	3000	3000							
MMSCFD								2.30	3.50
TEMPERATURE (oF)	100 / 100	524 / 628	460 / 550	516 / 650	585 / 710	336 / 426	100 / 130	100 / 130	100 / 100
PRESSURE (PSIG)	20 / 20	765 / 805	760 / 800	715 / 760	670 / 675	630 / 630	625 / 625	620 / 620	185 / 185

STREAM STREAM NO:	RECYCLE GAS 16 SOR/EOR	RECYCLE PLUS MAKEUP GAS 23 SOR/EOR	LIQUID FROM D-1 24 SOR/EOR	D-2 VAPOUR 25 SOR/EOR	D-2 LIQUID 27 SOR/EOR	STRIPPER FEED 28 SOR/EOR	STRIPPER OFFGAS 32A SOR/EOR	NAPHTHA 39 SOR/EOR	DDS PRODUCT 46 SOR/EOR
BPSD					3185			0	3074
MMSCFD	2.51	6.00		0.10			0.25		
TEMPERATURE (oF)	100 / 130	230 / 250	100 / 130	100 / 130	100 / 130	512 / 512	98 / 98	- / -	115 / 120
PRESSURE (PSIG)	620 / 620	765 / 805	75 / 75	75 / 75	50 / 50	30 / 30	15 / 15	- / -	128 / 128

CASE 2 - 4000 BPSD. 75% DISTILLATE / 25% LCS, 1.13 WT% WITH DESULPHURIZATION TO 0.045 WT%

STREAM STREAM NO:	DDS FEED 2 SOR/EOR	17-E-1 SHELL SIDE OUT 5 SOR/EOR	17-H-1 FEED 6 SOR/EOR	REACTOR INLET 7 SOR/EOR	REACTOR OUTLET 8 SOR/EOR	17-E-1/9 OUTLET 9 SOR/EOR	D-1 INLET 12 SOR/EOR	PURGE GAS FROM D-1 15 SOR/EOR	MAKEUP GAS 18 SOR/EOR
BPSD	4000	4000							
MMSCFD								1.10	2.05
TEMPERATURE (oF)	100 / 100	480 / 540	430 / 490	535 / 620	585 / 660	330 / 385	100 / 130	100 / 130	100 / 100
PRESSURE (PSIG)	20 / 20	755 / 795	750 / 790	705 / 750	665 / 670	630 / 630	625 / 625	620 / 620	185 / 185

STREAM STREAM NO:	RECYCLE GAS 16 SQR/EQR	RECYCLE PLUS MAKEUP GAS 23 SQR/EQR	LIQUID FROM D-1 24 SQR/EQR	D-2 VAPOUR 25 SQR/EQR	D-2 LIQUID 27 SQR/EQR	STRIPPER FEED 28 SQR/EQR	STRIPPER OFFGAS 32A SQR/EQR	NAPHTHA 39 SQR/EQR	DDS PRODUCT 46 SQR/EQR
BPSD					4174			214	3860
MMSCFD	1.98	4.00		0.14			0.21		
TEMPERATURE (oF)	100 / 130	210 / 220	100 / 130	100 / 130	100 / 130	433 / 429	100 / 100	100 / 100	115 / 120
PRESSURE (PSIG)	620 / 620	755 / 795	75 / 75	75 / 75	50 / 50	30 / 30	15 / 15	85 / 85	128 / 128

MAJOR HEATER/EXCHANGER DUTIES (MM BTU/HR)

	100% LCS SOR	100% LCS EOR	75% #1 DIST 25% #1 LCS SOR	75% #1 DIST 25% #1 LCS EOR
COMBINED HEATER, 17-H-1, DUTY	3.4	5.4	5.9	7.6
EFFLUENT PRODUCTS CONDENSER, 17-E-3	5.9	6.0	6.1	8.0
STRIPPER CONDENSER, 17-E-10	1.1	1.1	1.8	1.8

B1	MAR.97	DDS MINI-REVAMP FOR DESIGN INCLUDING PHASE 1 PHA	PG		
B	DEC.96	DDS MINI-REVAMP FOR DESIGN EXCLUDING PHA	PG	AVKS	JM
A1	NOV.96	ISSUE FOR REVIEW - DDS MINI-REVAMP	JP	AVKS	RP
REVISION	DATE	DESCRIPTION	DRAWN BY	CHK'D BY	APP'D BY



TITLE		DEPARTMENT
PROCESS FLOW DIAGRAM DISTILLATE DESULPHURIZING (DDS) UNIT 17		AREA NO.
		CLASS NO.
		PROJ. NO. 10548.0005
		DATE NOV. 1996
		SCALE NONE
DRAWN BY	CHECKED OR DRAFT	SECTION NO.
JP	CHECKED ENGINEER	APPROVED BY
		DWG. NO. 117-KD-5
		REV. B1

NOTES

CASE 1 - 3000 BPSD. 100% #1 LCS, 2.4 WT% S WITH DESULPHURIZATION TO 0.3 WT%

STREAM	DDS FEED	17-E-1 SHELL SIDE OUT	17-H-1 FEED	REACTOR INLET	REACTOR OUTLET	17-E-1/9 OUTLET	D-1 INLET	PURGE GAS FROM D-1	MAKEUP GAS
STREAM NO:	2	5	6	7	8	9	12	15	18
	SOR/EOR	SOR/EOR	SOR/EOR	SOR/EOR	SOR/EOR	SOR/EOR	SOR/EOR	SOR/EOR	SOR/EOR
BPSD	3000	3000							
MMSGFD								2.30	3.50
TEMPERATURE (oF)	100 / 100	524 / 628	460 / 550	516 / 650	586 / 710	336 / 426	100 / 130	100 / 130	100 / 100
PRESSURE (PSIG)	20 / 20	765 / 805	760 / 800	715 / 760	670 / 675	630 / 630	625 / 625	620 / 620	185 / 185

STREAM	RECYCLE GAS	RECYCLE PLUS MAKEUP GAS	LIQUID FROM D-1	D-2 VAPOUR	D-2 LIQUID	STRIPPER FEED	STRIPPER OFFGAS	NAPHTHA	DDS PRODUCT
STREAM NO:	16	23	24	25	27	28	32A	39	46
	SOR/EOR	SOR/EOR	SOR/EOR	SOR/EOR	SOR/EOR	SOR/EOR	SOR/EOR	SOR/EOR	SOR/EOR
BPSD					3185			0	3074
MMSGFD	2.51	6.00		0.10			0.25		
TEMPERATURE (oF)	100 / 130	230 / 250	100 / 130	100 / 130	100 / 130	512 / 512	98 / 98	- / -	115 / 120
PRESSURE (PSIG)	620 / 620	765 / 805	75 / 75	75 / 75	50 / 50	30 / 30	15 / 15	- / -	128 / 128

CASE 2 - 4000 BPSD. 75% DISTILLATE / 25% LCS, 1.13 WT% WITH DESULPHURIZATION TO 0.045 WT%

STREAM	DDS FEED	17-E-1 SHELL SIDE OUT	17-H-1 FEED	REACTOR INLET	REACTOR OUTLET	17-E-1/9 OUTLET	D-1 INLET	PURGE GAS FROM D-1	MAKEUP GAS
STREAM NO:	2	5	6	7	8	9	12	15	18
	SOR/EOR	SOR/EOR	SOR/EOR	SOR/EOR	SOR/EOR	SOR/EOR	SOR/EOR	SOR/EOR	SOR/EOR
BPSD	4000	4000							
MMSGFD								1.10	2.05
TEMPERATURE (oF)	100 / 100	480 / 540	430 / 490	535 / 620	565 / 660	330 / 385	100 / 130	100 / 130	100 / 100
PRESSURE (PSIG)	20 / 20	755 / 795	750 / 790	705 / 750	665 / 670	630 / 630	625 / 625	620 / 620	185 / 185

STREAM	RECYCLE GAS	RECYCLE PLUS MAKEUP GAS	LIQUID FROM D-1	D-2 VAPOUR	D-2 LIQUID	STRIPPER FEED	STRIPPER OFFGAS	NAPHTHA	DDS PRODUCT
STREAM NO:	16	23	24	25	27	28	32A	39	46
	SOR/EOR	SOR/EOR	SOR/EOR	SOR/EOR	SOR/EOR	SOR/EOR	SOR/EOR	SOR/EOR	SOR/EOR
BPSD					4174			214	3860
MMSGFD	1.98	4.00		0.14			0.21		
TEMPERATURE (oF)	100 / 130	210 / 220	100 / 130	100 / 130	100 / 130	433 / 429	100 / 100	100 / 100	115 / 120
PRESSURE (PSIG)	620 / 620	755 / 795	75 / 75	75 / 75	50 / 50	30 / 30	15 / 15	85 / 85	128 / 128

MAJOR HEATER/EXCHANGER DUTIES (MM BTU/HR)

	100% LCS SOR	100% LCS EOR	75% #1 DIST SOR	75% #1 DIST LCS	25% #1 LCS EOR	25% #1 LCS
COMBINED HEATER, 17-H-1, DUTY	3.4	5.4	5.9	7.6		
EFFLUENT PRODUCTS CONDENSER, 17-E-3	5.9	6.0	6.1	8.0		
STRIPPER CONDENSER, 17-E-10	1.1	1.1	1.8	1.8		

BI	MAR-97	DDS MINI-REVMOP FOR DESIGN INCLUDING PHASE 1 PHA	PG
B	DEC-96	DDS MINI-REVMOP FOR DESIGN EXCLUDING PHA	PG AWS JM
A1	NOV-96	ISSUE FOR REVIEW - DDS MINI-REVMOP	JP AWS RP
REVISION	DATE	DESCRIPTION	DRAWN BY
			DATE

colt engineering corporation	
PETRO-CANADA	OAKVILLE REFINERY
PROCESS FLOW DIAGRAM	
DISTILLATE DESULPHURIZING (DDS)	
UNIT 17	
PREP. NO.	17
CHKD. NO.	
PREP. DATE	01/15/03
DATE	NOV. 1996
SCALE	IN/5
CHECKED BY	JP
SECTION NO.	
APPROVED BY	117-KD-5 B1