Table C-7. Phillips 66 Refinery Daily Maximum Effluent Limits

Basis/Parameter	Effluent Limitation Factor (lb/1000 bbl)	Aggregate Factor (=Size x Process)	Refinery Feedstock Rate (1000 BPD)	Effluent Limitation (lb/day)
BPT (40 CFR 419.22)				
BOD_5	9.9			1187
TSS	6.9			827
COD	74			8873
Oil & grease	3.0	1.966	61	360
Phenols	0.074			8.9
Ammonia	6.6			791
Sulfide	0.07			7.8
Chromium, Total	0.15			18
Chromium, hexavalent	0.012			1.4
BAT (40 CFR 419.23)				
COD	74			8873
Ammonia	6.6	1.966	61	791
Sulfide	0.065			7.8
Sum of Product Effluent Limits (1)				
Phenols		NA		23.0
Chromium, Total		NA		18.7
Hex Chromium		NA		1.19
BCT (40 CFR 419.24) (2)				
BOD_5	9.9			1187
TSS	6.9	1.966	61	827
Oil & Grease	3.0			360

Footnote:
(1) BAT for these three parameters derived as per 40 CFR 419.23(c)(1); see Tables C-4 and C-5.
(2) In addition, pH is limited to 6.0 - 9.0.

Table C-8. Phillips 66 Refinery Monthly Average Effluent Limits

Basis/Parameter	Effluent Limitation Factor (lb/1000 bbl)	Aggregate Factor (=Size x Process)	Refinery Feedstock Rate (1000 BPD)	Effluent Limitation (lb/day)
BPT (40 CFR 419.22)				
BOD_5	5.5			659
TSS	4.4			528
COD	38.4			4604
Oil & grease	1.6	1.966	61	192
Phenols	0.036			4.3
Ammonia	3.0			
Sulfide	0.029			
Chromium, Total	0.088			11
Chromium, hexavalent	0.0056			0.7
BAT (40 CFR 419.23)				
COD	38.4			4604
Ammonia	3.0	1.966	61	360
Sulfide	0.029			3.5
Sum of Product Effluent Limits (1)				
Phenols		NA		5.6
Chromium, Total		NA		6.5
Hex Chromium		NA		0.5
BCT (40 CFR 419.24) (2)				
BOD_5	5.5			659
TSS	4.4	1.966	61	528
Oil & Grease	1.6			192

Footnote:
(1) BAT for these three parameters derived as per 40 CFR 419.23(c)(1); see Tables C-4 and C-5.
(2) In addition, pH must remain within the range of 6.0 - 9.0 su.

Table C-1. Phillips 66 Refinery Process Configuration Worksheet

Process [1]	2015 Application Process Feedstock Rate, BPD	Process Feedstock Rate Relative to Refinery Feedstock Rate	Weighting Factor [2]	Process Configuration
Crude				
Atmospheric Distillation	61,000	1.00		
Desalters	61,000	1.00		
Vacuum Distillation	32,000	0.52		
		2.52	1	2.52
Cracking & Coking				
Fluid Cat Cracker	20,500	0.34		
Delayed Coking	19,500	0.32		
Catalytic Hydrotreating	89,400	1.47		
		2.12	6	12.73
Asphalt				
Production	-	0.000		
		0.000	12	-
Reforming & Alkylation				
Reforming (semi-regen)	14,800	0.24		
Alkylation	-	0.00		
		0.24	1	0.24
			Total Refinery Process Configuration:	15.50

Footnote:

(1) Processes organized under sub-categories as listed in Appendix A to 40 CFR Part 419.

(2) Weighting factors provided in 40 CFR 419.42(b)(3), except DEQ assigned Reforming & Alkylation as a "1" since the processes were not assigned a weighting factor and they did not fit into any of the other process categories.

Table C-2. Phillips 66 Refinery Aggregate Factor Worksheet

Total Refinery Aggregate Factor = Size Factor x Process Factor		
Size Factor	40 CFR 419.22(b)(1): for 50,000 to 74,900 BPD:	1.04
Process Factor	40 CFR 419.22(b)(2): Total Refinery Process Configuration ≥ 9.5:	1.89
	Total Refinery Aggregate Factor:	1.966

Footnote:

(1) Total Refinery Process Configuration developed in Table C-1.

Table C-3 BPT, BAT, and BCT Base Loadings Rates per 1000 BPD Feedstock

Pollutant	40 CFR 419 Subpart B Effluent Limitations, lbs per 1000 BPD					
	BPT		BAT		BCT	
	max daily	avg monthly	max daily	avg monthly	max daily	avg monthly
BOD_5	9.9	5.5			9.9	5.5
TSS	6.9	4.4			6.9	4.4
COD	74	38.4	74	38.4		
Oil & grease	3.0	1.6			3.0	1.6
Phenolics	0.074	0.036	(1)	(1)		
Ammonia-N	6.6	3.0	6.6	3.0		
Sulfide	0.065	0.029	0.065	0.029		
Chromium, Total	0.150	0.088	(1)	(1)		
Hexavalent Chromium	0.012	0.0056	(1)	(1)		
pH	6.0-9.0	6.0-9.0			6.0-9.0	6.0-9.0

Footnote:
(1) BAT for these three parameters (pheonolics, total Cr, and hex Cr) derived as per 40 CFR 419.23(c)(1); see Tables C-4 and C-5.

Table C-4. Amended BAT Base Loadings Rates per 1000 BPD Feedstock [40 CFR 419.23(c)(1)]

Refining Process	amended BAT, lbs per 1000 BPD					
	phenolics		total Cr		hex Cr	
	max daily	avg monthly	max daily	avg monthly	max daily	avg monthly
Crude	0.0130	0.003	0.011	0.004	0.0007	0.0003
Cracking/Coking	0.147	0.036	0.119	0.041	0.0076	0.0034
Asphalt	0.079	0.019	0.064	0.022	0.0041	0.0019
Lube	0.369	0.09	0.299	0.104	0.0192	0.0087
Reforming/Alkylation	0.132	0.032	0.107	0.037	0.0069	0.0031

Table C-5. Amended BAT Loadings, Phillips 66 Refinery

Refining Process	Throughput, 1000 BPD	amended BAT, lbs/day					
		phenolics		total Cr		hex Cr	
		max daily	avg monthly	max daily	avg monthly	max daily	avg monthly
Crude	154	2.00	0.46	1.69	0.62	0.11	0.05
Cracking/Coking	129.4	19.02	4.66	15.4	5.31	0.98	0.44
Asphalt	0.0	0.00	0.00	0.00	0.00	0.00	0.00
Lube	0	0.00	0.00	0.00	0.00	0.00	0.00
Reforming/Alkylation	14.8	1.95	0.47	1.58	0.55	0.10	0.05
Total Refinery Limit:		23.0	5.6	18.7	6.5	1.2	0.5

Table C-6. Comparison of BPT and Amended BAT Limits (1)

Pollutant	Max Daily (lb/day)		Avg Monthly (lb/day)	
	BPT	amended BAT	BPT	amended BAT
phenolics	***8.9***	23.0	***4.3***	5.6
total Cr	***18.0***	18.7	10.6	***6.5***
hex Cr	1.4	***1.2***	0.7	***0.5***

Footnote:

(1) Most stringent limit is indicated in bold-italics and shading.

Table C-9. Calculation of Storm Water Pollutant Credits, Phillips 66 Refinery (40 CFR 419 Subpart B)

Pollutant	Treatment	Estimated Daily Flow, 1000 gal/day	Daily Maximum		Monthly Average	
			lb/1000 gal	Limit (lb/day)	lb/1000 gal	Limit (lb/day)
BOD	BPT/BCT	11.52	0.4	4.61	0.22	2.53
TSS	BPT/BCT		0.28	3.23	0.18	2.07
COD	BPT/BAT		3.0	34.6	1.5	17.3
Oil and grease	BPT/BCT		0.13	1.50	0.067	0.77
Phenols	BPT/BAT		0.0029	0.0334	0.0014	0.0161
Chromium, total	BAT		0.005	0.0576	0.0018	0.0207
Chromium, hexavalent	BPT/BAT		0.00052	0.0060	0.00023	0.0026

STORM WATER CREDIT DETERMINATION

= 11,520 **gal/day**
= 8.0 gal/min

Table C-10. Phillips 66 Technology-based Effluent Limitations

Parameter	Max daily (lb/day)			Avg monthly (lb/day)			Basis
	Process	SW	Total	Process	SW	Total	
BOD_5	1187	4.6	1192	659	2.5	662	BPT/BCT
TSS	827	3.2	831	528	2	530	BPT/BCT
COD	8873	35	8907	4604	17	4622	BPT/BAT
Oil & grease	360	1.5	361	192	0.8	193	BPT/BCT
Phenolics	8.9	0.03	8.9	4.3	0.02	4.3	BPT
Ammonia-N	791	0	791	360	0	360	BAT
Sulfide	7.8	0	7.8	3.5	0.0	3.5	BAT
Chromium, Total	18.0	0.1	18.0	6.5	0.0	6.5	BAT
Hexavalent Chromium	1.19	0.01	1.20	0.53	0.00	0.53	BAT

Footnote:
(1) In addition, pH must remain within the range of 6.0 - 9.0 su.