

TEXTOX MENU #2 - INTERMITTENT STREAM WITHIN 3 MILES OF A FRESHWATER PERENNIAL

The water quality-based effluent limitations developed below are calculated using:

Table 1, 2014 Texas Surface Water Quality Standards (30 TAC 307) for Freshwater Aquatic Life

Table 2, 2014 Texas Surface Water Quality Standards for Human Health

"Procedures to Implement the Texas Surface Water Quality Standards," TCEQ, June 2010

PERMIT INFORMATION

Permittee Name:	Phillips 66 Gulf Coast Fractionators
TPDES Permit No.:	TX0085928
Outfall No.:	001
Prepared by:	Maria Okpala
Date:	1/22/15

DISCHARGE INFORMATION

Intermittent Receiving Waterbody:	Unnamed Ditch
Perennial Stream/River within 3 Miles:	Cedar Bayou
Segment No.:	0902
TSS (mg/L):	4
pH (Standard Units):	7.14
Hardness (mg/L as CaCO ₃):	54
Chloride (mg/L):	81
Effluent Flow for Aquatic Life (MGD):	0.297
Critical Low Flow [7Q2] (cfs) for intermittent:	0
Critical Low Flow [7Q2] (cfs) for perennial:	1.86
% Effluent for Chronic Aquatic Life (Mixing Zone):	19.81
% Effluent for Acute Aquatic Life (ZID):	100
Effluent Flow for Human Health (MGD):	0.297
Harmonic Mean Flow (cfs) for perennial:	4.91
% Effluent for Human Health:	8.558
Public Water Supply Use?	yes

CALCULATE DISSOLVED FRACTION (AND ENTER WATER EFFECT RATIO IF APPLICABLE):

<i>Stream/River Metal</i>	<i>Intercept (b)</i>	<i>Slope (m)</i>	<i>Partition Coefficient (Kp)</i>	<i>Dissolved Fraction (Cd/Ct)</i>	<i>Water Effect Ratio (WER)</i>
Aluminum	N/A	N/A	N/A	1.00	Assumed
Arsenic	5.68	-0.73	173978.75	0.59	1 Assumed
Cadmium	6.60	-1.13	831136.22	0.23	1 Assumed
Chromium (Total)	6.52	-0.93	912187.69	0.22	1 Assumed
Chromium (+3)	6.52	-0.93	912187.69	0.22	1 Assumed
Chromium (+6)	N/A	N/A	N/A	1.00	Assumed
Copper	6.02	-0.74	375383.87	0.40	1 Assumed

Lead	6.45	-0.80	929719.64	0.21		1 Assumed
Mercury	N/A	N/A	N/A	1.00	Assumed	1 Assumed
Nickel	5.69	-0.57	222241.83	0.53		1 Assumed
Selenium	N/A	N/A	N/A	1.00	Assumed	1 Assumed
Silver	6.38	-1.03	575278.59	0.30		1 Assumed
Zinc	6.10	-0.70	477043.53	0.34		1 Assumed

AQUATIC LIFE

CALCULATE DAILY AVERAGE AND DAILY MAXIMUM EFFLUENT LIMITATIONS:

Parameter	FW Acute	FW Chronic	WLAa	WLAc	LTAa	LTAc	Daily Avg. (ug/L)	Daily Max. (ug/L)
	Criterion (ug/L)	Criterion (ug/L)						
Aldrin	3.0	N/A	3.00	N/A	1.72	N/A	2.53	5.35
Aluminum	991	N/A	991	N/A	568	N/A	835	1766
Arsenic	340	150	576.611	1284.061	330.398	988.727	485.685	1027.538
Cadmium	4.712	0.160	20.379	3.498	11.677	2.694	3.960	8.377
Carbaryl	2.0	N/A	2.00	N/A	1.15	N/A	1.68	3.56
Chlordane	2.4	0.004	2.40	0.020	1.38	0.016	0.023	0.048
Chlorpyrifos	0.083	0.041	0.083	0.207	0.048	0.159	0.070	0.148
Chromium (+3)	343.974	44.744	1599.047	1049.930	916.254	808.446	1188.415	2514.267
Chromium (+6)	15.7	10.6	15.7	53.505	9.00	41.199	13.224	27.978
Copper	7.947	5.593	19.880	70.619	11.391	54.376	16.745	35.426
Cyanide (free)	45.8	10.7	45.8	54.010	26.2	41.588	38.578	81.617
4,4'-DDT	1.1	0.001	1.10	0.005	0.630	0.004	0.006	0.012
Demeton	N/A	0.1	N/A	0.505	N/A	0.389	0.571	1.209
Diazinon	0.17	0.17	0.170	0.858	0.097	0.661	0.143	0.303
Dicofol	59.3	19.8	59.3	99.944	34.0	76.957	49.949	105.674
Dieldrin	0.24	0.002	0.240	0.010	0.138	0.008	0.011	0.024
Diuron	210	70	210	353.336	120	272.069	176.885	374.226
Endosulfan I (alpha)	0.22	0.056	0.220	0.283	0.126	0.218	0.185	0.392
Endosulfan II (beta)	0.22	0.056	0.220	0.283	0.126	0.218	0.185	0.392
Endosulfan sulfate	0.22	0.056	0.220	0.283	0.126	0.218	0.185	0.392
Endrin	0.086	0.002	0.086	0.010	0.049	0.008	0.011	0.024
Guthion	N/A	0.01	N/A	0.050	N/A	0.039	0.057	0.121
Heptachlor	0.52	0.004	0.520	0.020	0.298	0.016	0.023	0.048
Hexachlorocyclohexane (Lindane)	1.126	0.08	1.13	0.404	0.645	0.311	0.457	0.967
Lead	32.820	1.279	154.873	30.464	88.743	23.457	34.482	72.951
Malathion	N/A	0.01	N/A	0.050	N/A	0.039	0.057	0.121
Mercury	2.4	1.3	2.40	6.562	1.38	5.053	2.022	4.277
Methoxychlor	N/A	0.03	N/A	0.151	N/A	0.117	0.171	0.363
Mirex	N/A	0.001	N/A	0.005	N/A	0.004	0.006	0.012
Nickel	278.016	30.879	525.163	294.427	300.918	226.709	333.262	705.064

Nonylphenol	28	6.6	28.0	33.315	16.0	25.652	23.585	49.897
Parathion (ethyl)	0.065	0.013	0.065	0.066	0.037	0.051	0.055	0.116
Pentachlorophenol	10.041	7.704	10.041	38.886	5.754	29.942	8.458	17.894
Phenanthrene	30	30	30.0	151.430	17.2	116.601	25.269	53.461
Polychlorinated Biphenyls (PCBs)	2.0	0.014	2.00	0.071	1.15	0.054	0.080	0.169
Selenium	20	5	20.0	25.238	11.5	19.433	16.846	35.641
Silver	0.8	N/A	18.0083163	N/A	10.319	N/A	15.169	32.091
Toxaphene	0.78	0.0002	0.780	0.001	0.447	0.001	0.001	0.002
Tributyltin (TBT)	0.13	0.024	0.130	0.121	0.074	0.093	0.110	0.232
2,4,5 Trichlorophenol	136	64	136	323.050	77.9	248.749	114.554	242.356
Zinc	69.520	70.089	202.177	1028.871	115.848	792.231	170.296	360.286

HUMAN HEALTH

CALCULATE DAILY AVERAGE AND DAILY MAXIMUM EFFLUENT LIMITATIONS:

Parameter	Water and	Fish Only	WLAh	LTAh	Daily Avg. (ug/L)	Daily Max. (ug/L)
	Fish Criterion (ug/L)	Criterion (ug/L)				
Acrylonitrile	0.80	3.8	44.403	41.295	60.703	128.426
Aldrin	0.00094	0.0010	0.012	0.011	0.016	0.034
Anthracene	5,569	N/A	N/A	N/A	N/A	N/A
Antimony	6	1,071	12514.585	11638.564	17108.689	36195.935
Arsenic	10	N/A	N/A	N/A	N/A	N/A
Barium	2,000	N/A	N/A	N/A	N/A	N/A
Benzene	5	513	5994.381	5574.774	8194.918	17337.549
Benzidine	0.00086	0.0020	0.023	0.022	0.032	0.068
Benzo(a)anthracene	0.68	3.28	38.327	35.644	52.396	110.852
Benzo(a)pyrene	0.068	0.33	3.856	3.586	5.272	11.153
Bis(chloromethyl)ether	0.0024	0.44	5.141	4.781	7.029	14.870
Bis(2-chloroethyl)ether	0.57	10.06	117.551	109.322	160.703	339.992
Bis(2-ethylhexyl)phthalate	6	41	479.083	445.547	654.954	1385.652
Bromodichloromethane (Dichlorobromomethane)	10.2	322	3762.555	3499.176	5143.789	10882.438
Bromoform	69.1	2,175	25414.774	23635.740	34744.537	73507.151
Cadmium	5	N/A	N/A	N/A	N/A	N/A
Carbon Tetrachloride	4.3	30.5	356.391	331.444	487.222	1030.790
Chlordane	0.0080	0.0081	0.095	0.088	0.129	0.274
Chlorobenzene	100	5,201	60773.443	56519.302	83083.374	175775.030
Chlorodibromomethane (Dibromochloromethane)	7.6	239	2792.704	2597.215	3817.905	8077.337
Chloroform	70	7,143	83465.623	77623.029	114105.853	241407.622
Chromium (+6)	62	502	5865.847	5455.237	8019.199	16965.788
Chrysene	68.13	327	3820.980	3553.511	5223.661	11051.420
Cresols (Methylphenols)	1,041	9,301	108681.753	101074.030	148578.824	314340.234
Cyanide (free)	200	N/A	N/A	N/A	N/A	N/A

4,4'-DDD	0.0059	0.0059	0.069	0.064	0.094	0.199
4,4'-DDE	0.0040	0.0040	0.047	0.043	0.064	0.135
4,4'-DDT	0.0040	0.0040	0.047	0.043	0.064	0.135
2,4'-D	70	N/A	N/A	N/A	N/A	N/A
Danitol	262	473	5526.983	5140.094	7555.938	15985.693
1,2-Dibromoethane	0.17	4.24	49.544	46.076	67.732	143.297
m-Dichlorobenzene (1,3-Dichlorobenzene)	473	1,445	16884.758	15702.825	23083.152	48835.785
o-Dichlorobenzene (1,2-Dichlorobenzene)	600	4,336	50665.959	47119.341	69265.432	146541.152
p-Dichlorobenzene (1,4-Dichlorobenzene)	75	N/A	N/A	N/A	N/A	N/A
3,3'-Dichlorobenzidine	0.32	0.44	5.141	4.781	7.029	14.870
1,2-Dichloroethane	5	553	6461.779	6009.455	8833.898	18689.404
1,1-Dichloroethylene	7	23,916	279457.349	259895.334	382046.141	808274.490
Dichloromethane (Methylene Chloride)	5	22,222	259663.037	241486.625	354985.339	751023.403
1,2-Dichloropropane	5	226	2640.799	2455.944	3610.237	7637.984
1,3-Dichloropropene (1,3-Dichloropropylene)	3.4	211	2465.525	2292.938	3370.619	7131.039
Dicofol	0.30	0.30	3.505	3.260	4.792	10.139
Dieldrin	0.001	0.001	0.012	0.011	0.016	0.034
2,4-Dimethylphenol	257	571	6672.108	6205.061	9121.439	19297.739
Di-n-Butyl Phthalate	1,318	3,010	35171.710	32709.690	48083.245	101727.137
Dioxins/Furans (TCDD Equivalents)	7.80E-08	7.97E-08	0.000	8.66E-07	1.27E-06	2.69E-06
Endrin	0.20	0.20	2.337	2.173	3.195	6.759
Ethylbenzene	700	7,143	83465.623	77623.029	114105.853	241407.622
Fluoride	4,000	N/A	N/A	N/A	N/A	N/A
Heptachlor	0.0015	0.0015	0.018	0.016	0.024	0.051
Heptachlor Epoxide	0.00074	0.00075	0.009	0.008	0.012	0.025
Hexachlorobenzene	0.0044	0.0045	0.053	0.049	0.072	0.152
Hexachlorobutadiene	6.5	274	3201.677	2977.560	4377.013	9260.211
Hexachlorocyclohexane (alpha)	0.050	0.093	1.087	1.011	1.486	3.143
Hexachlorocyclohexane (beta)	0.17	0.33	3.856	3.586	5.272	11.153
Hexachlorocyclohexane (gamma) (Lindane)	0.2	6.2	72.447	67.375	99.042	209.538
Hexachlorocyclopentadiene	50	N/A	N/A	N/A	N/A	N/A
Hexachloroethane	4.97	11.51	134.494	125.079	183.866	388.996
Hexachlorophene	2.05	2.90	33.886	31.514	46.326	98.010
Lead	1.15	3.83	211.186	196.403	288.712	610.812
Mercury	0.0122	0.0122	0.143	0.133	0.195	0.412
Methoxychlor	1.59	1.61	18.813	17.496	25.719	54.412
Methyl Ethyl Ketone	13,865	992,000	11591474	10780071	15846704	33526020
Nickel	332	1,140	25162.645	23401.260	34399.852	72777.917
Nitrate-Nitrogen (as Total Nitrogen)	10,000	N/A	N/A	N/A	N/A	N/A
Nitrobenzene	45	1,853	21652.219	20136.564	29600.748	62624.713
N-Nitrosodiethylamine	0.0037	2.1	24.538	22.821	33.546	70.972
N-Nitroso-di-n-Butylamine	0.119	4.2	49.077	45.641	67.093	141.945

Pentachlorobenzene	1.0	1.0	11.685	10.867	15.974	33.796
Pentachlorophenol	0.80	9.1	106.333	98.890	145.368	307.547
Polychlorinated Biphenyls (PCBs)	6.4E-04	6.4E-04	7.48E-03	6.95E-03	1.02E-02	2.16E-02
Pyridine	23	947	11065.651	10291.055	15127.851	32005.182
Selenium	50	N/A	N/A	N/A	N/A	N/A
1,2,4,5-Tetrachlorobenzene	0.65	0.71	8.296	7.716	11.342	23.995
1,1,1,2-Tetrachloroethane	1.7	40	467.398	434.680	638.980	1351.856
Tetrachloroethylene	5	525	6134.601	5705.179	8386.612	17743.105
Thallium	0.12	0.23	2.688	2.499	3.674	7.773
Toluene	1,000	N/A	N/A	N/A	N/A	N/A
Toxaphene	0.0053	0.0053	0.062	0.058	0.085	0.179
2,4,5-TP (Silvex)	19	21	245.384	228.207	335.464	709.724
1,1,1-Trichloroethane	200	956,663	11178563	10396063	15282213	32331757
1,1,2-Trichloroethane	5	295	3447.061	3205.767	4712.477	9969.935
Trichloroethylene	5	82	958.166	891.095	1309.909	2771.304
2,4,5-Trichlorophenol	1,194	2,435	28452.862	26461.162	38897.907	82294.212
TTHM (Sum of Total Trihalomethanes)	80	N/A	N/A	N/A	N/A	N/A
Vinyl Chloride	0.25	24	280.439	260.808	383.388	811.113

CALCULATE 70% AND 85% OF DAILY AVERAGE EFFLUENT LIMITATIONS:

Aquatic Life

Parameter	70%	85%	
Aldrin	1.77	2.15	
Aluminum	584	710	570
Arsenic	339.980	412.833	7.2
Cadmium	2.772	3.366	
Carbaryl	1.18	1.43	
Chlordane	0.016	0.019	
Chlorpyrifos	0.049	0.059	
Chromium (+3)	831.891	1010.153	
Chromium (+6)	9.257	11.241	
Copper	11.721	14.233	
Cyanide (free)	27.004	32.791	
4,4'-DDT	0.004	0.005	
Demeton	0.400	0.486	
Diazinon	0.100	0.122	
Dicofol	34.964	42.457	
Dieldrin	0.008	0.010	
Diuron	123.820	150.352	
Endosulfan (alpha)	0.130	0.158	
Endosulfan (beta)	0.130	0.158	

Endosulfan sulfate	0.130	0.158	
Endrin	0.008	0.010	
Guthion	0.040	0.049	
Heptachlor	0.016	0.019	
Hexachlorocyclohexane (Lindane)	0.320	0.389	
Lead	24.137	29.310	
Malathion	0.040	0.049	
Mercury	1.415	1.718	0.009091
Methoxychlor	0.120	0.146	
Mirex	0.004	0.005	
Nickel	233.283	283.273	
Nonylphenol	16.509	20.047	
Parathion (ethyl)	0.038	0.047	
Pentachlorophenol	5.920	7.189	
Phenanthrene	17.689	21.479	
Polychlorinated Biphenyls (PCBs)	0.056	0.068	
Selenium	11.792	14.319	0.74
Silver	10.618	12.893	
Toxaphene	0.001	0.001	
Tributyltin (TBT)	0.077	0.093	
2,4,5 Trichlorophenol	80.188	97.371	
Zinc	119.207	144.752	32

Human Health

Parameter	70%	85%
Acrylonitrile	42.492	51.598
Aldrin	0.011	0.014
Anthracene	N/A	N/A
Antimony	11976.083	14542.386
Arsenic	N/A	N/A
Barium	N/A	N/A
Benzene	5736.443	6965.681
Benzidine	0.022	0.027
Benzo(a)anthracene	36.677	44.537
Benzo(a)pyrene	3.690	4.481
Bis(chloromethyl)ether	4.920	5.974
Bis(2-chloroethyl)ether	112.492	136.598
Bis(2-ethylhexyl)phthalate	458.468	556.711
Bromodichloromethane (Dichlorobromomethane)	3600.652	4372.221
Bromoform	24321.176	29532.857
Cadmium	N/A	N/A
Carbon Tetrachloride	341.056	414.139

Chlordane	0.091	0.110
Chlorobenzene	58158.362	70620.868
Chlorodibromomethane (Dibromochloromethane)	2672.534	3245.220
Chloroform	79874.097	96989.975
Chromium (+6)	5613.439	6816.319
Chrysene	3656.563	4440.112
Cresols (Methylphenols)	104005.177	126292.001
Cyanide (free)	N/A	N/A
4,4'-DDD	0.066	0.080
4,4'-DDE	0.045	0.054
4,4'-DDT	0.045	0.054
2,4'-D	N/A	N/A
Danitrol	5289.157	6422.548
1,2-Dibromoethane	47.412	57.572
m-Dichlorobenzene (1,3-Dichlorobenzene)	16158.207	19620.680
o-Dichlorobenzene (1,2-Dichlorobenzene)	48485.802	58875.617
p-Dichlorobenzene (1,4-Dichlorobenzene)	N/A	N/A
3,3'-Dichlorobenzidine	4.920	5.974
1,2-Dichloroethane	6183.729	7508.814
1,1-Dichloroethylene	267432.299	324739.220
Dichloromethane (Methylene Chloride)	248489.737	301737.538
1,2-Dichloropropane	2527.166	3068.701
1,3-Dichloropropene (1,3- Dichloropropylene)	2359.434	2865.027
Dicofol	3.355	4.073
Dieldrin	0.011	0.014
2,4-Dimethylphenol	6385.008	7753.224
Di-n-Butyl Phthalate	33658.271	40870.758
Dioxins/Furans (TCDD Equivalents)	8.91E-07	1.08E-06
Endrin	2.236	2.716
Ethylbenzene	79874.097	96989.975
Fluoride	N/A	N/A
Heptachlor	0.017	0.020
Heptachlor Epoxide	0.008	0.010
Hexachlorobenzene	0.050	0.061
Hexachlorobutadiene	3063.909	3720.461
Hexachlorocyclohexane (alpha)	1.040	1.263
Hexachlorocyclohexane (beta)	3.690	4.481
Hexachlorocyclohexane (gamma) (Lindane)	69.329	84.186
Hexachlorocyclopentadiene	N/A	N/A
Hexachloroethane	128.707	156.287
Hexachlorophene	32.428	39.377
Lead	202.098	245.405

Mercury	0.136	0.166
Methoxychlor	18.003	21.861
Methyl Ethyl Ketone	11092693	13469698
Nickel	24079.896	29239.874
Nitrate-Nitrogen (as Total Nitrogen)	N/A	N/A
Nitrobenzene	20720.524	25160.636
N-Nitrosodiethylamine	23.483	28.514
N-Nitroso-di-n-Butylamine	46.965	57.029
Pentachlorobenzene	11.182	13.578
Pentachlorophenol	101.758	123.563
Polychlorinated Biphenyls (PCBs)	7.16E-03	8.69E-03
Pyridine	10589.496	12858.674
Selenium	N/A	N/A
1,2,4,5-Tetrachlorobenzene	7.939	9.641
1,1,2,2-Tetrachloroethane	447.286	543.133
Tetrachloroethylene	5870.629	7128.621
Thallium	2.572	3.123
Toluene	N/A	N/A
Toxaphene	0.059	0.072
2,4,5-TP (Silvex)	234.825	285.145
1,1,1-Trichloroethane	10697549	12989881
1,1,2-Trichloroethane	3298.734	4005.606
Trichloroethylene	916.936	1113.423
2,4,5-Trichlorophenol	27228.535	33063.221
TTHM (Sum of Total Trihalomethanes)	N/A	N/A
Vinyl Chloride	268.372	325.880