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

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

Table 1, 2010 Texas Surface Water Quality Standards (30 TAC 307) for Freshwater Aquatic Life
Table 2, 2010 Texas Surface Water Quality Standards for Human Health (except Mercury)
Table 3, 2000 Texas Surface Water Quality Standards for Human Health (Mercury)
"Procedures to Implement the Texas Surface Water Quality Standards," Texas Commission on Environmental Quality, January 2003
"Procedures to Implement the Texas Surface Water Quality Standards," Appendix D, Texas Commission on Environmental Quality, June 2010

PERMIT INFORMATION

Permittee Name:	Rock Creek Gas Plant
TPDES Permit No.:	TX0009172
Outfall No.:	001
Prepared by:	Maria Okpala
Date:	2/25/14

DISCHARGE INFORMATION

Intermittent Receiving Waterbody:	Unnamed tributary of Rock Creek
Perennial Stream/River within 3 Miles:	Rock Creek
Segment No.:	0101B
TSS (mg/L):	8
pH (Standard Units):	7.5
Hardness (mg/L as $CaCO_3$):	540
Chloride (mg/L):	840
Effluent Flow for Aquatic Life (MGD):	0.02
Critical Low Flow [7Q2] (cfs) for intermittent:	0
Critical Low Flow [7Q2] (cfs) for perennial:	0.24
Percent Effluent for Mixing Zone:	7.70
Percent Effluent for Zone of Initial Dilution:	8
Effluent Flow for Human Health (MGD):	0.02
Harmonic Mean Flow (cfs) for perennial:	1.75
Percent Effluent for Human Health:	1.738
Public Water Supply Use?:	**no**

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

Stream/River Metal	*Intercept (b)*	*Slope (m)*	*Partition Coefficient (Kp)*	*Dissolved Fraction (Cd/Ct)*		*Water Effect Ratio (WER)*	
Aluminum	N/A	N/A	N/A	1.00	Assumed	1	Assumed
Arsenic	5.68	-0.73	104892.47	0.54		1	Assumed

Cadmium	6.60	-1.13	379759.21	0.25		1	Assumed
Chromium (Total)	6.52	-0.93	478769.32	0.21		1	Assumed
Chromium (+3)	6.52	-0.93	478769.32	0.21		1	Assumed
Chromium (+6)	N/A	N/A	N/A	1.00	Assumed	1	Assumed
Copper	6.02	-0.74	224757.09	0.36		1	Assumed
Lead	6.45	-0.80	533983.71	0.19		1	Assumed
Mercury	N/A	N/A	N/A	1.00	Assumed	1	Assumed
Nickel	5.69	-0.57	149705.83	0.46		1	Assumed
Selenium	N/A	N/A	N/A	1.00	Assumed	1	Assumed
Silver	6.38	-1.03	281719.76	0.31		1	Assumed
Zinc	6.10	-0.70	293654.74	0.30		1	Assumed

CONVERT TISSUE-BASED CRITERIA TO WATER COLUMN CRITERIA:

Parameter	*Water and Fish Criterion (ug/kg)*	*Fish Only Criterion (ug/kg)*	*BCF*	*(l/kg)*	*Water and Fish Criterion (ug/L)*	*Fish Only Criterion (ug/L)*
4,4'-DDD	166.16	166.16		53600	0.0031	0.0031
4,4'-DDE	214.4	214.4		53600	0.004	0.004
4,4'-DDT	209.04	209.04		53600	0.0039	0.0039
Dioxins/Furans	0.0004	0.0004		5000	8.00E-08	8.00E-08
Mercury						
Polychlorinated Biphenyls (PCBs)	19.96	19.96		31200	6.40E-04	6.40E-04

AQUATIC LIFE

CALCULATE DAILY AVERAGE AND DAILY MAXIMUM EFFLUENT LIMITATIONS:

Parameter	*FW Acute Criterion (ug/L)*	*FW Chronic Criterion (ug/L)*	*WLAa*	*WLAc*	*LTAa*	*LTAc*	*Daily Avg. (ug/L)*	*Daily Max. (ug/L)*
Aldrin	3	N/A	38.96	N/A	22.32	N/A	32.82	69.43
Aluminum	991	N/A	12870	N/A	7375	N/A	10841	22935
Arsenic	340	150	8120.877	3582.740	4653.262	2758.710	4055.303	8579.587
Cadmium	44.097	0.792	2312.575	41.510	1325.106	31.963	46.985	99.404
Carbaryl	2	N/A	25.97	N/A	14.88	N/A	21.88	46.29
Chlordane	2.4	0.004	31.17	0.052	17.86	0.040	0.059	0.124
Chlorpyrifos	0.083	0.041	1.078	0.532	0.618	0.410	0.603	1.275
Chromium (+3)	2267.384	294.940	142231.371	18501.379	81498.576	14246.062	20941.711	44305.253
Chromium (+6)	15.7	10.6	203.9	137.662	116.83	106.000	155.820	329.660
Copper	69.567	40.006	2527.964	1453.746	1448.523	1119.384	1645.495	3481.285
Cyanide	45.8	10.7	594.8	138.961	340.8	107.000	157.290	332.770
4,4'-DDT	1.1	0.001	14.29	0.013	8.186	0.010	0.015	0.031
Demeton	N/A	0.1	N/A	1.299	N/A	1.000	1.470	3.110

Diazinon	0.17	0.17	2.208	2.208	1.265	1.700	1.860	3.934
Dicofol	59.3	19.8	770.1	257.143	441.3	198.000	291.060	615.780
Dieldrin	0.24	0.002	3.117	0.026	1.786	0.020	0.029	0.062
Diuron	210	70	2727	909.091	1563	700.000	1029.000	2177.000
Endosulfan I (alpha)	0.22	0.056	2.857	0.727	1.637	0.560	0.823	1.742
Endosulfan II (beta)	0.22	0.056	2.857	0.727	1.637	0.560	0.823	1.742
Endosulfan sulfate	0.22	0.056	2.857	0.727	1.637	0.560	0.823	1.742
Endrin	0.086	0.002	1.117	0.026	0.640	0.020	0.029	0.062
Guthion	N/A	0.01	N/A	0.130	N/A	0.100	0.147	0.311
Heptachlor	0.52	0.004	6.753	0.052	3.870	0.040	0.059	0.124
Hexachlorocyclohexane (Lindane)	1.126	0.08	14.62	1.039	8.379	0.800	1.176	2.488
Lead	380.962	14.846	26082.856	1016.411	14945.477	782.637	1150.476	2434.001
Malathion	N/A	0.01	N/A	0.130	N/A	0.100	0.147	0.311
Mercury	2.4	1.3	31.17	16.883	17.86	13.000	19.110	40.430
Methoxychlor	N/A	0.03	N/A	0.390	N/A	0.300	0.441	0.933
Mirex	N/A	0.001	N/A	0.013	N/A	0.010	0.015	0.031
Nickel	1950.158	216.602	55659.186	6182.017	31892.714	4760.153	6997.425	14804.077
Nonylphenol	28	6.6	363.6	85.714	208.4	66.000	97.020	205.260
Parathion (ethyl)	0.065	0.013	0.844	0.169	0.484	0.130	0.191	0.404
Pentachlorophenol	14.418	11.062	187.251	143.660	107.295	110.618	157.723	333.687
Phenanthrene	30	30	389.6	389.610	223.2	300.000	328.173	694.297
Polychlorinated Biphenyls (PCBs)	2	0.014	25.97	0.182	14.88	0.140	0.206	0.435
Selenium	20	5	259.7	64.935	148.8	50.000	73.500	155.500
Silver (free ion)	0.8	N/A	376.4149571	N/A	215.686	N/A	317.058	670.783
Toxaphene	0.78	0.0002	10.130	0.003	5.804	0.002	0.003	0.006
Tributyltin (TBT)	0.13	0.024	1.688	0.312	0.967	0.240	0.353	0.746
2,4,5 Trichlorophenol	136	64	1766	831.169	1012.1	640.000	940.800	1990.400
Zinc	489.117	493.118	21274.907	21448.935	12190.522	16515.680	17920.067	37912.523

HUMAN HEALTH

CALCULATE DAILY AVERAGE AND DAILY MAXIMUM EFFLUENT LIMITATIONS:

Parameter	*Water and Fish Criterion (ug/L)*	*Fish Only Criterion (ug/L)*	*WLAh*	*LTAh*	*Daily Avg. (ug/L)*	*Daily Max. (ug/L)*
Acrylonitrile	0.8	3.8	218.701	203.392	298.987	632.550
Aldrin	0.00094	0.001	0.058	0.054	0.079	0.166
Anthracene	5569	N/A	N/A	N/A	N/A	N/A
Antimony	6	1071	61639.263	57324.515	84267.036	178279.240
Arsenic	10	N/A	N/A	N/A	N/A	N/A
Barium	2000	N/A	N/A	N/A	N/A	N/A
Benzene	5	513	29524.689	27457.961	40363.202	85394.258
Benzidine	0.00086	0.002	0.115	0.107	0.157	0.333

Benzo(a)anthracene	0.068	0.33	18.992	17.663	25.965	54.932
Benzo(a)pyrene	0.068	0.33	18.992	17.663	25.965	54.932
Bis(chloromethyl)ether	0.0024	0.44	25.323	23.551	34.620	73.243
Bis(2-chloroethyl)ether	0.3	5.27	303.304	282.073	414.647	877.247
Bis(2-ethylhexyl)phthalate	6	41	2359.673	2194.496	3225.909	6824.882
Bromodichloromethane	10.2	322	18532.066	17234.821	25335.187	53600.294
Bromoform	69.1	2175	125177.775	116415.331	171130.536	362051.679
Cadmium	5	N/A	N/A	N/A	N/A	N/A
Carbon Tetrachloride	4.1	29	1669.037	1552.204	2281.740	4827.356
Chlordane	0.008	0.0081	0.466	0.434	0.637	1.348
Chlorobenzene	100	5201	299333.153	278379.832	409218.353	865761.278
Chlorodibromomethane (Dibromochloromethane)	7.6	239	13755.167	12792.305	18804.689	39784.070
Chloroform	70	7143	411101.079	382324.003	562016.285	1189027.651
Chromium (+6)	62	502	28891.606	26869.194	39497.715	83563.192
Chrysene	68.13	327	18819.831	17502.443	25728.591	54432.597
Cresols	736	1981	114012.493	106031.618	155866.479	329758.334
Cyanide	200	N/A	N/A	N/A	N/A	N/A
4,4'-DDD	0.0031	0.0031	0.178	0.166	0.244	0.516
4,4'-DDE	0.004	0.004	0.230	0.214	0.315	0.666
4,4'-DDT	0.0039	0.0039	0.224	0.209	0.307	0.649
2,4'-D	70	N/A	N/A	N/A	N/A	N/A
Danitol	5.39	5.44	313.088	291.172	428.023	905.545
1,2-Dibromoethane	0.16	2.13	122.588	114.007	167.590	354.561
m-Dichlorobenzene	473	1445	83164.085	77342.599	113693.621	240535.483
o-Dichlorobenzene	600	4336	249549.808	232081.321	341159.543	721772.910
p-Dichlorobenzene	75	N/A	N/A	N/A	N/A	N/A
3,3'-Dichlorobenzidine	0.32	0.44	25.323	23.551	34.620	73.243
1,2-Dichloroethane	5	553	31826.809	29598.932	43510.431	92052.680
1,1-Dichloroethylene	7	23916	1376437.548	1280086.920	1881727.772	3981070.320
Dichloromethane	5	5926	341059.078	317184.943	466261.866	986445.171
1,2-Dichloropropane	5	226	13006.978	12096.490	17781.840	37620.082
1,3-Dichloropropene (1,3- Dichloropropylene)	3.4	211	12143.683	11293.625	16601.629	35123.174
Dicofol	0.076	0.076	4.374	4.068	5.980	12.651
Dieldrin	0.0005	0.0005	0.029	0.027	0.039	0.083
2,4-Dimethylphenol	257	571	32862.763	30562.370	44926.683	95048.969
Di-n-Butyl Phthalate	1318	3010	173234.530	161108.113	236828.926	501046.231
Dioxins/Furans (TCDD Equivalents)	8.00E-08	8.00E-08	0.000	4.28E-06	6.29E-06	1.33E-05
Endrin	0.2	0.2	11.511	10.705	15.736	33.292
Ethylbenzene	700	7143	411101.079	382324.003	562016.285	1189027.651
Fluoride	4000	N/A	N/A	N/A	N/A	N/A
Heptachlor	0.0015	0.0015	0.086	0.080	0.118	0.250
Heptachlor Epoxide	0.00074	0.00075	0.043	0.040	0.059	0.125

Hexachlorobenzene	0.0044	0.0045	0.259	0.241	0.354	0.749
Hexachlorobutadiene	6.5	274	15769.522	14665.655	21558.514	45610.188
Hexachlorocyclohexane (alpha)	0.05	0.093	5.352	4.978	7.317	15.481
Hexachlorocyclohexane (beta)	0.17	0.33	18.992	17.663	25.965	54.932
Hexachlorocyclohexane (gamma) (Lindane)	0.2	6.2	356.829	331.851	487.820	1032.055
Hexachlorocyclopentadiene	50	N/A	N/A	N/A	N/A	N/A
Hexachloroethane	27	62	3568.286	3318.506	4878.204	10320.554
Hexachlorophene	0.008	0.008	0.460	0.428	0.629	1.332
Lead	1.15	3.83	1162.068	1080.723	1588.663	3361.048
Mercury	0.0122	0.0122	0.702	0.653	0.960	2.031
Methoxychlor	0.33	0.33	18.992	17.663	25.965	54.932
Methyl Ethyl Ketone	13932	1500000	86329500.000	8.03E+07	1.18E+08	2.50E+08
Nickel	332	1140	144188.518	134095.322	197120.123	417036.451
Nitrate-Nitrogen (as Total Nitrogen)	10000	N/A	N/A	N/A	N/A	N/A
Nitrobenzene	11	463	26647.039	24781.746	36429.167	77071.231
N-Nitrosodiethylamine	0.0037	2.1	120.861	112.401	165.229	349.567
N-Nitroso-di-n-Butylamine	0.119	4.2	241.723	224.802	330.459	699.134
Pentachlorobenzene	1	1	57.553	53.524	78.681	166.461
Pentachlorophenol	1	57	3280.521	3050.885	4484.800	9488.251
Polychlorinated Biphenyls (PCBs)	6.40E-04	6.40E-04	0.037	0.034	0.050	0.106
Pyridine	23	2014	115911.742	107797.920	158462.942	335251.531
Selenium	50	N/A	N/A	N/A	N/A	N/A
1,2,4,5-Tetrachlorobenzene	0.65	0.71	40.863	38.002	55.863	118.187
1,1,2,2-Tetrachloroethane	3.2	76	4374.028	4067.846	5979.734	12651.001
Tetrachloroethylene	5	49	2820.097	2622.690	3855.355	8156.567
Thallium	0.75	1.5	86.330	80.286	118.021	249.691
Toluene	1000	N/A	N/A	N/A	N/A	N/A
Toxaphene	0.0053	0.0053	0.305	0.284	0.417	0.882
2,4,5-TP (Silvex)	7.3	7.6	437.403	406.785	597.973	1265.100
1,1,1-Trichloroethane	200	956663	55058825.639	51204707.844	75270920.531	159246641.396
1,1,2-Trichloroethane	5	295	16978.135	15789.666	23210.808	49105.860
Trichloroethylene	5	649	37351.897	34737.264	51063.778	108032.892
2,4,5-Trichlorophenol	1194	2435	140141.555	130331.646	191587.520	405331.420
TTHM (Sum of Total Trihalomethanes)	80	N/A	N/A	N/A	N/A	N/A
Vinyl Chloride	0.25	24	1381.272	1284.583	1888.337	3995.053

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

Aquatic Life

Parameter	***70%***	***85%***	
Aldrin	22.97	27.89	
Aluminum	7588	9215	104

Arsenic	2838.712	3447.008	
Cadmium	32.890	39.937	
Carbaryl	15.31	18.60	
Chlordane	0.041	0.050	
Chlorpyrifos	0.422	0.512	
Chromium (+3)	14659.198	17800.454	
Chromium (+6)	109.074	132.447	
Copper	1151.846	1398.671	
Cyanide	110.103	133.697	
4,4'-DDT	0.010	0.012	
Demeton	1.029	1.250	
Diazinon	1.302	1.581	
Dicofol	203.742	247.401	
Dieldrin	0.021	0.025	
Diuron	720.300	874.650	
Endosulfan (alpha)	0.576	0.700	
Endosulfan (beta)	0.576	0.700	
Endosulfan sulfate	0.576	0.700	
Endrin	0.021	0.025	
Guthion	0.103	0.125	
Heptachlor	0.041	0.050	
Hexachlorocyclohexane (Lindane)	0.823	1.000	
Lead	805.333	977.905	
Malathion	0.103	0.125	
Mercury	13.377	16.244	
Methoxychlor	0.309	0.375	
Mirex	0.010	0.012	
Nickel	4898.198	5947.812	
Nonylphenol	67.914	82.467	
Parathion (ethyl)	0.134	0.162	
Pentachlorophenol	1.10E+02	1.34E+02	
Phenanthrene	229.721	278.947	
Polychlorinated Biphenyls (PCBs)	0.144	0.175	
Selenium	51.450	62.475	
Silver (free ion)	221.941	269.499	
Toxaphene	0.002	0.002	
Tributyltin (TBT)	0.247	0.300	
2,4,5 Trichlorophenol	658.560	799.680	
Zinc	12544.047	15232.057	8.1

Human Health

Parameter	***70%***	***85%***

Acrylonitrile	209.291	254.139
Aldrin	0.055	0.067
Anthracene	N/A	N/A
Antimony	58986.926	71626.981
Arsenic	N/A	N/A
Barium	N/A	N/A
Benzene	28254.242	34308.722
Benzidine	0.110	0.134
Benzo(a)anthracene	18.175	22.070
Benzo(a)pyrene	18.175	22.070
Bis(chloromethyl)ether	24.234	29.427
Bis(2-chloroethyl)ether	290.253	352.450
Bis(2-ethylhexyl)phthalate	2258.136	2742.023
Bromodichloromethane	17734.631	21534.909
Bromoform	119791.375	145460.956
Cadmium	N/A	N/A
Carbon Tetrachloride	1597.218	1939.479
Chlordane	0.446	0.542
Chlorobenzene	286452.847	347835.600
Chlorodibromomethane (Dibromochloromethane)	13163.282	15983.985
Chloroform	393411.400	477713.842
Chromium (+6)	27648.400	33573.057
Chrysene	18010.014	21869.302
Cresols	109106.535	132486.507
Cyanide	N/A	N/A
4,4'-DDD	0.171	0.207
4,4'-DDE	0.220	0.268
4,4'-DDT	0.215	0.261
2,4'-D	N/A	N/A
Danitol	299.616	363.820
1,2-Dibromoethane	117.313	142.451
m-Dichlorobenzene	79585.534	96639.578
o-Dichlorobenzene	238811.680	289985.611
p-Dichlorobenzene	N/A	N/A
3,3'-Dichlorobenzidine	24.234	29.427
1,2-Dichloroethane	30457.301	36983.866
1,1-Dichloroethylene	1317209.440	1599468.606
Dichloromethane	326383.306	396322.586
1,2-Dichloropropane	12447.288	15114.564
1,3-Dichloropropene (1,3- Dichloropropylene)	11621.140	14111.385
Dicofol	4.186	5.083
Dieldrin	0.028	0.033

2,4-Dimethylphenol	31448.678	38187.681
Di-n-Butyl Phthalate	165780.248	201304.587
Dioxins/Furans (TCDD Equivalents)	4.41E-06	5.35E-06
Endrin	11.015	13.376
Ethylbenzene	393411.400	477713.842
Fluoride	N/A	N/A
Heptachlor	0.083	0.100
Heptachlor Epoxide	0.041	0.050
Hexachlorobenzene	0.248	0.301
Hexachlorobutadiene	15090.959	18324.736
Hexachlorocyclohexane (alpha)	5.122	6.220
Hexachlorocyclohexane (beta)	18.175	22.070
Hexachlorocyclohexane (gamma) (Lindane)	341.474	414.647
Hexachlorocyclopentadiene	N/A	N/A
Hexachloroethane	3414.743	4146.473
Hexachlorophene	0.441	0.535
Lead	1112.064	1350.363
Mercury	0.672	0.816
Methoxychlor	18.175	22.070
Methyl Ethyl Ketone	8.26E+07	1.00E+08
Nickel	137984.086	167552.104
Nitrate-Nitrogen (as Total Nitrogen)	N/A	N/A
Nitrobenzene	25500.417	30964.792
N-Nitrosodiethylamine	115.661	140.445
N-Nitroso-di-n-Butylamine	231.321	280.890
Pentachlorobenzene	55.076	66.879
Pentachlorophenol	3139.360	3812.080
Polychlorinated Biphenyls (PCBs)	3.52E-02	4.28E-02
Pyridine	110924.060	134693.501
Selenium	N/A	N/A
1,2,4,5-Tetrachlorobenzene	39.104	47.484
1,1,2,2-Tetrachloroethane	4185.814	5082.774
Tetrachloroethylene	2698.748	3277.051
Thallium	82.615	100.318
Toluene	N/A	N/A
Toxaphene	0.292	0.354
2,4,5-TP (Silvex)	418.581	508.277
1,1,1-Trichloroethane	52689644.372	63980282.451
1,1,2-Trichloroethane	16247.566	19729.187
Trichloroethylene	35744.645	43404.212
2,4,5-Trichlorophenol	134111.264	162849.392
TTHM (Sum of Total Trihalomethanes)	N/A	N/A

Vinyl Chloride	1321.836	1605.086