

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:	Gas Solutions
NPDES Permit No.:	TX000485
Outfall No.:	002
Prepared by:	Maria Okpala
Date:	7/1/13

DISCHARGE INFORMATION

Intermittent Receiving Waterbody:	Unnamed Creek, thence 1.5 miles to the Sabine River
Perennial Stream/River within 3 Miles:	Sabine River
Segment No.:	0505
TSS (mg/L):	16
pH (Standard Units):	6.7
Hardness (mg/L as CaCO ₃):	41
Chloride (mg/L):	42
Effluent Flow for Aquatic Life (MGD):	0.0144
Critical Low Flow [7Q2] (cfs) for intermittent:	0
Critical Low Flow [7Q2] (cfs) for perennial:	60
Percent Effluent for Mixing Zone:	0.04
Percent Effluent for Zone of Initial Dilution:	100
Effluent Flow for Human Health (MGD):	0.0144
Harmonic Mean Flow (cfs) for perennial:	194
Percent Effluent for Human Health:	0.011
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	63240.08	0.50	1 Assumed
Cadmium	6.60	-1.13	173517.95	0.26	1 Assumed
Chromium (Total)	6.52	-0.93	251286.07	0.20	1 Assumed

Chromium (+3)	6.52	-0.93	251286.07	0.20		1 Assumed
Chromium (+6)	N/A	N/A	N/A	1.00	Assumed	1 Assumed
Copper	6.02	-0.74	134570.92	0.32		1 Assumed
Lead	6.45	-0.80	306693.11	0.17		1 Assumed
Mercury	N/A	N/A	N/A	1.00	Assumed	1 Assumed
Nickel	5.69	-0.57	100844.36	0.38		1 Assumed
Selenium	N/A	N/A	N/A	1.00	Assumed	1 Assumed
Silver	6.38	-1.03	137961.03	0.31		1 Assumed
Zinc	6.10	-0.70	180765.69	0.26		1 Assumed

CONVERT TISSUE-BASED CRITERIA TO WATER COLUMN CRITERIA:

<i>Parameter</i>	<i>Water and Fish Criterion (ug/kg)</i>	<i>Fish Only Criterion (ug/kg)</i>	<i>BCF</i>	<i>(l/kg)</i>	<i>Water and Fish Criterion (ug/L)</i>	<i>Fish Only Criterion (ug/L)</i>
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:

<i>Parameter</i>	<i>FW Acute Criterion (ug/L)</i>	<i>FW Chronic Criterion (ug/L)</i>	<i>WLAa</i>	<i>WLAc</i>	<i>LTAa</i>	<i>LTAc</i>	<i>Daily Avg. (ug/L)</i>	<i>Daily Max. (ug/L)</i>
Aldrin	3	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	684.026	812985.063	391.947	625998.499	576.162	1218.955
Cadmium	3.604	0.132	13.610	1345.764	7.798	1036.238	11.464	24.253
Carbaryl	2	N/A	2.00	N/A	1.15	N/A	1.68	3.56
Chlordane	2.4	0.004	2.40	10.776	1.38	8.298	2.022	4.277
Chlorpyrifos	0.083	0.041	0.083	110.454	0.048	85.050	0.070	0.148
Chromium (+3)	274.514	35.709	1378.219	482974.861	789.719	371890.643	1160.888	2456.028
Chromium (+6)	15.7	10.6	15.7	28556.400	9.00	21988.428	13.224	27.978
Copper	6.131	4.420	19.331	37545.349	11.077	28909.919	16.283	34.448
Cyanide	45.8	10.7	45.8	28825.800	26.2	22195.866	38.578	81.617
4,4'-DDT	1.1	0.001	1.10	2.694	0.630	2.074	0.927	1.960
Demeton	N/A	0.1	N/A	269.400	N/A	207.438	304.934	645.132
Diazinon	0.17	0.17	0.170	457.980	0.097	352.645	0.143	0.303
Dicofol	59.3	19.8	59.3	53341.200	34.0	41072.724	49.949	105.674
Dieldrin	0.24	0.002	0.240	5.388	0.138	4.149	0.202	0.428
Diuron	210	70	210	188580.000	120	145206.600	176.885	374.226

Endosulfan I (alpha)	0.22	0.056	0.220	150.864	0.126	116.165	0.185	0.392
Endosulfan II (beta)	0.22	0.056	0.220	150.864	0.126	116.165	0.185	0.392
Endosulfan sulfate	0.22	0.056	0.220	150.864	0.126	116.165	0.185	0.392
Endrin	0.086	0.002	0.086	5.388	0.049	4.149	0.072	0.153
Guthion	N/A	0.01	N/A	26.940	N/A	20.744	30.493	64.513
Heptachlor	0.52	0.004	0.520	10.776	0.298	8.298	0.438	0.927
Hexachlorocyclohexane (Lindane)	1.126	0.08	1.13	215.520	0.645	165.950	0.948	2.007
Lead	24.167	0.942	142.757	14986.852	81.800	11539.876	120.246	254.398
Malathion	N/A	0.01	N/A	26.940	N/A	20.744	30.493	64.513
Mercury	2.4	1.3	2.40	3502.200	1.38	2696.694	2.022	4.277
Methoxychlor	N/A	0.03	N/A	80.820	N/A	62.231	91.480	193.540
Mirex	N/A	0.001	N/A	2.694	N/A	2.074	3.049	6.451
Nickel	220.232	24.461	575.578	172224.453	329.806	132612.829	484.815	1025.697
Nonylphenol	28	6.6	28.0	17780.400	16.0	13690.908	23.585	49.897
Parathion (ethyl)	0.065	0.013	0.065	35.022	0.037	26.967	0.055	0.116
Pentachlorophenol	6.453	4.951	6.453	13336.799	3.697	10269.335	5.435	11.499
Phenanthrene	30	30	30.0	80820.000	17.2	62231.400	25.269	53.461
Polychlorinated Biphenyls (PCBs)	2	0.014	2.00	37.716	1.15	29.041	1.685	3.564
Selenium	20	5	20.0	13470.000	11.5	10371.900	16.846	35.641
Silver (free ion)	0.8	N/A	9.603151093	N/A	5.503	N/A	8.089	17.113
Toxaphene	0.78	0.0002	0.780	0.539	0.447	0.415	0.610	1.290
Tributyltin (TBT)	0.13	0.024	0.130	64.656	0.074	49.785	0.110	0.232
2,4,5 Trichlorophenol	136	64	136	172416.000	77.9	132760.320	114.554	242.356
Zinc	55.051	55.502	214.273	581973.809	122.779	448119.833	180.484	381.841

HUMAN HEALTH

CALCULATE DAILY AVERAGE AND DAILY MAXIMUM EFFLUENT LIMITATIONS:

<i>Parameter</i>	<i>Water and Fish</i>	<i>Fish Only</i>	<i>WLAh</i>	<i>LTAh</i>	<i>Daily Avg. (ug/L)</i>	<i>Daily Max. (ug/L)</i>
	<i>Criterion (ug/L)</i>	<i>Criterion (ug/L)</i>				
Acrylonitrile	0.8	3.8	33091.793	30775.368	45239.791	95711.394
Aldrin	0.00094	0.001	8.708	8.099	11.905	25.187
Anthracene	5569	N/A	N/A	N/A	N/A	N/A
Antimony	6	1071	9326660.700	8673794.451	12750477.843	26975500.743
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	4467392.100	4154674.653	6107371.740	12921038.171
Benzidine	0.00086	0.002	17.417	16.198	23.810	50.374
Benzo(a)anthracene	0.068	0.33	2873.761	2672.598	3928.719	8311.779
Benzo(a)pyrene	0.068	0.33	2873.761	2672.598	3928.719	8311.779
Bis(chloromethyl)ether	0.0024	0.44	3831.681	3563.464	5238.292	11082.372
Bis(2-chloroethyl)ether	0.3	5.27	45893.092	42680.576	62740.447	132736.591
Bis(2-ethylhexyl)phthalate	6	41	357043.033	332050.021	488113.531	1032675.565
Bromodichloromethane	10.2	322	2804094.067	2607807.482	3833476.999	8110281.269

Bromoform	69.1	2175	18940697.500	17614848.675	25893827.552	54782179.379
Cadmium	5	N/A	N/A	N/A	N/A	N/A
Carbon Tetrachloride	4.1	29	252542.633	234864.649	345251.034	730429.058
Chlordane	0.008	0.0081	70.538	65.600	96.432	204.016
Chlorobenzene	100	5201	45292215.033	42121759.981	61918987.172	130998673.541
Chlorodibromomethane (Dibromochloromethane)	7.6	239	2081299.633	1935608.659	2845344.729	6019742.929
Chloroform	70	7143	62203863.100	57849592.683	85038901.244	179912233.244
Chromium (+6)	62	502	4371600.067	4065588.062	5976414.451	12643978.873
Chrysene	68.13	327	2847635.900	2648301.387	3893003.039	8236217.314
Cresols	736	1981	17251274.367	16043685.161	23584217.187	49895860.851
Cyanide	200	N/A	N/A	N/A	N/A	N/A
4,4'-DDD	0.0031	0.0031	26.996	25.106	36.906	78.080
4,4'-DDE	0.004	0.004	34.833	32.395	47.621	100.749
4,4'-DDT	0.0039	0.0039	33.963	31.585	46.430	98.230
2,4'-D	70	N/A	N/A	N/A	N/A	N/A
Danitol	5.39	5.44	47373.515	44057.369	64764.332	137018.416
1,2-Dibromoethane	0.16	2.13	18548.821	17250.404	25358.093	53648.755
m-Dichlorobenzene	473	1445	12583589.833	11702738.545	17203025.661	36395516.875
o-Dichlorobenzene	600	4336	37759477.867	35116314.416	51620982.192	109211737.834
p-Dichlorobenzene	75	N/A	N/A	N/A	N/A	N/A
3,3'-Dichlorobenzidine	0.32	0.44	3831.681	3563.464	5238.292	11082.372
1,2-Dichloroethane	5	553	4815726.767	4478625.893	6583580.063	13928526.527
1,1-Dichloroethylene	7	23916	208269297.200	193690446.396	284724956.202	602377288.292
Dichloromethane	5	5926	51605780.867	47993376.206	70550263.023	149259400.001
1,2-Dichloropropane	5	226	1968090.867	1830324.506	2690577.024	5692309.214
1,3-Dichloropropene (1,3- Dichloropropylene)	3.4	211	1837465.367	1708842.791	2511998.903	5314501.080
Dicofol	0.076	0.076	661.836	615.507	904.796	1914.228
Dieldrin	0.0005	0.0005	4.354	4.049	5.953	12.594
2,4-Dimethylphenol	257	571	4972477.367	4624403.951	6797873.808	14381896.288
Di-n-Butyl Phthalate	1318	3010	26212183.667	24377330.810	35834676.291	75813498.819
Dioxins/Furans (TCDD Equivalents)	8.00E-08	8.00E-08	0.001	6.48E-04	9.52E-04	2.01E-03
Endrin	0.2	0.2	1741.673	1619.756	2381.042	5037.442
Ethylbenzene	700	7143	62203863.100	57849592.683	85038901.244	179912233.244
Fluoride	4000	N/A	N/A	N/A	N/A	N/A
Heptachlor	0.0015	0.0015	13.063	12.148	17.858	37.781
Heptachlor Epoxide	0.00074	0.00075	6.531	6.074	8.929	18.890
Hexachlorobenzene	0.0044	0.0045	39.188	36.445	53.573	113.342
Hexachlorobutadiene	6.5	274	2386092.467	2219065.994	3262027.011	6901295.241
Hexachlorocyclohexane (alpha)	0.05	0.093	809.878	753.187	1107.184	2342.410
Hexachlorocyclohexane (beta)	0.17	0.33	2873.761	2672.598	3928.719	8311.779
Hexachlorocyclohexane (gamma) (Lindane)	0.2	6.2	53991.873	50212.442	73812.290	156160.695
Hexachlorocyclopentadiene	50	N/A	N/A	N/A	N/A	N/A
Hexachloroethane	27	62	539918.733	502124.422	738122.900	1561606.952
Hexachlorophene	0.008	0.008	69.667	64.790	95.242	201.498

Lead	1.15	3.83	197019.425	183228.065	269345.255	569839.282
Mercury	0.0122	0.0122	106.242	98.805	145.244	307.284
Methoxychlor	0.33	0.33	2873.761	2672.598	3928.719	8311.779
Methyl Ethyl Ketone	13932	1500000	13062550000.000	1.21E+10	1.79E+10	3.78E+10
Nickel	332	1140	25945717.300	24129517.089	35470390.121	75042798.147
Nitrate-Nitrogen (as Total Nitrogen)	10000	N/A	N/A	N/A	N/A	N/A
Nitrobenzene	11	463	4031973.767	3749735.603	5512111.336	11661677.725
N-Nitrosodiethylamine	0.0037	2.1	18287.570	17007.440	25000.937	52893.139
N-Nitroso-di-n-Butylamine	0.119	4.2	36575.140	34014.880	50001.874	105786.277
Pentachlorobenzene	1	1	8708.367	8098.781	11905.208	25187.209
Pentachlorophenol	1	57	496376.900	461630.517	678596.860	1435670.908
Polychlorinated Biphenyls (PCBs)	6.40E-04	6.40E-04	5.571	5.181	7.616	16.113
Pyridine	23	2014	17538650.467	16310944.934	23977089.053	50727038.745
Selenium	50	N/A	N/A	N/A	N/A	N/A
1,2,4,5-Tetrachlorobenzene	0.65	0.71	6182.940	5750.135	8452.698	17882.918
1,1,2,2-Tetrachloroethane	3.2	76	661835.867	615507.356	904795.813	1914227.877
Tetrachloroethylene	5	49	426709.967	396840.269	583355.195	1234173.237
Thallium	0.75	1.5	13062.550	12148.172	17857.812	37780.813
Toluene	1000	N/A	N/A	N/A	N/A	N/A
Toxaphene	0.0053	0.0053	46.154	42.924	63.098	133.492
2,4,5-TP (Silvex)	7.3	7.6	66183.587	61550.736	90479.581	191422.788
1,1,1-Trichloroethane	200	956663	8330972180.433	7747804127.803	11389272067.870	24095670837.467
1,1,2-Trichloroethane	5	295	2568968.167	2389140.395	3512036.381	7430226.628
Trichloroethylene	5	649	5651729.967	5256108.869	7726480.037	16346498.583
2,4,5-Trichlorophenol	1194	2435	21204872.833	19720531.735	28989181.650	61330853.696
TTHM (Sum of Total Trihalomethanes)	80	N/A	N/A	N/A	N/A	N/A
Vinyl Chloride	0.25	24	209000.800	194370.744	285724.994	604493.014

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

Aquatic Life

<i>Parameter</i>	<i>70%</i>	<i>85%</i>	
Aldrin	1.77	2.15	
Aluminum	584	710	459
Arsenic	403.313	489.738	
Cadmium	8.025	9.744	
Carbaryl	1.18	1.43	
Chlordane	1.415	1.718	
Chlorpyrifos	0.049	0.059	
Chromium (+3)	812.621	986.754	4
Chromium (+6)	9.257	11.241	3.77
Copper	11.398	13.840	12.6
Cyanide	27.004	32.791	
4,4'-DDT	0.649	0.788	

Demeton	213.454	259.194	
Diazinon	0.100	0.122	
Dicofol	34.964	42.457	
Dieldrin	0.142	0.172	
Diuron	123.820	150.352	
Endosulfan (alpha)	0.130	0.158	
Endosulfan (beta)	0.130	0.158	
Endosulfan sulfate	0.130	0.158	
Endrin	0.051	0.062	
Guthion	21.345	25.919	
Heptachlor	0.307	0.372	
Hexachlorocyclohexane (Lindane)	0.664	0.806	
Lead	84.172	102.209	3
Malathion	21.345	25.919	
Mercury	1.415	1.718	
Methoxychlor	64.036	77.758	
Mirex	2.135	2.592	
Nickel	339.370	412.093	4
Nonylphenol	16.509	20.047	
Parathion (ethyl)	0.038	0.047	
Pentachlorophenol	3.80E+00	4.62E+00	
Phenanthrene	17.689	21.479	
Polychlorinated Biphenyls (PCBs)	1.179	1.432	
Selenium	11.792	14.319	
Silver (free ion)	5.662	6.876	
Toxaphene	0.427	0.518	
Tributyltin (TBT)	0.077	0.093	
2,4,5 Trichlorophenol	80.188	97.371	
Zinc	126.339	153.412	103

Human Health

<i>Parameter</i>	<i>70%</i>	<i>85%</i>
Acrylonitrile	31667.853	38453.822
Aldrin	8.334	10.119
Anthracene	N/A	N/A
Antimony	8925334.490	10837906.167
Arsenic	N/A	N/A
Barium	N/A	N/A
Benzene	4275160.218	5191265.979
Benzidine	16.667	20.239
Benzo(a)anthracene	2750.103	3339.411
Benzo(a)pyrene	2750.103	3339.411
Bis(chloromethyl)ether	3666.804	4452.548
Bis(2-chloroethyl)ether	43918.313	53329.380

Bis(2-ethylhexyl)phthalate	341679.472	414896.501
Bromodichloromethane	2683433.899	3258455.449
Bromoform	18125679.287	22009753.419
Cadmium	N/A	N/A
Carbon Tetrachloride	241675.724	293463.379
Chlordane	67.503	81.967
Chlorobenzene	43343291.020	52631139.096
Chlorodibromomethane (Dibromochloromethane)	1991741.310	2418543.019
Chloroform	59527230.871	72283066.057
Chromium (+6)	4183490.116	5079952.283
Chrysene	2725102.127	3309052.583
Cresols	16508952.031	20046584.609
Cyanide	N/A	N/A
4,4'-DDD	25.834	31.370
4,4'-DDE	33.335	40.478
4,4'-DDT	32.501	39.466
2,4'-D	N/A	N/A
Danitol	45335.032	55049.682
1,2-Dibromoethane	17750.665	21554.379
m-Dichlorobenzene	12042117.963	14622571.812
o-Dichlorobenzene	36134687.534	43877834.863
p-Dichlorobenzene	N/A	N/A
3,3'-Dichlorobenzidine	3666.804	4452.548
1,2-Dichloroethane	4608506.044	5596043.053
1,1-Dichloroethylene	199307469.341	242016212.772
Dichloromethane	49385184.116	59967723.569
1,2-Dichloropropane	1883403.917	2286990.470
1,3-Dichloropropene (1,3- Dichloropropylene)	1758399.232	2135199.067
Dicofol	633.357	769.076
Dieldrin	4.167	5.060
2,4-Dimethylphenol	4758511.666	5778192.737
Di-n-Butyl Phthalate	25084273.403	30459474.847
Dioxins/Furans (TCDD Equivalents)	6.67E-04	8.10E-04
Endrin	1666.729	2023.885
Ethylbenzene	59527230.871	72283066.057
Fluoride	N/A	N/A
Heptachlor	12.500	15.179
Heptachlor Epoxide	6.250	7.590
Hexachlorobenzene	37.501	45.537
Hexachlorobutadiene	2283418.908	2772722.960
Hexachlorocyclohexane (alpha)	775.029	941.107
Hexachlorocyclohexane (beta)	2750.103	3339.411
Hexachlorocyclohexane (gamma) (Lindane)	51668.603	62740.447
Hexachlorocyclopentadiene	N/A	N/A

Hexachloroethane	516686.030	627404.465
Hexachlorophene	66.669	80.955
Lead	188541.679	228943.467
Mercury	101.670	123.457
Methoxychlor	2750.103	3339.411
Methyl Ethyl Ketone	1.25E+10	1.52E+10
Nickel	24829273.085	30149831.603
Nitrate-Nitrogen (as Total Nitrogen)	N/A	N/A
Nitrobenzene	3858477.935	4685294.636
N-Nitrosodiethylamine	17500.656	21250.796
N-Nitroso-di-n-Butylamine	35001.312	42501.593
Pentachlorobenzene	8333.646	10119.427
Pentachlorophenol	475017.802	576807.331
Polychlorinated Biphenyls (PCBs)	5.33E+00	6.47E+00
Pyridine	16783962.337	20380525.695
Selenium	N/A	N/A
1,2,4,5-Tetrachlorobenzene	5916.888	7184.793
1,1,2,2-Tetrachloroethane	633357.069	769076.441
Tetrachloroethylene	408348.637	495851.916
Thallium	12500.468	15179.140
Toluene	N/A	N/A
Toxaphene	44.168	53.633
2,4,5-TP (Silvex)	63335.707	76907.644
1,1,1-Trichloroethane	7972490447.509	9680881257.690
1,1,2-Trichloroethane	2458425.466	2985230.924
Trichloroethylene	5408536.026	6567508.032
2,4,5-Trichlorophenol	20292427.155	24640804.403
TTHM (Sum of Total Trihalomethanes)	N/A	N/A
Vinyl Chloride	200007.496	242866.245