TEXTOX MENU #9 - INTERMITTENT FRESHWATER STREAM WITHIN 3 MILES OF A NARROW TIDAL RIVER

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

Table 1, 2014 Texas Surface Water Quality Standards (30 TAC 307) for Freshwater and Saltwater 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:	Lone Star NGL Fractionator
TPDES Permit No:	TX0140082
Outfall No:	001
Prepared by:	Maria Okpala
Date:	3/3/2015

DISCHARGE INFORMATION

Intermittent Receiving Waterbody:	Cedar Bayou above Tidal
Segment No. for Freshwater Ambient Data:	902
TSS (mg/L) (Intermittent):	3
pH (Standard Units) (Intermittent):	7.1
Hardness (mg/L as $CaCO_3$) (Intermittent):	40
Chloride (mg/L) (Intermittent):	83
Effluent Flow for Aquatic Life (MGD):	0.19
% Effluent for Acute Aquatic Life (Intermittent):	100
Saltwater Receiving Waterbody:	Cedar Bayou Tidal
Segment No.:	901
TSS (mg/L) (Narrow Tidal River):	18
Critical Low Flow [7Q2] (cfs):	6.18
% Effluent for Chronic Aquatic Life (Narrow Tidal River):	8.000
% Effluent for Acute Aquatic Life (Narrow Tidal River):	30.000
Effluent Flow for Human Health (MGD):	0.19
Harmonic Mean Flow (cfs):	43.6
% Effluent for Human Health (Narrow Tidal River):	4.000

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	1.00	Assumed
Arsenic	5.68	-0.73	214635.47	0.61		1.00	Assumed
Cadmium	6.60	-1.13	1150410.88	0.22		1.00	Assumed
Chromium (Total)	6.52	-0.93	1192002.68	0.22		1.00	Assumed
Chromium (+3)	6.52	-0.93	1192002.68	0.22		1.00	Assumed
Chromium (+6)	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Copper	6.02	-0.74	464440.70	0.42		1.00	Assumed
Lead	6.45	-0.80	1170315.61	0.22		1.00	Assumed
Mercury	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Nickel	5.69	-0.57	261842.95	0.56		1.00	Assumed
Selenium	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed

Silver	6.38	-1.03	773686.66	0.30		1.00	Assumed
Zinc	6.10	-0.70	583465.42	0.36		1.00	Assumed

Estuarine 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	1.00	Assumed
Arsenic	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Cadmium	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Chromium (Total)	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Chromium (+3)	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Chromium (+6)	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Copper	4.85	-0.72	8834.94	0.86		1.00	Assumed
Lead	6.06	-0.85	98405.27	0.36		1.00	Assumed
Mercury	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Nickel	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Selenium	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Silver	5.86	-0.74	85329.33	0.39		1.00	Assumed
Zinc	5.36	-0.52	50963.39	0.52		1.00	Assumed

AQUATIC LIFE

CALCULATE DAILY AVERAGE AND DAILY MAXIMUM EFFLUENT LIMITATIONS:

Parameter	*FW Acute Criterion (ug/L)*	*SW Acute Criterion (ug/L)*	*SW Chronic Criterion (ug/L)*	*FW WLAa*	*SW WLAa*	*SW WLAc*	*FW LTAa*	*SW LTAa*	*SW LTAc*	*Daily Avg. (ug/L)*	*Daily Max. (ug/L)*
Aldrin	3.0	1.3	N/A	3.000	4.333	N/A	1.719	2.483	N/A	2.527	5.346
Aluminum	991	N/A	N/A	991.000	N/A	N/A	567.843	N/A	N/A	834.729	1765.992
Arsenic	340	149	78	558.928	496.667	975.000	320.266	284.590	750.750	418.347	885.075
Cadmium	3.51835537	40.0	8.75	15.661	133.333	109.375	8.974	76.400	84.219	13.191	27.908
Carbaryl	2.0	613	N/A	2.000	2043.333	N/A	1.146	1170.830	N/A	1.685	3.564
Chlordane	2.4	0.09	0.004	2.400	0.300	0.050	1.375	0.172	0.039	0.057	0.120
Chlorpyrifos	0.083	0.011	0.006	0.083	0.037	0.075	0.048	0.021	0.058	0.031	0.065
Chromium (+3)	269.0182463	N/A	N/A	1231.030	N/A	N/A	705.380	N/A	N/A	1036.909	2193.732
Chromium (+6)	15.7	1,090	49.6	15.700	3633.333	620.000	8.996	2081.900	477.400	13.224	27.978
Copper	5.98969341	13.5	3.6	14.335	52.156	52.156	8.214	29.886	40.160	12.075	25.546
Cyanide (free)	45.8	5.6	5.6	45.800	18.667	70.000	26.243	10.696	53.900	15.723	33.265
4,4'-DDT	1.1	0.13	0.001	1.100	0.433	0.013	0.630	0.248	0.010	0.014	0.030
Demeton	N/A	N/A	0.1	N/A	N/A	1.250	N/A	N/A	0.963	1.415	2.993
Diazinon	0.17	0.819	0.819	0.170	2.730	10.238	0.097	1.564	7.883	0.143	0.303
Dicofol	59.3	N/A	N/A	59.300	N/A	N/A	33.979	N/A	N/A	49.949	105.674
Dieldrin	0.24	0.71	0.002	0.240	2.367	0.025	0.138	1.356	0.019	0.028	0.060
Diuron	210	N/A	N/A	210.000	N/A	N/A	120.330	N/A	N/A	176.885	374.226
Endosulfan I (alpha)	0.22	0.034	0.009	0.220	0.113	0.113	0.126	0.065	0.087	0.095	0.202
Endosulfan II (beta)	0.22	0.034	0.009	0.220	0.113	0.113	0.126	0.065	0.087	0.095	0.202
Endosulfan sulfate	0.22	0.034	0.009	0.220	0.113	0.113	0.126	0.065	0.087	0.095	0.202
Endrin	0.086	0.037	0.002	0.086	0.123	0.025	0.049	0.071	0.019	0.028	0.060
Guthion	N/A	N/A	0.01	N/A	N/A	0.125	N/A	N/A	0.096	0.141	0.299

Heptachlor	0.52	0.053	0.004	0.520	0.177	0.050	0.298	0.101	0.039	0.057	0.120
Hexachlorocyclohexane (Lindane)	1.126	0.16	N/A	1.126	0.533	N/A	0.645	0.306	N/A	0.449	0.950
Lead	23.51077014	133	5.3	106.056	1228.607	183.598	60.770	703.992	141.371	89.332	188.995
Malathion	N/A	N/A	0.01	N/A	N/A	0.125	N/A	N/A	0.096	0.141	0.299
Mercury	2.4	2.1	1.1	2.400	7.000	13.750	1.375	4.011	10.588	2.022	4.277
Methoxychlor	N/A	N/A	0.03	N/A	N/A	0.375	N/A	N/A	0.289	0.424	0.898
Mirex	N/A	N/A	0.001	N/A	N/A	0.013	N/A	N/A	0.010	0.014	0.030
Nickel	215.6787464	118	13.1	385.101	393.333	163.750	220.663	225.380	126.088	185.349	392.132
Nonylphenol	28	7	1.7	28.000	23.333	21.250	16.044	13.370	16.363	19.654	41.581
Parathion (ethyl)	0.065	N/A	N/A	0.065	N/A	N/A	0.037	N/A	N/A	0.055	0.116
Pentachlorophenol	9.64558	15.1	9.6	9.646	50.333	120.000	5.527	28.841	92.400	8.125	17.189
Phenanthrene	30	7.7	4.6	30.000	25.667	57.500	17.190	14.707	44.275	21.619	45.739
Polychlorinated Biphenyls (PCBs)	2.0	10	0.03	2.000	33.333	0.375	1.146	19.100	0.289	0.424	0.898
Selenium	20	564	136	20.000	1880.000	1700.000	11.460	1077.240	1309.000	16.846	35.641
Silver	0.8	2	N/A	18.534	16.906	N/A	10.620	9.687	N/A	14.240	30.127
Toxaphene	0.78	0.21	0.0002	0.780	0.700	0.0025	0.447	0.401	0.0019	0.0028	0.0060
Tributyltin (TBT)	0.13	0.24	0.0074	0.130	0.800	0.093	0.074	0.458	0.071	0.105	0.222
2,4,5 Trichlorophenol	136	259	12	136.000	863.333	150.000	77.928	494.690	115.500	114.554	242.356
Zinc	53.91139969	92.7	84.2	148.278	592.458	2018.001	84.963	339.479	1553.861	124.896	264.235

HUMAN HEALTH

CALCULATE DAILY AVERAGE AND DAILY MAXIMUM EFFLUENT LIMITATIONS:

Parameter	*Fish Only Criterion (ug/L)*	*WLAh*	*LTAh*	*Daily Avg. (ug/L)*	*Daily Max. (ug/L)*
Acrylonitrile	3.8	95.00	88.35	129.87	274.77
Aldrin	0.0010	0.03	0.02	0.03	0.07
Anthracene	N/A	N/A	N/A	N/A	N/A
Antimony	1,071	26775.00	24900.75	36604.10	77441.33
Arsenic	N/A	N/A	N/A	N/A	N/A
Barium	N/A	N/A	N/A	N/A	N/A
Benzene	513	12825.00	11927.25	17533.06	37093.75
Benzidine	0.0020	0.05	0.05	0.07	0.14
Benzo(a)anthracene	3.28	82.00	76.26	112.10	237.17
Benzo(a)pyrene	0.33	8.25	7.67	11.28	23.86
Bis(chloromethyl)ether	0.44	11.00	10.23	15.04	31.82
Bis(2-chloroethyl)ether	10.06	251.50	233.90	343.83	727.41
Bis(2-ethylhexyl)phthalate	41	1025.00	953.25	1401.28	2964.61
Bromodichloromethane (Dichlorobromomethane)	322	8050.00	7486.50	11005.16	23283.02
Bromoform	2,175	54375.00	50568.75	74336.06	157268.81
Cadmium	N/A	N/A	N/A	N/A	N/A
Carbon Tetrachloride	30.5	762.50	709.13	1042.41	2205.38
Chlordane	0.0081	0.20	0.19	0.28	0.59
Chlorobenzene	5,201	130025.00	120923.25	177757.18	376071.31
Chlorodibromomethane (Dibromochloromethane)	239	5975.00	5556.75	8168.42	17281.49
Chloroform	7,143	178575.00	166074.75	244129.88	516492.47
Chromium (+6)	502	12550.00	11671.50	17157.11	36298.37

Chrysene	327	8175.00	7602.75	11176.04	23644.55
Cresols (Methylphenols)	9,301	232525.00	216248.25	317884.93	672532.06
Cyanide (free)	N/A	N/A	N/A	N/A	N/A
4,4'-DDD	0.0059	0.15	0.14	0.20	0.43
4,4'-DDE	0.0040	0.10	0.09	0.14	0.29
4,4'-DDT	0.0040	0.10	0.09	0.14	0.29
2,4'-D	N/A	N/A	N/A	N/A	N/A
Danitol	473	11825.00	10997.25	16165.96	34201.45
1,2-Dibromoethane	4.24	106.00	98.58	144.91	306.58
m-Dichlorobenzene (1,3-Dichlorobenzene)	1,445	36125.00	33596.25	49386.49	104484.34
o-Dichlorobenzene (1,2-Dichlorobenzene)	4,336	108400.00	100812.00	148193.64	313525.32
p-Dichlorobenzene (1,4-Dichlorobenzene)	N/A	N/A	N/A	N/A	N/A
3,3'-Dichlorobenzidine	0.44	11.00	10.23	15.04	31.82
1,2-Dichloroethane	553	13825.00	12857.25	18900.16	39986.05
1,1-Dichloroethylene	23,916	597900.00	556047.00	817389.09	1729306.17
Dichloromethane (Methylene Chloride)	22,222	555550.00	516661.50	759492.41	1606817.27
1,2-Dichloropropane	226	5650.00	5254.50	7724.12	16341.50
1,3-Dichloropropene (1,3- Dichloropropylene)	211	5275.00	4905.75	7211.45	15256.88
Dicofol	0.30	7.50	6.98	10.25	21.69
Dieldrin	0.001	0.03	0.02	0.03	0.07
2,4-Dimethylphenol	571	14275.00	13275.75	19515.35	41287.58
Di-n-Butyl Phthalate	3,010	75250.00	69982.50	102874.28	217645.58
Dioxins/Furans (TCDD Equivalents)	7.97E-08	1.99E-06	1.85E-06	2.72E-06	5.76E-06
Endrin	0.20	5.00	4.65	6.84	14.46
Ethylbenzene	7,143	178575.00	166074.75	244129.88	516492.47
Fluoride	N/A	N/A	N/A	N/A	N/A
Heptachlor	0.0015	0.04	0.03	0.05	0.11
Heptachlor Epoxide	0.00075	0.02	0.02	0.03	0.05
Hexachlorobenzene	0.0045	0.11	0.10	0.15	0.33
Hexachlorobutadiene	274	6850.00	6370.50	9364.64	19812.26
Hexachlorocyclohexane (alpha)	0.093	2.33	2.16	3.18	6.72
Hexachlorocyclohexane (beta)	0.33	8.25	7.67	11.28	23.86
Hexachlorocyclohexane (gamma) (Lindane)	6.2	155.00	144.15	211.90	448.31
Hexachlorocyclopentadiene	N/A	N/A	N/A	N/A	N/A
Hexachloroethane	11.51	287.75	267.61	393.38	832.26
Hexachlorophene	2.90	72.50	67.43	99.11	209.69
Lead	3.83	265.35	246.78	362.76	767.48
Mercury	0.0250	0.63	0.58	0.85	1.81
Methoxychlor	1.61	40.25	37.43	55.03	116.42
Methyl Ethyl Ketone	992,000	24,800,000	23,064,000	33,904,080	71,729,040
Nickel	1,140	28500.00	26505.00	38962.35	82430.55
Nitrate-Nitrogen (as Total Nitrogen)	N/A	N/A	N/A	N/A	N/A
Nitrobenzene	1,853	46325.00	43082.25	63330.91	133985.80
N-Nitrosodiethylamine	2.1	52.50	48.83	71.77	151.85
N-Nitroso-di-n-Butylamine	4.2	105.00	97.65	143.55	303.69
Pentachlorobenzene	1.0	25.00	23.25	34.18	72.31
Pentachlorophenol	9.1	227.50	211.58	311.02	658.00

Polychlorinated Biphenyls (PCBs)	6.4E-04	0.02	0.01	0.02	0.05
Pyridine	947	23675.00	22017.75	32366.09	68475.20
Selenium	N/A	N/A	N/A	N/A	N/A
1,2,4,5-Tetrachlorobenzene	0.71	17.75	16.51	24.27	51.34
1,1,2,2-Tetrachloroethane	40	1000.00	930.00	1367.10	2892.30
Tetrachloroethylene	525	13125.00	12206.25	17943.19	37961.44
Thallium	0.23	5.75	5.35	7.86	16.63
Toluene	N/A	N/A	N/A	N/A	N/A
Toxaphene	0.0053	0.13	0.12	0.18	0.38
2,4,5-TP (Silvex)	21	525.00	488.25	717.73	1518.46
1,1,1-Trichloroethane	956,663	23,916,575	22,242,415	32,696,350	69,173,910
1,1,2-Trichloroethane	295	7375.00	6858.75	10082.36	21330.71
Trichloroethylene	82	2050.00	1906.50	2802.56	5929.22
2,4,5-Trichlorophenol	2,435	60875.00	56613.75	83222.21	176068.76
TTHM (Sum of Total Trihalomethanes)	N/A	N/A	N/A	N/A	N/A
Vinyl Chloride	24	600.00	558.00	820.26	1735.38

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

Aquatic Life			Outfall 001	Outfall 002
Parameter	***70%***	***85%***		
Aldrin	1.769	2.148		
Aluminum	584	710	192.1	303.3
Arsenic	292.843	355.595	3	2.3
Cadmium	9.234	11.213		
Carbaryl	1.179	1.432		
Chlordane	0.040	0.048		
Chlorpyrifos	0.022	0.026		
Chromium (+3)	725.84	881.37		
Chromium (+6)	9.257	11.241		
Copper	8.452	10.264	2.1	3.2
Cyanide (free)	11.006	13.365		
4,4'-DDT	0.010	0.012		
Demeton	0.990	1.203		
Diazinon	0.100	0.122		
Dicofol	35.0	42.5		
Dieldrin	0.020	0.024		
Diuron	124	150		
Endosulfan (alpha)	0.067	0.081		
Endosulfan (beta)	0.067	0.081		
Endosulfan sulfate	0.067	0.081		
Endrin	0.020	0.024		
Guthion	0.099	0.120		
Heptachlor	0.040	0.048		
Hexachlorocyclohexane (Lindane)	0.314	0.382		
Lead	62.532	75.932		
Malathion	0.099	0.120		

Mercury	1.415	1.718		
Methoxychlor	0.297	0.361		
Mirex	0.010	0.012		
Nickel	129.744	157.546	4.4	3.1
Nonylphenol	13.758	16.706		
Parathion (ethyl)	0.038	0.047		
Pentachlorophenol	5.687	6.906		
Phenanthrene	15.134	18.376		
Polychlorinated Biphenyls (PCBs)	0.297	0.361		
Selenium	11.792	14.319		
Silver	9.968	12.104		
Toxaphene	0.0020	0.0024		
Tributyltin (TBT)	0.073	0.089		
2,4,5 Trichlorophenol	80.188	97.371		
Zinc	87.427	106.161	23.4	60

Human Health

Parameter	***70%***	***85%***
Acrylonitrile	90.912	110.393
Aldrin	0.024	0.029
Anthracene	N/A	N/A
Antimony	25622.872	31113.487
Arsenic	N/A	N/A
Barium	N/A	N/A
Benzene	12273.140	14903.099
Benzidine	0.048	0.058
Benzo(a)anthracene	78.472	95.287
Benzo(a)pyrene	7.895	9.587
Bis(chloromethyl)ether	10.527	12.782
Bis(2-chloroethyl)ether	240.678	292.252
Bis(2-ethylhexyl)phthalate	980.894	1191.086
Bromodichloromethane (Dichlorobromomethane)	7703.609	9354.382
Bromoform	52035.244	63185.653
Cadmium	N/A	N/A
Carbon Tetrachloride	729.690	886.052
Chlordane	0.194	0.235
Chlorobenzene	124430.024	151093.601
Chlorodibromomethane (Dibromochloromethane)	5717.896	6943.159
Chloroform	170890.918	207510.400
Chromium (+6)	12009.974	14583.539
Chrysene	7823.230	9499.636
Cresols (Methylphenols)	222519.45	270202.19
Cyanide (free)	N/A	N/A
4,4'-DDD	0.141	0.171
4,4'-DDE	0.096	0.116
4,4'-DDT	0.096	0.116
2,4'-D	N/A	N/A

Danitol	11316.170	13741.064
1,2-Dibromoethane	101.439	123.176
m-Dichlorobenzene (1,3-Dichlorobenzene)	34570.541	41978.514
o-Dichlorobenzene (1,2-Dichlorobenzene)	103735.548	125964.594
p-Dichlorobenzene (1,4-Dichlorobenzene)	N/A	N/A
3,3'-Dichlorobenzidine	10.527	12.782
1,2-Dichloroethane	13230.110	16065.134
1,1-Dichloroethylene	572172.363	694780.727
Dichloromethane (Methylene Chloride)	531644.684	645568.544
1,2-Dichloropropane	5406.881	6565.498
1,3-Dichloropropene (1,3- Dichloropropylene)	5048.017	6129.735
Dicofol	7.177	8.715
Dieldrin	0.024	0.029
2,4-Dimethylphenol	13660.747	16588.050
Di-n-Butyl Phthalate	72011.993	87443.134
Dioxins/Furans (TCDD Equivalents)	1.91E-06	2.32E-06
Endrin	4.785	5.810
Ethylbenzene	170890.918	207510.400
Fluoride	N/A	N/A
Heptachlor	0.036	0.044
Heptachlor Epoxide	0.018	0.022
Hexachlorobenzene	0.108	0.131
Hexachlorobutadiene	6555.245	7959.940
Hexachlorocyclohexane (alpha)	2.225	2.702
Hexachlorocyclohexane (beta)	7.895	9.587
Hexachlorocyclohexane (gamma) (Lindane)	148.330	180.115
Hexachlorocyclopentadiene	N/A	N/A
Hexachloroethane	275.368	334.376
Hexachlorophene	69.380	84.248
Lead	253.933	308.348
Mercury	0.598	0.726
Methoxychlor	38.518	46.772
Methyl Ethyl Ketone	23,732,856	28,818,468
Nickel	27273.645	33117.998
Nitrate-Nitrogen (as Total Nitrogen)	N/A	N/A
Nitrobenzene	44331.635	53831.271
N-Nitrosodiethylamine	50.241	61.007
N-Nitroso-di-n-Butylamine	100.482	122.014
Pentachlorobenzene	23.924	29.051
Pentachlorophenol	217.711	264.363
Polychlorinated Biphenyls (PCBs)	0.015	0.019
Pyridine	22656.26	27511.18
Selenium	N/A	N/A
1,2,4,5-Tetrachlorobenzene	16.986	20.626
1,1,2,2-Tetrachloroethane	956.970	1162.035
Tetrachloroethylene	12560.231	15251.709
Thallium	5.503	6.682

Toluene	N/A	N/A
Toxaphene	0.127	0.154
2,4,5-TP (Silvex)	502.409	610.068
1,1,1-Trichloroethane	22,887,445	27,791,897
1,1,2-Trichloroethane	7057.654	8570.008
Trichloroethylene	1961.789	2382.172
2,4,5-Trichlorophenol	58255.549	70738.881
TTHM (Sum of Total Trihalomethanes)	N/A	N/A
Vinyl Chloride	574.182	697.221