

TEXTTOX 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, 2018 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 I, II, & III
TPDES Permit No:	TX0140082
Outfall No:	001 & 002
Prepared by:	Maria Okpala
Date:	2/5/2019

DISCHARGE INFORMATION

<i>Intermittent Receiving Waterbody:</i>	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):	0.432
% Effluent for Acute Aquatic Life (Intermittent):	100
<i>Saltwater Receiving Waterbody:</i>	Cedar Bayou Tidal
Segment No.:	901
TSS (mg/L) (Narrow Tidal River):	18
Critical Low Flow [7Q2] (cfs):	4.51
% Effluent for Chronic Aquatic Life (Narrow Tidal River):	12.907
% Effluent for Acute Aquatic Life (Narrow Tidal River):	37.218
Effluent Flow for Human Health (MGD):	0.432
Harmonic Mean Flow (cfs):	14.66
% Effluent for Human Health (Narrow Tidal River):	4.361

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>Source</i>	<i>Water Effect Ratio (WER)</i>	<i>Source</i>
Aluminum	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Arsenic	5.68	-0.73	214635.47	0.608		1.00	Assumed
Cadmium	6.60	-1.13	1150410.88	0.225		1.00	Assumed
Chromium (total)	6.52	-0.93	1192002.68	0.219		1.00	Assumed
Chromium (trivalent)	6.52	-0.93	1192002.68	0.219		1.00	Assumed
Chromium (hexavalent)	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Copper	6.02	-0.74	464440.70	0.418		1.00	Assumed
Lead	6.45	-0.80	1170315.61	0.222		1.00	Assumed
Mercury	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Nickel	5.69	-0.57	261842.95	0.560		1.00	Assumed
Selenium	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed
Silver	6.38	-1.03	773686.66	0.301		1.00	Assumed
Zinc	6.10	-0.70	583465.42	0.364		1.00	Assumed

	<i>Intercept</i>	<i>Slope</i>	<i>Partition</i>	<i>Dissolved</i>			<i>Water Effect</i>	
<i>Estuarine Metal</i>	<i>(b)</i>	<i>(m)</i>	<i>Coefficient</i>	<i>Fraction</i>	<i>Source</i>	<i>Ratio (WER)</i>	<i>Source</i>	
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 (trivalent)	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed	
Chromium (hexavalent)	N/A	N/A	N/A	1.00	Assumed	1.00	Assumed	
Copper	4.85	-0.72	8834.94	0.863		1.00	Assumed	
Lead	6.06	-0.85	98405.27	0.361		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	0.394		1.00	Assumed	
Zinc	5.36	-0.52	50963.39	0.522		1.00	Assumed	

AQUATIC LIFE

CALCULATE DAILY AVERAGE AND DAILY MAXIMUM EFFLUENT LIMITATIONS:

<i>Parameter</i>	<i>FW Acute</i>	<i>SW Acute</i>	<i>SW Chronic</i>									
	<i>Criterion</i>	<i>Criterion</i>	<i>Criterion</i>	<i>FW WLAa</i>	<i>SW WLAa</i>	<i>SW WLAc</i>	<i>FW LTa</i>	<i>SW LTa</i>	<i>SW LTAc</i>	<i>Daily Avg.</i>	<i>Daily Max.</i>	
	<i>(µg/L)</i>	<i>(µg/L)</i>	<i>(µg/L)</i>	<i>(µg/L)</i>	<i>(µg/L)</i>	<i>(µg/L)</i>	<i>(µg/L)</i>	<i>(µg/L)</i>	<i>(µg/L)</i>	<i>(µg/L)</i>	<i>(µg/L)</i>	
Aldrin	3.0	1.3	N/A	3.0	3.49	N/A	1.72	2.00	N/A	2.53	5.35	
Aluminum	991	N/A	N/A	991	N/A	N/A	568	N/A	N/A	835	1766	
Arsenic	340	149	78	559	400	604	320	229	465	337	713	
Cadmium	3.5	40.0	8.75	15.7	107	68	9.0	61.6	52.2	13.2	27.9	
Carbaryl	2.0	613	N/A	2.0	1647.05	N/A	1.15	943.76	N/A	1.68	3.56	
Chlordane	2.4	0.09	0.004	2.4	0.242	0.031	1.38	0.139	0.024	0.035	0.074	
Chlorpyrifos	0.083	0.011	0.006	0.083	0.030	0.046	0.048	0.017	0.036	0.025	0.053	
Chromium (trivalent)	269	N/A	N/A	1231	N/A	N/A	705	N/A	N/A	1037	2194	
Chromium (hexavalent)	15.7	1090	49.6	15.7	2929	384	9.00	1678	296	13.2	28.0	
	6.0	13.5	3.6	14.3	42.0	32.3	8.2	24.1	24.9	12.1	25.5	
Cyanide (free)	45.8	5.6	5.6	45.8	15.0	43.4	26.2	8.6	33.4	12.7	26.8	
4,4'-DDT	1.1	0.13	0.001	1.1	0.349	0.008	0.630	0.200	0.0060	0.009	0.019	
Demeton	N/A	N/A	0.1	N/A	N/A	0.77	N/A	N/A	0.597	0.88	1.86	
Diazinon	0.17	0.819	0.819	0.17	2.20	6.3	0.097	1.26	4.89	0.143	0.303	
Dicofol [Kelthane]	59.3	N/A	N/A	59.3	N/A	N/A	34.0	N/A	N/A	49.9	106	
Dieldrin	0.24	0.71	0.002	0.24	1.91	0.015	0.138	1.09	0.012	0.018	0.037	
Diuron	210	N/A	N/A	210	N/A	N/A	120	N/A	N/A	177	374	
Endosulfan I (<i>alpha</i>)	0.22	0.034	0.009	0.22	0.091	0.070	0.126	0.052	0.054	0.077	0.163	
Endosulfan II (<i>beta</i>)	0.22	0.034	0.009	0.22	0.091	0.070	0.126	0.052	0.054	0.077	0.163	
Endosulfan sulfate	0.22	0.034	0.009	0.22	0.091	0.070	0.126	0.052	0.054	0.077	0.163	
Endrin	0.086	0.037	0.002	0.086	0.099	0.015	0.049	0.057	0.012	0.018	0.037	
Guthion [Azinphos Methyl]	N/A	N/A	0.01	N/A	N/A	0.077	N/A	N/A	0.060	0.088	0.186	
Heptachlor	0.52	0.053	0.004	0.52	0.142	0.031	0.298	0.082	0.024	0.035	0.074	
Hexachlorocyclohexane (<i>gamma</i>) [Lindane]	1.126	0.16	N/A	1.126	0.430	N/A	0.645	0.246	N/A	0.362	0.766	
Lead	24	133	5.3	106	990	114	61	567	88	89	189	
Malathion	N/A	N/A	0.01	N/A	N/A	0.077	N/A	N/A	0.060	0.088	0.186	
Mercury	2.4	2.1	1.1	2.4	5.64	8.5	1.38	3.23	6.6	2.02	4.28	
Methoxychlor	N/A	N/A	0.03	N/A	N/A	0.232	N/A	N/A	0.179	0.263	0.557	
Mirex	N/A	N/A	0.001	N/A	N/A	0.008	N/A	N/A	0.0060	0.009	0.019	
Nickel	216	118	13.1	385	317	101	221	182	78	115	243	

Nonylphenol	28	7	1.7	28	18.8	13.2	16.0	10.8	10.1	14.9	31.5
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	9.6	15.1	9.6	9.6	40.6	74	5.5	23.2	57.3	8.1	17.2
Phenanthrene	30	7.7	4.6	30	20.7	35.6	17.2	11.9	27.4	17.4	36.9
Polychlorinated Biphenyls [PCBs]	2.0	10	0.03	2.0	26.9	0.232	1.146	15.4	0.179	0.263	0.557
Selenium	20	564	136	20	1515	1054	11.5	868	811	16.8	35.6
Silver	0.8	2	N/A	18.53	13.6	N/A	10.62	7.81	N/A	11.48	24.3
Toxaphene	0.78	0.21	0.0002	0.78	0.564	0.0015	0.447	0.323	0.0012	0.0018	0.0037
Tributyltin [TBT]	0.13	0.24	0.0074	0.13	0.645	0.057	0.074	0.369	0.044	0.065	0.137
2,4,5 Trichlorophenol	136	259	12	136	696	93	77.9	399	72	105	223
Zinc	54	92.7	84.2	148	478	1251	85	274	963	125	264

HUMAN HEALTH

CALCULATE DAILY AVERAGE AND DAILY MAXIMUM EFFLUENT LIMITATIONS:

<i>Fish Only</i>					
<i>Parameter</i>	<i>Criterion (µg/L)</i>	<i>WLAh (µg/L)</i>	<i>LTAh (µg/L)</i>	<i>Daily Avg. (µg/L)</i>	<i>Daily Max. (µg/L)</i>
Acrylonitrile	115	2637	2453	3605	7628
Aldrin	1.147E-05	2.63E-04	2.45E-04	3.60E-04	7.61E-04
Anthracene	1317	30203	28089	41290	87355
Antimony	1071	24561	22842	33578	71038
Arsenic	N/A	N/A	N/A	N/A	N/A
Barium	N/A	N/A	N/A	N/A	N/A
Benzene	581	13324	12391	18215	38537
Benzidine	0.107	2.45	2.28	3.35	7.10
Benzo(a)anthracene	0.025	0.573	0.533	0.784	1.66
Benzo(a)pyrene	0.0025	0.057	0.053	0.078	0.166
Bis(chloromethyl)ether	0.2745	6.30	5.85	8.61	18.2
Bis(2-chloroethyl)ether	42.83	982	913	1343	2841
Bis(2-ethylhexyl) phthalate [Di(2-ethylhexyl) phthalate]	7.55	173	161	237	501
Bromodichloromethane [Dichlorobromomethane]	275	6307	5865	8622	18240
Bromoform [Tribromomethane]	1060	24309	22607	33233	70309
Cadmium	N/A	N/A	N/A	N/A	N/A
Carbon Tetrachloride	46	1055	981	1442	3051
Chlordane	0.0025	0.057	0.053	0.078	0.166
Chlorobenzene	2737	62768	58374	85810	181543
Chlorodibromomethane [Dibromochloromethane]	183	4197	3903	5737	12138
Chloroform [Trichloromethane]	7697	176515	164159	241314	510535
Chromium (hexavalent)	502	11512	10706	15739	33297
Chrysene	2.52	57.8	53.7	79.0	167
Cresols [Methylphenols]	9301	213300	198369	291602	616927
Cyanide (free)	N/A	N/A	N/A	N/A	N/A
4,4'-DDD	0.002	0.046	0.043	0.063	0.133
4,4'-DDE	0.00013	0.0030	0.0028	0.0041	0.0086
4,4'-DDT	0.0004	0.0092	0.0085	0.013	0.027
2,4'-D	N/A	N/A	N/A	N/A	N/A
Danitol [Fenpropathrin]	473	10847	10088	14829	31374
1,2-Dibromoethane [Ethylene Dibromide]	4.24	97	90.43	133	281
m-Dichlorobenzene [1,3-Dichlorobenzene]	595	13645	12690	18654	39466
o-Dichlorobenzene [1,2-Dichlorobenzene]	3299	75656	70360	103429	218820
p-Dichlorobenzene [1,4-Dichlorobenzene]	N/A	N/A	N/A	N/A	N/A
3,3'-Dichlorobenzidine	2.24	51.4	47.8	70.2	149
1,2-Dichloroethane	364	8348	7763	11412	24144

1,1-Dichloroethylene [1,1-Dichloroethene]	55114	1263929	1175454	1727917	3655661
Dichloromethane [Methylene Chloride]	13333	305766	284362	418012	884366
1,2-Dichloropropane	259	5940	5524	8120	17179
1,3-Dichloropropene [1,3-Dichloropropylene]	119	2729	2538	3731	7893
Dicofol [Kelthane]	0.30	6.88	6.40	9.4	19.9
Dieldrin	2.0E-05	4.59E-04	4.27E-04	6.27E-04	1.33E-03
2,4-Dimethylphenol	8436	193463	179920	264483	559552
Di- <i>n</i> -Butyl Phthalate	92.4	2119	1971	2897	6129
Dioxins/Furans [TCDD Equivalents]	7.97E-08	1.83E-06	1.70E-06	2.50E-06	5.29E-06
Endrin	0.02	0.459	0.427	0.627	1.33
Epichlorohydrin	2013	46164	42933	63111	133520
Ethylbenzene	1867	42816	39819	58534	123836
Ethylene Glycol	1.68E+07	3.85E+08	3.58E+08	5.27E+08	1.11E+09
Fluoride	N/A	N/A	N/A	N/A	N/A
Heptachlor	0.0001	0.0023	0.0021	0.0031	0.0066
Heptachlor Epoxide	0.00029	0.0067	0.0062	0.0091	0.0192
Hexachlorobenzene	0.00068	0.016	0.015	0.021	0.045
Hexachlorobutadiene	0.22	5.05	4.69	6.90	14.6
Hexachlorocyclohexane (<i>alpha</i>)	0.0084	0.193	0.179	0.263	0.557
Hexachlorocyclohexane (<i>beta</i>)	0.26	5.96	5.55	8.15	17.2
Hexachlorocyclohexane (<i>gamma</i>) [Lindane]	0.341	7.82	7.27	10.7	22.6
Hexachlorocyclopentadiene	11.6	266	247	364	769
Hexachloroethane	2.33	53.4	49.7	73.0	155
Hexachlorophene	2.90	66.5	61.9	90.9	192
4,4'-Isopropylidenediphenol [Bisphenol A]	15982	366515	340859	501063	1060071
Lead	3.83	243	226	333	704
Mercury	0.0250	0.573	0.533	0.784	1.66
Methoxychlor	3.0	68.8	64.0	94	199
Methyl Ethyl Ketone	9.92E+05	2.27E+07	2.12E+07	3.11E+07	6.58E+07
Methyl <i>tert</i> -butyl ether [MTBE]	10482	240384	223557	328628	695261
Nickel	1140	26144	24314	35741	75615
Nitrate-Nitrogen (as Total Nitrogen)	N/A	N/A	N/A	N/A	N/A
Nitrobenzene	1873	42953	39947	58722	124234
N-Nitrosodiethylamine	2.1	48.2	44.8	65.8	139
N-Nitroso-di- <i>n</i> -Butylamine	4.2	96	89.6	132	279
Pentachlorobenzene	0.355	8.14	7.57	11.1	23.5
Pentachlorophenol	0.29	6.65	6.19	9.09	19.2
Polychlorinated Biphenyls [PCBs]	6.4E-04	0.015	0.014	0.020	0.042
Pyridine	947	21718	20197	29690	62814
Selenium	N/A	N/A	N/A	N/A	N/A
1,2,4,5-Tetrachlorobenzene	0.24	5.50	5.12	7.52	15.9
1,1,2,2-Tetrachloroethane	26.35	604	562	826	1748
Tetrachloroethylene [Tetrachloroethylene]	280	6421	5972	8778	18572
Thallium	0.23	5.27	4.91	7.21	15.3
Toluene	N/A	N/A	N/A	N/A	N/A
Toxaphene	0.011	0.252	0.235	0.345	0.730
2,4,5-TP [Silvex]	369	8462	7870	11569	24475
1,1,1-Trichloroethane	784354	1.80E+07	1.67E+07	2.46E+07	5.20E+07
1,1,2-Trichloroethane	166	3807	3540	5204	11011
Trichloroethylene [Trichloroethene]	71.9	1649	1533	2254	4769
2,4,5-Trichlorophenol	1867	42816	39819	58534	123836
TTHM [Sum of Total Trihalomethanes]	N/A	N/A	N/A	N/A	N/A
Vinyl Chloride	16.5	378	352	517	1094

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

	70% of	85% of	Outfall 001	Outfall 002
Aquatic Life	Daily Avg.	Daily Avg.		
Parameter	(µg/L)	(µg/L)		
Aldrin	1.77	2.15		
Aluminum	584	710	110	110
Arsenic	236	287	4	4
Cadmium	9.2	11.2		
Carbaryl	1.18	1.43		
Chlordane	0.025	0.030		
Chlorpyrifos	0.017	0.021		
Chromium (trivalent)	726	881		
Chromium (hexavalent)	9.26	11.2		
Copper	8.5	10.3	5	5
Cyanide (free)	8.9	10.8		
4,4'-DDT	0.0061	0.0075		
Demeton	0.614	0.75		
Diazinon	0.100	0.122		
Dicofol [Kelthane]	35.0	42.5		
Dieldrin	0.012	0.015		
Diuron	124	150		
Endosulfan I (<i>alpha</i>)	0.054	0.065		
Endosulfan II (<i>beta</i>)	0.054	0.065		
Endosulfan sulfate	0.054	0.065		
Endrin	0.012	0.015		
Guthion [Azinphos Methyl]	0.061	0.075		
Heptachlor	0.025	0.030		
Hexachlorocyclohexane (<i>gamma</i>) [Lindane]	0.253	0.308		
Lead	63	76	0.4	0.4
Malathion	0.061	0.075		
Mercury	1.42	1.72		
Methoxychlor	0.184	0.224		
Mirex	0.006	0.007		
Nickel	80	98	2	2
Nonylphenol	10.4	12.7		
Parathion (ethyl)	0.038	0.047		
Pentachlorophenol	5.7	6.9		
Phenanthrene	12.2	14.8		
Polychlorinated Biphenyls [PCBs]	0.184	0.224		
Selenium	11.8	14.3		
Silver	8.03	9.76		
Toxaphene	0.0012	0.0015		
Tributyltin [TBT]	0.045	0.055		
2,4,5 Trichlorophenol	73.7	89.4		
Zinc	87	106	120	120
	70% of	85% of		
Human Health	Daily Avg.	Daily Avg.		
Parameter	(µg/L)	(µg/L)		
Acrylonitrile	2524	3065		
Aldrin	2.52E-04	3.06E-04		

Anthracene	28903	35097
Antimony	23504	28541
Arsenic	N/A	N/A
Barium	N/A	N/A
Benzene	12751	15483
Benzidine	2.35	2.85
Benzo(<i>a</i>)anthracene	0.549	0.666
Benzo(<i>a</i>)pyrene	0.055	0.067
Bis(chloromethyl)ether	6.02	7.32
Bis(2-chloroethyl)ether	940	1141
Bis(2-ethylhexyl) phthalate [Di(2-ethylhexyl) phthalate]	166	201
Bromodichloromethane [Dichlorobromomethane]	6035	7328
Bromoform [Tribromomethane]	23263	28248
Cadmium	N/A	N/A
Carbon Tetrachloride	1010	1226
Chlordane	0.055	0.067
Chlorobenzene	60067	72938
Chlorodibromomethane [Dibromochloromethane]	4016	4877
Chloroform [Trichloromethane]	168920	205117
Chromium (hexavalent)	11017	13378
Chrysene	55.3	67.2
Cresols [Methylphenols]	204121	247862
Cyanide (free)	N/A	N/A
4,4'-DDD	0.044	0.053
4,4'-DDE	0.0029	0.0035
4,4'-DDT	0.0088	0.0107
2,4'-D	N/A	N/A
Danitol [Fenprothrin]	10381	12605
1,2-Dibromoethane [Ethylene Dibromide]	93	113
<i>m</i> -Dichlorobenzene [1,3-Dichlorobenzene]	13058	15856
<i>o</i> -Dichlorobenzene [1,2-Dichlorobenzene]	72400	87915
<i>p</i> -Dichlorobenzene [1,4-Dichlorobenzene]	N/A	N/A
3,3'-Dichlorobenzidine	49.2	59.7
1,2-Dichloroethane	7988	9700
1,1-Dichloroethylene [1,1-Dichloroethene]	1.21E+06	1.47E+06
Dichloromethane [Methylene Chloride]	292608	355310
1,2-Dichloropropane	5684	6902
1,3-Dichloropropene [1,3-Dichloropropylene]	2612	3171
Dicofol [Kelthane]	6.58	7.99
Dieldrin	4.39E-04	5.33E-04
2,4-Dimethylphenol	185138	224810
Di- <i>n</i> -Butyl Phthalate	2028	2462
Dioxins/Furans [TCDD Equivalents]	1.75E-06	2.12E-06
Endrin	0.439	0.533
Epichlorohydrin	44178	53644
Ethylbenzene	40974	49754
Ethylene Glycol	3.69E+08	4.48E+08
Fluoride	N/A	N/A
Heptachlor	0.0022	0.0027
Heptachlor Epoxide	0.0064	0.0077
Hexachlorobenzene	0.015	0.018
Hexachlorobutadiene	4.83	5.86
Hexachlorocyclohexane (<i>alpha</i>)	0.184	0.224

Hexachlorocyclohexane (<i>beta</i>)	5.71	6.93
Hexachlorocyclohexane (<i>gamma</i>) [Lindane]	7.48	9.09
Hexachlorocyclopentadiene	255	309
Hexachloroethane	51.1	62.1
Hexachlorophene	63.6	77.3
4,4'-Isopropylidenediphenol [Bisphenol A]	350744	425903
Lead	233	283
Mercury	0.549	0.666
Methoxychlor	66	80
Methyl Ethyl Ketone	2.18E+07	2.64E+07
Methyl <i>tert</i> -butyl ether [MTBE]	230040	279334
Nickel	25019	30380
Nitrate-Nitrogen (as Total Nitrogen)	N/A	N/A
Nitrobenzene	41105	49913
N-Nitrosodiethylamine	46.1	56.0
N-Nitroso-di- <i>n</i> -Butylamine	92	112
Pentachlorobenzene	7.79	9.5
Pentachlorophenol	6.36	7.73
Polychlorinated Biphenyls [PCBs]	0.014	0.017
Pyridine	20783	25237
Selenium	N/A	N/A
1,2,4,5-Tetrachlorobenzene	5.27	6.40
1,1,2,2-Tetrachloroethane	578	702
Tetrachloroethylene [Tetrachloroethylene]	6145	7462
Thallium	5.05	6.13
Toluene	N/A	N/A
Toxaphene	0.241	0.293
2,4,5-TP [Silvex]	8098	9833
1,1,1-Trichloroethane	1.72E+07	2.09E+07
1,1,2-Trichloroethane	3643	4424
Trichloroethylene [Trichloroethene]	1578	1916
2,4,5-Trichlorophenol	40974	49754
TTHM [Sum of Total Trihalomethanes]	N/A	N/A
Vinyl Chloride	362	440