

US EPA ARCHIVE DOCUMENT

Evaluation of TCLP Data Provided By Horsehead (mg/L)
 -- Calculation of TS (Minus Statistical Outliers)

Samples	Waste	Antimony		Arsenic		Barium		Beryllium		Cadmium					
		Treated	(LN)	Treated	(LN)	Treated	(LN)	Treated	(LN)	Treated	(LN)				
1	HRD	0.21	-1.5606	<	0.02	-3.9120	1.76	0.5653	<	0.001	-6.9078	<	0.02	-3.9120	
2	HRD	0.01	-4.6052	<	0.02	-3.9120	1.6	0.4700	<	0.001	-6.9078	<	0.02	-3.9120	
3	HRD	<	0.1	-2.3026	<	0.02	-3.9120			<	0.001	-6.9078	<	0.02	-3.9120
4	HRD	<	0.01	-4.6052	<	0.02	-3.9120	0.58	-0.5447	<	0.001	-6.9078	<	0.02	-3.9120
5	HRD	0.01	-4.6052	<	0.02	-3.9120	0.55	-0.5978	<	0.001	-6.9078	<	0.02	-3.9120	
6	HRD	0.13	-2.0402	<	0.02	-3.9120	2.05	0.7178	<	0.001	-6.9078	<	0.02	-3.9120	
7	HRD	<	0.1	-2.3026	<	0.02	-3.9120	1.52	0.4187	<	0.001	-6.9078	<	0.02	-3.9120
8	HRD	<	0.01	-4.6052	<	0.02	-3.9120	0.4	-0.9163	<	0.001	-6.9078	<	0.02	-3.9120
9	HRD	<	0.01	-4.6052	<	0.02	-3.9120	0.64	-0.4463	<	0.001	-6.9078	<	0.02	-3.9120
10	HRD	<	0.1	-2.3026	<	0.02	-3.9120	1.52	0.4187	<	0.001	-6.9078	<	0.02	-3.9120
11	HRD	0.13	-2.0402	<	0.02	-3.9120	1.63	0.4886	<	0.001	-6.9078	<	0.02	-3.9120	
12	HRD	<	0.1	-2.3026	<	0.02	-3.9120	0.86	-0.1508	<	0.001	-6.9078	<	0.02	-3.9120
13	HRD	<	0.1	-2.3026	<	0.02	-3.9120	0.69	-0.3711	<	0.001	-6.9078	<	0.02	-3.9120
14	HRD	0.18	-1.7148				1.34	0.2927							
15	HRD	<	0.01	-4.6052	<	0.02	-3.9120			<	0.001	-6.9078	<	0.02	-3.9120
16	HRD	<	0.01	-4.6052	<	0.02	-3.9120	1.53	0.4253	<	0.001	-6.9078	<	0.02	-3.9120
17	HRD	0.02	-3.9120	<	0.02	-3.9120	0.38	-0.9676	<	0.001	-6.9078	<	0.02	-3.9120	
18	HRD	<	0.01	-4.6052	<	0.02	-3.9120	0.45	-0.7985	<	0.001	-6.9078	<	0.02	-3.9120
19	HRD	0.11	-2.2073	<	0.02	-3.9120	2.13	0.7561	<	0.001	-6.9078	<	0.02	-3.9120	
20	HRD	<	0.1	-2.3026	<	0.02	-3.9120	0.98	-0.0202	<	0.001	-6.9078	<	0.02	-3.9120
21	HRD	0.23	-1.4697	<	0.03	-3.5066	1.75	0.5596	<	0.001	-6.9078	<	0.02	-3.9120	
22	HRD	0.12	-2.1203	<	0.02	-3.9120	4.94	1.5974	<	0.001	-6.9078	<	0.02	-3.9120	
23	HRD	0.01	-4.6052	<	0.02	-3.9120	1.39	0.3293	<	0.001	-6.9078	<	0.02	-3.9120	
24	HRD	<	0.1	-2.3026	<	0.02	-3.9120	2.67	0.9821	<	0.001	-6.9078	<	0.02	-3.9120
25	HRD	<	0.1	-2.3026	<	0.02	-3.9120	1.99	0.6881	<	0.001	-6.9078	<	0.02	-3.9120
26	HRD	0.25	-1.3863	<	0.02	-3.9120	1.65	0.5008	<	0.001	-6.9078	<	0.02	-3.9120	
27	HRD	0.1	-2.3026	<	0.02	-3.9120	2.84	1.0438	<	0.001	-6.9078	<	0.02	-3.9120	
28	HRD	0.21	-1.5606	<	0.02	-3.9120	2.2	0.7885	<	0.001	-6.9078	<	0.02	-3.9120	
29	HRD	<	0.1	-2.3026	<	0.02	-3.9120	0.92	-0.0834	<	0.001	-6.9078	<	0.02	-3.9120
30	HRD	<	0.1	-2.3026	<	0.02	-3.9120	0.62	-0.4780	<	0.001	-6.9078	<	0.02	-3.9120
31	HRD	<	0.01	-4.6052	<	0.02	-3.9120	1.94	0.6627	<	0.001	-6.9078	<	0.02	-3.9120
32	HRD	<	0.1	-2.3026	<	0.02	-3.9120	2.12	0.7514	<	0.001	-6.9078	<	0.02	-3.9120
33	HRD	<	0.01	-4.6052	<	0.02	-3.9120	0.5	-0.6931	<	0.001	-6.9078	<	0.02	-3.9120
34	HRD	<	0.1	-2.3026	<	0.02	-3.9120	1.66	0.5068	<	0.001	-6.9078	<	0.02	-3.9120
35	HRD	0.12	-2.1203	<	0.02	-3.9120	1.74	0.5539	<	0.001	-6.9078	<	0.02	-3.9120	
36	HRD	<	0.01	-4.6052	<	0.02	-3.9120	1.61	0.4762	<	0.001	-6.9078	<	0.02	-3.9120
37	HRD	<	0.1	-2.3026	<	0.02	-3.9120			<	0.001	-6.9078	<	0.02	-3.9120
38	HRD	<	0.1	-2.3026	<	0.02	-3.9120	1.35	0.3001	<	0.001	-6.9078	<	0.02	-3.9120
39	HRD	<	0.01	-4.6052	<	0.02	-3.9120	2.39	0.8713	<	0.001	-6.9078	<	0.02	-3.9120
40	HRD	0.01	-4.6052	<	0.02	-3.9120	0.5	-0.6931	<	0.001	-6.9078	<	0.02	-3.9120	
41	HRD	0.16	-1.8326	<	0.02	-3.9120	2.19	0.7839							
42	HRD	0.16	-1.8326	<	0.02	-3.9120	2.76	1.0152	<	0.001	-6.9078	<	0.02	-3.9120	
43	HRD	<	0.1	-2.3026	<	0.02	-3.9120	1.04	0.0392	<	0.001	-6.9078	<	0.02	-3.9120
44	HRD	0.21	-1.5606	<	0.02	-3.9120	2.71	0.9969	<	0.001	-6.9078	<	0.02	-3.9120	
45	HRD	0.02	-3.9120	<	0.02	-3.9120	0.45	-0.7985	<	0.001	-6.9078	<	0.02	-3.9120	
46	HRD	0.1	-2.3026				1.89	0.6366	<	0.001	-6.9078	<	0.02	-3.9120	
47	HRD	<	0.01	-4.6052	<	0.02	-3.9120	1.71	0.5365	<	0.001	-6.9078	<	0.02	-3.9120
48	HRD	<	0.1	-2.3026	<	0.02	-3.9120	1.32	0.2776	<	0.001	-6.9078	<	0.02	-3.9120
49	HRD	<	0.01	-4.6052	<	0.02	-3.9120	1.7	0.5306	<	0.001	-6.9078	<	0.02	-3.9120
50	HRD	<	0.1	-2.3026	<	0.02	-3.9120	0.77	-0.2614	<	0.001	-6.9078	<	0.02	-3.9120
51	HRD	<	0.1	-2.3026	<	0.02	-3.9120	1.62	0.4824	<	0.001	-6.9078	<	0.02	-3.9120
52	HRD	<	0.1	-2.3026	<	0.02	-3.9120	1.37	0.3148	<	0.001	-6.9078	<	0.02	-3.9120
53	HRD	0.13	-2.0402	<	0.02	-3.9120	3.19	1.1600	<	0.001	-6.9078	<	0.02	-3.9120	
54	HRD	0.07	-2.6593	<	0.02	-3.9120	1.46	0.3784	<	0.001	-6.9078	<	0.02	-3.9120	
55	HRD	<	0.1	-2.3026	<	0.02	-3.9120	1.63	0.4886	<	0.001	-6.9078	<	0.02	-3.9120
56	HRD	<	0.01	-4.6052	<	0.02	-3.9120	3.1	1.1314	<	0.001	-6.9078	<	0.02	-3.9120
57	HRD	0.17	-1.7720	<	0.02	-3.9120	2.3	0.8329	<	0.001	-6.9078	<	0.02	-3.9120	
58	HRD	0.16	-1.8326	<	0.02	-3.9120	2.25	0.8109	<	0.001	-6.9078	<	0.02	-3.9120	
59	HRD	<	0.01	-4.6052	<	0.02	-3.9120			<	0.001	-6.9078	<	0.02	-3.9120
60	HRD	<	0.1	-2.3026	<	0.02	-3.9120	1.06	0.0583	<	0.001	-6.9078	<	0.02	-3.9120
61	HRD	<	0.1	-2.3026	<	0.02	-3.9120	1.75	0.5596	<	0.001	-6.9078	<	0.02	-3.9120
62	HRD	<	0.01	-4.6052	<	0.02	-3.9120	1.62	0.4824	<	0.001	-6.9078	<	0.02	-3.9120
63	HRD	<	0.01	-4.6052	<	0.02	-3.9120	2.26	0.8154	<	0.001	-6.9078	<	0.02	-3.9120
64	HRD	0.06	-2.8134				1.42	0.3507							
65	HRD	0.07	-2.6593	<	0.02	-3.9120	2.11	0.7467	<	0.001	-6.9078	<	0.02	-3.9120	
66	HRD	<	0.01	-4.6052	<	0.02	-3.9120	1.35	0.3001	<	0.001	-6.9078	<	0.02	-3.9120
67	HRD	<	0.1	-2.3026	<	0.02	-3.9120	1.65	0.5008	<	0.001	-6.9078	<	0.02	-3.9120
68	HRD	0.03	-3.5066	<	0.02	-3.9120			<	0.001	-6.9078	<	0.02	-3.9120	
69	HRD	<	0.1	-2.3026	<	0.02	-3.9120	1.58	0.4574	<	0.001	-6.9078	<	0.02	-3.9120
70	HRD	<	0.1	-2.3026	<	0.02	-3.9120	0.61	-0.4943	<	0.001	-6.9078	<	0.02	-3.9120
71	HRD	<	0.1	-2.3026	<	0.02	-3.9120	0.64	-0.4463	<	0.001	-6.9078	<	0.02	-3.9120
72	HRD	<	0.1	-2.3026	<	0.02	-3.9120	1.58	0.4574	<	0.001	-6.9078	<	0.02	-3.9120
73	HRD	<	0.01	-4.6052	<	0.02	-3.9120	0.62	-0.4780	<	0.001	-6.9078	<	0.02	-3.9120
74	HRD	<	0.01	-4.6052	<	0.02	-3.9120	2.41	0.8796	<	0.001	-6.9078	<	0.02	-3.9120
75	HRD	<	0.01	-4.6052	<	0.02	-3.9120	4.05	1.3987	<	0.001	-6.9078	<	0.02	-3.9120
76	HRD	<	0.1	-2.3026	<	0.02	-3.9120	2.47	0.9042	<	0.001	-6.9078	<	0.02	-3.9120
77	HRD	0.14	-1.9661	<	0.02	-3.9120	2.72	1.0006	<	0.001	-6.9078	<	0.02	-3.9120	
78	HRD	0.19	-1.6607	<	0.02	-3.9120	2.95	1.0818	<	0.001	-6.9078	<	0.02	-3.9120	
79	HRD	<	0.1	-2.3026	<	0.02	-3.9120	0.68	-0.3857						

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 -- Calculation of TS (Minus Statistical Outliers)

Samples	Waste	Antimony		Arsenic		Barium		Beryllium		Cadmium	
		Treated	(LN)	Treated	(LN)	Treated	(LN)	Treated	(LN)	Treated	(LN)
80	HRD	<	0.1 -2.3026	<	0.02 -3.9120	0.65	-0.4308	<	<	<	0.02 -3.9120
81	HRD	<	0.15 -1.8971	<	0.02 -3.9120	2.27	0.8198	<	0.001 -6.9078	<	0.02 -3.9120
82	HRD	<	0.02 -3.9120	<	0.02 -3.9120	1.8	0.5878	<	0.001 -6.9078	<	0.02 -3.9120
83	HRD	<	0.1 -2.3026	<	0.02 -3.9120	3.6	1.2809	<	<	<	0.02 -3.9120
84	HRD	<	0.1 -2.3026	<	0.02 -3.9120	1.87	0.6259	<	<	<	0.02 -3.9120
85	HRD	<	0.16 -1.8326	<	0.02 -3.9120	1.57	0.4511	<	0.001 -6.9078	<	0.02 -3.9120
86	HRD	<	0.01 -4.6052	<	0.02 -3.9120	1.79	0.5822	<	0.001 -6.9078	<	0.02 -3.9120
87	HRD	<	0.01 -4.6052	<	0.02 -3.9120	3.09	1.1282	<	0.001 -6.9078	<	0.02 -3.9120
88	HRD	<	0.18 -1.7148	<	0.02 -3.9120	1.99	0.6881	<	0.001 -6.9078	<	0.02 -3.9120
89	HRD	<	0.24 -1.4271	<	0.02 -3.9120	1.68	0.5188	<	0.001 -6.9078	<	0.02 -3.9120
90	HRD	<	0.01 -4.6052	<	0.02 -3.9120	1.58	0.4574	<	0.001 -6.9078	<	0.02 -3.9120
91	HRD	<	0.01 -4.6052	<	0.02 -3.9120	3	1.0986	<	0.001 -6.9078	<	0.02 -3.9120
92	HRD	<	0.06 -2.8134	<	0.02 -3.9120	1.51	0.4121	<	0.001 -6.9078	<	0.02 -3.9120
93	HRD	<	0.01 -4.6052	<	0.02 -3.9120	3	1.0986	<	0.001 -6.9078	<	0.02 -3.9120
94	HRD	<	0.01 -4.6052	<	0.02 -3.9120	2.93	1.0750	<	0.001 -6.9078	<	0.02 -3.9120
95	HRD	<	0.01 -4.6052	<	0.02 -3.9120	<	<	<	0.001 -6.9078	<	0.02 -3.9120
96	HRD	<	0.03 -3.5066	<	0.02 -3.9120	0.39	-0.9416	<	0.001 -6.9078	<	0.02 -3.9120
97	HRD	<	0.13 -2.0402	<	<	0.91	-0.0943	<	<	<	0.02 -3.9120
98	HRD	<	0.01 -4.6052	<	0.02 -3.9120	1.11	0.1044	<	0.001 -6.9078	<	0.02 -3.9120
99	HRD	<	0.01 -4.6052	<	0.02 -3.9120	0.78	-0.2485	<	0.001 -6.9078	<	0.02 -3.9120
100	HRD	<	0.03 -3.5066	<	0.02 -3.9120	0.91	-0.0943	<	0.001 -6.9078	<	0.02 -3.9120
101	HRD	<	0.01 -4.6052	<	0.02 -3.9120	2.09	0.7372	<	0.001 -6.9078	<	0.02 -3.9120
102	HRD	<	0.02 -3.9120	<	0.02 -3.9120	<	<	<	0.001 -6.9078	<	0.02 -3.9120
103	HRD	<	0.02 -3.9120	<	0.02 -3.9120	0.76	-0.2744	<	0.001 -6.9078	<	0.02 -3.9120
104	HRD	<	0.24 -1.4271	<	0.02 -3.9120	3.32	1.2000	<	0.001 -6.9078	<	0.02 -3.9120
105	HRD	<	0.01 -4.6052	<	0.02 -3.9120	1.97	0.6780	<	0.001 -6.9078	<	0.02 -3.9120
106	HRD	<	0.13 -2.0402	<	0.02 -3.9120	1.49	0.3988	<	0.001 -6.9078	<	0.02 -3.9120
107	HRD	<	0.01 -4.6052	<	0.02 -3.9120	0.73	-0.3147	<	0.001 -6.9078	<	0.02 -3.9120
108	HRD	<	0.01 -4.6052	<	0.02 -3.9120	1.54	0.4318	<	0.001 -6.9078	<	0.02 -3.9120
109	HRD	<	0.06 -2.8134	<	<	1	0.0000	<	0.001 -6.9078	<	0.02 -3.9120
110	HRD	<	0.01 -4.6052	<	0.02 -3.9120	2.74	1.0080	<	0.001 -6.9078	<	0.02 -3.9120
111	HRD	<	0.01 -4.6052	<	0.02 -3.9120	2.15	0.7655	<	0.001 -6.9078	<	0.02 -3.9120
112	HRD	<	0.01 -4.6052	<	0.02 -3.9120	1.81	0.5933	<	0.001 -6.9078	<	0.02 -3.9120
113	HRD	<	0.01 -4.6052	<	0.02 -3.9120	1.19	0.1740	<	0.001 -6.9078	<	0.02 -3.9120
114	HRD	<	0.07 -2.6593	<	0.02 -3.9120	0.99	-0.0101	<	0.001 -6.9078	<	0.02 -3.9120
115	HRD	<	0.01 -4.6052	<	0.02 -3.9120	1.45	0.3716	<	0.001 -6.9078	<	0.02 -3.9120
116	HRD	<	0.01 -4.6052	<	0.02 -3.9120	2.02	0.7031	<	0.001 -6.9078	<	0.02 -3.9120
117	HRD	<	0.01 -4.6052	<	0.02 -3.9120	1.22	0.1989	<	0.001 -6.9078	<	0.02 -3.9120
118	HRD	<	0.17 -1.7720	<	0.02 -3.9120	0.81	-0.2107	<	0.001 -6.9078	<	0.02 -3.9120
119	HRD	<	0.01 -4.6052	<	0.02 -3.9120	1.73	0.5481	<	0.001 -6.9078	<	0.02 -3.9120
120	HRD	<	0.01 -4.6052	<	0.02 -3.9120	1.76	0.5653	<	0.001 -6.9078	<	0.02 -3.9120
121	HRD	<	0.1 -2.3026	<	0.02 -3.9120	1.42	0.3507	<	0.001 -6.9078	<	0.02 -3.9120
122	HRD	<	0.01 -4.6052	<	0.02 -3.9120	1.56	0.4447	<	0.001 -6.9078	<	0.02 -3.9120
123	HRD	<	0.01 -4.6052	<	0.02 -3.9120	1.47	0.3853	<	0.001 -6.9078	<	0.02 -3.9120
124	HRD	<	0.01 -4.6052	<	0.02 -3.9120	1.77	0.5710	<	0.001 -6.9078	<	0.02 -3.9120
125	HRD	<	0.13 -2.0402	<	0.02 -3.9120	1.26	0.2311	<	0.001 -6.9078	<	0.02 -3.9120
126	HRD	<	0.01 -4.6052	<	0.02 -3.9120	2.06	0.7227	<	0.001 -6.9078	<	0.02 -3.9120
127	HRD	<	0.01 -4.6052	<	0.02 -3.9120	2.96	1.0852	<	0.001 -6.9078	<	0.02 -3.9120
128	HRD	<	0.01 -4.6052	<	0.02 -3.9120	0.67	-0.4005	<	0.001 -6.9078	<	0.02 -3.9120
129	HRD	<	0.01 -4.6052	<	0.02 -3.9120	1.81	0.5933	<	0.001 -6.9078	<	0.02 -3.9120
130	HRD	<	0.01 -4.6052	<	<	0.44	-0.8210	<	0.001 -6.9078	<	0.02 -3.9120
131	HRD	<	0.01 -4.6052	<	0.02 -3.9120	4.69	1.5454	<	0.001 -6.9078	<	0.02 -3.9120
132	HRD	<	0.01 -4.6052	<	0.02 -3.9120	0.99	-0.0101	<	0.001 -6.9078	<	0.02 -3.9120
133	HRD	<	0.01 -4.6052	<	0.02 -3.9120	0.47	-0.7550	<	0.001 -6.9078	<	0.02 -3.9120
134	HRD	<	0.19 -1.6607	<	<	1.54	0.4318	<	0.001 -6.9078	<	0.02 -3.9120
135	HRD	<	0.01 -4.6052	<	0.02 -3.9120	2.23	0.8020	<	0.001 -6.9078	<	0.02 -3.9120
136	HRD	<	0.01 -4.6052	<	0.02 -3.9120	3.34	1.2060	<	0.001 -6.9078	<	0.02 -3.9120
137	HRD	<	0.01 -4.6052	<	0.02 -3.9120	2.06	0.7227	<	0.001 -6.9078	<	0.02 -3.9120
138	HRD	<	0.01 -4.6052	<	0.02 -3.9120	2.26	0.8154	<	0.001 -6.9078	<	0.02 -3.9120
139	HRD	<	0.12 -2.1203	<	0.02 -3.9120	2.41	0.8796	<	0.001 -6.9078	<	0.02 -3.9120
140	HRD	<	0.01 -4.6052	<	0.02 -3.9120	4.18	1.4303	<	0.001 -6.9078	<	0.02 -3.9120
141	HRD	<	0.01 -4.6052	<	0.02 -3.9120	3.23	1.1725	<	0.001 -6.9078	<	0.02 -3.9120
142	HRD	<	0.03 -3.5066	<	0.02 -3.9120	2.41	0.8796	<	0.001 -6.9078	<	0.02 -3.9120
143	HRD	<	0.13 -2.0402	<	0.02 -3.9120	1.69	0.5247	<	0.001 -6.9078	<	0.02 -3.9120
144	HRD	<	0.01 -4.6052	<	0.02 -3.9120	4	1.3863	<	0.001 -6.9078	<	0.02 -3.9120
145	HRD	<	0.01 -4.6052	<	0.02 -3.9120	3.34	1.2060	<	0.001 -6.9078	<	0.02 -3.9120
146	HRD	<	0.01 -4.6052	<	0.02 -3.9120	1.05	0.0488	<	0.001 -6.9078	<	0.02 -3.9120
147	HRD	<	0.01 -4.6052	<	0.02 -3.9120	0.96	-0.0408	<	0.001 -6.9078	<	0.02 -3.9120
148	HRD	<	0.19 -1.6607	<	0.02 -3.9120	0.73	-0.3147	<	0.001 -6.9078	<	0.02 -3.9120
149	HRD	<	0.01 -4.6052	<	0.02 -3.9120	3.41	1.2267	<	0.001 -6.9078	<	0.02 -3.9120
150	HRD	<	0.11 -2.2073	<	0.02 -3.9120	1.68	0.5188	<	0.001 -6.9078	<	0.02 -3.9120
151	HRD	<	0.05 -2.9957	<	0.02 -3.9120	1.52	0.4187	<	0.001 -6.9078	<	0.02 -3.9120
152	HRD	<	0.01 -4.6052	<	0.02 -3.9120	3.45	1.2384	<	0.001 -6.9078	<	0.02 -3.9120
	# of Obs:	152	152	145	145	145	145	143	143	152	152
	# of NDs:	95		137		0		143		152	
	Minimum:	0.0100	-4.6052	0.0200	-3.9120	0.3800	-0.9676	0.0010	-6.9078	0.0200	-3.9120
	Mean:	0.0666	-3.3549	0.0201	-3.9092	1.7699	0.4216	0.0010	-6.9078	0.0200	-3.9120
	Maximum:	0.2500	-1.3863	0.0300	-3.5066	4.9400	1.5974	0.0010	-6.9078	0.0200	-3.9120
	Std:	0.0651	1.2258	0.0008	0.0337	0.9280	0.5774	0.0000	0.0000	0.0000	0.0000

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Evaluation of TCLP Data Provided By Horsehead (mg/L)
-- Calculation of TS (Minus Statistical Outliers)

Samples	Waste	Antimony Treated (LN)	Arsenic Treated (LN)	Barium Treated (LN)	Beryllium Treated (LN)	Cadmium Treated (LN)
	VF:	9.11	1.08	3.31	2.80	2.80
	TS:	0.61	0.022	5.9	0.0028	0.056

Evaluation of TCLP Data Provided By Horsehead (mg/L)
-- Calculation of TS (Minus Statistical Outliers)

Samples	Waste	Chromium Treated (LN)	Lead Treated (LN)	Mercury Treated (LN)	Nickel Treated (LN)
	VF:	2.80	5.66	2.80	1.60
	TS:	0.28	0.19	0.028	0.089

Evaluation of TCLP Data Provided By Horsehead (mg/L)
 -- Calculation of TS (Minus Statistical Outliers)

Samples	Waste	Selenium		Silver		Thallium		Vanadium		Zinc	
		Treated	(LN)	Treated	(LN)	Treated	(LN)	Treated	(LN)	Treated	(LN)
1	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.77	-0.2614
2	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
3	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.23	-1.4697
4	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.01	-4.6052
5	HRD	<	0.02 -3.9120	<	0.02 -3.9120	<	0.03 -3.5066			0.2	-1.6094
6	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.39	-0.9416
7	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.06	-2.8134
8	HRD	<	0.02 -3.9120	<	0.02 -3.9120	<	0.03 -3.5066			0.27	-1.3093
9	HRD	<	0.02 -3.9120	<	0.02 -3.9120	<	0.03 -3.5066			0.41	-0.8916
10	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.25	-1.3863
11	HRD	<	0.03 -3.5066	<	0.01 -4.6052	<	0.03 -3.5066			0.13	-2.0402
12	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
13	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.2	-1.6094
14	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.14	-1.9661
15	HRD	<	0.02 -3.9120	<	0.02 -3.9120	<	0.03 -3.5066			0.2	-1.6094
16	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
17	HRD	<	0.02 -3.9120	<	0.02 -3.9120	<	0.03 -3.5066			0.12	-2.1203
18	HRD	<	0.02 -3.9120	<	0.02 -3.9120	<	0.03 -3.5066			0.08	-2.5257
19	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.19	-1.6607
20	HRD	<	0.02 -3.9120	<		<	0.03 -3.5066			0.1	-2.3026
21	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.1	-2.3026
22	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066				
23	HRD	<	0.02 -3.9120	<		<	0.03 -3.5066			<	0.01 -4.6052
24	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.31	-1.1712
25	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			1.27	0.2390
26	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.14	-1.9661
27	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.32	-1.1394
28	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.16	-1.8326
29	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
30	HRD	<	0.02 -3.9120	<	0.02 -3.9120	<	0.03 -3.5066			0.42	-0.8675
31	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
32	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.26	-1.3471
33	HRD	<	0.02 -3.9120	<	0.02 -3.9120	<	0.03 -3.5066			0.16	-1.8326
34	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
35	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.11	-2.2073
36	HRD	<	0.02 -3.9120	<	0.02 -3.9120	<	0.03 -3.5066			<	0.01 -4.6052
37	HRD	<	0.02 -3.9120	<	0.02 -3.9120	<	0.03 -3.5066			0.12	-2.1203
38	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.54	-0.6162
39	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
40	HRD	<	0.02 -3.9120	<	0.02 -3.9120	<	0.03 -3.5066			0.13	-2.0402
41	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.08	-2.5257
42	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.19	-1.6607
43	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.02	-3.9120
44	HRD	<	0.02 -3.9120	<		<	0.03 -3.5066			0.11	-2.2073
45	HRD	<	0.02 -3.9120	<	0.03 -3.5066	<	0.03 -3.5066			0.27	-1.3093
46	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.07	-2.6593
47	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
48	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
49	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
50	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
51	HRD	<	0.02 -3.9120	<	0.02 -3.9120	<	0.03 -3.5066				
52	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.21	-1.5606
53	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.17	-1.7720
54	HRD	<	0.02 -3.9120	<		<	0.03 -3.5066				
55	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.22	-1.5141
56	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
57	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.16	-1.8326
58	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.34	-1.0788
59	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
60	HRD	<	0.02 -3.9120	<	0.02 -3.9120	<	0.03 -3.5066			0.1	-2.3026
61	HRD	<	0.02 -3.9120	<	0.02 -3.9120	<	0.03 -3.5066			0.1	-2.3026
62	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
63	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.16	-1.8326
64	HRD	<	0.02 -3.9120	<		<	0.03 -3.5066			0.44	-0.8210
65	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.11	-2.2073
66	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.2	-1.6094
67	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.23	-1.4697
68	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
69	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.44	-0.8210
70	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.19	-1.6607
71	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066				
72	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.14	-1.9661
73	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
74	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
75	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.75	-0.2877
76	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.2	-1.6094
77	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.33	-1.1087
78	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.07	-2.6593
79	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052

US EPA ARCHIVE DOCUMENT

Evaluation of TCLP Data Provided By Horsehead (mg/L)
 -- Calculation of TS (Minus Statistical Outliers)

Samples	Waste	Selenium		Silver		Thallium		Vanadium		Zinc	
		Treated	(LN)	Treated	(LN)	Treated	(LN)	Treated	(LN)	Treated	(LN)
80	HRD	<	0.02 -3.9120			<	0.03 -3.5066			0.59	-0.5276
81	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.31	-1.1712
82	HRD	<	0.02 -3.9120		0.01 -4.6052	<	0.03 -3.5066			0.06	-2.8134
83	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
84	HRD	<	0.02 -3.9120		0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
85	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.14	-1.9661
86	HRD	<	0.02 -3.9120		0.01 -4.6052	<	0.03 -3.5066			0.12	-2.1203
87	HRD	<	0.02 -3.9120		0.03 -3.5066	<	0.03 -3.5066			0.27	-1.3093
88	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.05	-2.9957
89	HRD	<	0.02 -3.9120		0.01 -4.6052	<	0.03 -3.5066			0.11	-2.2073
90	HRD	<	0.02 -3.9120		0.01 -4.6052	<	0.03 -3.5066			0.23	-1.4697
91	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.01	-4.6052
92	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
93	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
94	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
95	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.05	-2.9957
96	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.63	-0.4620
97	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.06	-2.8134
98	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
99	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
100	HRD	<	0.02 -3.9120		0.01 -4.6052	<	0.03 -3.5066				
101	HRD	<	0.02 -3.9120		0.02 -3.9120	<	0.03 -3.5066			<	0.01 -4.6052
102	HRD				0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
103	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
104	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.12	-2.1203
105	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.03	-3.5066
106	HRD	<	0.02 -3.9120		0.02 -3.9120	<	0.03 -3.5066			0.67	-0.4005
107	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.04	-3.2189
108	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.29	-1.2379
109	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.12	-2.1203
110	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.07	-2.6593
111	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.13	-2.0402
112	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.94	-0.0619
113	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.06	-2.8134
114	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.18	-1.7148
115	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.02	-3.9120
116	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.14	-1.9661
117	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.91	-0.0943
118	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.06	-2.8134
119	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.1	-2.3026
120	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.04	-3.2189
121	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
122	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.21	-1.5606
123	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.16	-1.8326
124	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
125	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
126	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
127	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.15	-1.8971
128	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
129	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.11	-2.2073
130	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
131	HRD	<	0.02 -3.9120		0.02 -3.9120	<	0.03 -3.5066			0.17	-1.7720
132	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
133	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
134	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.22	-1.5141
135	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.07	-2.6593
136	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.21	-1.5606
137	HRD	<	0.02 -3.9120			<	0.03 -3.5066			0.02	-3.9120
138	HRD	<	0.02 -3.9120		0.01 -4.6052	<	0.03 -3.5066			0.06	-2.8134
139	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.08	-2.5257
140	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.11	-2.2073
141	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.17	-1.7720
142	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.29	-1.2379
143	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			1.55	0.4383
144	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.23	-1.4697
145	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.16	-1.8326
146	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
147	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.02	-3.9120
148	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			2.01	0.6981
149	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			<	0.01 -4.6052
150	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066				
151	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066				
152	HRD	<	0.02 -3.9120	<	0.01 -4.6052	<	0.03 -3.5066			0.01	-4.6052
	# of Obs:	151	151	145	145	152	152	0	0	145	145
	# of NDs:	146		107		151				40	
	Minimum:	0.0200	-3.9120	0.0100	-4.6052	0.0300	-3.5066			0.0100	-4.6052
	Mean:	0.0201	-3.9093	0.0114	-4.5088	0.0300	-3.5066			0.1797	-2.6416
	Maximum:	0.0300	-3.5066	0.0300	-3.5066	0.0300	-3.5066			2.0100	0.6981
	Std:	0.0008	0.0330	0.0039	0.2532	0.0000	0.0000			0.2778	1.4888

US EPA ARCHIVE DOCUMENT

Evaluation of TCLP Data Provided By Horsehead (mg/L)
-- Calculation of TS (Minus Statistical Outliers)

Samples	Waste	Selenium Treated (LN)	Silver Treated (LN)	Thallium Treated (LN)	Vanadium Treated (LN)	Zinc Treated (LN)
	VF:	1.08	1.74	2.80		12.73
	TS:	0.022	0.020	0.084		2.3