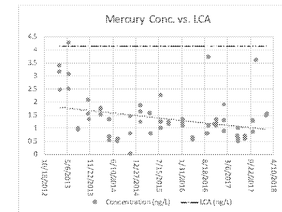
Rock Creek Mercury Discharge Monitoring Report Data Sept 2016 - Sept 2018
Data Collected: Feb, May, August and November (typically)

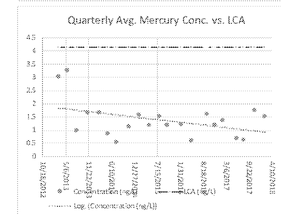
				INFLUENT									EFFLUENT										
				influent Total Hg		Dissolved Hg		Total Methly Hg		Dissolved Methyl Hg		Effluent Total Hg		Dissolved Hg		Total Methly Hg		Dissolved Methyl Hg				
	year	Date	Influent (MGD)	Concentration (ng/L)	Mass (mg/day)	Concentration (ng/L)	Mass (mg/day)	Concentration (ng/L)	Mass (mg/day)	Concentration (ng/L)	Mass (mg/day)	Concentration (ng/L)	Mass (mg/day)	Concentration (ng/L)	Mass (mg/day)	Concentration (ng/L)	Mass (mg/day)	Concentration (ng/L)	Mass (mg/day)	ln conc	LCA (ng/L)	
Q1	2013	3/5/2013	33.32									3.16								1.150572028	4.14483047	2.876463811
Q1	2013	3/6/2013	37.26									3.38								1.217875709	4.14483047	2.876463811
Q1	2013	3/7/2013	34.08									2.47								0.904218151	3.003333333	4.14483047	2.876463811
Q2	2013	5/21/2013	29.56	122								3.06								1.118414916	4.14483047	2.876463811
Q2	2013	5/22/2013	41.08	69.7								2.48								0.90825856	4.14483047	2.876463811
Q2	2013	5/23/2013	48.57	136								4.24								1.444563269	3.26	4.14483047	2.876463811
Q3	2013	8/13/2013	25.3	887								0.99								0.010050336		4.14483047	2.876463811
Q3	2013	8/14/2013	25.94	58.9								0.97								0.030459207		4.14483047	2.876463811
Q3	2013	8/15/2013	26.81	127								0.94								-0.061875404	0.966666667	4.14483047	2.876463811
Q4	2013	11/12/2013	31.66	73.7								2.08								0.732367894		4.14483047	2.876463811
Q4	2013	11/13/2013	30.11	13.4								1.54								0.431782416		4.14483047	2.876463811
Q4	2013	11/14/2013	29.3	51.4								1.32								0.277631737	1.646666667	4.14483047	2.876463811
Q1	2014	2/25/2014	40.53	105								1.7								0.530628251		4.14483047	2.876463811
Q1	2014	2/26/2014	37.88	40.5								1.49								0.39877612		4.14483047	2.876463811
Q1	2014	2/27/2014	38.31	60								1.78								0.576613364	1.656666667	4.14483047	2.876463811
Q2	2014	5/13/2014	31.62	76.9								0.68								-0.385662481		4.14483047	2.876463811
Q2	2014	5/14/2014	31.29	55.4								1.31								0.270027137		4.14483047	2.876463811
Q2	2014	5/15/2014	30.52	41.1								0.53								-0.634878272	0.84	4.14483047	2.876463811
Q3	2014	7/22/2014	27.37	50.2								0.5								0.693147181		4.14483047	2.876463811
Q3	2014	7/23/2014	30.11	58.6								0.52								-0.653926467		4.14483047	2.876463811
Q3	2014	7/24/2014	28.58	60.7								0.59								-0.527632742	0.536666667	4.14483047	2.876463811
Q4	2014	11/11/2014	31.97	137																		4.14483047	2.876463811
Q4	2014	11/12/2014	31.25	37.4								0.79								-0.235722334		4.14483047	2.876463811
Q4	2014	11/13/2014	33.24	57								1.44								0.364643114	1.115	4.14483047	2.876463811
Q1	2015	2/10/2015	57.77	26.9								1.87								0.625938431		4.14483047	2.876463811
Q1	2015	2/11/2015	51.89	27.3								1.24								0.21511138		4.14483047	2.876463811
Q1	2015	2/12/2015	47.28	70.7								1.62								0.482426149	1.576666667	4.14483047	2.876463811
Q2	2015	5/5/2015	29.26	358								1.56								0.444685821		4.14483047	2.876463811
Q2	2015	5/6/2015	29.73	40.2																		4.14483047	2.876463811
Q2	2015	5/7/2015	29.7	49.2								0.79								-0.235722334	1.175	4.14483047	2.876463811
Q3	2015	8/4/2015	28.79	48.4								2.25								0.810930216		4.14483047	2.876463811
Q3	2015	8/5/2015	27.06	76.2								1.24								0.21511138		4.14483047	2.876463811
Q3	2015	8/6/2015	28.43	43.7								0.99								-0.010050336	1.493333333	4.14483047	2.876463811
Q4	2015	10/13/2015	27.03	81.6								1.22								0.198850859		4.14483047	2.876463811
Q4	2015	10/14/2015	26.87	37.7								1.21								0.19062036		4.14483047	2.876463811
Q4	2015	10/15/2015	27.27	31.9								1.14								0.131028262	1.19	4.14483047	2.876463811
Q1	2016	2/9/2016	41.89	52.8								1.33								0.285178942		4.14483047	2.876463811
Q1	2016	2/10/2016	39.8	37.3								1.21								0.19062036		4.14483047	2.876463811
Q1	2016	2/11/2016	41.55	42.1								1.1								0.09531018	1.213333333	4.14483047	2.876463811
Q2	2016	5/9/2016	36.33	199								0.64								-0.446287103		4.14483047	2.876463811
Q2	2016	5/10/2016	35.99	158								0.59								-0.527632742		4.14483047	2.876463811
Q2	2016	5/11/2016	35.87	157								0.55								-0.597837001	0.593333333	4.14483047	2.876463811
Q3	2016	9/13/2016	31.8	110.8	13,324	19.3	2,323	0.66	79	0.37	45	0.8	95	0.6	66	0.05	6	0.05	6	-0.223143551		4.14483047	2.876463811
Q3	2016	9/20/2016	31.5	190.1	22,682							0.8	97							-0.223143551		4.14483047	2.876463811
Q3	2016	9/21/2016	31.7	71.2	8,540							3.7	433							1.30833282		4.14483047	2.876463811
Q3	2016	9/22/2016	31.5	127.6	15,240							1.1	128							0.09531018	1.6	4.14483047	2.876463811
Q4	2016	11/16/2016	49.8	68.66	12,945	12.48	2,353.60	0.82	154.2	0.27	50	1.13	210.6	0.94	175.2	<0.02	<3.7	<0.02	<3.7	0.122217633		4.14483047	2.876463811
Q4	2016	11/30/2016	49.1									1.33	242.3							0.285178942		4.14483047	2.876463811
Q4	2016	12/1/2016	45.5									1.1	185.4							0.09531018		4.14483047	2.876463811
Q4	2016	12/2/2016	43.4									1.18	190.9							0.165514438	1.185	4.14483047	2.876463811
Q1	2017	2/6/2017	85.1	35.38	11,391.40	2.53	813.4	0.21	68.9	0.03	8.5	1.89	593.8	0.78	244.1	0.02	7.9	<0.02	<6.3	0.636576829		4.14483047	2.876463811
Q1	2017	2/7/2017	65.5	39.92	9,901.30							0.87	211							-0.139262067		4.14483047	2.876463811
Q1	2017	2/8/2017	94.5	23.43	8,381.20							1.3	466.6							0.262364264	1.353333333	4.14483047	2.876463811
Q2	2017	6/5/2017	31.6	77.73	9,310	6.6	790.5	0.63	75	0.13	15	0.69	82	0.64	76.3	<0.02	<2.4	~0.03	~3.2	-0.371063681		4.14483047	2.876463811
Q2	2017	6/6/2017	31.5	114.64	13,656.30																	4.14483047	2.876463811
Q2	2017	6/7/2017	31.4	85.79	10,197.30							0.57	67.8							-0.562118918		4.14483047	2.876463811
Q2	2017	6/8/2017	33.7									0.5	57.8							0.693147181		4.14483047	2.876463811
Q2	2017	6/9/2017	31.9									0.99	119.9							0.010050336	0.6875	4.14483047	2.876463811
Q3	2017	8/7/2017	33.5	66.44	8,435	9.32	1182.7	1.02	129.2	0.48	60.9	0.71	90.7	0.58	74.6	0.04	5.1	0.03	3.5	-0.342490309		4.14483047	2.876463811
Q3	2017	8/8/2017	32.8	67.75	8,419.40							0.58	73.1							-0.544727175		4.14483047	2.876463811
Q3	2017	8/9/2017	33.6	82.75	10,515.50							0.6	75.4							-0.510825624	0.63	4.14483047	2.876463811
Q4	2017	10/17/2017	31.3	63.4	7,501.00	10.9	1290					0.84	115	0.78	106					-0.174353387		4.14483047	2.876463811
Q4	2017	10/18/2017	32	51.7	6,255.00							1.25	176							0.223143551		4.14483047	2.876463811
Q4	2017	10/19/2017	40.1	84.9	12,894.00							1.3	225							0.262364264		4.14483047	2.876463811
Q4	2017	11/14/2017	36	408	55,634	3.71	506	0.6	81.8	0.14	19.1	3.6	559	1	155	<0.02	<3.1	<0.02	<3.1	1.280933845	1.7475	4.14483047	2.876463811
Q1	2018	2/12/2018	33.3	38.8	4,894							1.48	196							0.392042088		4.14483047	2.876463811
Q1	2018	2/13/2018	33.5	77.2	9,800	11.5	1460	0.48	60.9	0.24	30.5	1.48	203	1.18	161	0.02	3.3	<0.02	3.1	0.392042088		4.14483047	2.876463811
Q1	2018	2/14/2018	35	32.8	4,343							1.54	223							0.431782416	1.5	4.14483047	2.876463811
												mean								0.174155213			
												variance								0.287743536			

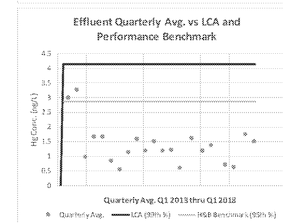
Sept 2016, August 2017 and October 2017 data includes flows from Forest Grove and Hillsboro
November/December 2016, February 2017, June 2017 data includes only Rock Creek Flows.

Rock Creek 2016 Pretreatment Report - Mercury Data
Mercury analysis by Purge and Trap

		Date	Influent Flow (MGD	Effluent Flow (MGD	Influent Concentration (ug/L)	Effluent Concentration (ug/L)	Percent Removal													
		2/9/2016	41.89	41.82	52.8	1.33	97.5													
		2/10/2016	39.8	40.09	37.3	1.21	96.8													
		2/11/2016	41.55	41.64	42.1	1.1	97.4													
		5/9/2016	36.33	34.25	199	0.64	99.7													
		5/10/2016	36.99	34.11	158	0.59	99.6													
		5/11/2016	35.87	33.51	157 (Q)	0.55	99.6													
		9/13/2016	31.8	30.37	126	0.83	99.3													
		9/20/2016	31.5	31.24	195	0.82	99.6													
		9/21/2016	31.7	31.35	81.8	3.65 (E)	95.5													
		9/22/2016	31.5	31.92	134	1.06	99.2													
		11/16/2016	49.8	49.23	67.6	1.13	98.3													
		11/30/2016	49.1	48.14	25.9	1.33	94.9													
		12/1/2016	45.5	44.53	28.9	1.1	96.2													
		12/2/2106	43.4	42.75	67.9	1.18	98.3													
Q2	2018	4/9/2018	47.9	22	3,988							1.65	288							0.500775288
Q2	2018	4/10/2018	44.7	29.7	5,019	2.49	421	0.42	71	0.08	14	0.96	157	0.75	122	0.03	5	0.03	5	-0.040821995
Q2	2018	4/11/2018	43.6	33.6	5,542							1.06	168							0.058268908
Q3	2018	7/16/2018	29.9	55	6,210							0.9	92							-0.105360516
Q3	2018	7/17/2018	29.1	57	6,319	11	1156	0.47	52	0.2	22	0.7	71	0.8	80	<0.02	2	<0.02	2	-0.356674944
Q3	2018	7/18/2018	29.3	34	3,777							0.7	70							-0.356674944



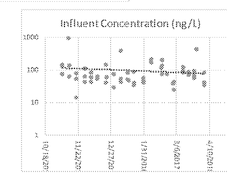




Year	Tot. Hg Avg.
2013	2.2
2014	1.0
2015	1.4
2016	1.2
2017	1.1
2018	1.5

mmary Statist	
Average	1.4
Max	4.2
Min	0.5
99%	3.9
95%	3.3
Geomean	1.2

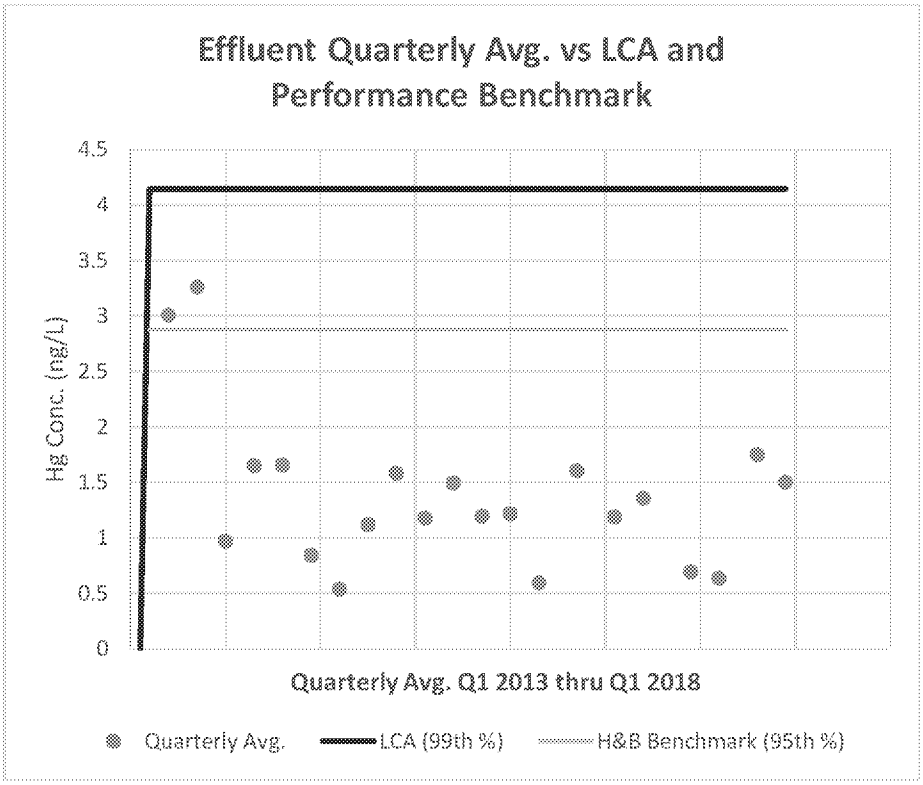
Rock Creek Effluent Statistics		
Statistic	Value	Unit
Number of Samples	65	
Geometric mean	1.2	ng/l
Arithmetic mean	1.4	ng/l
Maximum	4.2	ng/l
Minimum	0.5	ng/l
Standard deviation	0.9	
99%	3.9	ng/l
95%	3.3	ng/l
Coefficient of variation	0.6	



Performance-based LCA Limits

Rock Creek WWTF

INPUT	
LogNormal Transformed Mean:	0.1742
LogNormal Transformed Variance:	0.2877
Number of Samples per month for compliance monitoring:	1
Autocorrelation factor (n_e) (use 0 if unknown):	0
OUTPUT	
E(X) =	1.3744
V(X) =	0.630
VARn	0.2877
MEANn=	0.1742
VAR(Xn)=	0.630
RESULTS	
Lowest Concentration Achievable Limit (99%):	**4.1**
Highest and Best Benchmark (95%):	**2.9**
2.97546281	2.879910766



Performance Limit Description and User Instructions

Revised 2012

This spreadsheet calculates performance-based effluent limits. It will account for autocorrelation if the autocorrelation factor is known. Effluent data are typically non-normally distributed the permit manager should use EXCEL to transform the data using a lognormal transformation. If the permit manager suspects the effluent data *may* be normally distributed, use the Norm spreadsheet to test for normality.	
Procedure for lognormal data transformation: Transform data to lognormal by using LN( ) function in Excel. The table on the right above contains the proper formula. Enter values under Data. Add or delete rows as needed. Use the calculated Mean and Variance to populate values in the table on the left above.	
Input cells include the lognormal transformed mean and variance, the number of samples per month that will be required for compliance monitoring, and the autocorrelation factor if it is known.	
Output contains calculated intermediate values.	
Results are the calculated maximum daily and average monthly effluent limits.	
-- Click here to return to spreadsheet --	

Cell: C7

Comment: insert effective sample size (ne) if accounting for autocorrelation (see E-8 and E-9 of the TSD) otherwise use 0 here