Centerville

Date: 12-8-2023 update with new format April 2023

Calculation of Plant Protection Criteria to prevent Pass Through, Inhibition and contamination of Biosolids.

Plant Protection Limits

Parameter	Pass through Con. ug/L	Act. Sludge % removal	Plant Protection ug/L	Reference	AS or Nit.	Inhibition Con. ug/L	Biosolids Criteria ug/L	503 Ceil. cont	Sludge wasted lbs per Day	Avg Flow
	C	D	E			I	K	L	M	O
			C/(1-(D/100))				(M*S)/(1000*V*8.34*(D/100)			
Pass Through Limits from TDEC date	11/3/2023									
Arsenic		45		EPA LL	Act Sludge	100	9.363937	41	264	0.308
Copper *	80	76	333.33	EPA LL	Nit @ 50%	265	202.8452	1500	264	0.308
Chromium III	report		0.00	EPA LL	Nitrification	250				
Chromium VI	report		0.00	EPA LL	Nitrification	250				
Chromium	0	0	0.00	EPA LL	Nitrification	250			264	0.308
Nickel *	180	32	264.71	EPA LL	Nitrification	250	134.8921	420	264	0.308
Cadmium	5	85	33.33	EPA LL	Act Sludge	1000	4.715555	39	264	0.308
Lead	45	82	250.00	TN Guid	Act Sludge	100	37.60058	300	264	0.308
Mercury	0.17	76	0.71	EPA LL	Act Sludge	100	2.298913	17	264	0.308
Zinc *	200	57	465.12	EPA LL	Nit @ 50%	290	504.8593	2800	264	0.308
Molybdenum		41					18.80029	75	264	0.308
Selenium		73					14.07876	100	264	0.308
Silver	5	83	29.41	TN Guid	Act Sludge	250				
Cyanide	230	62	605.26	EPA LL	Act Sludge	100				
Toluene	15	93	214.29	EPA LL	Act Sludge	200000				
Benzene	3	77	13.04	EPA LL	Act Sludge	100000				
1,1,1-Trichloroethane	30	88	250.00							
Ethybenzene	4	90	40.00	EPA LL	Act Sludge	200000				
Carbon Tetrachloride	15	99	1500.00							
Chloroform	85	62	223.68			10000				
Tetrachloroethylene	25	82	138.89							
Trichlorethylene	10	90	100.00							
1,2 Transdichloroethylene	1.5	80	7.50							
Methylene chloride	50	48	96.15							
Phenol	50	89	454.55	EPA LL	Nitrification	4000				
Naphthalene	1	92	12.50	EPA LL	Act Sludge	500000				
Bis(2-ethyl hexyl) phathalate		62	0.00							
Butyl benzyl phathalate		94	0.00							
Di-n-butyl phathalate		68	0.00							
Diethyl phathalate		91	0.00							
Total Phathalate	64.5	62	169.74							

* percent removal from SAR's

Information Cells

PLANT PROTECTION DATA

Design Capacity	0.9	MGD
Current Average Flow	0.308	MGD
Biosolids	264	lbs/day
Pass Through Limits Da	09/18/00	
Nitrification Required	N, but occurring	Y/N

				Percent of Current Flow
Current SIU Flow	0.068	MGD	0.220779	22.07792
Current R/C Flow	0.24	MGD	0.779221	77.92208
Unused or Available Flow	0.592	MGD		

Full Capacity flow estimate using current flow percentages

Residential/Commercial	0.701298701	MGD
SIU Flow	0.198701299	MGD

LOCAL LIMIT DATA Calculation Data

Residential/Commercial Flow	0.24	MGD
Industrial Reserve Percent	10	%
SIU Average Flow	0.068	MGD
SIU Maximum Flow		MGD
Daily Max Multiplier	1.5	

Pollutant Loading	B	D Maximum Allowable Headworks Loading MAHL		I	J	K	M	O Maximum Allowable Industrial Loading MAIL	R Monthly Average Local Limit at Flow		Daily Maximum
Parameter	Plant Protection Criteria ug/L B= lowest value of column 'E,G,I	Loading lbs/day @ Design Flow B/1000*8.34*S7		Residential/Commercial Background mg/l	Flow	Load in lbs I*J*8.34	Available Loading D-K= lbs	Available Load after Reserve is Removed	0.068 MGD		Mo Avg * 1.5
Arsenic	9.363937	0.0702857		0.000125	0.24	0.00025	0.070036	0.063032	0.11114396	Arsenic	0.166716
Copper	202.84524	1.5225564		0.02685	0.24	0.053743	1.468813	1.321932	2.330956535	Copper	3.496435
Chromium III	250	1.8765		0.007555	0.24	0.015122	1.861378	1.67524	2.953942941	Chromium III	4.430914
Chromium VI	250	1.8765		0.005	0.24	0.010008	1.866492	1.679843	2.962058824	Chromium VI	4.443088
Chromium	250	1.8765		0.027555	0.24	0.055154	1.821346	1.639211	2.890413529	Chromium	4.33562
Nickel	134.89209	1.0125		0.009325	0.24	0.018665	0.993835	0.894452	1.577182249	Nickel	2.365773
Cadmium	4.7155553	0.035395		0.0005	0.24	0.001001	0.034394	0.030955	0.05458235	Cadmium	0.081874
Lead	37.600582	0.28223		0.004005	0.24	0.008016	0.274214	0.246792	0.435167521	Lead	0.652751
Mercury	0.71	0.0053293		0.0001	0.24	0.0002	0.005129	0.004616	0.008139706	Mercury	0.01221
Zinc	290	2.17674		0.134	0.24	0.268214	1.908526	1.717673	3.028764706	Zinc	4.543147
Molybdenum	18.800291	0.141115		0.0025	0.24	0.005004	0.136111	0.1225	0.216003466	Molybdenum	0.324005
Selenium	14.078757	0.1056752		0.001	0.24	0.002002	0.103674	0.093306	0.16452637	Selenium	0.24679
Silver	29.41	0.2207515		0.0005	0.24	0.001001	0.219751	0.197776	0.348736765	Silver	0.523105
Cyanide	100	0.7506		0.0025	0.24	0.005004	0.745596	0.671036	1.183235294	Cyanide	1.774853
Toluene	214.29	1.6084607		0.0005	0.24	0.001001	1.60746	1.446714	2.550983824	Toluene	3.826476
Benzene	13.04	0.0978782		0.0005	0.24	0.001001	0.096877	0.08719	0.153741176	Benzene	0.230612
1,1,1-Trichloroethane	250	1.8765		0.0005	0.24	0.001001	1.875499	1.687949	2.976352941	1,1,1-Trichloroethane	4.464529
Ethybenzene	40	0.30024		0.0005	0.24	0.001001	0.299239	0.269315	0.474882353	Ethybenzene	0.712324
Carbon Tetrachloride	1500	11.259		0.0005	0.24	0.001001	11.258	10.1322	17.86605882	Carbon Tetrachloride	26.79909
Chloroform	223.68	1.6789421		0.0025	0.24	0.005004	1.673938	1.506544	2.656482353	Chloroform	3.984724
Tetrachloroethylene	138.89	1.0425083		0.0005	0.24	0.001001	1.041508	0.937357	1.652836765	Tetrachloroethylene	2.479255
Trichlorethylene	100	0.7506		0.0005	0.24	0.001001	0.749599	0.674639	1.189588235	Trichlorethylene	1.784382
1,2 Transdichloroethylene	7.5	0.056295		0.0005	0.24	0.001001	0.055294	0.049765	0.08775	1,2 Transdichloroethyler	0.131625
Methylene chloride	96.15	0.7217019		0.0025	0.24	0.005004	0.716698	0.645028	1.137375	Methylene chloride	1.706063
Phenol	454.55	3.4118523		0.02	0.24	0.040032	3.37182	3.034638	5.350963235	Phenol	8.026445
Naphthalene	12.5	0.093825		0.0005	0.24	0.001001	0.092824	0.083542	0.147308824	Naphthalene	0.220963
Bis(2-ethyl hexyl) phathalate										Bis(2-ethyl hexyl) phathalate	
Butyl benzyl phathalate										Butyl benzyl phathalate	
Di-n-butyl phathalate										Di-n-butyl phathalate	
Diethyl phathalate										Diethyl phathalate	
Total Phathalate	169.74	1.2740684		0.03405	0.24	0.068154	1.205914	1.085323	1.913744118	Total Phathalate	2.870616

									Compatable Local Limit (MAIL)				BOD Individual allocation Total Lbs	Agrana Load lbs	Pounds for remaining industry	Potential BOD mg/L for remaining industry
BOD	500000.00	3753		240	0.24	480.384	3272.616		2781.724	lbs	1482.4	BOD Mav-Oct	2781.724	1200	1581.724	1307.966
TSS	500000.00	3753		240	0.24	480.384	3272.616		2781.724	lbs	1482.4	TSS				