

Application for Approval of Alternative Minimum Total Organic Carbon (TOC) Removal Percentage (STEP 2)

PWS INFORMATION- Section 1		LABORATORY INFORMATION - Section 2		
PWS Name:		Parameter	Analytical Lab	Lab ID
STU Name:		TOC:		
PWSID#	STU#:	Alkalinity:		
ADDRESS:		pH:		

Section 3 - Jar Testing Equipment			
Manufacturer and Model Number	Number of Jars	Jar Volume	Jar Dimensions

Section 4 - Coagulant Stock Solution Make-Up. OEPA recommends that the stock solution be formulated so that when 1 mg/L of stock solution is added to a 2 liter jar, it results in a coagulant dose of 10 mg/L (Note: Must use an aqueous solution of Alum unless prior approval is given by Ohio EPA . For dosage equivalents for iron salts - see Appendix A)			
Coagulant Used	Percent $Al_2(SO_4)_3 \cdot 14H_2O$	Specific Gravity of Aqueous solution	grams per milliliter of solution (g/mL)
Note: $g/mL = \%Al_2(SO_4)_3 \cdot 14H_2O \times \text{specific gravity} \times \frac{g \text{ alum}}{100 \text{ g solution}} \times \frac{1000 \text{ ml}}{1 \text{ L}} \times \frac{1L}{1000 \text{ ml}}$			

Section 5 - Raw Water Sample Collection			
Volume Collected	pH	Alkalinity	*Describe efforts to minimize temperature change
*OEPA recommends that jars be submersed in a water bath through which plant water is circulated if possible			

Section 6 - Maximum Coagulant Dose evaluation (Add coagulant dose in 10 mg/L increments until the measured pH reaches or falls below the target pH (See table below) . Circle the target pH					
Coagulant Dose mg/L	pH	Coagulant Dose	pH	Coagulant Dose	pH
10		50		90	
20		60		100	
30		70		110	
40		80		120	

ENHANCED COAGULATION STEP 2 TARGET PH	
ALKALINITY (MG/L AS CaCO ₃)	TARGET PH
0-60	5.5
>60-120	6.3
>120-240	7.0
>240	7.5

Section 7 - Jar Testing Mechanical Parameters				
Rapid Mix rpm	Rapid Mix duration (min)	Flocculation rpm	Flocculation duration (min)	Settling duration (min)

Section 8 - Jar Testing Results Table								
	Units	Raw	Jar 1	Jar 2	Jar 3	Jar 4	Jar 5	Jar 6
Coagulant Dose	mg/L							
Volume of Coag. Stock Solution	mL							
TOC	mg/L							
*DOC	mg/L							
*UV ₂₄₅	1/cm							
*SUVA	L/mg-m							
pH								
Alkalinity	mg/L as CaCO ₃							

Note: * = optional parameters. These parameters are not necessary to establish the **point of diminishing returns** (PODR), however, utilities may find them useful.

Section 11

I certify under penalty of law that I have personally examined and am familiar with the data submitted in this MOR; that the data in this report is true, accurate and complete; and I am aware that falsification thereof could result in the imposition of fines and penalties including revocation of my certification as a public water system operator.

Name of Certified Operator and Certification Number	Signature of Responsible Official	Date
Name:	Signature:	Date:

EPA 5115-A

Appendix A

Regular Grade Alum $\text{Al}_2(\text{SO}_4)_3 \cdot 14\text{H}_2\text{O}$ mg/L	Regent Grade Alum $\text{Al}_2(\text{SO}_4)_3 \cdot 18\text{H}_2\text{O}$ mg/L	Ferric Chloride $\text{FeCl}_3 \cdot 6\text{H}_2\text{O}$ mg/L	Ferric Chloride FeCl_3 mg/L	Ferric Sulfate $\text{Fe}_2(\text{SO}_4)_3 \cdot 9\text{H}_2\text{O}$ mg/L	Ferrous Sulfate $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ mg/L
10	11.2	9.1	5.5	9.5	9.4
20	22	18	11	10	19
30	34	27	16	28	28
40	45	36	22	38	37
50	56	46	27	47	47
60	67	55	33	57	56
70	78	64	38	66	66
80	90	73	44	76	75
90	101	82	49	85	84
100	112	91	55	95	94