Surface Water Treatment Rule: MOR-11s

Small Surface Water/GUI Systems - Alternative Filtration

Population less than 1000

Maine Drinking Water Program (DWP)

207-287-2070

(after hours: 207-557-4214)

System Name:				**Please fill in all applicable yellow fields. White fields will calculate automatically.**	
PWSID:		Population[1]:			
Reporting Month:					
Reporting Year:				**Submit a completed MOR each month to DWPMOR@maine.gov by the 10th of the following month**	
Treatment plant/pump station location/name:					
Operator Signature:				Date:	

1. Enter system population as of last sanitary survey

General Notes on the Month: Document any operational issues, adjustments, and/or other general maintenance notes

1. Daily Entry Point Chlorine Residual (mg/L): Take reading at 1st tap after all treatment at the time of peak hourly flow[2]

Day of the Month	Lowest Daily Reading	Day of the Month	Lowest Daily Reading	Day of the Month	Lowest Daily Reading	Day of the Month	Lowest Daily Reading	Day of the Month	Lowest Daily Reading
1		8		15		22		29	
2		9		16		23		30	
3		10		17		24		31	
4		11		18		25			
5		12		19		26			
6		13		20		27			
7		14		21		28			

Lowest residual this month:	
Number of chlorine residual measurements required each day:	
Number of operational[3] days this month:	
Residual measurements multiplied by operational days:	
Actual number of residual measurements taken (if different) this month:	

Please explain any days with missing data, when the residual was below 0.2 mg/L, or when monitoring equipment failed:

2. "Peak hourly flow" is essentially the maximum gallons per minute being pumped during the hour of the day when there is the most water usage

3. "Operational" means days when the system is producing water that is going out to the distribution system

Call the DWP ASAP (no later than next business day):

- If your residual falls below 0.2 mg/L at any time (must sample at least every 4 hours until residual goes back up)
- If your disinfection or filtration equipment fails, or your monitoring equipment fails

Violation Trigger:

- Taking fewer chlorine residuals than required for your system's population (<500=1/day; 501-1,000=2/day; 1,001-2,500=3/day; 2,501-3,300=4/day)
- Failing to maintain/document a residual disinfectant concentration level of 0.2 mg/L entering the distribution system

2. Distribution Chlorine Residual: Sample monthly in the distribution system

A detectable chlorine residual is a key required indicator of effective disinfection in water treatment. Using the chlorine residual result below, calculate the value "V" of the percentage of your measurements that do not have a detectable chlorine residual. In lieu of taking a total chlorine concentration measurement, a heterorophic plate count (HPC)[4] may be used.

One monthly[5] routine bacteria sample for compliance - collect according to your sample site plan

Date	Location	Chlorine Residual	Comment

Enter information for distribution compliance sample(s) for a-e below:	
a. number of **distribution** chlorine residual readings (not daily operational readings):	
b. number of HPC samples taken in lieu of taking a chlorine residual:	
c. number of readings where chlorine residual was not detected, and no HPC was measured:	
d. number of readings where chlorine residual was not detected, and the HPC was > 500/ml:	
e. number of readings where chlorine residual was not measured and the HPC was > 500/ml:	
$V = \frac{c+d+e}{a+b} \times 100$	
Current month V =	
Previous month V =	
Was V > 5% for 2 months?	No

4. Contact your lab to conduct an HPC on any samples when a chlorine measurement cannot be taken

5. Systems with a population greater than 1000 must take 2 samples monthly

Violation Trigger:

- Residual disinfection concentration is undetectable in more than 5% of the monthly samples measured as “V” for 2 consecutive months

3. Turbidity: Take reading once daily after filtration

Turbidity is a measure of the amount of suspended particles in a water sample. It is measured in NTU (Nephelometric Turbidity Unit). Turbidity must be sampled at least **once daily** on days you are producing water to show turbidity was less than 1 NTU for more than 95% of readings for the month.

At what frequency are you monitoring turbidity:	
Highest turbidity reading this month (NTU):	
Total number of turbidity readings this month:	
Number of readings below 1 NTU this month:	
Percent of monthly readings below 1 NTU:	

List ALL results where turbidity was over 1 NTU this month *Must not exceed 1 NTU in at least 95% of measurements*			**List ALL results where turbidity was over 5 NTU this month** *Must not exceed 5 NTU at any time*			*A note about rounding and turbidity: Due to rounding, functional turbidity limits are 1.49 NTU for 95% of results and 5.49 NTU for the daily max. All readings below these two values would round down to 1 NTU and 5 NTU respectively.*
Date	Value	Date reported to DWP	Date	Value	Date reported to DWP	

Calibration of Turbidity Meters for Daily Readings:

Verify your meter calibration daily before taking your turbidity measurement(s), according to manufacturer instructions. Fully calibrate every 90 days using primary standards.

Date when you last calibrated your turbidity meter(s):		Notes:	
Date of last full calibration of turbidity meter using primary standards:		Notes:	

Call the DWP ASAP (no later than 24 hours):

- If turbidity exceeds 5 NTU at any time
- If your monitoring equipment fails

Violation Trigger:

- Failure to collect and report required turbidity samples
- Representative samples of a system's filtered water exceed 1 NTU in more than 5% of measurements for the month
- A representative sample of a system's filtered water sample exceeds 5 NTU

4. Inactivation of Giardia with Chlorination: Enter temperature, pH, and chlorine residual measurements daily in the table below

Additional information required for calculations in the table below :

Contact tank total vol. (gal):		*Contact tank total volume in gallons*
Lowest operating vol. (gal):		*Lowest operating volume - typically the contact tank volume when the well/intake pump turns on, in gallons*
Baffle factor of contact tank:		
Log credit for filtration:		*Log credit for alternative filtration technologies. All surface water systems are required to achieve a total of 3.0 log (99.9%) removal or inactivation of Giardia lamblia*
Disinfection inactivation required:	**3.00**	*Log inactivation needed using disinfection*

Note: Temperature must be reported in Celsius. If measuring in Fahrenheit, use this conversion calculator:

Degrees Fahrenheit	*Degrees Celsius*
32	0.00

Contact Time Calculation

Day of the month	**Water temp** (deg. C)	**pH** (values between 6-9 only[6])	**Chlorine residual** (C), ppm	**Peak hourly flow** (gpm)	CT_{calc}	CT_{needed}[7]	Disinfection inactivation ratio[7]	Disinfection log inactivation	Total log credit *(disinfection & filtration)*	**Treating adequately to meet 3-log *Giardia* requirements**
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
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26										
27										
28										
29										
30										
31										
Min:										
Max:										

6. These calculations are based on pH values between 6-9 only. If pH measurements fall outside of this range, other CT tables must be consulted

*7. Values based on **remaining** log credit after filtration. This differs from the previous MOR-11 which provided total disinfection log inactivation only, excluding*

Call the DWP ASAP (no later than 24 hours):

- If you have 2 days in a row where you are not meeting CT

Violation Trigger:

- Failure to maintain treatment processes that achieve 99% (2-log) removal of *Cryptosporidum,* 99.9% (3-log) inactivation/removal of *Giardia,* and at least 99.99% (4-log) inactivation/removal of viruses