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Maine People Living
Safe, Healthy and Productive Lives

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# SANITARY SURVEY – LARGE SYSTEM PROCEDURE

**PURPOSE:** This procedure is written to document the sanitary survey process used for large public water systems (PWS).

**SCOPE:** This procedure covers the sanitary survey process for large community PWS which include both groundwater and surface supplies. It is used for most PUC regulated systems, but not all; some with minimal treatment are small and warrant using the Small System Procedure (DWP0114).

**ORIGINATOR/OWNER:** Denise Douin and the Large PWS Field Inspection Team/Field Inspection Team Manager

## EXECUTIVE SUMMARY:

**For Ground Water Systems,** field inspectors will use the Sanitary Survey Form for Large Community Systems Using Ground Water (DWP0123). The form is used to ensure that all necessary areas of inspection are covered and the proper questions are asked during each sanitary survey, consistently by all field inspectors. Once the inspection is complete the field inspector will write a letter to the system documenting deficiencies, recommendations, and requirements for that PWS – See Appendix A. The remainder of this procedure provides reference information for use during the sanitary survey as needed and for training field inspectors. This procedure documents the general steps of completing a sanitary survey, the creation of the sanitary survey inspection report, and the updating of the DWP electronic database: SDWIS.

**For Surface Water Systems:** field inspectors will use the Sanitary Survey Form for Large Community Systems Using Surface Water (DWP0124).

**For Surface Water and Ground Water Systems combined:** field inspectors will use the Sanitary Survey Form for Large Community Systems Using Surface Water and Ground Water. Document number: (DWP0125)

## Index

**DEFINITIONS:**

**Deficiency:** A finding during a sanitary survey that results in a requirement, as detailed in this document or otherwise. Deficiencies can be "**Minor**" or "**Significant**".

**DWO:** Drinking Water Order

**DWP:** Drinking Water Program

**(either):** In this document this term is used to identify requirements that can be either "**Minor**" or "**Significant**" deficiencies, depending on the circumstances.

**MSDS:** Material Safety Data Sheet

**(Minor):** A minor deficiency requiring resolution but not reaching a level that warrants a Notice of Non-Compliance at the time it is identified. When a minor deficiency is not resolved in the time frame given for resolution, pre-enforcement options are to be considered and potentially the PWS is issued a Notice of Non-Compliance and entered into the enforcement process.

**MOR:** Monthly Operating Report

**NSF:** National Sanitary Foundation

**POC:** Point of Contact – Administrative Contact, Emergency Contact, Designated Operator, Operator, Financial Contact, Sampler, Owner

**POU:** Point of Use

**PSC:** Potential Sources of Contamination

**PWS**: Public Water System

**Sanitary Defect:** is a defect that could provide a pathway of entry for microbial contamination into the distribution system or that is indicative of a failure or imminent failure in a barrier that is already in place.

**Sanitary Survey**: A Sanitary Survey is defined in 40 CFR 141.2 as "an onsite review of the water source (identifying sources of contamination using results of source water assessments where available), facilities, equipment, operation, and maintenance and monitoring compliance of a public water system for the purpose of evaluating the adequacy of such sources, facilities, equipment, operation, and maintenance for producing and distributing safe drinking water."

**(S.D.):** A "Sanitary Defect"

**SDWIS**: The Safe Drinking Water Information System is the database used by the DWP to capture PWS information and data.

**(Significant):** A significant deficiency requiring resolution which serves as Formal Notice of Non-Compliance of Maine's Water for Human consumption Act and *Rules Relating to Drinking Water*

**SOP:** Standard Operating Procedure

**RESPONSIBILITIES:** DWP Field Inspectors complete sanitary survey inspections every five years for Transient and Non-Transient Non-Community PWS, or every three years for Community PWS. Included in the sanitary survey process is the following:

- On-site Inspection of the PWS
- A written record of the inspection provided to the owner
- A written or electronic record of the inspection retained by the DWP
- Completion of SDWIS Updates
- Communicating SDWIS changes to DWP staff
- Entering compliance schedules in SDWIS for required PWS action
- Following SDWIS compliance schedules through to completion
- Writing inspection related violations as necessary
- Referring PWS to DWP Enforcement as necessary

## A. SANITARY SURVEY STEPS

1. Review previous PWS sanitary survey before site visit if available or if possible.
2. Ask DWP staff for system specific input related to compliance, DO needs.
3. Complete the sanitary survey inspection as detailed in this procedure, taking pictures of key system components.
4. Sketch/update a system schematic as necessary/appropriate.
5. Complete the Sanitary Survey question set for Large Community systems.
6. Write a letter to the system documenting deficiencies, recommendations, and requirements – see Attachment A, or provide a copy of the Sanitary Survey Summary Report.
7. Enter Site Visit in SDWIS, including Compliance Schedules to monitor the resolution of any deficiencies found during the sanitary survey.
8. Enter SDWIS Information and Data as necessary.
9. E-mail a summary of SDWIS Changes to the DWP distribution list.
10. Complete the Sanitary Survey Inspection Report (per instructions provided in this procedure).
11. Send completed report to Field Inspection Manager.

## B. INSPECTION PROCEDURE:

The sanitary survey inspection is completed using the appropriate Sanitary Survey form for Large Community systems (DWP0123, 124, 125). The questions located in this form cover the required elements of a Sanitary Survey:

1. General
2. Source
3. Treatment
4. Pumps (Facilities, controls, etc.,)
5. Finished Water Storage

6. Distribution System
7. Monitoring & Reporting and Data Verification
8. Management & Operations
9. Operator Compliance
10. Security
11. Financial

The following includes each of the above eleven categories broken down to give inspection details for each question. Also included are example recommendations and requirements associated with any deficiencies found during the sanitary survey inspection.

# SANITARY SURVEY FORM FOR LARGE COMMUNITY SYSTEMS USING SURFACEWATER AND GROUNDWATER

Date: _____ Date of Last Survey: _____

Inspector(s): _____, _____, _____

## Water System Information

PWSID #:_____

Water System Name: _____

Water System Operating Categories: VSWS _____ or Treatment _____ Distribution _____

Contact Person: _____

Cell phone: _____

Other Phone: _____

## Operator Information

("T" = Treatment, "D"= Distribution)

Designated Operator: _____ VSWS or "T": I II III IV
"D": I II III IV

Operator: _____ VSWS or "T": I II III IV
"D": I II III IV

Operator: _____ VSWS or "T": I II III IV
"D": I II III IV

Operator: _____ VSWS or "T": I II III IV
"D": I II III IV

Operator: _____ VSWS or "T": I II III IV
"D": I II III IV

Operator: _____ VSWS or "T": I II III IV
"D": I II III IV

Operator: _____ VSWS or "T": I II III IV
"D": I II III IV

Does the system have a designated operator with Treatment and Distribution classifications meeting the system's classification? ☐ Yes ☐ No

_____

_____

_____

____**Complete system point's calculation form and include form with the sanitary survey inspection report.**

- Use Maine Rules Relating to the Licensure of Water System Operators and "WOB-Guidelines for Water System Classification (DWP0018), to determine system classifications. The form comes from these rules.
- Verify both treatment and distribution classifications for the PWS.
- If the operator point tally shows that the PWS's current treatment and/or distribution system classification is different than what is shown in SDWIS, change the operating category in SDWIS either up or down to reflect the points tally made at this sanitary survey [treatment and distribution classifications can be changed downward]. Work with the system as needed to ensure that the PWS has operators with licenses that meet the classification of the PWS.

____ **Verify that the PWS has a properly licensed operator**

- Verify that the necessary Designated Operator forms have been submitted to the DWP
- Based on the Licensed Operator Minimum Requirements for PWS (DWP0021), the Primary Operator must have a valid license equal to, or greater than, both the treatment and distribution classifications of the PWS they are operating.
- A Designated Operator is identified as "DO" in SDWIS
- The Primary Operator is identified as "PO" in SDWIS, and also as a "DO" in SDWIS. This identifies the individual as a "Designated Operator" (documented with signature using the DO Form) and also as the Primary Operator who will receive copies of violations etc. that the Administrative Contact receives. The "PO" designation in SDWIS is created to make sure that the primary operator is aware (through mailing) of issues/violations that occur with the PWS.

____ **Explain licensed operator responsibilities (Re. all quality and quantity decisions)**

- The Maine Rule Related to Drinking Water state that all operating personnel making process control system integrity decisions about water quality or quantity that affect public health must be licensed.
- For a contract operator, the contract must support the licensed operator being involved with all water quality and quantity decisions.

Requirements:

- Field inspector indicates that the system needs to obtain an appropriately licensed water operator within 3-4 working days, enough time to hire a contract operator if needed. If the PWS has not provided a signed designated operator form to the DWP by the end of that 3-4 day window, then the field inspector sends a Notice of Noncompliance (NON) letter (using a template provided in the Electronic Field Manual, Section 29) to the PWS. The NON needs to be issued within one week of getting the list of inactivated DOs. **(Significant)**

Recommendations:

**********

# MANAGEMENT & OPERATION INFORMATION

## ***Staffing***

What type of management structure exists (board, selectman, etc.)? _____

_____

Inspection Details

- The management structure of a District will typically have a Board of Trustees that makes decisions for the system.
- The management structure of a Department is run by the town and typically will have a town manager and those under him/her making the decisions for the system.

Requirements

- There are usually no requirements or recommendations. This is data that is collected for awareness of what the governing authority of the water system is.

Recommendations:

Is there enough staff to effectively maintain the water system? ☐ Yes ☐ No

Inspection Details

- Listen to the response here to gauge whether the operator feels that the system has adequate staffing to properly operate the system.

Requirements

Recommendations:

- If the operator feels that there is not enough staff, you may make a recommendation on the SS report to evaluate staffing adequacy.

Is staff active or a member in industry organizations? ☐ Yes ☐ No

Inspection Details:

- MWUA, MRWA, AWWA, WARN

Requirements:

- If Staff is not active we strongly recommend being involved for continued education, new technology….

Recommendations:

Notes: _____

_____

## ***Public Outreach***

Describe public outreach efforts: _____

_____

_____

Inspection Details:

- Examples of public outreach include annual CCR, tours of the treatment plant for schools, presentations to schools, flyers

Requirements:

- Typically this is just information we gather for our records and do not require or recommend anything.

Recommendations:

## ***Emergency Response***

Does the system have an emergency response plan? ☐ Yes ☐ No

Inspection Details:

- A PWS that is required to have a designated operator is required to have an adequate emergency response plan (ERP). All community systems are required to have an ERP.
- Should be up to date with current and accurate contact information. Should be briefly reviewed during inspection. For example: what will staff do when they have a water main break that requires a BWO? How will they communicate the BWO to customers, DWP, etc.?
- Refer to the DWP Website (www.medwp.com) for the template **"Emergency Response Plan of Action *for PWS serving less than 500*"……do we have more than 500?**
- Maine WARN is a great asset for many systems to have the ability to reach out to other systems for help in the event of an emergency. (WARN: Water and Wastewater Resource Network)

Requirements:

- Community Systems must have an ERP and they must be up to date. **(Minor)**

Recommendations:

- Update annually
- Practice ERP annually through a table top exercise, partial, or full scale exercise.

When was it last updated? _____

Does all necessary staff have a copy of the emergency response plan? ☐ Yes ☐ No

Inspection Details:

- Are copies of the ERP located in critical area's including but not limited to office, treatment plant, does the on call DO have one,
- Do all staff know where they are located

Requirements:

Recommendations:

- Have ERP available and accessible at all times
- Train employees annually on ERP

Are there alarms and are they operating properly? ☐ Yes ☐ No

Inspection Details:

- Document what type of alarms
- Do they have a process to verify they are functioning properly

Requirements:

- Repair any alarms not functioning properly **(Minor)**

Recommendations:

- If no alarms, suggest installing them in most critical areas.

Do alarms notify emergency personnel? ☐ Yes ☐ No

Inspection Details:
- Who is notified and how
- Does the process work
- Any problems within the last year

Requirements:

Recommendations:

Does the system have an emergency generator at needed locations? ☐ Yes ☐ No

Is it regularly exercised under load? ☐ Yes ☐ No

Can the e-generator operate the whole plant? ☐ Yes ☐ No

What type of fuel does the e-generator use? ☐ Diesel ☐ Propane ☐ Other: _____

Inspection Details:
- How often is it exercised under load?
- If no generators does the system have a long term plan to purchase them (is it in their master plan)?
- Where is the generator and fuel stored in relation to the treatment plant (clearwell, floor drains etc.)?

Requirements:

Recommendations:
- Exercise under load if not being done.
- For systems with <1 day of storage and no generator, suggest identifying an emergency plan (on the MEMA list, rental prior to storms, sharing program, etc.)

Notes: _____

_____

***Budgeting Information***

Does the system have a comprehensive facilities plan (master plan)? ☐ Yes ☐ No

If yes, when was it last updated _____

Inspection Details:
- A comprehensive facilities plan is a necessary part of long term sustainability for the PWS.

Requirements:

Recommendations:
- If they don't have one that has been updated in the last 5 years, recommend that they create/update one.

Are current rates covering current costs? ☐ Yes ☐ No

Inspection Details:
- Current rates need to cover current costs.

Requirements:

Recommendations:
- If current rates aren't covering current costs, recommend that the PWS start the rate changing process (rate increase).

Does the system have an Asset Management Plan? ☐ Yes ☐ No

Inspection Details:
- An Asset Management Plan is usually part of a comprehensive facilities plan, but can be one in the same.
- Asset management is an essential part of long term PWS sustainability.

Requirements:

Recommendations:

Notes: _____

_____

_____

## ***Operations***

Does the system have written operating procedures? ☐ Yes ☐ No

Inspection Details:
Requirements:
Recommendations:

Are they up-to-date? ☐ Yes ☐ No
Are they available and reviewed by staff? ☐ Yes ☐ No
Are they under revision control (at least dated?) ☐ Yes ☐ No

Inspection Details:
- Standard Operating Procedures (SOPs) are written instructions designed to achieve uniformity of the performance of a specific function
- Some examples of necessary SOP topics include main breaks, adding chemicals, delivery of chemicals, daily site inspections, or customer complaints.
- Should be updated annually
- Should be reviewed annually through an employee training process
- SOPs are also great training tools for new employees

Requirements:
- Create necessary and useful SOPs if the system does not have any. **(Minor)**
- Update annually and train employees annually or with any new updates. **(Minor)**

Recommendations:
- Include revision or date information on every SOP.
- Add SOPs for manual operating and other emergency procedures

Notes: _____

_____

## ***Recordkeeping***

Does the system have:

Daily logs? ☐ Yes ☐ No
Calibration Logs*? ☐ Yes ☐ No
Chlorine**? ☐ Yes ☐ No
Turbidity*? ☐ Yes ☐ No
Maintenance Logs? ☐ Yes ☐ No
Chemical Receiving Logs? ☐ Yes ☐ No
Monthly Operating Reports? ☐ Yes ☐ No
"As-Built" plans? ☐ Yes ☐ No
System specifications? ☐ Yes ☐ No
In-house training records? ☐ Yes ☐ No
Are sample results kept on file? ☐ Yes ☐ No

Inspection Details:
- Logs and reports should be reviewed
- Equipment Calibration Records.
- MOR's should also be reviewed by CET prior to the visit – address any comments they may have had.
- Chemical receiving logs – determine how they verify NSF certification.
- Sample results – retention – 3 years, 5 years, 10 years…….

Requirements:
- Calibrate per EPA Requirements **(either) (S.D. if disinfection related)**
- Submit MORs monthly by the 10th of the following month **(Minor)**

Recommendations:
- Consider creating reports/logs on any "no's" listed above

Notes: _____

_____

_____

_____

* Per EPA Requirements

** Online chlorine analyzer calibration requirements used at surface water systems for entry point compliance reporting must be either:

- Calibrated with a grab sample measurement at least every five days; or
- Checked using a grab sample that is analyzed on a separate approved device (such as a Hach digital colorimeter):
    - Provided the results between the grab sample and the online analyzer are within 0.1 mg/L or 15%, whichever is greater, then the online unit is considered calibrated.
    - There is a litany of other special case requirements that is too cumbersome to include on the sanitary survey form though it would be good to link to the EPA method so that in the likely uncommon/rare instance the Field Inspector discovers calibration is occurring but the calibration is not to spec they could locate the details without having to look:
      http://www.epa.gov/safewater/methods/pdfs/methods/met334_0.pdf

_____

_____

_____

_____

_____

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**********

# SURFACEWATER SOURCE AND PUMPING INFORMATION

| SOURCE NAME | TYPE | MAX PHYSICAL YIELD (GPM) | ACTIVE (Y/N) |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Type: River, Lake, Stream, Impoundment Pond, Reservoir, etc.

Please attach information for additional sources to this form. Check this box if additional information is provided: ☐

## ***Raw Water Monitoring***

Does the system monitor for Giardia lamblia, and Cryptosporidium? ☐ Yes ☐ No

Inspection Details:
- The requirements for raw water Giardia and Cryptosporidium testing are specified in the Surface Water Treatment Rule, Long Term 2 (LT2).

Requirements:
Recommendations:

Which of the following does the system routinely monitor?

| | | | |
|---|---|---|---|
| ☐ Transparency (secchi disk) | ☐ Total Phosphorous | ☐ Temperature | ☐ _____ |
| ☐ Dissolved Oxygen | ☐ Chlorophyll-a | ☐ Alkalinity | ☐ _____ |
| ☐ Apparent Color | ☐ pH | ☐ Turbidity | ☐ _____ |

Inspection Details:
- Gives details on what and how closely a system monitors their surface water body.
- Most systems will not routinely monitor all of the above
- Most common include: pH, Temperature, Alkalinity, and Turbidity.

Requirements:
Recommendations:

Which conditions change water quality? _____

_____

Inspection Details:

- Examples may include: rain events, seasonal turnover
- How does it affect the water quality (changes in turbidity, chlorine demand etc.)?

Requirements:
Recommendations:

Notes: _____

_____

_____

_____

_____

_____

***Intake Information***

| NAME | ACTIVE (Y/N) | MAX PHYSICAL YIELD (GPM) | DEPTH | LOCATION |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

***Intake Information***

How many intakes are in use? _____

Intake locations and depths: _____

_____

Are intake locations marked with buoys? ☐ Yes ☐ No

Inspection Details:

- Some systems choose not to mark their intakes with buoys. There is no requirement to mark them.

Requirements:
Recommendations:

Are waterfowl a problem around the intake(s)? ☐ Yes ☐ No

Inspection Details:

- Will often see one intake in use with an emergency intake at a different location and depth.
- Some intakes are marked with a no entry zone of 200', 400' or not at all.
- Geese, seagulls, and ducks can all cause fecal problems when located near the intakes.
- If waterfowl are a problem do they have a plan to reduce the risk of fecal contamination issues
- Identify actions that have been taken.

Requirements:

Recommendations:

Notes: _____

_____

_____

_____

_____

## ***Watershed Control***

Does the system have a Watershed Protection plan? ☐ Yes ☐ No

Inspection Details:
- Surface Water systems that have received a filtration waiver are required by the SDWA to have a Watershed Protection Plan
- For all other systems it is an option that is strongly recommended but not a requirement.
- We attempt to make it incentive based as well; in theory systems should not get a Phase II/V waiver unless they have an active, up-to-date plan.
- Watershed/Sourcewater plans include threat inventory and assessment in three different zones: intake, shoreland, and watershed, and different levels of management for each.
- River intakes have assessments only in the areas one half mile upstream, unless the system chose to do more.

Requirements:

Recommendations:
- If a system does not have a plan the DWP should recommend creating one.
- The DWP can also give guidance and direction on creating one. Direct to Education and Outreach Coordinator on Water Resources Team.

Is the Watershed Protection Plan up-to-date and actively being used by system? ☐ Yes ☐No

When was the watershed protection plan last updated? _____

Inspection Details:
- Should not be more than ten years.
- This question will also determine when was the last time they looked at it and have things changed
- Are they actively implanting their plan (within the last 3 years)? Examples:
  - Reduction or elimination of PSCs identified in plan
  - Use of Best Management Practicies to reduce identified threats to the source within the source protection area
  - Public outreach and education to increase landowners' and the general public's awareness of the need for source water protection
- Can the system produce a copy of the plan?

Requirements:

Recommendations:
- Should update plan if it has been more than 10 years since it was last updated/revised.

Does the system own the entire amount of land within the delineated source water (watershed) protection area? ☐ Yes ☐ No

If no, does the system have an active program for watershed acquisition? ☐ Yes ☐ No

Inspection Details:
- How well protected is their watershed/how much land do they own?
- Do they have a budget set aside to purchase more land if and when available?

Requirements:

Recommendations:
- Land Acquisitions loans/grants are available through the DWP which allows a system to purchase land located in their watershed protection area. Contact a member of the Water & Resource Team for more information.

Are portions of the watershed controlled by land owner agreements or zoning? ☐ Yes ☐ No

Inspection Details:

Requirements:

Recommendations:
- Pursue landowner agreements and zoning for watershed control whenever possible.

Are there existing watershed control concerns/issues? ☐ Yes ☐ No

Inspection Details:
- Identify areas of concern on a map & note reason
- Identify location specific plans of action or monitoring programs

Requirements:

Recommendations:

Does the system inspect septic systems and leach fields in the watershed? ☐ Yes ☐ No

Inspection Details:
- Identify areas of concern on a map

Requirements:
Recommendations:

Notes:_____

_____

***Industrial and Commercial Pollution Sources***

Are there any industrial discharges in the watershed? ☐ Yes ☐ No

Inspection Details:
- Is anything done to monitor this?
- Identify areas of concern on a map

Requirements:
Recommendations:

Are there any agricultural runoffs into the watershed? ☐ Yes ☐ No

Inspection Details:
- Farms, stock piles of manure that could allow for run-off in the watershed
- Is anything done to monitor this?
- Identify areas of concern on a map

Requirements:
Recommendations:

Describe potential contaminants: _____

_____

_____

Are zoning restrictions in place that control pollution in the watershed? ☐ Yes ☐ No

Inspection Details:
- Zoning restrictions or ordinances are designed to limit or restrict high risk activities in and around the source water.
- Each town will create and pass their own zoning restrictions (although not every town does this).
- What types of restrictions are there?
- Does the operator feel these restrictions are sufficient?

Requirements:
Recommendations:

Notes:_____

_____

_____

_____

_____

_____

_____

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# GROUNDWATER SOURCE AND PUMPING INFORMATION

| SOURCE NAME | DEPTH | YIELD (GPM) | CASE DIA | VENT HEIGHT | WELL SEALED PROPERLY? | VENT SCREENED? | ACTIVE/BACKUP/EMERGENCY |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Please attach information for additional sources to this form. Check this box if additional information is provided: ☐

Are any wells located in a flood plain? ☐ Yes ☐ No

Inspection Details:

- Is the casing/vent raised above the flood plain?

Requirements

Recommendations:

- Raise the casing/vent above the flood plain

Are wells protected from vandalism? ☐ Yes ☐ No

Inspection Details:

- Any signs of vandalism – eg.spray paint, broken locks, windows etc.
- Locking well caps, cement tile covers, enclosed in a locked building are all great ways to protect from vandals
- Has vandalism occurred to the wells in the past?
- If vandalism has occurred, what precautions have been taken to prevent more in the future?

Requirements:

Recommendations:

- Protect wells by adding locking well caps, cement tiles, a building, cameras etc. If significant vandalism has occurred, maybe make this a requirement?
- Deer cameras have been used effectively in remote areas.

Can a raw water sample be taken from each well? ☐ Yes ☐ No

Inspection Details:

- From the Maine Rules Relating to Drinking Water, all new public water systems shall have a raw water (prior to any treatment or storage) sampling port. See "Source Water Sampling and Tap Installation Procedure" DWP0088 for installation details

Requirements:

- Install a raw water tap at each well if the source currently does not have one.

Recommendations:

Label the raw water tap as "Raw Water"

For multiple wells, describe how the wells are operated (e.g. one at a time with each used for a day/week/month, or wells come on based on demand, or other… note: sampling requirements are determined using this information) _____

_____

Inspection Details:
- If a well is connected but not in use (termed in SDWIS as an "emergency – active" well) (requiring manual intervention to bring it on-line) it is required to have quarterly bacteria testing and annual nitrate testing so when needed it can be brought on-line without a BWO or DNO.
- If a well is physically disconnected and has not been tested or used for years it cannot be brought on-line without have bacteria and nitrate results completed first. If it is brought on-line without these tests and results the system or DWP must place a DNO on.

Requirements:
Recommendations:

Notes: _____

_____

## ***Wellhead Protection***

Does the system have a Wellhead Protection Plan? ☐ Yes ☐ No

Inspection Details:
- A plan designed to protect the ground water supply by eliminating or controlling sources of pollution to the surface and sub-surface area surrounding a water well or well field.
- Wellhead plans cover a delineated area: either a circle (300 feet for small systems, calculated radius for larger ones) or a modeled contributing area for larger community systems. They have certain required elements, and include threat assessment and management within that area.
- It will identify all of the potential contaminant sources in the wellhead protection area
- A partnership between property owners, the public and government agencies will work together to develop a management plan to minimize the risk of contamination from these sources.

Requirements:
- Update the plan if needed.

Recommendations:
- If a system does not have a plan the DWP should recommend creating one.
- The DWP can also give guidance and direction on creating one. Direct to Education and Outreach Coordinator on Water Resources Team.

If yes, is the Wellhead Protection Plan up-to-date and actively being used by system? ☐ Yes ☐No

When was the plan last updated? _____

Inspection Details:
- Should not be more than ten years.
- This question will also determine when was the last time they looked at it and have things changed
- Does the plan contain an updated list of landowners within the source protection area and an updated inventory of PSCs?
- Are they actively implanting their plan (within the last 3 years)? Examples:

    - Reduction or elimination of PSCs identified in plan
    - Use of Best Management Practices to reduce identified threats to the source within the source protection area
    - Public outreach and education to increase landowners' and the general public's awareness of the need for source water protection
- Can the system produce a copy of the plan?

Requirements:
Recommendations:

- Should update plan if it has been more than 10 years since it was last updated/revised.

Does the system own the entire amount of land within the delineated wellhead protection area? ☐ Yes ☐ No

Are zoning ordinances, or other legal restrictions in place in the wellhead protection area? ☐ Yes ☐ No

Inspection Details:

- Zoning restrictions or ordinances are designed to limit or restrict high risk activities in and around the source water/wellhead protection areas.
- Each town will create and pass their own zoning restrictions (although not every town does this).
- What types of restrictions are there?
- Does the operator feel that zoning restrictions are sufficient?
- If zoning restrictions are insufficient, is the town trying to work with the district?

Requirements:
Recommendations:

List Potential Sources of Contamination (PSCs) within 300 feet of any well:

☐ Septic System/Leach Field ☐ Surface Water ☐ Fuel Storage Tanks ☐ Agricultural Lands
☐ Industrial Manufacturer ☐ Other _____

Does the system have a map delineating the recharge area(s) or aquifer(s)? ☐ Yes ☐ No

Inspection Details:
Requirements:
Recommendations:

What percentage (%) of the well head protection area is owned by the system? _____

Inspection Details:
Requirements:
Recommendations:

How many acres of the 200 day wellhead protection zone are owned by the system? _____

Inspection Details:
Requirements:
Recommendations:

Does the system have a plan to purchase additional land within the protection area?

☐ Yes ☐ No

Inspection Details:

- Land Acquisition loans/grants are available through the DWP which allows a system to purchase land located in their watershed protection area. Contact a member of the Water & Resource Team for more information.

Notes:

_____

_____

_____

_____

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_____

_____

_____

_____

_____

_____

**********

# TREATMENT INFORMATION

## ***Treatment Plant***

Have any changes to the treatment plant been made without DWP approval? ☐ Yes ☐ No

Inspection Details:
- Are different chemicals being used than originally approved?
- Has the treatment process changed types of treatment?

Requirements:
- If "Yes" remind that all treatment plant changes or chemical changes must be approved by the DWP prior to the change being implemented. And request submittal of details for an after the fact review. **(either)(may be a S.D.)**

Recommendations:

Does the system have a treatment schematic? ☐ Yes ☐ No

Inspection Details:
- Is this schematic accurate and up to date?

Requirements:

Recommendations:

Housekeeping: ☐ Very Good ☐ Good ☐ Fair ☐ Poor

Inspection Details:
- Is the treatment building used for storage of other items (e.g. Paints, chemicals [other than those used to treat] tires,
- Are the floors cleaned, swept and or washed down.
- Are there any chemical spills evident

Requirements:
- Any nonpublic water related items should not be stored in the treatment plant **(Minor)**

Recommendations:
- Remind them that storage of chemicals, paints, fuels, etc. should be according to OSHA guidelines.

Is there a SCADA system? ☐ Yes ☐ No

If yes, are procedures in place for manual operation if SCADA becomes inoperable? ☐ Yes ☐ No

Inspection Details:
- SCADA – Supervisory Control And Data Acquisition
- Is there an SOP for operators to understand how to run the plant in the event manual operations is required?
- Allows for control and optimization of the treatment plant while providing product quality information

Requirements:
- An SOP for manual operation is necessary. **(Minor)**

Recommendations:
- Emergency contact info for SCADA tech located near SCADA equipment

Can the system be operated remotely? ☐ Yes ☐ No

Inspection Details:
- Can changes to chemical feed pumps, raw water pumps, etc. occur outside of the treatment plant by accessing a computer?
- Who has remote access?

Requirements:

Recommendations:

Is all equipment installed after July 1, 2008 ANSI/NSF STD 61 Certified? ☐ Yes ☐ No

Inspection Details:
- Look for markings that indicate certification
- Purchase specifications or shipping documents provided by the water system may indicate certification
- As needed, use certification entity websites to verify certification
- Waivers on this requirement may be possible.
- See Maine Rule Related to Drinking Water for exemptions from this requirement.
- See NSF guidance document and handout in section 30 of the Electronic Field Manual

Requirements:
- Per the Maine Rules Relating to Drinking Water, all materials, products, and coatings that contact drinking water must be certified to meet ANSI/NSF Standard 61-2007: Drinking Water System Components – Health Effects, there are some exceptions that can be found in the electronic field manual. **(Significant)**

Recommendations:
- Have the system develop a purchasing SOP that will ensure Std 61 certification on materials, products, and coatings in contact with drinking water.

Are Material Safety Data Sheets available? ☐ Yes ☐ No

Are they located near the chemical? ☐ Yes ☐ No

Inspection Details:
- Should be reviewable onsite near the chemicals (not in a central office offsite).
- Should be one MSDS for each chemical
- Ideal situation is to have them located all together in a binder
- If chemicals are located in different rooms or buildings multiple binders should be made and available near chemical
- Are all operators aware of location(s)?

Requirements:

Recommendations:
- Make sure all MSDS sheets are current (contact company for updates)
- If questions, refer the PWS to Maine Safety Works: 207-623-7900

Is proper safety equipment available? ☐ Yes ☐ No

Is it used? ☐ Yes ☐ No

Inspection Details:
- This may include: chemical resistant gloves, safety glasses, splash shield, chemical apron, eyewash, hand washing sink, etc.
- Are all operators aware of where safety equipment is located?
- Are operators trained on how and when to use equipment?
- This is also regulated by DOL/OSHA

Requirements:

Recommendations:
- If questions, refer the PWS to Maine Safety Works: 207-623-7900

Is eyewash station/shower within a safe distance and maintained properly? ☐ Yes ☐ No

Inspection Details:
- Eye wash station should be tagged indicating dates of when it was tested/run. Test/Fill per manufacturers recommendations.
- Should be in close proximity to all the chemicals
- If chemicals are located in different areas of the building then multiple stations/showers may be necessary
- This is also regulated by DOL/OSHA

Requirements:

Recommendations:
- If questions, refer the PWS to Maine Safety Works: 207-623-7900

Are there cross connections in the treatment plant? ☐ Yes ☐ No

(make-up process water, waste water, drains, analyzer waste, fire protection, boilers, etc.)

If yes, describe: _____

Inspection Details:

- Must always inspect the plant for any cross connection. Cross connections may include potable water lines connected to waste water pipes, floor drain, analyzer waste lines, boilers, etc. There should always be an air gap to prevent any back siphonage to occur.

Requirements:

- If a cross connection is discovered and it is not separated by an appropriate* backflow device or an air gap then the cross connection must be taken care of with either an appropriate* device or an air gap. (* See Main Internal Plumbing Code Table 6-2) **(either)(may be a S.D.)**

Recommendations:

_____

_____

Where do floor drains drain to? _____

_____

Inspection Details:

- Examples include: septic, lagoons, day light,
- Depending on the area and location of the drains the floor drains may go to different locations. This needs to be verified
- The Maine DEP has rules related to floor drains.

Requirements:

Recommendations:

- Drains for rooms with chemical storage without secondary containment should not flow to daylight

Notes: _____

_____

_____

## ***Production Capacity***

Average Daily Production: _____

limited by what factor?: _____

Inspection Details:

- If the pws has seasonal averages, it's useful to note the seasonal averages

Requirements:

Recommendations:

Max. Daily Production during the past year?: _____

limited by what factor?:_____

Inspection Details:

- The highest daily production the system saw in the last year

Requirements:

Recommendations:

Plant Design Capacity (what can you produce)?: _____

limited by what factor? _____

Inspection Details:

- Maximum that the plant can produce
- Review capacities of major components (pumps, filters, aerators, contact tanks)

Requirements:

Recommendations:

Does the system have a master meter? ☐ Yes ☐ No

Inspection Details:

- The master meter records the entire flow/production of water leaving the plant
- Can give great historical data by recording readings over many years.
- Can help indicate if a leak is present

- Has the meter been calibrated? If so when was the last time?

Requirements:

Recommendations:

- Calibrate meters per manufacturer's recommendations.

What is the condition of the interior piping? ☐ Good ☐ Average ☐ Marginal ☐ Poor

Inspection Details:

- Have the pipes been painted recently or is the paint chipping?
- Is any color coding used to determine raw water, treated water etc.?
- Is moisture a problem on the pipes?
- Are there any apparent leaks?

Requirements:

Recommendations:

- Paint or re-paint the pipes to protect from corrosion.

Notes: _____

_____

_____

***Wetwell (Raw Water Storage)***

Number of wetwells: _____

Inspection Details:

- A wetwell is the term used for the storage of raw water or partially treated water.
- Most often seen on surface water supplies.

Requirements:

Recommendations:

Volume: _____ (Gals) Depth (Ft): _____ Width (Ft): _____ Length (Ft): ____

Is the wetwell protected from accidental spills and run-off? ☐ Yes ☐ No

Inspection Details:

- Could a chemical spill, oil spill etc. flow into the wetwell?
- Has the system evaluated the potential risk of a spill or run-off getting into the Wetwell?
- Is there an SOP if this should occur? Is the SOP part of their emergency response procedure?

Requirements:

Recommendations:

- Evaluate the risks
- Create an SOP
- Reference SOP in the ER procedure

Is the wetwell secure (latches? vent?) ☐ Yes ☐ No

Inspection Details:

Requirements:

Recommendations:

Are wetwell vents screened with rodent/bird screen? ☐ Yes ☐ No

Inspection Details:

- If the wetwell has a vent is it properly screened to prevent rodents/birds from entering the storage area?

Requirements:

- Screen with rodent/bird screen (1/4 inch) if not properly screened **(either)(S.D.)**

Recommendations:

- Inspect vent annually
-

Are pump lubricants in contact with drinking water food grade? ☐ Yes ☐ No

Inspection Details:

- Verify/inspect what type of lubricant is used and on what pumps
- Is there an SOP for this/how do the operators know or get trained for the proper use of lubricants

Requirements:

- Any pump that is in contact with drinking water must use a food grade lubricant

Recommendations:

## ***Raw Water Pumping***

| PUMP # | 1 | 2 | 3 |
|---|---|---|---|
| **Source Name** | | | |
| **Capacity (GPM)** | | | |
| **HP Rating** | | | |
| **Pump Type** | | | |
| **Manufacturer** | | | |
| **Last Service Date** | | | |
| **Pump Condition** | | | |
| **Motor Condition** | | | |

## ***Disinfection Chemicals***

☐ Chlorine Gas ☐ Chlorine Dioxide ☐ Chloramines

☐ Calcium Hypochlorite ☐ Sodium Hypochlorite

Inspection Details:

- Chlorine Gas – Not commonly used in Maine – Two systems or less.
- Chlorine Dioxide –
- Chloramines – combination of chlorine and ammonia.
- Calcium Hypochlorite – comes in the form of powder, pellets, granules, or tablets – not widely used
- Sodium Hypochlorite – most commonly used form of disinfectant in Maine. The liquid form purchased in industrial quantities normally has 12.25% chlorine.

Requirements:

- For filtration avoidance waiver SW systems, redundant disinfection equipment is necessary **or** automatic shutoff must be present. [CFR 141.72 (a)(2)] **(Significant)(S.D.)**

Recommendations:

- For non-filtration avoidance SW Systems, redundant equipment recommended if using for CT .

Product name: _____

Inspection Details:

- Name of chemical

Requirements:
Recommendations:

Manufacturer: _____ Supplier: _____

Inspection Details:

- Manufacturer - Company that produces the chemical (Example: Clorox)
- Supplier – Company that delivers the chemical to the water district (Example: Monson)

Requirements:
Recommendations:

Are chemicals ANSI/NSF STD 60 certified? ☐ Yes ☐ No

How documented? _____

Inspection Details:
- Look for marking on chemical containers indicating certification
- Review shipping documentation for evidence of certification
- Determine which certification entity has certified the chemical(s) to ANSI/NSF Std 60: Water Quality Association (WQA), National Sanitary Foundation (NSF), Underwriter's Laboratory (UL).
- As needed, use certification entity websites to verify certification
- Waivers on this requirement may be possible.
- See NSF guidance document and handout in section 30 of the Electronic Field Manual

Requirements:
- Per the Maine Rules Relating to Drinking Water, all chemicals in contact with drinking water must be certified to meet ANSI/NSF Standard 60 – 2005: Drinking Water Treatment Chemicals – Health Effects. **(Significant)**
- Label tanks identifying the contents/chemical/mineral inside **(Minor)**

Recommendations:
- Have the system develop an SOP for receipt of chemicals to ensure proper certification upon chemical delivery.

Are chemicals being dosed within the range of their NSF 60 specification? ☐ Yes ☐ No

Inspection Details:
- Ask PWS to confirm this and report back to the DWP

Requirements:
- Chemicals must be dosed within the range of their NSF 60 specification. **(Significant)**

Recommendations:
- Record range of dose in an SOP

Application Point? ☐ Pre ☐ Post ☐ Both

Inspection Details:
- Where is the chemical injected into the main
- Pre – before any treatment
- Post – after all treatment or if it is the only treatment
- Both – some system inject before and after treatment to aid in the treatment process

Requirements:

Recommendations:

Considering disinfection chemicals only, what is the target log inactivation for each of the following: Giardia: _____ Virus: _____ Crypto: _____

Inspection Details:
- For Surface Water Systems Giardia, Virus, and Crypto inactivation levels should be known. This will be based on filter removal, UV, and disinfection contact time. If not known they need to find this out and get back to you.
- For Ground Water Systems (not including those under the influence of surface water) under the Ground Water Rule a system that is required to disinfect is required to meet 4 log inactivation of viruses.
- A ground water system may not know their log inactivation for Virus's but this can be determined by using a **log reduction** chart which can be found in the Electronic Field Manual under "Disinfection".

Requirements:

Recommendations:

How is "CT" evaluated and calculated (min tank level, baffling factor, T, pH, Max actual flow rate, etc.):_____

_____

_____

Inspection Details:
- Speak with your compliance officer for the system if there are any questions or concerns with "CT"

Requirements:
- PWS must know this and have their method for calculating "CT" available in their records. **(Minor)**

Recommendations:

Pump Type? ☐ Diaphragm ☐ Peristaltic ☐ Other _____

Inspection Details:

- A diaphragm pump is a positive displacement pump that works by trapping a fixed amount of liquid and forcing that trapped liquid into the discharge pipe with the use of a diaphragm. When the diaphragm moves up, the pressure decreases, and fluid is drawn into the chamber. When the chamber pressure later increases from decreased volume (the diaphragm moving down), the fluid previously drawn in is forced to the outlet of the pipe. Tend to work better under high pressure
- A Peristaltic pump is a positive displacement pump that works by the use of a rotor inside the pump. The rotor moves in a circular motion around the plastic hose which carries the liquid. The rotor squeezes a section of the tube and pushes the liquid toward the outlet of the pipe

Requirements:

Recommendations:

- A peristaltic pump is the preferred chemical feed pump

Is a redundant pump or spare parts available? ☐ Yes ☐ No

Inspection Details:

- Spare parts or a redundant pump are critical to have in the event a pump will no longer pump liquid to prevent a possible boil water order if used for disinfection.

Requirements:

Recommendations:

- Always have a proper spare hose for the rotor cavity of a peristaltic pump (the hose can wear out).

What controls the chemical pump operation?

Pressure switch for well pump ____ Flowmeter____

Other: _____

Inspection Details:

- Does the chlorine pump turn on when the well pump turns on?
- Is the chlorine feed "paced to flow" based on a flow meter?

Requirements:

- Pump must have automatic controls **(Minor)**

Recommendations:

Size of Day Tank (gallons)? _____ Bulk Storage (gallons)? _____

A full day tank = _____ days of supply?

Inspection Details:

- Importance of a day tank is that they limit the amount of overfeed, should an overfeed occur.
- 10 State Standards says the following: Day tanks shall be provided where bulk storage of liquid chemicals is provided. Also: Day tanks should hold no more than a 30 hour supply.

Requirements:

Recommendations:

- Day tank should have 1-2 days of chemical only
- Day tanks are strongly recommended for safety reasons; to protect the public in the event of an overfeed.

Tanks and chemical room labeled properly? ☐ Yes ☐ No

Inspection Details:

- Chemical labels and hazmat labels protect employees against biohazards and chemical dangers
- Proper labeling of tanks and chemical rooms is critical
- Should be able to clearly read and identify easily each tank and chemical room

Requirements:

- Must meet DOL/OSHA requirements **(Minor)**

Recommendations:

- Contact Maine Safety works 207-623-7900 for assistance.
- Label mixing recipes on/above the tank

How is chemical monitored? ☐ Continuously ☐ Daily ☐ Other _____

Inspection Details:

- Continuously means they have an in-line analyzer where treated water constantly flows through the analyzer giving a continual reading which is usually captured in some type of SCADA system.
- Daily monitoring is a daily grab sample where a system may use a colorimeter HDP or an electronic chlorine meter. A surface water system with a population 3,300 or fewer may take grab samples in lieu of providing continuous monitoring based on the following:
    - Under 500 – 1 daily sample
    - 501 to 1000 – 2 daily samples
    - 1001 to 2500 – 3 daily samples
    - 2501 to 3300 – 4 daily samples
- Groundwater systems are not required by rule to follow this.
- Most larger system have in-line monitors

Requirements:
Recommendations:

What is the chlorine analyzer type? _____

Inspection Details:
- What is the make/model of the chlorine analyzer? E.g. Hach Cl17, ??

Requirements:
Recommendations:

How often is the analyzer calibrated? (Recommend mnfgr's specs) _____

Inspection Details:
- Has it ever been calibrated?
- Do they know the mnfgr's specs?

Requirements:
Recommendations:
- Must be calibrated per manufacturer's specs or an alternate, documented schedule.

What is the Chlorine residual being monitored? Free ☐ Combined ☐ Total ☐

Where is the residual monitored? _____

What is the target residual? _____

Inspection Details:
- Ground water systems will typically monitor for Free chlorine.
- Surface water systems must measure total chlorine in the distribution and have a minimum of a trace

Requirements:
Recommendations:
- At the plant Surface Water Systems will measure free chlorine and should have a minimum of 0.2mg/l leaving the plant.

Will plant shut down on High/Low levels of disinfectant? ☐ Yes ☐ No

What are the alarm setpoints? High _____ ppm Low _____ ppm

Inspection Details:
- Often times an alarm is tied to the chlorine analyzer through SCADA and will have a high and low shut-off set point
- Ask if the alarms are working
- Ask how they are tested.

Requirements:
Recommendations:
- Test with a documented frequency and record results.

Are there adequate backflow prevention/antisiphon devices? ☐ Yes ☐ No

Inspection Details:
- Make note of backflow prevention devices and locations

Requirements:
Recommendations:

Is spill containment adequate? ☐ Yes ☐ No

Inspection Details:

- Does the chemical storage tank have containment?
- Is it large enough to hold a spill from the tank if filled to its maximum (must be 110% containment)?

Requirements:

- Open containers must have 110% secondary containment **(Minor)**
- Must meet DOL/OSHA requirements **(Minor)**

Recommendations:

- If questions, refer the PWS to Maine Safety Works: 207-623-7900

Are there sample taps before and after treatment? ☐ Yes ☐ No

Inspection Details:

- Verify that samples taps are available before the chemical is injected and after the chemical is injected
- This allows to see the water quality before the chemical and after the chemical has been injected

Requirements:

Recommendations:

- Sample taps should be present before and after a chemical is injected and may be required by the DWP.

What is the mixing recipe? _____

_____

Inspection Details:

- Does the system add straight sodium hypochlorite or do they add water to dilute the chemical strength.
- Most large community systems add Sodium Hypochlorite at full strength of 12.25%.
- If the system does dilute how, what is the Sodium Hypo to water ratio?

Requirements:

Recommendations:

- Document ratio in a mixing SOP

Notes: _____

_____

_____

## ***Ozone Disinfection***

What type of ozone system is it (check all that apply): ☐ Air ☐ Liquid Oxygen (LOX)

☐ Direct Injection ☐ Sidestream Injection ☐ Vacuum

Inspection Details:

- Air –
  - Redundant compressors?
  - Redundant desiccant systems?
- Liquid oxygen –
  - LOX tanks securely stored?
  - LOX tanks away from sparks, flammable materials?
- Direct Injection –
  - Maintenance issues with diffusers?
  - Spare parts?
- Sidestream Injection –
  - Redundant sidestream pump (and motor)?

Requirements:

- For filtration avoidance waiver SW systems, redundant equipment is necessary if using Ozone for CT **or** automatic shutoff must be present. [CFR 141.72 (a)(2)] **(Significant)(S.D.)**

Recommendations:

- Adequate spare parts.
- For non-filtration avoidance SW Systems, redundant equipment recommended if using for CT .

What controls the ozone feed (check all that apply): ☐ Flowmeter ☐ Ozone concentration

☐ Pump Activation ☐ Operator ☐ Other: _____

Inspection Details:

- Is the feed flow paced?
- Is the feed adjusted based on ozone concentration and/or CT?

- If based on pump activation and pump fails to start what will occur (e.g., will chemical be fed?)?

Requirements:
- See Recommendations.

Recommendations:
- If chemical feed is based on pump activation, should pump not start but chemical is still fed there should be a means to stop chemical feed (e.g., analyzer with high residual shutoff, low amperage detection shutoff, flow switch, switchover to other pump).
- If chemical feed is based on operator there should be a means to ensure that inadequate feed is detected quickly so that adequate CT is always achieved.
- If system flows vary regularly and feed rate not flow paced then it may be efficient for the system to convert to that form of process control.

Where is ozone contact achieved (pipe, contact tank, baffled contact tank, etc.): _____

_____

Inspection Details:
- Identify injection location(s) of ozone.
- Identify location of residual analyzer(s).
- Attempt to determine the physical dimensions of the contact vessel and note salient features such as baffles.
- If possible determine the baffling factor that was assigned to the contact vessel.

Requirements:
- No piped bypasses around CT vessels. **(either) (S.D.)**

Recommendations:
- None noted.

How is it determined that adequate ozonation/inactivation/CT has occurred:_____

_____

Inspection Details:
- Is a baffling factor included in the CT calculation?
- If there is a CT tank is the actual volume used to calculate CT (instead of maximum volume)
- Is CT automatically calculated by the SCADA system?
  - If so is this ever hand-checked?

Requirements:

Recommendations:
- If any necessary variables are missing from evaluation (such as a baffling factor) or if there are incorrect assumptions these should be corrected.
- If the CT calculation has not been verified in sometime it may be appropriate for the utility to check it to ensure variables and assumptions are (still) correct.

Is CT based on worst case operating conditions (lowest tank level, highest pumping rate, lowest ozone concentration)? ☐ Yes ☐ No ☐ Other: _____

Inspection Details:
- CT should be based on worst case operating conditions or based on instantaneous operating conditions (for systems that have sufficient online data).

Requirements:

Recommendations:
- If CT calculations are being based on (daily) averages this practice should be changed and based either on worst case conditions or instantaneous conditions (with lowest CT for the day evaluated against minimum requirement).

Considering ozone only what is the target log inactivation for each of the following:

Giardia: _____ Virus: _____ Crypto: _____

Inspection Details:

Requirements:

Recommendations:

Does each piece of needed infrastructure (e.g., ozone generator, LOX tank, air compressor, desiccant, ozone destruct unit, ozone contact basin, ozone monitor, etc.) have redundancy?

☐ Yes ☐ No ☐ Partial

If “Yes” does the redundancy allow for the system achieving disinfection requirements during average daily flow? ☐ Yes ☐ No ☐ N/A

Notes: _____

Inspection Details:
- Identify the type and nature of redundancy.
- Are redundant units alternated? If so how and at what frequency?

Requirements:
- For filtration avoidance waiver SW systems, redundant equipment is necessary if using Ozone for CT **or** automatic shutoff must be present. [CFR 141.72 (a)(2)] **(Significant)(S.D.)**

Recommendations:
- For non-filtration avoidance SW Systems, redundant equipment recommended if using for CT .

How and where is ozone monitored (referencing an included diagram or picture is adequate):

_____

_____

Inspection Details:
- Monitoring via online ozone analyzer? Grab samples? Both? Other?
- Note on drawing.

Requirements:

Recommendations:

How often are online ozone monitors calibrated/checked for accuracy:_____

_____

Inspection Details:
- How is the monitor checked?
- What defines when a monitor is considered out of calibration?
- What occurs when utility determines a monitor is out of calibration?
- What does the manufacturer’s literature suggest regarding routine calibration checking and calibration?

Requirements:

Recommendations:
- Utility should follow manufacturer’s literature regarding routine calibration checking and calibration.

Is grab sampling used to check against ozone monitoring readings? ☐ Yes ☐ No

If yes, how often? _____

Inspection Details:
- Do results correlate with online monitoring results?

Requirements:
- None noted.

Recommendations:
- None noted.

Are there alarms for ozone residuals (low, high)? ☐ Yes ☐ No

If “Yes” describe: _____

Inspection Details:
- What are the alarm levels?
- How do the alarms work:
  - Local audio? Local visual?
  - Alarm on SCADA screen?
  - Autodialer/callout?
- Are there alarms based on CT (for systems with SCADA only)?

Requirements:
- None noted.

Recommendations:
- Low alarm should be set to a residual level equal to or greater than minimum necessary concentration to achieve CT.

Will the system shutdown based on ozone residuals (low, high)? ☐ Yes ☐ No

If "Yes" describe: _____

Inspection Details:
- What are the shutoff levels?
- Will the system shutdown if CT inadequate (for systems with SCADA)?
- Does the system also alarm on a shutdown and if so how (see above)?

Requirements:

Recommendations:
- For filtration avoidance waiver SW systems using ozone for necessary CT but without equipment redundancy alarm should be set to a residual level equal to or greater than minimum necessary concentration to achieve CT.

If the ozone system uses LOX for liquid oxygen generation is the chemical certified to NSF/ANSI Standard 60 or equivalent? ☐ Yes ☐ No ☐ N/A

Inspection Details:
- Standard check – label on tank, documentation that came with delivery, appropriate website, etc..
- If LOX is not certified to NSF Standard 60 is it certified to something reasonably equivalent (e.g., hospital grade)?

Requirements:
- LOX should be certified to NSF Standard 60 or something reasonably equivalent. **(Significant)**

Recommendations:
- None noted.

If using LOX how many days of supply is onsite: _____

Inspection Details:
- Determine minimum amount of product that is typically onsite (i.e., how much LOX is left when they receive a new delivery?).
- Goal is to determine whether a delay in shipment such as a weather event may leave the utility with an insufficient supply (e.g., if they operate with as little as six days supply and an ice storm hits they may not be able to get a shipment for two weeks and would not have enough product to generate ozone).

Requirements:
- None noted.

Recommendations:
- If utility appears to be vulnerable to running out of LOX if any delays occur, encourage them to consider storing more chemical or ordering before supply gets as low as when they are currently ordering.

If using LOX who supplies the LOX: _____

Inspection Details:
- Note supplier.

Requirements:
- None noted.

Recommendations:
- None noted.

Are there MSDS sheets available for ozone and LOX (if applicable)? ☐ Yes ☐ No

Inspection Details:
- Identify presence (and if present) location of MSDS.

Requirements:
- If MSDS not present or not present in appropriate area require utility to have a copy made available. **(Minor)**

Recommendations:
- If questions, refer the PWS to Maine Safety Works: 207-623-7900

Is appropriate PPE available? ☐ Yes ☐ No

Inspection Details:
- Appropriate PPE identified in MSDS.

Requirements:
- If necessary PPE not present then utility should procure and keep onsite. **(Minor)**

Recommendations:
- If questions, refer the PWS to Maine Safety Works: 207-623-7900.

Are there ambient air ozone monitors in needed locations? ☐ Yes ☐ No

If "Yes" what is the ambient air ozone concentration: _____

(Threshold Limit Values for $O_3$ are 0.1 mg/L for eight hours and 0.3 mg/L for short-term)

Notes:_____

_____

Inspection Details:
- Are ambient air ozone monitors located at necessary locations?
- Are these monitors tested?
- Have monitors ever read equal to or above TLVs? If so what was done?

Requirements:
- None noted.

Recommendations:
- If monitors not present utility should contact Department of Labor/OSHA, Safety Works (623-7900), or other appropriate entity to determine whether these should be present and in which location(s).

## ***Ultra Violet Disinfection***

Type of UV system: ☐ Low Pressure ☐ Low Pressure, High Output ☐ Medium Pressure

Number of Units:___

Inspection Details:
- Note the number and type of unit,

Requirements:

Recommendations:

Manufacturer:_____

Is the UV S.O.P. Available? (Should be approved prior to bringing system on-line):

☐ Updated ☐ Updates been approved by the DWP?

Inspection Details:
- Is the SOP at the Treatment Plant?
- Is it current?
- SOP has to be approved by the DWP (CET) prior to bringing the facility on-line.

Requirements:
- An SOP must be in place that reflects the actual system and how they deal with and report, (or avoid), off-spec water production **(Minor)**

Recommendations:
- The SOP must be available, approved, and current.

Design Flow rates: Upper Limit___ Low Limit___

Inspection Details:
- Design flow rates will have an upper and lower limit and will be part of the original validation report.
- Flow rates outside of the validated parameters may result in production of off-spec water

Requirements:

Recommendations:
- Ensure that the operator is aware of the operating parameters.

UV Dose Monitoring Strategy ☐ UV Intensity Set Point ☐ Calculated Dose

☐ % UVT (needed if calculated dose Validation method)

Inspection Details:

- Dose monitoring strategy is dictated by the Validation methodology of the unit. ( typically UV intensity set point)
- If the "Calculated Dose" method was used then the facility is required to monitor and report % UV Transmittance

Requirements:
Recommendations:
- While important to know what methodology was used, the Validation will have used an approved process and the validation must have been approved for the unit prior to final approval of the treatment, and likely prior to specification of the unit for installation at the facility.

Considering UV only, what is the target log inactivation for each of the following:

Giardia: _____ Crypto: _____

Inspection Details:
- Log inactivation credits will be on the MO Requirements:

Requirements:
Recommendations:
- Off-spec water production is based on the required credits. The facility should be able to tell us what credits they are requesting.

UV Cleaning System ☐ Off-Line Chemical Cleaning ☐ On-Line Mechanical Cleaning ☐ On-Line Mechanical-Chemical Cleaning

Inspection Details:
- Which type of cleaning system does the UV system have

Requirements:
Recommendations:

How often are the UV lamps sleeves chemically cleaned?

☐ annually ☐ as per operation manual ☐ as needed _____

Inspection Details:
- Note the process used which will be part of the original O&M manual. The original maintenance schedule will be fairly conservative, especially related to fowling of the sleeves and required cleaning, and will need to be modified as the facility tracks their water quality and the actual conditions of the lamps & sleeves. (modifications to the O&M manual should be noted and dated)

Requirements:
- The manual(s) must be available and up to date **(Minor)**

Recommendations:

Is the chemical cleaning solution approved for use in a water system? ☐ Yes ☐ No

Inspection Details:
- Inspect the chemical solution. Must be NSF/ANSI Standard 60 compliant or a food grade citric acid.

Requirements:
- All chemicals must be NSF/ANSI Standard 60 compliant or a food grade citric acid. **(Significant)**

Recommendations:

How often are the lamps replaced? ☐ 8,000 to 12,000 hours ☐ as per operations manual

Inspection Details:
- Same brand of lamps as used in the Validation?
- Ask to see the replacement schedule. Note that most LPHO and Low Pressure lamps have a design life of up to 12000 hours whereas Medium Pressure lamps are 8000.

Requirements:
Recommendations:
- Lamp replacement should be on a schedule based on what the facility has determined is needed and relatively close to the manufacturer's recommendations.

Is the UV maintenance and operations manual available? ☐ Yes ☐ No

Inspection Details:

- The maintenance and operation plan must be available and clearly identify the method of calculating off-spec water. The Operations manual must be approved by the compliance staff prior to start up as this document will include the MOR requirements.

Requirements:

- The manuals should be on hand and readily available **(Minor)**

Recommendations:

- Staff should be very familiar with the maintenance and Operations manual.

Are sufficient spare parts available? (10% number lamps in use, 5% of Quartz sleeves, 2 UV sensors, 2 UV reference sensors) ☐ Yes ☐ No

Inspection Details:

- Spare parts should be in the storage area and clearly labeled.

Requirements:

- If the spare parts are not in storage the system must order the appropriate parts to have on hand. **(Minor)**

Recommendations:

- The quartz sleeves and lamps must be the same as used in the original validation, if not it is possible that the facility may require re-validation of the unit(s).

Are spare and/or used lamps stored in a secure and properly labeled location?

☐ Yes ☐ No

Inspection Details:

- Used bulbs/broken bulbs represent the potential/reality of a hazardous waste. The facility should have an appropriate safe storage area and a plan to remediate hazardous waste, if that should occur.

Requirements:

Recommendations:

- Storage area should not be in a high traffic area and the potential for accidental damage to stored materials is at a minimum.
- Each facility's storage area will vary, based on available space, but the storage should be as secure and separate as possible.

How often are UV sensors Calibrated? (at least monthly)

☐ Weekly ☐ Monthly ☐ Per operations manual

Inspection Details:

- How many UV sensors are there (at least 1 per unit)?

Requirements:

- UV Sensor calibration must be at least monthly, comparing the duty UV sensor to the reference sensor, the facility may have 3 duty UV sensors and a mean calibration ratio can be used. **(Significant)(S.D.)**

Recommendations:

How often are UVT analyzers Calibrated? (important for calculated dose approach, minimum weekly) ☐ Daily ☐ Weekly ☐ Per operations manual

Inspection Details:

- Confirm calibration at least weekly against a bench top spectro-photometer.

Requirements:

- Confirm calibration has been completed and that records are kept. **(Significant)(S.D.)**

Recommendations:

Proper safety equipment available? ☐ Yes ☐ No

Notes: _____

_____

_____

_____

## ***Corrosion Control Chemicals***

☐ Soda Ash ☐ Caustic ☐ Other

Inspection Details:
- Soda Ash – Sodium Carbonate – typically known as a safer product to handle than caustic. It is a white powder usually in a 50# bag. Used to raise the pH and alkalinity of water to reduce leaching of lead/copper from pipes.
- Caustic – Sodium Hydroxide - an acidic product and proper handling procedures must be used. Is typically delivered in a liquid form. Used to raise the pH of water to reduce leaching of lead/copper pipes.

Requirements:

Recommendations:
- If questions on chemical handling, refer the PWS to Maine Safety Works: 207-623-7900

Product name: _____

Inspection Details:
- Name of chemical

Requirements:

Recommendations:

Manufacturer: _____ Supplier:_____

Inspection Details:
- Manufacturer - Company that produces the chemical
- Supplier – Company that delivers the chemical to the water district

Requirements:

Recommendations:

Are chemicals ANSI/NSF STD 60 certified? ☐ Yes ☐ No

How documented? _____

Inspection Details:
- Look for marking on chemical containers indicating certification
- Review shipping documentation for evidence of certification
- Determine which certification entity has certified the chemical(s) to ANSI/NSF Std 60: Water Quality Association (WQA), National Sanitary Foundation (NSF), Underwriter's Laboratory (UL).
- As needed, use certification entity websites to verify certification
- Waivers on this requirement may be possible.
- See NSF guidance document and handout in section 30 of the Electronic Field Manual

Requirements:
- Per the Maine Rules Relating to Drinking Water, all chemicals in contact with drinking water must be certified to meet ANSI/NSF Standard 60 – 2005: Drinking Water Treatment Chemicals – Health Effects. **(Significant)**
- Label tanks identifying the contents/chemical/mineral inside **(Minor)**

Recommendations:
- Have the system develop an SOP for receipt of chemicals to ensure proper certification upon chemical delivery.

Are chemicals being dosed within the range of their NSF 60 specification? ☐ Yes ☐ No

Inspection Details:
- Ask PWS to confirm this and report back to the DWP

Requirements:
- Chemicals must be dosed within the range of their NSF 60 specification. **(Significant)**

Recommendations:
- Record range of does in an SOP
-

Application Point? ☐ Pre ☐ Post ☐ Both

Inspection Details:
- Where is the chemical injected into the main
- Pre – before any treatment
- Post – after all treatment
- Both – some system inject before and after treatment to aid in the treatment process

Requirements:

Recommendations:

Pump Type? ☐ Diaphragm ☐ Peristaltic ☐ Other _____

Inspection Details:
- A diaphragm pump is a positive displacement pump that works by trapping a fixed amount of liquid and forcing that trapped liquid into the discharge pipe with the use of a diaphragm. When the diaphragm moves up, the pressure decreases, and fluid is drawn into the chamber. When the chamber pressure later increases from decreased volume (the diaphragm moving down), the fluid previously drawn in is forced to the outlet of the pipe. Tend to work better under high pressure
- A Peristaltic pump is a positive displacement pump that works by the use of a rotor inside the pump. The rotor moves in a circular motion around the plastic hose which carries the liquid. The rotor squeezes a section of the tube and pushes the liquid toward the outlet of the pipe

Requirements:
Recommendations:
- A peristaltic pump is the preferred chemical feed pump

Is a redundant pump or spare parts available? ☐ Yes ☐ No

Inspection Details:
- Spare parts or a redundant pump are critical to have in the event a pump will no longer pump liquid

Requirements:
Recommendations
- Always have a proper spare hose for the rotor cavity of a peristaltic pump (the hose can wear out).

What controls the chemical pump operation?

Pressure switch for well pump ____ Flowmeter____

Other: _____

Inspection Details:
- Does the corrosion control pump turn on when the well pump turn on?
- Is the corrosion control feed “paced to flow” based on a flow meter?

Requirements:
- Pump must have automatic controls

Recommendations:

Size of Day Tank (gallons)? _____ Bulk Storage (gallons)? _____

A full day tank = _____ days of supply?

Inspection Details:
- Importance of a day tank is that they limit the amount of overfeed, should an overfeed occur.
- 10 State Standards says the following: Day tanks shall be provided where bulk storage of liquid chemicals is provided. Also: Day tanks should hold no more than a 30 hour supply.

Requirements
Recommendations:
- Day tank should have 1-2 days of chemical only
- Day tanks are strongly recommended for safety reasons; to protect the public in the event of an overfeed.

Tanks and chemical room labeled properly? ☐ Yes ☐ No

Inspection Details:
- Chemical labels and hazmat labels protect employees against biohazards and chemical dangers
- Proper labeling of tanks and chemical rooms is critical
- Should be able to clearly read and identify easily each tank and chemical room

Requirements:
- Must meet DOL/OSHA requirements **(Minor)**

Recommendations:
- Contact Maine Safety works 207-623-7900 for assistance.
- Label mixing recipes on/above the tank

How is chemical monitored? ☐ Continuously ☐ Daily ☐ Other _____

Inspection Details:
- Continuously means they have an in-line analyzer where treated water constantly flows through the analyzer giving a continual reading which is usually captured in some type of SCADA system.
- Daily monitoring is a daily grab sample where a system may use a hand held ph meter.
- Systems that use in-line meters will also collect grab sample to compare readings for accuracy.
- Most larger system have in-line monitors

Requirements:
Recommendations:

What is the analyzer type? _____

Inspection Details:
- What is the make/model of the analyzer?

Requirements:
Recommendations

How often is the analyzer calibrated? (recommend mnfgr's specs) _____

Inspection Details:
- Has it ever been calibrated?
- Do they know the mnfgr's specs?

Requirements:
Recommendations:
- Must be calibrated per manufacturer's specs or an alternate, documented schedule.

.

What residual is being measured? _____

Inspection Details:
- pH reading

Requirements:
Recommendations:

Where is the residual monitored? _____

What is the target residual? _____

Inspection Details:
- What is the pH range/reading they need to maintain?

Requirements:
Recommendations:

Will plant shut down on High/Low levels of chemical? ☐ Yes ☐ No

What are the alarm setpoints? High _____ pH Std Units Low _____ pH Std Units

Inspection Details:
- Often times an alarm is tied to an online analyzer through SCADA and will have a high and low shut-off set point
- Ask if the alarms are working
- Ask how they are tested.

Requirements:
Recommendations:
- Test with a documented frequency and record results.

Are there adequate backflow prevention/antisiphon devices? ☐ Yes ☐ No

Inspection Details:
Requirements:
Recommendations:

Is spill containment adequate? ☐ Yes ☐ No

Inspection Details:
- Does the chemical storage tank have containment?
- Is it large enough to hold a spill from the tank if filled to its maximum?

Requirements:
- Open containers must have 110% secondary containment **(Minor)**
- Must meet DOL/OSHA requirements **(Minor)**

Recommendations:

- Contact Maine Safety works 207-623-7900 for assistance.

Are there sample taps before and after treatment? ☐ Yes ☐ No

Inspection Details:
- Verify that samples taps are available before the chemical is injected and after the chemical is injected
- This allows for the system to see the water quality before the chemical and after the chemical has been injected

Requirements:
Recommendations:
- Sample taps should be present before and after a chemical is injected and may be required by the DWP.

What is the mixing recipe? _____

_____

Inspection Details:
- How many pounds of the chemical is to how many gallons of water
- Is this giving them the desired pH they need?

Requirements:
Recommendations:
- Document ratio in a mixing SOP

Notes: _____

_____

_____

***pH Adjustment Chemicals (if different than Corrosion Control Chemicals)***

☐ Soda Ash ☐ Caustic ☐ Other

Inspection Details:
- Soda Ash – Sodium Carbonate – typically known as a safer product to handle than caustic. It is a white powder usually in a 50# bag. Used to raise the ph and alkalinity of water to reduce leaching of lead/copper from pipes.
- Caustic – Sodium Hydroxide - is an acidic product and proper handling procedures must be used. Is typically delivered in a liquid form. Used to raise the ph of water to reduce leaching of lead/copper pipes.

Requirements:
Recommendations:

Product name: _____

Inspection Details:
- Name of chemical

Requirements:
Recommendations:

Manufacturer: _____ Supplier: _____

Inspection Details:
- Manufacturer - Company that produces the chemical
- Supplier – Company that delivers the chemical to the water district

Requirements:
Recommendations:

Are chemicals ANSI/NSF STD 60 certified? ☐ Yes ☐ No

How documented? _____

Inspection Details:
- Look for marking on chemical containers indicating certification
- Review shipping documentation for evidence of certification
- Determine which certification entity has certified the chemical(s) to ANSI/NSF Std 60: Water Quality Association (WQA), National Sanitary Foundation (NSF), Underwriter's Laboratory (UL).
- As needed, use certification entity websites to verify certification

- Waivers on this requirement may be possible.
- See NSF guidance document and handout in section 30 of the Electronic Field Manual

Requirements:

- Per the Maine Rules Relating to Drinking Water, all chemicals in contact with drinking water must be certified to meet ANSI/NSF Standard 60 – 2005: Drinking Water Treatment Chemicals – Health Effects.
- Label tanks identifying the contents/chemical/mineral inside **(Significant)**

Recommendations:

- Have the system develop an SOP for receipt of chemicals to ensure proper certification upon chemical delivery.

Are chemicals being dosed within the range of their NSF 60 specification? ☐ Yes ☐ No

Inspection Details:

- Ask PWS to confirm this and report back to the DWP

Requirements:

- Chemicals must be dosed within the range of their NSF 60 specification. **(Significant)**

Recommendations:

- Record range of dose in an SOP

Application Point? ☐ Pre ☐ Post ☐ Both

Inspection Details:

- Where is the chemical injected into the main
- Pre – before any treatment
- Post – after all treatment
- Both – some system inject before and after treatment to aid in the treatment process

Requirements:

Recommendations:

Pump Type? ☐ Diaphragm ☐ Peristaltic ☐ Other _____

Inspection Details:

- A diaphragm pump is a positive displacement pump that works by trapping a fixed amount of liquid and forcing that trapped liquid into the discharge pipe with the use of a diaphragm. When the diaphragm moves up, the pressure decreases, and fluid is drawn into the chamber. When the chamber pressure later increases from decreased volume (the diaphragm moving down), the fluid previously drawn in is forced to the outlet of the pipe. Tend to work better under high pressure
- A Peristaltic pump is a positive displacement pump that works by the use of a rotor inside the pump. The rotor moves in a circular motion around the plastic hose which carries the liquid. The rotor squeezes a section of the tube and pushes the liquid toward the outlet of the pipe

Requirements:

Recommendations:

- A peristaltic pump is the preferred chemical feed pump

Is a redundant pump or spare parts available? ☐ Yes ☐ No

Inspection Details:

- Spare parts or a redundant pump are critical to have in the event a pump will no longer pump liquid

Requirements:

Recommendations:

What controls the chemical pump operation?

Pressure switch for well pump ____ Flowmeter____

Other: _____

Inspection Details:

- Does the pH adjustment chemical pump turn on when the well pump turn on?
- Is the pH adjustment chemical feed “paced to flow” based on a flow meter?

Requirements:

- Pump must have automatic controls **(Minor)**

Recommendations:

Size of Day Tank (gallons)? _____ Bulk Storage (gallons)? _____

A full day tank = _____ days of supply?

Inspection Details:
- Importance of a day tank is that they limit the amount of overfeed, should an overfeed occur.
- 10 State Standards says the following: Day tanks shall be provided where bulk storage of liquid chemicals is provided. Also: Day tanks should hold no more than a 30 hour supply.

Requirements:

Recommendations:
- Day tank should have 1-2 days of chemical only
- Day tanks are strongly recommended for safety reasons; to protect the public in the event of an overfeed.

Tanks and chemical room labeled properly? ☐ Yes ☐ No

Inspection Details:
- Chemical labels and hazmat labels protect employees against biohazards and chemical dangers
- Proper labeling of tanks and chemical rooms is critical
- Should be able to clearly read and identify easily each tank and chemical room

Requirements:
- Must meet DOL/OSHA requirements **(Minor)**

Recommendations:
- Contact Maine Safety works 207-623-7900 for assistance.

How is chemical monitored? ☐ Continuously ☐ Daily ☐ Other _____

Inspection Details:
- Continuously means they have an in-line analyzer where treated water constantly flows through the analyzer giving a continual reading which is usually captured in some type of SCADA system.
- Daily monitoring is a daily grab sample where a system may use a hand held ph meter.
- Systems that use in-line meters will also collect grab sample to compare readings for accuracy.
- Most larger system have in-line monitors

Requirements:

Recommendations:

What is the analyzer type? _____

Inspection Details:
- What is the make/model of the analyzer???

Requirements:

Recommendations

How often is the analyzer calibrated? (recommend mnfgr's specs) _____

Inspection Details:
- Has it ever been calibrated?
- Do they know the mnfgr's specs?

Requirements:

Recommendations:
- Must be calibrated per manufacturer's specs or an alternate, documented schedule.

Where is the pH monitored? _____

Inspection Details:

Requirements:

Recommendations:

What is the target residual? _____

Inspection Details:
- What is the pH range/reading they need to maintain?

Requirements:

Recommendations:

Will plant shut down on High/Low levels of chemical? ☐ Yes ☐ No

What are the alarm setpoints? High _____ ppm Low _____ ppm

Inspection Details:
- Often times an alarm is tied to the analyzer through SCADA and will have a high and low shut-off set point

- Ask if the alarms are working
- Ask how they are tested.

Requirements:

Recommendations:

- Test with a documented frequency and record results.

Are there adequate backflow prevention/antisiphon devices? ☐ Yes ☐ No

Inspection Details:

Requirements:

Recommendations:

Is spill containment adequate? ☐ Yes ☐ No

Inspection Details:

- Does the chemical storage tank have containment?
- Is it large enough to hold a spill from the tank if filled to its maximum?

Requirements:

- Open containers must have 110% secondary containment **(Minor)**
- Must meet DOL/OSHA requirements **(Minor)**

Recommendations:

- Contact Maine Safety works 207-623-7900 for assistance.

Are there sample taps before and after treatment? ☐ Yes ☐ No

Inspection Details:

- Verify that samples taps are available before the chemical is injected and after the chemical is injected
- This allows for the system to see the water quality before the chemical and after the chemical has been injected

Requirements:

Recommendations:

What is the mixing recipe? _____

_____

Inspection Details:

- How many pounds of the chemical is to how many gallons of water
- Is this giving them the desired pH they need?

Requirements:

Recommendations:

- Document ratio in a mixing SOP

Notes: _____

_____

_____

## ***Fluoride Chemicals***

☐ Sodium Fluoride ☐ Fluorosilicic Acid ☐ Sodium Fluorosilicate

Inspection Details:

- Sodium Fluoride – NaF – a white powdery substance (a dry additive) that usually comes in 50# bags. Typically used in smaller systems. Bags should not be stacked more than 6 bags high as NaF can cake under compression. Is used in an up flow saturator where the minimum depth of sodium fluoride on the bottom of the tank should be a minimum of 12 inches. Is a much safer product than Fluorosilicic Acid. Should be kept in a secured, dry area away from other chemicals.
- Fluorosilicic Acid – H2SiF6 - FSA - A water based corrosive white to straw colored solution used by many larger public water supplies. Typically delivered in drums or bulk shipment and pumped of the truck into bulk storage tanks. This chemical is typically kept in its own room and vented to the outside due to its corrosive nature.

- Sodium Fluorosilicate - $Na_2SiF_6$ – A white or yellow-white, odorless crystalline powder.

Requirements:
Recommendations:

Product name: _____

Inspection Details:
- Name of chemical

Requirements:
Recommendations:

Manufacturer: _____ Supplier: _____

Inspection Details:
- Manufacturer - Company that produces the chemical
- Supplier – Company that delivers the chemical to the water district

Requirements:
Recommendations:

Are chemicals ANSI/NSF STD 60 certified? ☐ Yes ☐ No

How documented? _____

Inspection Details:
- Look for marking on chemical containers indicating certification
- Review shipping documentation for evidence of certification
- Determine which certification entity has certified the chemical(s) to ANSI/NSF Std 60: Water Quality Association (WQA), National Sanitary Foundation (NSF), Underwriter's Laboratory (UL).
- As needed, use certification entity websites to verify certification
- Waivers on this requirement may be possible.
- See NSF guidance document and handout in section 30 of the Electronic Field Manual

Requirements:
- Per the Maine Rules Relating to Drinking Water, all chemicals in contact with drinking water must be certified to meet ANSI/NSF Standard 60 – 2005: Drinking Water Treatment Chemicals – Health Effects. **(Significant)**
- Label tanks identifying the contents/chemical/mineral inside **(Minor)**

Recommendations:
- Have the system develop an SOP for receipt of chemicals to ensure proper certification upon chemical delivery.

Are chemicals being dosed within the range of their NSF 60 specification? ☐ Yes ☐ No

Inspection Details:
- Ask PWS to confirm this and report back to the DWP

Requirements:
- Chemicals must be dosed within the range of their NSF 60 specification. **(Significant)**

Recommendations:
- Record range of dose in an SOP

Application Point? ☐ Pre ☐ Post ☐ Both

Inspection Details:
- Where is the chemical injected into the main
- Pre – before any treatment
- Post – after all treatment
- Both – some system inject before and after treatment to aid in the treatment process

Requirements:
Recommendations:
- Injector should be placed in the lower third of the pipe at an upward angle to achieve better mixing
- Injector should not be angled straight down into pipe
- Injector should have two feet of separation on either side from other chemical injectors

Pump Type? ☐ Diaphragm ☐ Peristaltic ☐ Other _____

Inspection Details:
- A diaphragm pump is a positive displacement pump that works by trapping a fixed amount of liquid and forcing that trapped liquid into the discharge pipe with the use of a diaphragm. When the diaphragm moves up, the

pressure decreases, and fluid is drawn into the chamber. When the chamber pressure later increases from decreased volume (the diaphragm moving down), the fluid previously drawn in is forced to the outlet of the pipe. Tend to work better under high pressure
- A Peristaltic pump is a positive displacement pump that works by the use of a rotor inside the pump. The rotor moves in a circular motion around the plastic hose which carries the liquid. The rotor squeezes a section of the tube and pushes the liquid toward the outlet of the pipe

Requirements:
Recommendations:
- A peristaltic pump is the preferred chemical feed pump

Is a redundant pump or spare parts available? ☐ Yes ☐ No

Inspection Details:
- Spare parts or a redundant pump are critical to have in the event a pump will no longer pump liquid to prevent a possible boil water order if used for disinfection.

Requirements:
Recommendations:
- Always have a proper spare hose for the rotor cavity of a peristaltic pump (the hose can wear out).

What controls the chemical pump operation?

Pressure switch for well pump ____ Flowmeter____

Other: _____

Inspection Details:
- Does the fluoride pump turn on when the well pump turn on?
- Is the fluoride feed "paced to flow" based on a flow meter?

Requirements:
- Pump must have automatic controls **(Minor)**

Recommendations:

Size of Day Tank (gallons)? _____ Bulk Storage (gallons)? _____

A full day tank = _____ days of supply?

Inspection Details:
- Importance of a day tank is that they limit the amount of overfeed, should an overfeed occur.
- 10 State Standards says the following: Day tanks shall be provided where bulk storage of liquid chemicals is provided. Also: Day tanks should hold no more than a 30 hour supply.
- How are day tanks filled?
- For dry additives (particularly Sodium Fluoride) an upflow saturator can double as a day tank (water flows through bed, becomes saturated with fluoride additive, then saturated solution is injected into distribution line). Operators need to provide sufficient time to dissolve saturated solutions. Some cold climate systems with high hardness find better results by elevating the feed water temperature.
- Sodium Fluorosilicate (sometimes Sodium Fluoride) typically use volumetric or gravimetric feeders which deliver a constant volume or a measured quantity of dry additive by means of a rotating helix or scale to a solution tank.

Requirements:
Recommendations:
- Day tank should have 1-2 days of chemical only
- Day tanks are strongly recommended for safety reasons; to protect the public in the event of an overfeed.
- Avoid filling day tank by gravity.
- Positive manual pumping to fill day tank; no automatic refilling.
- Minimum of 5 minutes to dissolve NaF. More time required for hard water or colder temperatures (<60F).

Are Fluorosilicic Acid tanks properly vented? ☐ Yes ☐ No

Inspection Details:
- Are day tanks and bulk storage vented to the outside?
- Is there etching on surfaces in chemical storage room?

Requirements:
Recommendations:
- By standard, the vent line to the outside should be the at least the same diameter as the tank fill line
- If there is significant etching on surfaces within chemical storage room, the vent is either not properly sized or sealed – resize vent or conduct a pressure test to check for air tightness in vent line.

Tanks and chemical room labeled properly? ☐ Yes ☐ No

Inspection Details:
- Chemical labels and hazmat labels protect employees against biohazards and chemical dangers
- Proper labeling of tanks and chemical rooms is critical
- Should be able to clearly read and identify easily each tank and chemical room
- All delivery points should be clearly labeled

Requirements:
- Must meet DOL/OSHA requirements. **(Minor)**

Recommendations:
- Contact Maine Safety works 207-623-7900 for assistance.
- Standard painting identification for pipes is light blue with red bands.

How is chemical monitored? ☐ Continuously ☐ Daily ☐ Other _____

Inspection Details:
- Continuously means they have an in-line analyzer where treated water constantly flows through the analyzer giving a continual reading which is usually captured in some type of SCADA system.
- Daily monitoring is a daily grab sample where a system may use a hand held meter.
- Systems that use in-line meters will also collect grab sample to compare readings for accuracy.
- Most larger systems have in-line monitors.
- Check if tank has a calibration cylinder – installed in the piping manifold, these cylinders verify pump discharge rates are accurate. Particularly important with fluoride as flow rates tend to be very small.

Requirements:

Recommendations:

What is the analyzer type? _____

Inspection Details:
- What is the make/model of the analyzer?
- Two bench test methods: colorimetric or specific ion electrode (SIE).

Requirements:

Recommendations:
- SIE testing typically more accurate than colorimetric.

How often is the analyzer calibrated? (recommend mnfgr's specs) _____

Inspection Details:
- Has it ever been calibrated?
- Do they know the mnfgr's specs?

Requirements:

Recommendations:
- Must be calibrated per manufacturer's specs or an alternate, documented schedule.

Where is the residual monitored? _____

Inspection Details:
- Verify sampling location is representative of flow

Requirements:

Recommendations:

What is the target residual? _____

Inspection Details:
- What is the fluoride range/reading they need to maintain?

Requirements:
- DWP rules optimal range is 0.7 – 1.2 mg/l.
- Lowest level fluoride can be set at is 0.7mg/l. **(Significant)**
- SMCL is 2.0mg/l **(Significant)**

Recommendations:

Will plant shut down on High/Low levels of Fluoride? ☐ Yes ☐ No

What are the alarm setpoints? High _____ ppm Low _____ ppm

Inspection Details:

- Often times an alarm is tied to the fluoride analyzer through SCADA and will have a high and low shut-off set point
- Ask if the alarms are working
- Ask how they are tested.

Requirements:
Recommendations:
- Test with a documented frequency and record results.

Are there adequate backflow prevention/antisiphon devices? ☐ Yes ☐ No

Inspection Details:
Requirements:
Recommendations:

Is spill containment adequate? ☐ Yes ☐ No

Inspection Details:
- Does the chemical storage tank have containment?
- Is it large enough to hold a spill from the tank if filled to its maximum?

Requirements:
- Open containers must have 110% secondary containment **(Minor)**
- Must meet DOL/OSHA requirements **(Minor)**

Recommendations:
- Contact Maine Safety works 207-623-7900 for assistance.

Is fluoride chemical stored separately from other chemicals? ☐ Yes ☐ No

Inspection Details:
- Dry additives should be secured away from other chemicals and in a dry location, bags should be elevated from floor and stacked no more than six high (to prevent damage to the chemical).
- Sili Acid should never be stored next to other chemicals.
- Ideally fluoride operations should have their own room; without this, careful segregation of chemicals is critical to safe operations.

Requirements:
Recommendations:

Is Fluorosilicic Acid on a weight scale? ☐ Yes ☐ No

Inspection Details:
- Day tanks or direct acid feed carboys/drums should be located on scales to improve management and verification of precise fluoride feed.
- Daily weights should be measured and recorded.
- Fluoride is an extremely unique additive to drinking water in that once added to water, in any strength – it is tasteless and odorless.

Requirements:
Recommendations:

Are there sample taps before and after treatment? ☐ Yes ☐ No

Inspection Details:
- Verify that samples taps are available before the chemical is injected and after the chemical is injected
- This allows for the system to see the water quality before the chemical and after the chemical has been injected

Requirements:
Recommendations:
- Sample taps should be present before and after a chemical is injected and may be required by the DWP.

What is the mixing recipe? _____

Inspection Details:
- The depth of sodium fluoride in a saturator should be 12 inches. This depth should be marked on the outside of the saturator tank.
- The saturator should never be filled so high that the undissolved chemical is drawn into the pump suction line.
- If diluting Sili Acid, mix in the range of 100:1, avoiding the danger zone of 10:1 to 20:1 where scaling can occur.

Requirements:
Recommendations:
- Document ratio in a mixing SOP

Notes: _____

## ***Air Stripping***

Type of air stripping system: ☐ Lowry ☐ Shallow Tray ☐ Packed Tower ☐ Spray ☐ Other

Inspection Details:

- Lowry – Engineered by Dr. Jerry Lowry. System is a multi-staged deep bubble air stripper. Diffuser systems (like Lowry) inject air (usually as bubbles) into water. The radon moves from the water to the bubbles as they move through the liquid. The bubble then reach the surface of the water which is vented to the outside releasing the Radon gas.
- Shallow Tray – a system that is in the shape of a tower that contains a series of slats or trays with perforated bottoms. Water entering the trays is distributed over the slats as air is added to flow past the thin layer of water formed.
- Packed Tower – (PTA) – is the most common technology for treatment of large flows of water with high Radon concentrations. Raw water is sprayed into the top of the tower (3–9 m high) and trickles down over plastic packing (for example, rings and saddles) that has a high ratio of surface area to volume. Simultaneously, a flow of air is pumped through the packing. The treated water is collected in a reservoir below the tower and pumped to a pressurized storage tank or directly into the distribution system. Air containing the radon is released from the top of the tower.
- Spray – a system where water is formed into droplets when it is forced through a nozzle. The droplets are sprayed in different directions into a large volume of air.

Requirements:
Recommendations:

Manufacturer: _____

Inspection Details:

- Manufacturer - Company that makes/builds the aerator.

Requirements:
Recommendations:

Purpose: ☐ Radon Removal ☐ Corrosion Control ☐ Other: _____

Inspection Details:

- Why has the system installed the aeration unit? What are they trying to remove from the water.
- Radon Removal – Aeration is the most common treatment for Radon removal as it will remove the radon gas very effectively.
- Corrosion Control – Some systems use aeration to remove Carbon Dioxide (CO2). CO2 in water increases the acidity, therefore making the water more corrosive. CO2 being a gas is removed by aeration to raise the pH of the water.

Requirements:
Recommendations:

Is post aeration water disinfected? ☐ Yes ☐ No

Inspection Details:

- Because aeration units pull in air from the outside it can increase the risk of bacterial contamination.
- Systems are not required to disinfect after an aeration unit but the system should understand that if they begin to have bacteria problems they will likely be required to disinfect.

Requirements:
Recommendations:

Are air intakes & outlets screened? ☐ Yes ☐ No

Inspection Details:

- The air intake is the area where air is being pulled into the radon contact chamber
- The air outlet is the area where the radon gas or Co2 is being released to the outside
- Both intake and outlets must be screened with rodent screening to prevent any rodents/animals from entering the piping.

Requirements:

- Vent must be screened ( ¼ ” to ½” mesh) to prevent birds from entering **(Minor)(S.D)**
- The area surrounding an air inlet must be clean and free of dust and debris **(either)(S.D.)**
- The vent cannot be an open vertical pipe. **(Minor)(S.D)**

Recommendations:

- Inspect air intakes and outlets annually
- For radon removal, the external vent needs to extend above roof level to avoid human contact with exiting air.
- Strongly recommend the outlet pipe to goose neck down.

Is the air outlet located a safe distance from the air inlet? ☐ Yes ☐ No

Inspection Details:

- The air outlet should be located far enough away from the air inlet to prevent pulling in the same air which is being released with Radon and/or CO2.
- Often the air outlet is located on the roof of the building and the air intake is located on the side of the building.

Requirements:
Recommendations:

Does the system have HEPA filters on the air intake? ☐ Yes ☐ No

Inspection Details:

- HEPA – high efficiency particulate air
- Is a filter that removes 99.97% of all particles greater than 0.3 micrometer from the air passing through.
- Designed to remove the particles that can carry bacteria contamination.
- Systems are not required to install a HEPA filter with their aeration unit unless bacteria problems occur in finished water.

Requirements:
Recommendations:

Is the outlet air protected from human consumption? ☐ Yes ☐ No

Inspection Details:

- The outlet air is where the Radon gas is released.
- The outlet air should not be located near any windows, doors, vents etc. that would allow for close human contact.
- Ideally on the back side of a building, away from windows, vents, humans etc.

Requirements:
Recommendations:

Are there sample taps before and after treatment? ☐ Yes ☐ No

Inspection Details:

- Verify that samples taps are available before the aeration unit and after the aeration unit
- This allows for the system to see the water quality before aeration and after aeration
- The DWP compliance officer may require sampling taps before and after treatment.

Requirements:
Recommendations:

How often is the unit serviced? _____

Inspection Details:

- Manufacturer's recommendations.
- Have the filters been inspected/cleaned/replaced per a written SOP

Requirements:
Recommendations:

Notes: _____

_____

_____

## ***Ion Exchange***

Purpose: ☐ Softening ☐ Contaminant Removal ☐ Other _____

Inspection Details:

- Softening (Cation Exchange) – removal of calcium and magnesium due to hard water. Non-MCL related
- Contaminant Removal – MCL related. Required treatment. Usually Anion Exchange, May include arsenic, uranium, nitrate etc.

Requirements:
Recommendations:

Type: ☐ Anion ☐ Cation

Inspection Details:
- Anion – removes negatively charged atoms by exchanging it with chloride or hydroxide. This includes nitrate, sulfate, arsenic, uranium etc.
- Cation (softeners)– removes positively charged atoms by exchanging it with sodium. This includes Calcium, magnesium, iron, radium, zinc etc.

Requirements:
Recommendations:

Manufacturer: _____

Inspection Details:
- Manufacturer - Company that makes the unit.

Requirements:
Recommendations:

Installer: _____

Inspection Details:
- Person or company who installs the treatment at the public water supply.

Requirements:
Recommendations:

Contaminants Removed: _____

Inspection Details:
- List the contaminant (nitrates, uranium, arsenic etc.) that the treatment is designed to treat for and remove.

Requirements:
Recommendations:

Resin Type: _____

Inspection Details:
- Resin is the small synthetic beads located in the ion exchange tank.
- The beads are treated to selectively adsorb either cations (positive) or anions (negative) and exchange certain ions based on their relative activity compared to the resin.

Requirements:
Recommendations:

Number of tanks: _____ ☐ Parallel ☐ Series

Inspection Details:
- How many ion exchange tanks are there. Typically there are two.
- Do the tanks operate in parallel or series
  - Parallel - Tanks are said to be “in parallel” when the incoming water from the well is sent to the treatment and as it approaches the treatment, the line splits and the flow is fed to 2 or more tanks at the **same time**. Once it is treated by flowing through the tanks the pipes will manifold into one again.
  - Series – When the tanks are said to be “in series” the incoming water from the well is sent through the first ion exchange tanks then it proceeds to be fed through the next tank and so on. Sometime “series” installation is termed “lead-lag”, but this term has other meanings and is not recommended for describing “series” installation.

Requirements:
Recommendations:

Is there a partial by-pass for blending purposes? ☐ Yes ☐ No

Inspection Details:
- See Treatment Review and Approval Policy and Procedure which includes our by-pass policy (DWP0161)

Requirements:
Recommendations:

Are there sample taps before and after treatment? ☐ Yes ☐ No

Inspection Details:

- Verify that samples taps are available before the chemical is injected and after the chemical is injected
- This allows for the system to see the water quality before the chemical and after the chemical has been injected

Requirements:

- The DWP compliance officer may require sampling taps before and after treatment.

Recommendations:

Is raw & treated water routinely monitored to determine removal efficiency? ☐ Yes ☐ No

Inspection Details:

- By measuring raw and treated water you can closely monitor the efficiency of the treatment system.
- This is a good operation & maintenance practice for a system to track how well their treatment is working.
- Depending on their original levels a system will be on quarterly or annual testing of the contaminant so the DWP tracks this closely. If levels start to increase the system is notified to have the treatment inspected.

Requirements:

Recommendations:

How often is the unit serviced? _____

Inspection Details:

- Should be serviced per manufactures recommendations/annually or per instructions in a written SOP.
- Should keep and have reviewable a maintenance log sheet showing this information.

Requirements:

Recommendations:

- Have the ion exchange system serviced/maintained annually.

What initiates the regeneration cycle? (enter number and units):

☐ Time: _____ ☐ Flow: _____ ☐ Other: _____

Inspection Details:

- The process of ion exchange will continue until all available exchange sites are filled, at which point the resin is exhausted and must be regenerated by using the salt/brine mix.
- Regeneration - Regeneration is achieved by passing a NaCl solution (brine) through the resin, exchanging the hardness or nitrate, uranium, arsenic ions etc. for sodium or chloride ions.
- Typically the regeneration cycle is based on either time or a maximum flow through the treatment.

Requirements:

Recommendations:

Is the salt ANSI/NSF STD 60 certified? ☐ Yes ☐ No

How documented? _____

Inspection Details:

- Check bags for labeling.

Requirements:

- Use ANSI/NSF Std 60 Certified Salt **(Significant)**

Recommendations:

Is there an air gap on the backwash drain line into sewer/septic? ☐ Yes ☐ No

Where is the backwash discharge disposed? _____

_____

Inspection Details:

- Determine where the regeneration/backwash discharge is being disposed of.
- Check for air gap of two times the inlet diameter of the pipe.
- Refer to Treatment Review and Approval Policy and Procedure (DWP0161)

Requirements:

- Where backwash waste water lines drain into a sewer pipe, an air gap of two times the inlet diameter pipe must be maintained. Air gap fittings approved by the plumbing code are “listed and labeled”. **(Significant)(S.D)**
- Backwash waste water may not be disposed of on the ground or in a dry well. **(Minor)**

Recommendations:

Notes: _____

_____

***Other Treatment (1)***

Name: _____

Purpose: _____

Manufacturer: _____ Supplier: _____

Are chemicals ANSI/NSF STD 60 certified? ☐ Yes ☐ No

How documented? _____

Are chemicals being dosed within the range of their NSF 60 specification? ☐ Yes ☐ No

Application Point? ☐ Pre ☐ Post ☐ Both

Pump Type? ☐ Diaphragm ☐ Peristaltic ☐ Other _____

Is a redundant pump or spare parts available? ☐ Yes ☐ No

What controls the chemical pump operation?

Pressure switch for well pump ____ Flowmeter____

Other: _____

Size of Day Tank (gallons)? _____ Bulk Storage (gallons)? _____

A full day tank = _____ days of supply?

Tanks and chemical room labeled properly? ☐ Yes ☐ No

How is chemical monitored? ☐ Continuously ☐ Daily ☐ Other _____

What is the analyzer type? _____

How often is the analyzer calibrated? (recommend mnfgr's specs) _____

What residual is being measured? _____

Where is the residual monitored? _____

What is the target residual? _____

Will plant shut down on High/Low levels of Chemical? ☐ Yes ☐ No

What are the alarm setpoints? High _____ ppm Low _____ ppm

Are there adequate backflow prevention/antisiphon devices? ☐ Yes ☐ No

Is spill containment adequate? ☐ Yes ☐ No

Are there sample taps before and after treatment? ☐ Yes ☐ No

What is the mixing recipe? _____

_____

Notes: _____

_____

**********

# FILTRATION PROCESS INFORMATION

## ***Filtration Process***

Type: ☐ Conventional ☐ Direct ☐ Slow Sand ☐ Membrane ☐ Alternative ☐ Other: _____

Inspection Details:

- Conventional – **Conventional filtration, as defined in 40 CFR 141.2, is a series of processes including coagulation, flocculation, sedimentation, and filtration resulting in substantial particulate removal. Conventional filtration is the most common type of filtration**
- Direct – **Direct filtration, as defined in 40 CFR 141.2, is a series of processes including coagulation and filtration, but excluding sedimentation, and resulting in substantial particulate removal. Typically, direct filtration can be used only with high-quality raw water that has low levels of turbidity and suspended solids.**
- Slow Sand – is a filtration process that creates a complex biological film that grows naturally on the surface of the sand. It is this *Schmutzdecke* layer that provides the effective purification
- Alternative – examples include micro-filtration, membrane, strain rite and bag filters, and package plants
- Membrane – See section below on Membrane Filtration

Requirements:
Recommendations:

Filter Manufacturer: _____

Number of filters in use: _____ Design flow rate (if known) : _____

Inspection Details:

- How many are actually in use vs. how many filters in total. Some systems may have one filter off line at all times.
- Don't count filters that are off-line at all times.

Requirements:
Recommendations:

Vessel Dimensions: _____

Date the filter media was last evaluated: _____

Inspection Details:

- Are they checking the media e.g. core samples, taking media measurements etc.
- May send out for evaluation

Requirements:
Recommendations:

Date the filter media was last changed or regenerated? _____

Inspection Details:

- Has it been changed, replaced, added to etc.

Requirements:
Recommendations:

How are filters cleaned? ☐ Air Scour ☐ Surface Wash ☐ Other _____

Inspection Details:
Requirements:
Recommendations:

How is filter performance evaluated? _____

Inspection Details:

- Has a CPE (Comprehensive Performance Evaluation) been done?.

Requirements:

Recommendations:

_____

Notes: _____

_____

***Filter Media***

| MEDIA LAYER | DEPTH OF MEDIA (IN) | TYPE OF MEDIA |
|---|---|---|
| **1 (top)** | | |
| **2** | | |
| **3** | | |
| **4** | | |
| **5 (bottom)** | | |

**Types of media: anthracite, garnet, GAC, sand, Gravel, support gravel, manganese greensand*

How is media loss measured? _____

Inspection Details:
- A mark on the wall or by a yard stick is the most common method.

Requirements:
Recommendations:

***Filter Backwashing***

Frequency (hrs)? _____ Volume (Gals): _____

Does the system backwash with clean (finished) water? ☐ Yes ☐ No

Inspection Details:
- Finished water is not required. They can backwash with raw water
- Finished water is more ideal because less contaminants are going back in

Requirements:
Recommendations:

Is backwash recycled? ☐ Yes ☐ No

If yes, percentage: _____%

Inspection Details:
- Maximum of 10% can be recycled – this is a guidance taken from 10 State Standards it is not in the rules.
- Most system recycle 3-4% or less
- Recycled water **must** be piped back to the **head** of the plant (prior to all treatment)

Requirements:
Recommendations:

Backwash is started by which of the following parameters?

☐ Headloss ☐ Time ☐ Turbidity ☐ Other: _____

Inspection Details:
- Some systems may have more than one parameter that starts the backwash
- Most often see time

Requirements:
Recommendations:

Is filter to waste used? ☐ Yes ☐ No

Inspection Details:
- Usually waste water is sent to a lagoon.

Requirements:
Recommendations:

What criteria are used to determine when a filter goes back on-line? _____

Inspection Details:
- Examples include low turbidity levels, time, after bacteria sample, etc.
- Depends on filter type

Requirements:
Recommendations:

How is the backwash disposed of? (recycled?): _____

_____

Inspection Details:
- Lagoons - waste evaporates from the lagoons. A DEP discharge permit may be required.
- If going to surface water must have a DEP discharge permit. Usually sent to a holding tank then decant is sent to the ground which is why a permit with DEP in needed.
- Sanitary Sewer – if waste is disposed of to the POTW then adequate backflow protection must be installed where appropriate. POTW must approve of waste going to the POTW

Requirements:
Recommendations:

What are the high turbidity alarm setpoints? _____

_____

Inspection Details:
- Set points are typically set lower than regulatory limits.

Requirements:
Recommendations:

Will the plant shut down on high turbidity? ☐ Yes ☐ No

Inspection Details:
- A plant that has a high alarm set point can also be designed so that the plant will automatically shut down when it reaches this high point.

Requirements:
Recommendations:
- It should shut down or it could initiate a backwash or filter to waste.

If yes, at what level will it shut down? _____

## Combined Filter Effluent (CFE) Turbidity Limits

| FILTRATION TYPE | 95% LIMIT | ACUTE LIMIT |
|---|---|---|
| Conventional | 0.3 NTU | 1 NTU |
| Slow Sand | 1 NTU | 5 NTU |
| Direct | 0.3 NTU | 1 NTU |
| Diatomaceous Earth | 1 NTU | 5 NTU |
| Alternative (clarifier with filter)* | 0.3 NTU | 1 NTU |
| Alternative (other)* | ≤1 NTU | ≤5 NTU |
| Unfiltered** | none | 5 NTU |

* The package plant type surface systems previous classified as *Direct Filtration* that were reclassified as *Alternative Filtration* in 2011/2012 have turbidity limits of 0.3 NTU (95%) and 1 NTU (acute). *Alternative Filtration* technologies other than those just identified such as cartridge filters, membrane filters, macrolite media, etc. have turbidity limits no greater than 1 NTU (95%) and no greater than 5 NTU (acute); for details regarding specific turbidity limits for any of these systems check with the Compliance Officer.

** Unfiltered surface water systems have additional requirements that require follow-up activities if the turbidity exceeds 1 NTU.

Note: the table above does not include individual filter effluent (IFE) turbidity requirements.

Notes: _____

_____

## ***Rapid Mix***

Inspection Details:
- Designed to break up laminar flow – causes turbulent water which helps mix coagulants and or flocculants.

Requirements:
Recommendations:

Type of Mixer: ☐ In-Line Static ☐ Other _____

What is the purpose of the rapid mix: _____

Is the mixing adequate (how is this known): _____

Notes: _____

_____

## ***Flocculation Basin***

Inspection Details:
- Agitation dispersal of coagulant chemical so it comes into contact with particulate matter to form larger particles

Requirements:
Recommendations:

Number of Floc Basins: _____

Type of Mixer: _____

Inspection Details:
- Some system may not have a mixer

Requirements:
Recommendations:

Basin Dimensions _____

Are baffle walls used? ☐ Yes ☐ No

Describe flocculation characteristics in this process: _____

_____

Inspection Details:
- Examples include pin floc, conventional systems looking for pea sized floc

Requirements:
Recommendations:

Are jar tests or streaming current detectors used to optimize coagulant dosing?

☐ Yes ☐ No

Inspection Details:
- System should use one or the other
- Current detectors measure the electrical charge of the water which affects efficiency of the floc

Requirements:
Recommendations:

Notes: _____

_____

## ***Coagulant***

Inspection Details:
- A coagulant will reduce the charge of the water to allow the particles to come together
- Chemicals include Aluminum Sulfate (Alum), Poly Aluminum Chloride (PAC) or Poly Aluminum Hydrochloride

Requirements:
Recommendations:

Chemical Used? _____

Have other types been tried? ☐ Yes ☐ No Type: _____

Does the coagulant contain acrylamide or epichlorohydrin ☐ Yes ☐ No

If yes, has the PWS submitted its annual certification? ☐ Yes ☐ No

Inspection Details:
- 40 CFR 141.111
- They are carcinogens that cannot be found in the coagulant

Requirements:
Recommendations:

Notes: _____

## ***Sequestrant***

Inspection Details:
- Poly Phosphate that binds with a metal to keep it dissolved

Requirements:
Recommendations:

Chemical Used? _____

Have other types been tried? ☐ Yes ☐ No Type: _____

Does the sequestrant contain acrylamide or epichlorohydrin ☐ Yes ☐ No

If yes, has the PWS submitted its annual certification? ☐ Yes ☐ No

Notes: _____

_____

## ***Sedimentation Basin***

Number of Units: _____

Volume of Each Basin (gal): _____

Dimensions: _____

How often is post-sedimentation turbidity measured? _____ _____

What is the post-sedimentation turbidity? _____NTU

How often is pre-sedimentation turbidity measured? _____

What is the presedimentation turbidity? _____NTU

Inspection Details:

- The above 4 questions are not a rule requirement but are an integral part of the process to optimize treatment

Requirements:
Recommendations:

Describe Basin Characteristics: _____

_____

How is the sedimentation basin cleaned? _____

_____

Notes: _____

_____

_____

***Clarifiers***

Clarifier Manufacturer: _____

Number of Clarifiers: _____ Volume of each unit: _____(Gals)

Dimensions: _____

Clarifier Type: ☐ media ☐ tubes ☐ Other : _____

Type of media used: _____

Date media was last inspected: _____

Is pre-clarification turbidity monitored? ☐ Yes ☐ No

If yes, what is pre-clarification turbidity? _____NTU

Is post-clarification turbidity monitored? ☐ Yes ☐ No

If yes, what is post-clarification turbidity? _____NTU

Inspection Details:

- The above 2 questions are not a rule requirement but are an integral part of the process to optimize treatment

Requirements:
Recommendations:

Is the clarifier flushed to waste? ☐ Yes ☐ No

Clarifier Flushing:

Frequency of flushing (hrs)? _____ Volume (Gal): _____

Clarifiers are flushed with: ☐ Raw water ☐ Filtered water ☐ Finish water

How is the flushed water disposed of? _____

Which of the following controls flush frequency?

☐ Head loss ☐ Turbidity ☐ Time ☐ Other: _____

Is air scouring used during flushing? ☐ Yes ☐ No

Notes: _____

***Chemical Receiving***

Are chemical receiving records kept showing the chemical, date, supplier, and verification of Std 60 compliance ☐ Yes ☐ No

Inspection Details:
- For every delivery a record should be kept showing this information verified to ensure that the chemical is the correct chemical and that it meets Std 60

Requirements:
- Per the Maine Rules Relating to Drinking Water, all chemicals in contact with drinking water must be certified to meet ANSI/NSF Standard 60 – 2005: Drinking Water Treatment Chemicals – Health Effects. **(Significant)**

Recommendations:
- Have the system develop an SOP for receipt of chemicals to ensure proper certification upon chemical delivery.

## Membrane Filtration

Inspection Details:
- Water is forced through porous membrane under pressure while suspended solids, larger molecules, or ions are held back or rejected.

Membrane Type: Microfiltration ☐ Ultrafiltration ☐ Nanofiltration ☐ Reverse Osmosis ☐

Inspection Details:
- **Microfiltration:** Pore size 0.1-0.2 micron and operating pressure of 15 to 60-psi. Removes Giardia and Crypto, but not viruses.
- **Ultrafiltration:** Pore size 0.01 to 0.05-micron and operating pressure of 30 to 100-psi. Removes Giardia, Crypto, and some viruses.
- **Nanofiltration:** Pore size .001-micron and operating pressure of 90 to 150-psi. Removes Giardia, Crypto, and viruses. Requires more energy than micro and ultra and also removes alkalinity which results in corrosive post-filtration water.
- **Reverse Osmosis:** Pore size .0001-micron and operating pressure of 30 to 250-psi. Removes Giardia, Crypto, and viruses. Produces the most wastewater at between 25-50% of feed.

Membrane Module Type: Hollow Fiber ☐ Spiral-Wound ☐ Cartridge ☐ Other ☐

Inspection Details:
- **Hollow Fiber:** 100 to 10K long and very narrow tubes, typically bundled together longitudinally, potted in a resin on both ends, and encased in a pressure vessel. Common for MF and UF membranes.
- **Spiral-Wound:** A sandwich arrangement of flat membrane sheets called a “leaf” wound around a central perforated tube. One leaf consists of two membrane sheets placed back to back and separated by a fabric spacer called a permeate carrier. A single spiral-wound module 8 inches in diameter may contain up to approximately 20 leaves. Common for NF and RO membranes.
- **Cartridge:** A flat sheet membrane is placed between a feed and filtrate support layer then pleated to increase the membrane surface area, and sealed within a plastic cartridge. *Membrane pore size must not exceed 1-micron to qualify as membrane filter.* Are not automated, are replaced rather than backwashed/cleaned.
- **Other:** hollow-fine-fiber (HFF), tubular, and plate-and-frame type modules. Seldom employed for drinking water treatment.

Filter Manufacturer: _____

Number of filters in use: _____

How is membrane integrity **directly** tested?

☐ Pressure/ Vacuum Decay ☐ Diffusive Airflow ☐ Particulate/ Molecular Marker

☐ Other: _____

Inspection Details:
- Direct Integrity Test: A physical test applied to a membrane unit in order to identify and isolate breaches.

- Pressure Decay Test: A test pressure is applied on the membrane, and the subsequent loss in pressure is monitored over several minutes. Generally associated with MF, UF, and MCF systems.
- Vacuum Decay Test: A test pressure is applied by drawing a vacuum on the membrane and monitoring the rate of vacuum decay over a period of time. Generally associated with spiral-wound NF and RO membranes.
- Diffusive Airflow Test: Provides a direct measurement of the airflow through an integrity breach; the test pressure is kept constant and the airflow through a breach is measured. Generally associated with MF, UF, and MCF membranes.
- Particulate/ Molecular Marker Test: A surrogate particle/molecule is periodically applied to the feed water concentrations of a particulate or molecular marker are measured in the feed and filtrate.

Requirements:

- The direct integrity test must be responsive to an integrity breach on the order of 3 □m or less.
- The direct integrity test must be able to verify a log removal value equal to or greater than the removal credit awarded to the membrane filtration process.
- A direct integrity test must be conducted on ***each membrane unit*** at a frequency of no less than once each day that the unit is in operation. Less frequent testing may be approved by the State if supported by demonstrated process reliability, the use of multiple barriers effective for *Cryptosporidium*, or reliable process safeguards.
- If the results of a direct integrity test exceed the upper control limit (UCL), the affected unit must be immediately taken off-line for diagnostic testing and subsequent repair.

Recommendations:

## How is membrane integrity **indirectly** tested?

☐ Turbidity Monitoring ☐ Particle Counting ☐ Particle Monitoring

☐ Other: _____

Inspection Details:

- Indirect Integrity Test: The monitoring of filtrate water quality on a continuous basis to verify membrane integrity.
- Turbidity Monitoring: the default indirect integrity monitoring technique under the LT2ESWR.
- Particle Countering: A laser-based light scattering technique to count particles and group them according to size.
- Particle Monitoring: A laser-based light scattering technique to measure particulate water quality on a dimensionless scale relative to an established baseline.

Requirements:

- Unless the state approves an alternative parameter, continuous indirect integrity monitoring must include continuous filtrate turbidity monitoring.
- Monitoring must be conducted at least once every 15 minutes on each membrane unit.
- If filtrate turbidity is above 0.15 NTU in two consecutive 15-minute readings, direct integrity testing must be performed immediately.

Recommendations:

## How is membrane flux maintained/ re-established after fouling?

☐ Backwash ☐ Chemically Cleaned ☐ Combination

☐ Other: _____

Inspection Details:

- During a backwash cycle, the direction of flow is reversed for a period ranging from about 30 seconds to 3 minutes. The force and direction of the flow dislodge the contaminants at the membrane surface and wash accumulated solids out through the discharge line.
- MF and UF membrane filtration systems are generally backwashed with intervals of 15 to 60 minutes between backwash events.
- NF and RO membrane systems are not backwashed.
- Some systems (MF/UF/NF/RO) use chemicals (such as acids, bases, surfactants, or other proprietary chemicals) for chemically cleaning the membranes.
- While backwashing may be conducted on a routine basis, chemical cleaning is typically conducted only when necessary.

Requirements:

- Follow manufacturer's specifications for determining backwash frequency.
- If chemicals other than chlorine are used for chemical cleaning, cross-connection control measures for the backwash piping must be in place.
- Chemicals for cleaning must be certified to NSF 60 standard

Recommendations:

- MF/UF systems are typically chemically cleaned every 30 days.

- NF/RO systems are typically chemically cleaned every 3 months to 1 year.
- Utilize chemical cleaning regimen specified by the manufacturer or identified based on site-specific pilot testing and source water quality analyses

How is backwash/waste disposed of? _____

Inspection Details:
- Disposal options for MF/UF backwash residuals are similar to those for conventional water treatment plants, and typically include discharge to surface water, a sanitary sewer, and solids disposal.

Requirements:
- The discharge of backwash residuals to surface water bodies or the sanitary sewer is likely to be subject to State and/or local regulations and, in the case of surface water discharge, to require a permit.

Recommendations:

Notes:_____

_____

_____

_____

_____

**********

## FINISHED WATER INFORMATION

### *Finished Water Storage*

☐ Clearwell ☐ Contact Tank ☐ Other _____

Inspection Details:
- A clearwell and contact tank can both be baffled
- A clearwell or contact tank is often seen in larger systems to allow a disinfectant to be held in storage for a short time before additional treatment is added or before going to the distribution
- These are typically concrete tanks located under or just outside the treatment plant.
- A contact tank is used to achieve required CT.
- Other – another way to store disinfected water is through a large diameter pipe through the ground such as a transmission main or looping pipe system.

Requirements:

Recommendations:

Depth (ft) _____ Width (ft) _____ Length (ft) _____

or vessel dimensions: _____

Number of installed units: _____

Is storage protected from spills? ☐ Yes ☐ No

Can storage be isolated for cleaning maintenance? ☐ Yes ☐ No

Inspection Details:
- Isolated means taken off line
- Clearwells/contacts tanks typically cannot be isolated because they need to achieve the chlorine contact time/CT.

Requirements:

Recommendations:

Is storage overflow located and screened properly? ☐ Yes ☐ No

Are storage vents separate from overflow? ☐ Yes ☐ No

Inspection Details:

Requirements:

- Storage vent and overflow must be separate. Should not use the overflow as the vent. **(Minor)**

Recommendations:

Are storage vents screened? ☐ Yes ☐ No

Inspection Details:

Requirements:

- Bird/Rodent screening is required (1/4" or ½" mesh) **(Minor)(S.D)**

Recommendations:

Contact Tank Questions:

Is the contact tank baffled? ☐ Yes ☐ No

Inspection Details:

- Baffled: when walls are added to the tank for the water to flow through like a maze. This allows for longer time in the tank increasing chlorine effectiveness

Requirements:

Recommendations:

What is the contact time? _____

Inspection Details:

- Contact time is the mathematical product of a "residual disinfectant concentration".
- Tables are located in the CFR
- Questions on this should be directed to the compliance officer for the PWS.
- Specific Contact times may be required of a PWS. See Compliance Officer.

Requirements:

Recommendations:

Is there a potential for short-circuiting of the water flow? ☐ Yes ☐ No

Inspection Details:

- Short-circuiting in a contact tank refers to water passing by the baffles improperly. For example when the tank fills with water, can water flow over the top of the baffles, therefore short circuiting the designed contact time.

Requirements:

Recommendations:

What are the operating levels in the tank? High_____ Low _____

High – Low = _____ (delta H)

Notes:_____

_____

_____

## ***Finish Water Pumping***

| PUMP # | 1 | 2 | 3 |
|---|---|---|---|
| **Source Name** | | | |
| **Capacity (GPM)** | | | |
| **HP Rating** | | | |
| **Pump Type** | | | |
| **Manufacturer** | | | |
| **Last Service Date** | | | |
| **Pump Condition** | | | |
| **Motor Condition** | | | |

Are food grade lubricants used when in contact with drinking water? ☐ Yes ☐ No

Draw a schematic of water flow from source(s) through treatment plant and label chemical feed points.

SCADA diagrams and print out may be attached to this form, check this box if they are: ☐

**********

## DISTRIBUTION SYSTEM INFORMATION

Number of metered service connections:_____

Number of unmetered service connections: _____

Inspection Details:
- Some systems are not metered and are charged a fixed rate.

Requirements:
Recommendations:

Population: _____ (multiply total # of service connections by 2.5 to determine)

List the communities served by the water system: _____

_____

Does the system have a leak detection program? ☐ Yes ☐ No

Inspection Details:
- A leak detection program is a plan that the system has in place to look for distribution leaks, account for water loss etc.
- The benefit of having a program in place is to save on lost revenue caused from underground water system leakage. Without one, increases in pumping, treatment and operational costs can become problematic.

Requirements:
Recommendations:

Unaccounted For Water: _____% *If above 10%, utility needs leak detection program.*

(Discussion topics include: fire uses, unmetered connections, leak detection, pipe types – cast iron)

Inspection Details:
- If a system has unaccounted for water above 10% the DWP can recommend a leak detection program. This is typically a recommendation.
- Discuss any known reasons for unaccounted for water (flushing, fire protection, etc.)

Requirements:
Recommendations:

Are meters calibrated according to PUC regulations (every 8 yrs)? ☐ Yes ☐ No

Inspection Details:
- This is a PUC regulation and not a DWP requirement.
- Not all systems meet this 8 year PUC requirement.
- Some systems have a change out policy (where they actually replace the meter every 8 years) vs. calibration of the meter.
- The DWP can recommend this if they are not meeting it or have not met it for many years or are experiencing high unaccounted for water

Requirements:
Recommendations:

Are there any low pressure points in the distribution system? ☐ Yes ☐ No

Inspection Details:
- DWP rules for low pressure say below 20psi is considered low pressure.
- Most connections located at the top of the hill near a tank will experience these low pressure problems and systems will enter into a limited water service agreement or may install booster pumps in the basements of homes.

Requirements:
Recommendations:

Where are they, and what is the pressure? _____

_____

Are plans of the distribution system available and current? ☐ Yes ☐ No

***Booster Stations***

| | | | |
|---|---|---|---|
| **LOCATION** | | | |
| **# OF Pumps/Type** | | | |
| **Pressure Tanks** | | | |
| **Chemicals Applied?** | | | |
| **Notes?** | | | |

Describe how the booster station(s) operates (on/off by pressure switch, VFDs, bladder tanks, etc.). _____

_____

_____

Inspection Details:

- Place a description here that explains how the booster station operations including how the pumps turn on/off. Is it based on a pressure switch so when it reaches a certain low pressure they turn on, then shut off at a set high pressure, or by a VFD?

Requirements:
Recommendations:

Are there separate pressure zones in the system? _____

_____

_____

Inspection Details:

- Some systems have high/low pressure zones. They will typically have pressure regulating valves.
- Pressure zones are necessary when drastic elevation occurs in a distribution system. These areas must be regulated with valves to reduce high pressures at the low end of a system.

Requirements:
Recommendations:

***Piping***

Is there asbestos cement (AC, Transite) pipe in this system? ☐ Yes ☐ No

If yes, is the system on a 9 year monitoring schedule for asbestos? ☐ Yes ☐ No

Inspection Details:

- Asbestos cement is pipe made from cement and asbestos fibers.
- It was often used from the 1940's to the 1970's as it was inexpensive, durable, and resistant to corrosion and tuberculation.
- Now it is a health concern due to the asbestos fibers
- When an asbestos pipe main break occurs, CET requests an asbestos test.

Requirements:

- The PWS needs to contact the DWP when an AC pipe in service breaks. **(Minor)**

Recommendations:

Is there lead or lead lined piping or services identified in the system? ☐ Yes ☐ No

If yes, are these locations part of the Lead/Copper testing plan? ☐ Yes ☐ No

Inspection Details:

- If there are lead lined pipes or services in the system, are there plans for their removal?
- Some systems know they have lead piping or services but don't know all the locations.

Requirements:

Recommendation:

- The system should have a procedure that when lead piping or services are found they are replaced.

How often is the system flushed? ☐ Spring ☐ Fall ☐ Both ☐ Other: _____

Is a directional flushing program used? ☐ Yes ☐ No

Inspection Details:

- Directional flushing is strategic flushing to move the water in the same direction vs. a random flushing program.
- Surface water systems and those with high iron/manganese tend to need a better flushing program

Requirements:

Recommendations:

Have there been water quality complaints? ☐ Yes ☐ No

If yes, how have they been handled? _____

_____

Inspection Details:

- Flushing creates dirty/rusty colored water and can often trigger water quality complaints from customers.
- System should have a procedure in place on how to handle customer complaints

Requirements:

Recommendation:

- Create a written procedure to deal with customer complaints

Do personnel have the proper equipment to maintain the distribution system? ☐ Yes ☐ No

Are valves regularly exercised? ☐ Yes ☐ No

Inspection Details:

- Varying responses from system on this question
- Some systems don't want to exercise valves as they are afraid they will break
- Some systems cannot find the time to get to them every year.
- Some will just clean out the valve boxes of all the dirt, sand etc.

Requirements:

Recommendation:

- Exercise annually

Has a hydraulic model been performed on the system? ☐ Yes ☐ No

Is it current?_____ ☐ Yes ☐ No

Inspection Details:

- A hydraulic model shows pressure, flows and friction loss through the system.
- Water CAD is a commercial computer based model showing this information for the system. It is often completed by an engineering firm. Usually only larger systems can afford them
- EPA has a free software that can be used by any system.
- If a system has pressure issues they may want to consider completing a hydraulic model.
- Even if the model was performed last year, if there have been system changes the model may not be current.

Requirements:

Recommendations:

Are swing tie records complete and current? ☐ Yes ☐ No

Inspection Details:
- It is a way to locate gate valves, valve boxes, etc. by the use of ropes, chains or tape measures.
- Records are kept for locating the devices underground at a later time.

Requirements:
Recommendations:

Is GPS used for infrastructure location? ☐ Yes ☐ No

Inspection Details:
- GPS replaces the "swing tie" method for identifying exact location of an underground device.
- Can be cost prohibitive for some systems.

Requirements:
Recommendations:

## ***Cross Connection Control***

Does the system have a cross connection program (high or low hazard)? ☐ Yes ☐ No

(A Community PWS with high or low hazards is required to have a cross connection control program. See Maine Cross Connection Rules. )

Inspection Details:
- PUC regulated systems may use EPA's model cross connection control program
- Non PUC regulated systems may use the one page version that the DWP created (DWP0089).

Requirements:
- Must submit their CCCP for review if it is out of date or unavailable at the time of inspection **(Minor)**

Recommendations:

Is the plan current? ☐ Yes ☐ No

Inspection Details:
- Current is 5-10 years old, reflecting requirements of the Maine Cross Connections Rules.
- Current includes the 2009 changes to the Maine Cross Connection Control Rules (high, low and residential degree of hazard vs. Levels 1, 2 and 3)

Requirements:
- Community PWS with a High or Low cross connection must have a Cross Connection Control Program. **(Minor)**

Recommendations:

When was it last updated? _____

Are the backflow prevention devices installed approved per the Maine Internal Plumbing Code (MIPC)? ☐ Yes ☐ No

(Approved devices are "listed and labeled" by approved standards organizations such as NSF, IAPMO, ASSE, ASME, and CSA)

Inspection Details:
- Is the PWS aware of the "listed and labeled" requirement
- Do they have a process in place to be sure the devices are installed per MIPC. Have them describe the process so you know they understand the meaning.

Requirement:
- If devices do not meet the "listed and labeled" requirements then the system must be required to install devices that are listed and labeled. **(Minor)**

Recommendations:

Are testable devices tested at least annually as required by the MIPC? ☐ Yes ☐ No

(Review testing records)

Inspection Details:
- System should have a list of every testable device in the distribution system
- System should also have a list of testing records that verify if the devise has been tested at least annually.
- Field inspector should ask to review 3-5 records randomly.

Requirement:
- Testable devices must be tested annually **(Minor)**

Recommendations:

Have testable devices been tested by a certified backflow tester? ☐ Yes ☐ No

(Maine Internal Plumbing Code accepts NEWWA, BPA, or ASSE certification. Review testing records)

Inspection Details:
- Ask PWS personnel if they have checked to verify that the person testing the devices is licensed/certified.
- To verify they can reference New England Water Works (NEWW) website or American Backflow Prevention Association (ABPA) website.

Requirements:
- Testable backflow devices must be tested by a certified tester. **(Minor)**

Recommendations:

Does the system require residences to install a X-connection control device? ☐ Yes ☐ No

Inspection Details:
- The Maine Cross Connection Control Rule recognizes residential backflow programs as being valuable, not required, but valuable.
- The DWP supports PWS in having a residential backflow program but it is not a requirement.

Requirements:

Recommendations:

Notes: _____

_____

## ***Distribution System Sampling Information***

How often are bacteriological samples taken? _____

Inspection Details:
- Quarterly or monthly
- The number of samples a PWS is required to take is based on their population. Verify how many samples the system collects monthly.

Requirements:

Recommendations:

Does the water system submit monthly reports? ☐ Yes ☐ No

Inspection Details:
- CET officer should review these prior to the field inspectors sanitary survey visit and report any issues/concerns they may have with the PWS to you for discussion during the inspection
- MOR must be received by the 10th day of the following month
- All PUC regulated systems must submit an MOR even if no chemicals are added. DWP wants the pumpage data.
- Consecutive systems that do not add additional chemicals must submit a MOR
- Any other concerns CET may have should be addressed at the sanitary survey inspection.

Requirements:
- If system is not submitting MOR's we should require them to do so **(Minor)**
- If not submitting them by the 10th of the month we should require them to be on time **(Minor)**
-

Recommendations:

Does the DWP have a sampling site plan on file? ☐ Yes ☐ No

Is it up to date? ☐ Yes ☐ No

Inspection Details:

- This sampling site plan is for the location of bacteria samples only
- With the Revised total coliform rule, all sampling site plans will need to be revised to also include recheck locations and raw water sampling locations.
- Ask where the sampling locations are and document them on the sampling site plan.
- See Sample Site Plan SOP (DWP0192)

Requirements:

Recommendations:

Is the system using it? ☐ Yes ☐ No

Does the sampling plan provide an accurate representation of the distribution system? ☐ Yes ☐ No

Inspection Details:

- Ask them to show you locations on a map or explain in detail.
- Are locations evenly distributed throughout the distribution system?

Requirements:

Recommendations:

Do you maintain at all times a Total Chlorine residual throughout the distribution system? ☐ Yes ☐ No

Inspection Details:

- Surface Water Systems are required by the CFR to have a total chlorine residual at the furthest point in the distribution (at all taps).
- Residual can be “total chlorine”, does not have to be “free chlorine” in the distribution of a surface water system.

Requirements:

- SW systems see above. **(either)C(S.D.)**

Recommendations:

Notes: _____

***Storage Tank Information***

| | | | | |
|---|---|---|---|---|
| **TANK NAME** | | | | |
| **Location** | | | | |
| **Volume (gals)** | | | | |
| **Type** | | | | |
| **Manufacturer (if known)** | | | | |
| **Date of Construction** | | | | |
| **Date of Last Inspection** | | | | |
| **Protected from vandalism?** | | | | |
| **Can tank be isolated from system?** | | | | |
| **Overflows/ Drains screened?** | | | | |
| **General Condition** | | | | |
| **Delta H for normal oper. Range** | | | | |
| **% of tank volume turned over each day** | | | | |

How many days of storage does the system have? _____

Inspection Details:

- System should know this
- Example: 500,000 gallon tank / 50,000 average daily production (ADP) = 10 days
- The more days of storage equals fewer turnovers that occur in the tank and risks stagnation problems/bacteria problems.
- Make note of max capacity and normal operating capacity

Requirements:

Recommendations:

What controls the tanks levels? _____

_____

Inspection Details:
- Options include: SCADA (automatic), timer, pressure, float switch

Requirements:

Recommendations:

Are hatches locked? ☐ Yes ☐ No

Do ladders have restricted access? ☐ Yes ☐ No

---

Inspection Details:
- We recommend ladders to be located 10' up from ground level to restrict access.

Requirements:

Recommendations:

Do the tank sites have restricted access (e.g. locked fence?) ☐ Yes ☐ No

---

Additional Storage tank table as needed:

| | | | | |
|---|---|---|---|---|
| **TANK NAME**<br>Inspection Details:<br>• System typically has a name chosen that they already call the tank | | | | |
| **Location**<br>Inspection Details:<br>• Typically a name of the street the tank is on or a hill | | | | |
| **Volume (gals)**<br>Inspection Details:<br>• Size/volume of the tank<br>• If using dimensions, use the fill capacity not the max capacity | | | | |
| **Type**<br>Inspection Details:<br>• Types include: underground (buried tank), standpipe (cylinder like tanks), elevated (tanks on legs), reservoir (typically an above ground concrete tank often circular ) | | | | |
| **Manufacturer (if known)**<br>Inspection Details:<br>• Examples include Natgun, Aquastore, Pre-load, Fisher | | | | |
| **Date of Construction**<br>Inspection Details:<br>• Date tank was constructed – typically included on the plate located on the tank | | | | |
| **Date of Last Inspection**<br>Inspection Details:<br>• Internal inspection with a report. This would include a live dive, tank taken off-line, or camera<br>Require:<br>• If last inspection has been more than 10 years and the system is having bacteria problems **(either)(may be a S.D.)**<br>Recommendation:<br>• DWP recommends tank cleaning every 5-10 years. | | | | |

| | | | | |
|---|---|---|---|---|
| **Protected from vandalism?**<br>Inspection Details:<br>• Fence around tank, hatches locked, cameras<br>• Many tanks have graffiti on them and therefore are accessible to vandals. Ask what the system does to control this. | | | | |
| **Can tank be isolated from system?**<br>Inspection Details:<br>• Isolated refers to can the tank be valved off so that the water would bypass it<br>• It is helpful for systems that need to inspect or make repairs | | | | |
| **Overflows/**<br>**Drains screened?**<br>Inspection Details:<br>• Overflows – should be 12-24 inches above grade with rip-rap (crushed stone) underneath to keep grass/shrubs/leaves from growing up around pipe and clogging it.<br>o Must be screened with rodent screen (1/4" mesh)<br>o Screen needs to be inspectable. If it is buried or not able to be located they must find it typically by overflowing the tank.<br>• Vents – must be screened with insect screen. (#24 mesh)<br>o Typically are not inspectable on standpipes, elevated tanks etc.<br>o Ask when the last time they were inspected | | | | |
| **General Condition**<br>Inspection Details:<br>• Looking for leaks, rust spots, dents, paint condition<br>• Responses – OK, good, needs improvement | | | | |
| **Delta H for normal oper. Range**<br>Inspection Details:<br>• High / low operating heights of the tank.<br>• Tanks will have set points as to how high they fill then a low level that tells the pumps to turn back on to fill.<br>• Ranges are usually measured in feet of the tank.<br>• If delta is very low , there is a risk of stagnation<br>• Example Delta H= 100' tank – high is 85 low is 70. Delta is 15 feet<br>• Delta H may occur several times a day | | | | |
| **% of tank volume turned over each day**<br>Inspection Details:<br>• Tank volume should turn over every 2-3 days<br>Recommendation:<br>• 30%-50% turnover each day | | | | |

Notes:_____

_____

_____

Draw a schematic of the distribution system and label major facilities (storage tanks, pump stations, etc.)

SCADA diagrams and print out may be attached to this form, check this box if they are: ☐

**********

## SECURITY

Are facilities secure? (locked, alarmed, checked) ☐ Yes ☐ No

_____

_____

_____

_____

_____

_____

_____

_____

Inspection Details:

- Cameras – deer cameras have been used effectively
- Are all gates, doors etc. locked
- Check fence line for holes in the fence that could allow access, trees that may have fallen on the fence etc.
- Wellhead protection grants can be issued for security

Requirements:

Recommendations:

Notes:_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Inspection Details:

- The following form must be completed for every sanitary survey to document the operator classification that is needed by the PWS
- **Guidance for each of the listed categories below can be found in an SOP - DWP0018: WOB – Guidelines for Water System Classifications. This can be found at G:\DWP\Controlled Documents. This document was last revised in 2007 and is currently in the process of being updated again by the Board of Licensure of Water Treatment Plant Operators.**

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# OPERATOR CERTIFICATION

***Use the tables below to determine the operator classification needed by the PWS***

**Treatment System Classification Point Values**

| Item | Points |
|---|---|
| **Size ( 2 point minimum to 10 point maximum)** | |
| Maximum population (1 point minimum to 5 points maximum) | 1 pt per 10,000 |
| Design flow average (1 point minimum to 5 points maximum) | 1 pt per MGD |
| **Water Supply Sources** | |
| Groundwater | 3 |
| Groundwater under the influence of surface water | 5 |
| Surface Water | 5 |
| **Chemical Treatment / Addition Processes** | |
| Fluoridation | 5 |
| Chlorination | 5 |
| Chloramination | 10 |
| Chlorine Dioxide | 5 |
| Ultraviolet Light | 5 |
| Ozonation | 10 |
| pH adjustment (calcium carbonate, carbon dioxide, hydrochloric acid, calcium oxide, calcium hydroxide, sodium hydroxide, sulfuric acid, other) | 5 |
| Stability or corrosion control (calcium oxide, calcium hydroxide, sodium carbonate, sodium hexametaphosphate, other) | 5 |
| **Coagulation & Flocculation Process** | |
| Chemical addition (aluminum sulfate, bauxite, ferrous sulfate, ferric sulfate, calcium oxide, bentonite, calcium carbonate, carbon dioxide, sodium silicate, other) | 1 pt per chemical coagulant added (5 points max.) |
| *Rapid mix units:* | |
| Mechanical mixers | 3 |
| Injection mixers | 2 |
| In-line blender mixers | 2 |
| *Flocculation tanks:* | |
| Hydraulic flocculators | 2 |
| Mechanical flocculators | 3 |
| **Clarification / Sedimentation Process** | |
| Horizontal Flow (rectangular basins) | 5 |
| Horizontal Flow (round basins) | 7 |
| Solid-contact sedimentation | 15 |
| Inclined-plate, tube sedimentation | 10 |
| Dissolved air flotation | 30 |
| **Filtration Process** | |
| Single media filtration | 3 |
| Dual or mixed media filtration | 5 |
| Microscreens | 5 |
| Diatomaceous earth filters | 5 |
| Cartridge filters<br>- As a pre-filter | 2 |

| | |
|---|---|
| - For microbiological removal | 5 |
| Membrane filtration (reverse osmosis, micro, ultra, nano) | 10 |
| Slow sand filters | 5 |
| Direct filtration | 5 |
| Pressure or greensand filtration | 5 |
| **Other Treatment Processes** | |
| Aeration | 3 |
| Packed tower aeration | 5 |
| Ion exchange / softening (cation, anion, adsorptive)<br>- For control of a primary MCL contaminant<br>- For control of a secondary MCL contaminant | <br>5<br>2 |
| Lime - soda ash softening | 5 |
| Powdered activated carbon | 5 |
| **Other Processes** | 0 to 15 |
| **Residuals Disposal** | |
| Discharge to lagoons | 5 |
| Discharge to lagoons and then raw water source | 8 |
| Discharge to raw water | 10 |
| Disposal to sanitary sewer | 3 |
| Mechanical dewatering | 5 |
| On-site disposal | 5 |
| Land application | 5 |
| Solids composting | 5 |
| **Facility Characteristics** | |
| *Instrumentation:* | |
| The use of SCADA or similar instrumentation to provide data with no process operation | 0 |
| The use of SCADA or similar instrumentation to provide data with limited process operation | 2 |
| The use of SCADA or similar instrumentation to provide data with moderate process operation | 4 |
| The use of SCADA or similar instrumentation to provide data with extensive or total process operation | 6 |
| **Gravity Fed Systems**<br>Total atmospheric storage less than average day design flow | 5 |

**Treatment Classification**

| Classification | Total Points (From App. A.) |
|---|---|
| **Very Small Water System (VSWS)** | **19 or less and serving <500 Pop.** |
| **Class I** | **19 or less** |
| **Class II** | **20 to 34** |
| **Class III** | **35 to 47** |
| **Class IV** | **48 or more** |

**Distribution Classification**

| Classification | Population Served |
|---|---|
| **Class I** | **1,500 and less** |
| **Class II** | **1,501 to 15,000** |
| **Class III** | **15,001 to 50,000** |
| **Class IV** | **50,001 and over** |

## C. INSPECTION REPORT:

1. The completed Sanitary Survey for Large Community Systems question set.
2. A copy of the letter sent to the public water supply indicating findings of the inspection (see Attachment A).
3. Completed “Inspection Report”:
   - Include pictures with descriptive comments
   - Include a schematic of the system
4. Include a Google Earth picture page or road map of the PWS location (optional)
5. If Potential Sources of Contamination (PSCs) are identified within 300 feet of the well, provide a Google Earth picture or provide a sketch if Google Earth is not available, of PSC’s within 300 feet of a well.

## D. SDWIS Entry Related to a Sanitary Survey

1. Entering the Site Visit
   - Open a new Site Visit in SDWIS
   - Enter type of visit (SNSV)
   - Enter Date of visit
   - Enter for eleven elements (not applicable, not evaluated, no deficiencies/ recommendations, recommendation(s) made, minor deficiency(ies), significant deficiency(ies))
   - Enter inspector name and mark name as “priority”
   - Associate names of others on site or not (?) TBD
   - Calculate next visit date (SDWIS calculates this)
   - Enter compliance schedules for any deficiency

2. Enter/Update SDWIS Inventory
   - Bring up the PWS in SDWIS Inventory
   - Update service connections
   - Update population
   - Update operating period if needed
   - Initiate changes to Points of Contact (minor “Inventory” changes made by field inspector, for major changes involving changes to Legal Entities, use the Point of Contact Change (POC) form)
   - Update well information/data
   - Update setback indicators
   - Update storage information/data
   - Update Treatment information/data
   - Update Facility Flows
   - E-mail a SDWIS update summary to the DWP distribution

Note: refer to specific SDWIS procedures in the Electronic Field Manual

## E. Equipment Needed for a Sanitary Survey

- Safety Glasses
- Chlorine Residual Test Kit
- Generic sample kits

- DWP handouts/forms
- Small Bottle of Clorox Bleach
- Camera
- Pen/Pencil
- clipboard
- Blackberry (cell phone)
- Flashlight
- 300 Foot Tape Measure
- Steel toed shoes/boots for construction or industrial environments where OSHA requires foot protection
- Blaze orange vest during hunting season

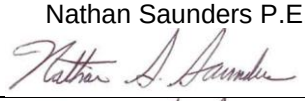
**ASSOCIATED DOCUMENTS/REFERENCES:**

40 CFR Sec 142.16 (b) 3 [requirements of a sanitary survey]
Field Data "System Summary" for a specific PWS
Form - Potential Sources of Contamination (PSC), Current or Past
Drinking Water Orders Policy, DWP0061
DWP Multiplications Factors Policy, DWP0084
Source Water Sampling and Tap Installation Procedure, DWP0088
Maine Cross Connection Rules
Maine Internal Plumbing Code
Model Cross Connection Control Program for Non-PUC Regulated Public Water Systems, DWP0089
DWP UV Policy, DWP0047
Policy for Administering the Maine Rules Relating to Drinking Water Regarding a PWS Operating Without a Licensed Operator, DWP0071
Policy and Procedure for DWP's Role in Addressing a Designated Operator's failure to Perform the Operator's Duties for a PWS Properly (DWP0183)
DWP Electronic Field Manual
DWP Chlorination System Design Guidelines
EPA Drinking Water Inspection Field Reference for Large Community Systems
WOB-Guidelines for Water System Classification (DWP0018)
Licensed Operator Minimum Requirement for PWS (DWP0021)
EPA UV Guidance Manual
Treatment Review and Approval Policy & Procedure (DWP0161)
Sample Site Plan SOP (DWP0192)
Membrane Filtration Guidance Manual EPA 815-R-06-009
http://www.epa.gov/safewater/disinfection/lt2/pdfs/guide_lt2_membranefiltration_final.pdf
Membrane Filtration Tech Brief – National Drinking Water Clearinghouse
http://www.nesc.wvu.edu/pdf/dw/publications/ontap/2009_tb/membrane_DWFSOM43.pdf
Membrane Technology for Water, Wastewater & Industrial Applications – MRWA/Pall Seminar 4-30-14

**RETENTION:**

This document is retained per the DWP Document Retention Requirements.

## REVISION LOG

| Section | Page | Rev. | Date | Description Of Change | Approved by: |
|---|---|---|---|---|---|
| | | Original | 3- 11--2014 | | Nathan Saunders P.E.  |
| Definitions. Inspection Procedure. Appendx B Sanitary Defects | various | A | 3-15-2015 | Defined each deficiency as Minor or Significant. Identified applicable deficiencies as “Sanitary Defects” Added related definitions and Appendix B – Sanitary Defects. Updated SS Follow-up letter to include Significant, Minor deficiencies and Recommendations. Modified source water and wellhead protection questions |  **Nathan Saunders** |
| Sec. B Appndix C | 59,79 85 | B | 5-27-2015 | Added details on Membrane Filtration under Filtration Processes Added references on Membrane Filtration Added Appndx C: Large System Sanitary Survey Deficiency Bullets |  **Nathan Saunders** |

## Appendix A

### Template FIT Letter NON Follow-up to Sanitary Survey for Large Systems

See the following page

The electronic file for this form is located at

G:\DWP\Field Inspection\Field Manual - Electronic\18 - Sanitary Surveys\D - Template FIT Letter NON Followup to SS for Large Systems 2-11-2013.docx

Maine Center for Disease Control and Prevention
An Office of the Department of Health and Human Services
Paul R. LePage, Governor  Mary C. Mayhew, Commissioner

Department of Health and Human Services
Maine Center for Disease Control and Prevention
286 Water Street
11 State House Station
Augusta, Maine 04333-0011
Tel.: (207) 287-8016; Fax: (207) 287-9058
TTY Users: Dial 711 (Maine Relay)

Date

District
Attn: PO
Address

RE: District - FOLLOW-UP TO SANITARY SURVEY INSPECTION
PWSID ME00xxxxx

Dear First Name:

Thank you for meeting with me at the District on Survey Date. This letter identifies my findings during the inspections, many of which were discussed at the sanitary survey, and provides you with a list of requirements and recommendations, for your water system to address.

**SIGNIFICANT DEFICIENCIES:**

Notice of Noncompliance - Maine's Water for Human Consumption Act at 22 M.R.S., Chapter 601 and Maine's *Rules Relating to Drinking Water* at 10-144 CMR, Chapter 231, requires your public water system to complete the following actions by the specified dates, in order to avoid further Drinking Water Program enforcement, which may include administrative orders and fines if this Notice of Noncompliance is not addressed.

- Broken Well Cap – You must replace the broken well cap on Well 3. When you have completed this work, please notify me at the phone number or email address listed on the following page, and we can set up a follow up inspection. You must have this work completed by 12/1/13.

**MINOR DEFICIENCIES:**

Maine's Water for Human Consumption Act at 22 M.R.S., Chapter 601 and Maine's *Rules Relating to Drinking Water* at 10-144 CMR, Chapter 231, requires your public water system to complete the following actions by the specified dates, in order to avoid further Drinking Water Program enforcement, which may include Notice of Noncompliance.

- Cross Connection Control – You must update the cross connection control plan for the Brownville Water Department to address the 2009 changes to Maine's cross connection control rules. I have included a separate letter that includes my findings upon reviewing your plan. When you have completed this update, please send a copy of the final plan to me either my mail or email to the address listed on the following page. Please have this work completed by 12/1/13.

**RECOMMENDATIONS:**

The following recommendations do not rise to the level of a violation of safe drinking water regulations but are items I identified during the sanitary survey.

- Make sure you can find the plant operating procedures in case of emergency and that there are copies in all necessary locations.

Thank you for your efforts to provide safe and reliable drinking water to the customers of the District. Remember that you must address the requirements identified above, before the listed deadlines, in order to avoid further Drinking Water Program enforcement. Should you have any comments or questions, please contact me at (207) 991-2383, or via email at: rychel.mckenzie@maine.gov.

Yours for safe drinking water,

**FIELD INSPECTOR NAME**
Field Services Engineer
Drinking Water Program
**ADDRESS**
**TOWN,** Maine 04**XXX**
www.medwp.com

e.c.: **COMPLIANCE OFFICER NAME,** Drinking Water Program
**OPERATOR NAME, if different than addressee**

**Appendix B**
**List of "Sanitary Defects"**
(as requested by the Revised Total Coliform Rule)
3/3/15

**Sanitary Defect**: *is a defect that could provide a pathway of entry for microbial contamination into the distribution system or that is indicative of a failure or imminent failure in a barrier that is already in place.* (S.D. = Sanitary Defect)

| Sanitary Defect | Minor Deficiency | Significant (Major) Deficiency |
|---|---|---|
| *Physical/System Defect (pathway of entry for microbial contamination):* | | |
| Well cap missing/off | | X |
| No water (system dewatered) | | X |
| Well head in a pit under water (including sanitary seal cover) | | X |
| Well head flush to ground with bacteria problem | | X |
| Improperly screened vent (wellhead, wetwell, clearwell, tank, etc.) | | either |
| Messy/dirty around intake for an air eductor (aeration) | | either |
| Inadequate sampling point | | either |
| Inactive treatment or tank still connected to system | | either |
| Large storage tank uninspected (may be a sanitary defect) | | either |
| Loose well cap | X | |
| Conduit not secured to well cap | X | |
| No well vent (usually in well cap) | X | |
| Inadequate vent height (may be a sanitary defect) | X | |
| Leaking tank | X | |
| System leaks (may be a sanitary defect) | X | |
| Waterlogged bladder tank (failed bladder) S.D. if bacteria present | X | |
| *Failure of a Barrier to Microbial Contamination:* | | |
| Not meeting 4-log inactivation when required by GW Rule | | X |
| Carbon filter after required chlorination | | X |
| Not talking disinfection residual measurements | | X |
| Un-calibrated UV Intensity sensors (power/area) | | X |
| Un-calibrated UV Transmissivity sensors (%) | | X |
| Inadequate or failed disinfection when required for a GW source | | either |
| Inadequate or failed disinfection for a system using SW | | either |
| Inadequate or failed filtration for a system using SW | | either |
| Unapproved changes to source, treatment, or storage (may be a S.D.) | | either |
| Significant sources of contamination (e.g. manure) within 300 feet | | either |
| *Cross Connection Related (Imminent Failure of a Barrier…):* | | |
| Treatment backwash cross connection to sewer line | | X |
| RO waste water line cross connection to sewer line | | X |
| Hard piped bypass around required disinfection treatment | | either |
| High hazard cross connection (may be a sanitary defect) | | either |
| Testable backflow devices not tested annually (may be a sanitary defect) | | either |

## Appendix C
## LARGE SYSTEM SANITARY SURVEY DEFICIENCY BULLETS

**DEFINITIONS:**

- **Deficiency:** A finding during a sanitary survey that results in a requirement, as detailed in this document or otherwise. Deficiencies can be "**Minor**" or "**Significant**".
- **(either):** In this document this term is used to identify requirements that can be either "**Minor**" or "**Significant**" deficiencies, depending on the circumstances.
- **(Minor):** A minor deficiency requiring resolution but not reaching a level that warrants a Notice of Non-Compliance at the time it is identified. When a minor deficiency is not resolved in the time frame given for resolution, pre-enforcement options are to be considered and potentially the PWS is issued a Notice of Non-Compliance and entered into the enforcement process.
- **Sanitary Defect (S.D.):** is a defect that could provide a pathway of entry for microbial contamination into the distribution system or that is indicative of a failure or imminent failure in a barrier that is already in place.
- **(Significant):** A significant deficiency requiring resolution which serves as Formal Notice of Non-Compliance of Maine's Water for Human consumption Act and *Rules Relating to Drinking Water*

### OPERATOR INFORMATION

- No operator or operator has improper classification. **(Significant)**

### MANAGEMENT & OPERATION INFORMATION

- Community Systems must have an ERP and they must be up to date. **(Minor)**
- Repair any system alarms not functioning properly **(Minor)**
- Create necessary and useful SOPs if the system does not have any. **(Minor)**
- Update annually and train employees annually or with any new updates. **(Minor)**
- Calibrate measurement equipment per EPA/Manufacturer requirements **(either) (S.D. if disinfection related)**
- Submit MORs monthly by the 10$^{th}$ of the following month **(Minor)**

### SURFACEWATER SOURCE AND PUMPING INFORMATION

### GROUNDWATER SOURCE AND PUMPING INFORMATION

- Install bug (24 mesh) ascreen on well vent **(Minor)(S.D.)**
- Secure/tighten/seal well cap **(Minor) (S.D.)**
- Install a raw water tap at each well if the source currently does not have one **(Minor)**
- Remove significant sources of caontamination within the wellhead protection zone **(either)(S.D.)**

### TREATMENT INFORMATION

***Treatment Plant***

- Treatment plant changes or chemical changes not approved by the DWP prior to the change being implemented. **(either)(may be a S.D.)**
- Any nonpublic water related items should not be stored in the treatment plant **(Minor)**
- No SOP for manual operation. **(Minor)**
- Per the Maine Rules Relating to Drinking Water, all chemicals in contact with drinking water must be certified to meet ANSI/NSF Standard 60 – 2005: Drinking Water Treatment Chemicals – Health Effects. **(Significant)**
- Chemicals must be dosed within the range of their NSF 60 specification. **(Significant)**

- Materials, products, and coatings that contact drinking water not certified to meet ANSI/NSF Standard 61-2007: Drinking Water System Components – Health Effects, there are some exceptions that can be found in the electronic field manual. **(Significant)**
- Cross connection not separated by an appropriate* backflow device or an air gap **(either)(may be a S.D.)**
- Label checmial room and tanks by OSHA/DOL standards, identifying the contents/chemical/mineral inside **(Minor)**
- Wetwell/Tank vent not screened with rodent/bird screen (1/4 inch) if not properly screened **(either)(S.D.)**
- Any pump that is in contact with drinking water must use a food grade lubricant **(Minor)**
- Open containers must have 110% secondary containment **(Minor)**
- Conainment must meet DOL/OSHA requirements **(Minor)**
- If MSDS not present or not present in appropriate area require utility to have a copy made available. **(Minor)**
- Analyzers must be calibrated per manufacturer's specs or an alternate, documented schedule **(either)(maybe S.D.)**
- Analyzer waste water may not be disposed of on the ground or in a dry well. **(Minor)**
- Pump must have automatic controls **(Minor)**

***Disinfection***

- No piped bypasses around CT vessels. **(either) (S.D.)**

***Disinfection Chemicals***

- For filtration avoidance waiver SW systems, redundant disinfection equipment is necessary **or** automatic shutoff must be present. [CFR 141.72 (a)(2)] **(Significant)(S.D.)**
- PWS must know and have their method for calculating "CT" available in their records. **(Minor)**

***Ozone Disinfection***

- For filtration avoidance waiver SW systems, redundant equipment is necessary if using Ozone for CT **or** automatic shutoff must be present. [CFR 141.72 (a)(2)] **(Significant)(S.D.)**
- LOX should be certified to NSF Standard 60 or something reasonably equivalent. **(Significant)**
- If necessary PPE not present then utility should procure and keep onsite. **(Minor)**

***Ultra Violet Disinfection***

- An SOP must be in place that reflects the actual system and how they deal with and report, (or avoid), off-spec water production **(Minor)**
- UV Equipment O&M manual(s) must be available and up to date to evaluate cleaning of sleeves and routine maintenance requirements **(Minor)**
- If the spare parts are not in storage the system must order the appropriate parts to have on hand. **(Minor)**
- UV Sensor calibration must be at least monthly, comparing the duty UV sensor to the reference sensor, the facility may have 3 duty UV sensors and a mean calibration ratio can be used. **(Significant)(S.D.)**
- Confirm UVT analyzer calibration has been completed and that records are kept. **(Significant)(S.D.)**

***Corrosion Control Chemicals***

***pH Adjustment Chemicals (if different than Corrosion Control Chemicals)***

***Fluoride Chemicals***

- Lowest level fluoride can be set at is 0.7mg/l. **(Significant)**
- Secondary MCL is 2.0mg/l **(Significant)**

***Air Stripping***

- Vent must be screened ( ¼ " to ½" mesh) to prevent birds from entering **(Minor)(S.D)**
- The area surrounding an air inlet must be clean and free of dust and debris **(either)(S.D.)**
- The vent cannot be an open vertical pipe. **(Minor)(S.D)**

***Ion Exchange***

- Use ANSI/NSF Std 60 Certified Salt **(Significant)**
- Where backwash waste water lines drain into a sewer pipe, an air gap of two times the inlet diameter pipe must be maintained. Air gap fittings approved by the plumbing code are "listed and labeled". **(Significant)(S.D)**
- Backwash waste water may not be disposed of on the ground or in a dry well. **(Minor)**

## FILTRATION PROCESS INFORMATION

***Filtration Process***

- Recycled water **must** be piped back to the **head** of the plant (prior to all treatment) **(Significant)(S.D.)**

***Rapid Mix***

***Flocculation Basin***

***Coagulant***

***Sedimentation Basin***

***Clarifiers***

***Chemical Receiving***

## FINISHED WATER INFORMATION

***Finished Water Storage***

- Storage overflow or vent not screened properly **(Minor)(S.D.)**
- Storage vent and overflow must be separate. Should not use the overflow as the vent. **(Minor)**

***Finish Water Pumping***

- Food grade lubricants not used when in contact with drinking water **(Minor)**

## DISTRIBUTION SYSTEM INFORMATION

- DWP rules for low pressure say below 20psi is considered low pressure **(Minor)**

***Booster Stations***

***Piping***

- The PWS needs to contact the DWP when an AC pipe in service breaks. **(Minor)**

***Cross Connection Control***

- Must submit their CCCP for review if it is out of date or unavailable at the time of inspection **(Minor)**
- Community PWS with a High or Low cross connection must have a Cross Connection Control Program. **(Minor)**
- If devices do not meet the "listed and labeled" requirements then the system must be required to install devices that are listed and labeled. **(Minor)**
- Testable devices must be tested annually **(Minor)**
- Testable backflow devices must be tested by a certified tester. **(Minor)**

***Distribution System Sampling Information***

- If system is not submitting MOR's we should require them to do so **(Minor)**
- If not submitting them by the 10$^{th}$ of the month we should require them to be on time **(Minor)**
- No sample site plan or plan is not up to date See Sample Site Plan SOP (DWP0192) **(Significant)**

- SW systems does not have a Total Chlorine residual throughout the distribution system. **(either)C(S.D.)**

***Storage Tank Information***

- If last inspection has been more than 10 years and the system is having bacteria problems **(either)(may be a S.D.)**

**OTHER:**

_____