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| **Project Name:** |  | **Date:** |  |
| **Engineer Name:** |  | **AK P.E. License No.:** |  |
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| This checklist is required for the construction of new, or modification of existing systems adding sodium fluoride or sodium fluorosilicate. If a system proposes using fluorosilicic acid, contact the Drinking Water Program for additional requirements. Additional information and guidance can be obtained from the CDC Morbidity and Mortality Weekly Report (MMWR) *Engineering and Administrative Recommendations for Water Fluoridation, 1995* and the Ten States Standards *Recommended Standards for Water Works.*  **Note:** When completing this checklist, please answer the question and also include where in the submittal detailed information is found for each submittal requirement. Please be as specific as possible (specify document name, page number, section number, paragraph, etc.). This will accelerate the review process. | | | |

| **Submittal Requirements** | ***Reference*** |
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| 1. **Design Documents:** Plans and specifications must be provided that cover construction of the fluoride related equipment, including but not limited to:  * Descriptions of feed and testing equipment * Location of feed system, piping layout, injection point, and sample tap * Procedures for operations and controls * Details of system components including tanks (including capacity, drains, overflow, and vent), pumps, piping, valves, injection quill, backflow prevention devices, air gaps, secondary containment, and emergency eyewash stations and showers | *18 AAC 80.200(b)*  *Ten States Standards 5.0.1* |
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| 1. **Design Calculations:** Do the design calculations cover:  * Water production (maximum, average, and minimum) * Proposed minimum (non-zero), average, and maximum fluoride dosages * Solution strength or purity and specific gravity or bulk density | *Ten States Standards 5.0.4*  *CDC MMWR Vol 44 No. RR-13* |
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| 1. **Natural Fluoride:** Are laboratory test results of raw water background fluoride levels included? | *18 AAC 80.205(b)(9)*  *CDC MMWR Vol 44 No. RR-13* |
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| 1. **Dosage Verification:** Are there provisions in the design for the operator to measure the quantities of fluoride used and water treated on a daily basis? Include an assessment of the accuracy of these methods compared to published recommendations of 5% of daily change. | *18 AAC 80.315(b)(6)*  *18 AAC 80.340(c)*  *Ten States Standards 2.8.1g, 5.1.2e.2, and 5.4.7.b&f* |
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| 1. **Saturator Make-Up Water:** Which specifications require a meter (or other method for measuring water quantity added) and backflow protection? | *Ten States Standards 5.4.7.b.11* |
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| 1. **Chemical Feed Pump:** What are the make and model of the fluoride feed pump? Has the engineer provided documentation of the feed pump’s suitability for the fluoride that will be injected, and included calculations showing the feed pump is sized for the system water flow rates (including max and min capacity) and chemical dosages. Feed pump capacity should be no more than twice the average flow feed rate. A pressure relief valve should be provided on the pump discharge line and the priming switch should be spring-loaded. | *18 AAC 80.205(a)(4)*  *Ten States Standards 5.1.4 and 5.4.7.b.4.*  *CDC MMWR Vol 44 No. RR-13 III.A.11. and Exhibit B* |
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| 1. **Feed Control:** Does the engineer’s report include feed control design details such as automation, manual controls override capabilities, means to measure dosed flow stream, how chemical feed rates are maintained proportional to the water flow, calibration tubes or mass flow monitors, and feed system accuracy? | *Ten States Standards 5.1.2 and 5.4.7* |
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| 1. **Power Supply:** Is the electrical outlet specified for the fluoride feed pump? It should be hardwired or have a nonstandard receptacle. | *Ten States Standards 5.4.7.b.10*  *CDC MMWR Vol 44 No. RR-13 III.A* |
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| 1. **Overfeed Prevention:** At least two flow-based control devices or methods are required to assure the fluoride feed system cannot operate unless water is flowing in the pipe where the fluoride is injected. | *Ten States Standards 5.1.5 and 5.4.7.c* |
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| 1. **Anti-siphon Feed Line:** Are diaphragm operated anti-siphon devices shown in the plans? One device shall be located on the discharge side of the fluoride feed pump. A second device shall be located at the injection point unless a peristaltic pump or suitable air gap is used. | *Ten States Standards 5.4.7.b.1*  *CDC MMWR Vol 44 No. RR-13, III.A.7* |
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| 1. **High Hazard Situations:** If the application point is substantially lower than the metering pump (> 4 feet), does the design provide for either a dual head feed pump or two separate pumps as required? Note: In this situation, a physical break box may be required and the anti-siphon device at the discharge side of the pump may be omitted. | *Ten States Standards 5.4.7.b.2* |
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| 1. **Injection Point Location:** Where is the placement of the point of application specified along with its relative spacing to any other chemical injection points? If fluoride is added into a horizontal pipe, it shall be in the lower half of the pipe, preferably at a 45 degree angle from the bottom of the pipe and protruding into the pipe one third of the pipe diameter. | *Ten States Standards 5.4.7.b.6* |
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| 1. **Injection Pressure:** Are the flows and pressures at the point of application addressed? Fluoride solutions shall be injected at a point of uniform flow and continuous positive pressure unless a suitable air gap is provided. If fluoride is injected under pressure, a corporation stop valve should be provided and must have a safety chain to protect the operator. | *Ten States Standards 5.4.7.b.9*  *CDC MMWR Vol 44 No. RR-13* |
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| 1. **Injection Mixing:** Is the location of the first customer identified? If the first customer is less than 100 feet from the fluoride injection point, where in the submittal have methods been included to ensure adequate mixing? | *CDC MMWR Vol 44 No. RR-13, III.A.12* |
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| 1. **Water Hardness:** Is there an analysis of water hardness? Softening should be considered for make-up water used for sodium fluoride dissolution if hardness exceeds 50 mg/L as calcium carbonate and will be required if hardness exceeds 75 mg/L as calcium carbonate. Is information on water softening provided if existing/proposed? Fluoride shall not be added before lime‑soda softening or ion exchange softening. | *Ten States Standards 5.4.7.b.5 & 8*  *CDC MMWR Vol 44 No. RR-13, III.B.3* |
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| 1. **Chemical Dust:** What provisions will be provided to minimize creation of dust and protect against fluoride dust exposure? | *Ten States Standards 5.4.7.e.* |
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| 1. **Operator Personal Protective Equipment (PPE):** Are PPE included for operators who will be handling fluoride compounds? These may include rubber gloves, a dust respirator certified by NIOSH for toxic dusts, an apron or other protective clothing, goggles or face mask, a deluge shower, eye washing device, and other protective equipment as necessary. Where will overexposure emergency procedures be posted? | *Ten States Standards 5.3.4 and 5.4.7.d;*  *CDC MMWR Vol 44 No. RR-13* |
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| 1. **Chemical Storage:** Is the storage area identified and is a description of how fluoride chemicals will be stored included? They should be isolated from other chemicals to prevent contamination. | *Ten States Standards 5.4.7.a* |
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| 1. **Monitoring Equipment:** Are details provided regarding the fluoride analyzer equipment to be used by the operator? Will calibration standards be provided? Will all maintenance and calibration instructions for the monitoring equipment be included in the operation and maintenance manual? | *Ten States Standards 5.4.7.f.*  *CDC MMWR Vol 44 No. RR-13* |
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| 1. **Cross-Connection Control**: Are specifications included requiring any drain or overflow from the fluoride chemical feed system and storage tank to terminate at least six inches or two pipe diameters, whichever is greater, above the overflow rim of the receiving sump, conduit, or waste receptacle? | *18 AAC 80.025*  *Ten States Standards 5.1.6* |
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| 1. **Disinfection Post-Install:** Which specifications address disinfection of components in contact with water before they are used? If AWWA Standard C653 is not specified, does the proposed method include adequate detail for the contractor to implement? | *18 AAC 80.205(b)(9)* |
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| 1. **Operator Certification:** Has the engineer verified the system has an operator certified in accordance with 18 AAC 74, Water and Wastewater Operator Certification and Training? Fluoride cannot be added to a public water system at any time without an adequately certified operator. | *18 AAC 80.007*  *18 AAC 74* |
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| 1. **On-site Operator Training:** Is contact information provided for the personnel or office that will train the operator on site a minimum of 6 hours in system specific fluoride operation, maintenance, safety, and emergency procedures? Proof of training conducted must be submitted with the request for final approval to operate. Start-up training must address:  * Information specific to the water plant and equipment * Procedures on how to test finished water fluoride concentration * Reporting requirements to the State * Information on public health benefits of fluoride and the role of water plant personnel in providing those benefits | *CDC MMWR Vol 44 No. RR-13:I.D.2* |
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| 1. **O&M Manual:** Is information provided on the schedule and responsible party for completing the fluoride section of the O&M manual? Please note: at least a draft version will be required when applying for interim operational approval. This should include, but is not limited to:  * Equipment maintenance and calibration schedules * Emergency and public notification procedures in case of system overfeed * Chemical safety procedures | *18 AAC 80.207* |
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| 1. **Operations Records:** Are copies included of the draft forms which the operator will use for recording daily operations such as dosage calculations, daily level of finished water fluoride, fluoride refills (date and quantity of both chemical and water), and saturator and feed line cleanings, etc? Please note: a copy of the final versions of these forms will be required for interim operational approval. | *CDC MMWR Vol 44 No. RR-13* |
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| 1. **Chemical Piping:** Do the plans specify that fluoride piping and pumping stations will be labeled to facilitate identification? Ten States Standards recommends light blue with a red band. | *Ten States Standards 2.14* |
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| 1. **Facility Fact Sheet:** Is contact information provided for the personnel or office that will submit Exhibit B in the CDCMMWR *Engineering and Administrative Recommendations for Water Fluoridation, 1995* as part of the system’s request for final operational approval? | *CDC MMWR Vol 44 No. RR-13* |
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