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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 a new or modification of an existing water treatment system for a surface water or groundwater under the direct influence of surface water (GWUDISW) source. This information is used to evaluate treatment effectiveness for systems using a surface water or GWUDISW source.  **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** | ***Regulatory Reference*** |
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| 1. **Construction Documents**: Do the drawings and specifications for construction of the proposed treatment system include a schematic, profile, and scaled plan view depicting the location of the treatment unit(s) within the treatment process? Which specifications include make, model, and description of key system components? | *18 AAC 80.205(a)(2)* |
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| 1. **Treatment Objectives:** What is the treatment objective for each unit process? Describe the proposed technology. This description should include an explanation of how the proposed treatment has been selected, the treatment’s suitability for removing contaminants and treating the full range of water qualities expected from this source, and the design minimum log-inactivation and log‑removal achieved for each applicable target pathogen (e.g. *Giardia*, *Cryptosporidium*, and viruses). In addition, include the design criteria used for selecting and sizing the system and relevant calculations. Please note that rain catchment and seawater systems are subject to a treatment technique requirement of 4-log virus and 3-log *Giardia* removal/inactivation. | *18 AAC 80.205(b)(2&5)* |
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| 1. **Raw Water Quality:** What characteristics of the watershed and surrounding hydrogeology, physical condition of the water source, and results of laboratory analyses of untreated water for biological quality, TOC, turbidity and any other contaminants is the proposed treatment system designed to remove? The data needs to adequately show variations in water quality for seasons the plant will be treating water. Are there any raw water quality characteristics that may limit or interfere with the treatment process? Discuss how potential water quality interference constituents will be addressed using the proposed treatment method. The discussion should include whether or not pretreatment is required to remove interfering constituents present in raw water. | *18 AAC 80.205(c)(1)(A)&(B)*  *18 AAC 80.205(c)(3)(B)* |
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| 1. **Pretreatment:** If pretreatment is required, provide design criteria for pretreatment process. Is the pretreatment suitability based on raw water quality and a pilot study or other demonstration of its effectiveness? Was particle count analysis used to determine the level of pretreatment needed? Does the proposed pretreatment provide a constant water quality to the proposed filtration? Is a disinfectant added at the head of the treatment process to reduce the growth of algae, bacteria, etc.? | *Ten States Standards* |
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| 1. **WTP Disinfection**: Which specifications address disinfection of the new treatment system before use? If AWWA Standard C653 is not specified, does the proposed method include adequate detail for the contractor to implement? Please note that some membrane manufacturers may specify a maximum oxidant limit to prevent damage to membranes. | *18 AAC 80.205(b)(9)* |
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| 1. **Sample taps:** Which design drawing shows the location of compliance and operational sample points in the water treatment plant? Which specification requires the project to provide fixed labels on all compliance sample taps? | *18 AAC 80.655*  *18 AAC 80.205(c)(6)* |
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| 1. **Treatment Startup:** How will the plant startup be implemented including details on temporary piping and the anticipated startup schedule? If the project is a modification or replaces a water treatment plant, discuss how the transition will be made from the existing system to the new. Will data loggers collect the data? | *18 AAC 80.205(b)(9)*  *18 AAC 80.205(c)(1)(A)* |
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| 1. **Chemical Feed Pump(s):** What are the make and model of the chemical feed pump(s)? Has the engineer addressed the selection of the chemical feed pump(s)? Is documentation included of each pump’s suitability for the chemical it will be injecting, and are calculations provided showing the feed pump(s) are sized for the water flow rates and chemical dosages? | *18 AAC 80.030*  *18 AAC 80.205(a)(4)*  *18 AAC 80.205(b)(9)* |
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| 1. **Chemical Overfeed Protection:** What design features provide chemical overfeed protection and backflow prevention during system operation and shutdown? | *18 AAC 80.205(b)(9)*  *18 AAC 80.025* |
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| 1. **Dose Monitoring Equipment:** Summarize equipment proposed for monitoring chemical doses. Which calibration standards will be provided? Will all maintenance and calibration instructions for the monitoring equipment be included in the operation and maintenance manual? | *18 AAC 80.205(b)(9)* |
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| 1. **Shutdown Events:** Explain how the public water system water demand will be met during scheduled shutdown events. | *18 AAC 80.205(b)(2)* |
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| 1. **Alarms:** Does the submitted operational narrative describe how the system will function when producing potable water, including a description of system alarms, their trigger settings, and follow-up actions (e.g. auto shut-off, filter to-waste) and control system interlocks to prevent serving water not meeting regulatory requirements? This should include a description of the system's capability for effective and safe manual operation. | *18 AAC 80.205(b)(9)* |
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| 1. **Operator On-Site Training:** Does the submitted written plan for training the water system operator(s) include who will provide the training, the scheduled date of training relative to the proposed system startup, training forms to be used, and spreadsheets and schedules the operator will be provided? The scope of training should include collecting, recording, and interpreting data necessary for on-going compliance and performance verification. In addition, the operator needs to have the ability to transmit/transfer data for submittal to DEC during interim approval to operate. | *18 AAC 80.007* |
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| 1. **O&M Manual:** Is information included on the schedule and responsible party for completing the system’s O&M manual? **Please note**: at least a draft version will be required when applying for interim operational approval. The manual needs to include procedures for recording, collecting, and storing data. | *18 AAC 80.205(b)(9)* |
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| 1. **Treatment Performance Claims Verification:** If required, does the submittal include objective and verifiable third-party data to support performance claims of the manufacturer? This may include documentation the device is certified by an ANSI accredited organization to ANSI/NSF Standard 53 for removal of the contaminant(s) in question. | *18 AAC 80.010(b)(14)*  *18 AAC 80.205(b)(5)* |
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| 1. **Pilot Testing:** Does the submittal include a report of the pilot test used to select the proposed treatment? Depending on system size, complexity, and treatment objectives, pilot testing may be necessary for up to one year using raw water from the public water system source. The report should provide monthly raw water and treated water sample results. If applicable, it should include change out/regeneration frequency information. In addition, it should describe any operation and maintenance problems experienced during the pilot phase and how they will be addressed during system‑wide use. | *18 AAC 80.205(b)(5)* |
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| 1. **Power Supply:** Do design details show an uninterruptible power supply tied to critical electronic equipment? This is important for power conditioning and to provide enough backup power for proper system and valve shutdown at the water treatment plant. | *18 AAC 80.205(b)(9)* |
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| 1. **Heat Exchangers:** Which specification requires heat exchangers be double wall? | *18 AAC 80.025* |
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| 1. **Conventional or Direct Filtration Backwash:** If the proposed treatment is conventional or direct filtration, has the engineer discussed backwash triggers, duration, and frequency? Do the design calculations cover loading rates, backwashing rates, volume of backwash water, and other items necessary to assess the efficiency of the proposed filtration process? Has the engineer addressed the selection of filtration media, resins, coagulants, oxidizing agents, and filter aids to achieve a finished water turbidity meeting the performance limit of 0.3 NTU? | *18 AAC 80.600*  *18 AAC 80.610* |
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| 1. **Cartridge or Bag Filters Selection Basis:** If the proposed treatment includes cartridge or bag filters, are the make and model of the filters and filter housings identified, and are the basis of their selection discussed? Is information included for the maximum flow rate and differential pressure for each filter? Is sufficient information provided demonstrating how the proposed system design will address the full range of raw water qualities expected and provide a finished water turbidity of 1 NTU or lower at least 95% of the time? | *18 AAC 80.610(a)* |
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| 1. **Cartridge or Bag Filters NSF Certification:** If the proposed treatment will use cartridge or bag filters, which specification requires the filters paired with the filter housings be certified to ANSI/NSF Standard 53 for cyst removal or be approved by the Department? The Department maintains a list of approved alternative filters on its website <http://dec.alaska.gov/eh/dw/engineering.aspx>, under “Guidance.” | *18 AAC 80.030(b)(1)(A)* |
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| 1. **Disinfection:** Has the engineer identified and justified the disinfection parameters and assumptions used in the proposed design such as pH, temperature, disinfectant dosage, disinfectant demand, residual disinfectant concentration, design log inactivation criteria, design flow rate, hydraulic efficiency factor, and contact time? Is the first user’s location identified? | *18 AAC 80.635(d)* |
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| 1. **Disinfection Monitoring:** Does the design include the sample taps and monitoring equipment necessary for the operator to determine if CT is met while treating water? The operator will be required to report calculated CT during interim approval to operate. A calculation spreadsheet is available from the Department upon request. What is the proposed target chlorine residual in the water exiting the CT tank? | *18 AAC 80.635(d)*  *18 AAC 80.340(d)(2)* |
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| 1. **Backwash Water:** If the proposed filtration system includes a backwash process, is appropriate backflow prevention assembly on the backwash water supply line shown and specified? Which drawing shows an air gap of at least two-pipe diameters on the backwash waste line? | *18 AAC 80.025* |
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| 1. **Distribution Chlorine Residual:** Are documentation, calculations, and specifications included showing the public water system will be able to maintain 0.2 mg/L minimum chlorine residual at the distribution system entry point(s)? | *18 AAC 80.635(d)* |
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| 1. **Continuous Turbidity Monitoring:** If the submittal is requesting approval of continuous turbidity monitoring in lieu of grab sampling, will the operator have a benchtop meter for verification of the accuracy of the continuous measurement on some regular frequency? If not, is a validation protocol proposed for our review and approval? For systems proposing conventional or direct filtration, do the specifications show the type, quantity, and placement of turbidimeters are adequate to meet the combined and individual filter turbidity monitoring requirements of the Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR) and Interim Enhanced Surface Water Treatment Rule (IESWTR)? | *18 AAC 80.660*  *18 AAC 80.665*  *40 CFR 141*  *40 CFR 174*  *40 CFR 550*  *40 CFR 560* |
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| 1. **Turbidity Data:** How will the operator monitor the system? For systems utilizing continuous turbidity monitoring, is a discussion provided of how the operator will record turbidity data results at least every 15 minutes, download the data for analysis and interpretation, and electronically store the data for at least three years? | *18 AAC 80.205(c)(1)(A)*  *18 AAC 80.665*  *40 CFR Subpart T* |
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| 1. **Data Integrity:** Does the project include a plan for assuring the accuracy and consistency of data from sample collection until the data is used? Will the O&M manual have SOPs for sensor setup such as configuration, output, error-hold mode, signal span settings, etc., and for managing flow rate through the instruments? Will the O&M manual provide SOPs for monitoring sample collection processes? | *18 AAC 80.205(b)(9)*  *18 AAC 80.340* |
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| 1. **Disinfection By-products:** Is an evaluation of the water’s disinfection by‑product formation potential included? | *18 AAC 80.205(c)(4)* |
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