

Water Quality Requirements by State

ALABAMA

ALASKA

ARIZONA

- The mean 24h turbidity of filtered effluent must be ≤ 2 NTU and must not exceed 5 NTU at any time.
- Class A+ and Class A: no detectable fecal coliform organisms in 4 of the last 7 days' reclaimed water samples; maximum fecal coliform concentration in any sample must be ≤ 23 cfu/100 mL.
- For class A+ water, the 5-sample geometric mean concentration of total nitrogen must be ≤ 10 mg/L.
- For Class A water, the total nitrogen concentration applied must be reported along with the type of vegetation to which it was applied.
- Other monitoring requirements, test procedures, and recording practices may be specified.

ARKANSAS

CALIFORNIA

- The daily mean operating filter effluent turbidity (continuously monitored) is calculated as the average of turbidity measures at 4-h intervals over 24 h, and it must be reported quarterly. The maximum daily turbidity must be based on measures from continuous monitoring taken at ≤ 1.2 h intervals over 24 h.
- The median total coliform concentration of the last 7 days' analyses may not exceed an MPN (most probable number) of 2.2 /100 mL. The maximum total coliform concentration may not exceed an MPN of 23/100 mL in more than one sample in 30 days. No single total coliform measure may exceed an MPN of 240/100 mL. Samples must be collected at least once daily from the disinfected effluent.
- The combined disinfection and filtration process must inactivate 99.999% of F-specific bacteriophage MS2 or polio virus in the influent wastewater.

COLORADO

- The monthly mean turbidity must be ≤ 3 NTU, and not more than 5% of individual analytical results in one calendar month may exceed 5 NTU.
- For landscape irrigation, the monthly geometric mean E. coli concentration must be ≤ 126 cfu/100 mL; the E. coli concentration in any single sample in one month must be ≤ 235 cfu/100 mL.
- For single-family residential use, the 7-day median E. coli concentration must be $\leq 2.2/100$ mL; the E. coli concentration in any single sample in one month must be ≤ 23 cfu/100 mL.

CONNECTICUT

DELAWARE

- BOD5 must be ≤ 10 mg/L.
- TSS must be ≤ 10 mg/L.
- Turbidity must be ≤ 5 TU (continuously monitored, prior to disinfection).
- Fecal coliforms must be ≤ 20 cfu/100 mL.
- Inorganic constituents in the effluent must be compatible with site soil and site vegetation as stipulated in a table provided to the permittee.
- Nitrate in the percolate must be ≤ 10 mg/L.
- Influent must be monitored as stipulated in the system permit.
 - A site permit will stipulate monitoring requirements and sampling frequency.
 - Continuous on-line monitoring of residual disinfection concentrations is required at the compliance monitoring point.

FLORIDA

- In general, secondary treatment water quality limits are required.
- CBOD annual mean concentration must be ≤ 20 mg/L
- TSS must be ≤ 5 mg/L
- Maximum allowable fecal coliforms in any one sample is 25 cfu/100 mL, and 75% of fecal coliform tests must measure below the detection limit in a 30-day period of sampling.
- Total chlorine residual concentration must be at least 1 mg/L.
- Monitoring is required for Giardia and Cryptosporidium at the point immediately following disinfection:
 - Sampling must occur one time during each 2-year period at plants with treatment capacity ≥ 1 mgd, and one time during each 5-year period at plants with capacity ≤ 1 mgd.
 - The intervals between sampling must be < 2 years or < 5 years, depending on the same treatment capacity criteria.
- Minimum schedule for sampling and testing is based on system capacity. Parameters to be monitored include flow, pH, chlorine residual, dissolved oxygen, suspended solids, CBOD, nutrients, and fecal coliform concentrations. Specific monitoring requirements are determined on a case-by-case basis.
- Primary and secondary drinking water standards must be monitored by facilities treating more than 100,000 gpd.

GEORGIA

- BOD5 must be ≤ 5 mg/L, monitored weekly.
- TSS must be ≤ 5 mg/L, monitored weekly.
- Turbidity must be ≤ 3 NTU, monitored continuously after filtration.
- Fecal coliform monthly geometric mean of all valid results for a reporting period must be ≤ 23 cfu/100mL; maximum in any daily sample must be ≤ 100 cfu/100 mL.
- Detectable disinfectant residual at the delivery point is strongly recommended. (Monitoring for detectable disinfection residual or recording of UV output and transmittance is required).
- pH between 6 and 9, monitored daily.

HAWAII

- Filtered effluent turbidity must be ≤ 2 NTU.
- Median fecal coliform concentration from last seven day's samples of disinfected effluent must be ≤ 2.2 cfu/100 mL. Maximum fecal coliform concentration in any one sample must be ≤ 200 cfu/100 mL; in no more than one sample within a 30-day period may the fecal coliform concentration exceed 23 cfu/100 mL.
- Removal of 99.999% of plaque-forming units of F-specific bacteriophage MS2 or polio virus is required.
- Composite BOD5 samples must be collected at least weekly, with at least five tests per month required.
- TSS grab samples from treated water before disinfection must be taken at least weekly, with at least five tests per month required. The TSS should be correlated to corresponding turbidity readings.
- Fecal coliforms must be sampled daily for spray irrigation systems.

IDAHO

- Median total coliform concentration must be ≤ 2.2 cfu/100 mL for all samples analyzed in the past seven days. Maximum total coliform concentration in any sample must be ≤ 23 cfu/100 mL. Sampling should occur daily.
- If the system is operating at less than 75% of the nitrogen permit limit (125% of the crop uptake), and no industrial users are contributing to the municipal system providing the treated wastewater, the following parameters may be sampled twice per season rather than monthly: total Kjeldahl nitrogen, chemical oxygen demand, total P, ammonia nitrogen, nitrate + nitrite nitrogen, total dissolved solids, and pH.

ILLINOIS

- Calculations for the loading rates of BOD5, nitrogen, phosphorus, and water onto vegetation receiving irrigation spray must be submitted.

INDIANA

- BOD5 must be ≤ 10 mg/L, monitored weekly.
- The mean TSS measured before disinfection must be ≤ 5 mg/L in 24 h period, monitored daily.
- The median fecal coliform value for the last seven days for which analyses have been completed must be "none detected." The maximum fecal coliform concentration on any day must be ≤ 14 cfu /100 mL. Fecal coliforms must be monitored daily by membrane filtration or fermentation tube test.
- pH between 6 and 9, monitored weekly.
- If chlorination is used, the total chlorine residual after a minimum contact time of 30 minutes must be ≥ 1 mg/L, monitored daily.
- Monthly monitoring of total nitrogen, ammonium nitrogen, nitrate nitrogen, phosphorus, and potassium is required.
- Annual monitoring of a list of specified metals is required.

IOWA

- Fecal coliforms must be monitored.
- A chlorine residual 0.5 mg/L is required.
- The following parameters must be monitored unless it can be shown that they are present in insignificant amounts: TOC, TDS, SAR, conductivity, total N, ammonia-N, organic-N and nitrate-N, total P, chloride, pH, alkalinity, hardness; and specified trace elements.

KANSAS

- Supplemental condition language includes a stipulation that the wastewater be disinfected to ≤ 200 cfu/100 mL monthly average, and a chlorine residual must be maintained at ≥ 0.1 mg/L free or ≥ 1.0 mg/L combined.
- Sampling locations are designated. They include the sprinkler head or sampling tap at the end of the distribution system, for each application site of a given reclamation facility.

KENTUCKY

LOUISIANA

MAINE

MARYLAND

- BOD5 should be ≤ 70 mg/L.
- TSS should be ≤ 90 mg/L.
- Fecal coliforms must be ≤ 3 MPN/100 mL for golf courses.
- pH between 6.5 and 8.5.

MASSACHUSETTS

- BOD5 must be ≤ 10 mg/L, monitored weekly.
 - TSS must be ≤ 5 mg/L, measured 2 times weekly.
 - The mean turbidity (continuously monitored) must be ≤ 2 NTU/24 h, measured prior to disinfection; maximum turbidity must be ≤ 5 NTU.
 - The median fecal coliform value for a running 7-day sampling (measured daily) should be "none detected"; the maximum fecal coliform concentration in any sample must be ≤ 14 cfu/100 mL.
 - pH 6-9, measured daily.
 - The total N concentration must be ≤ 10 mg/L, measured twice times monthly.
 - The effluent water should be able to meet Class I Groundwater Permit Standards (SDWA Drinking Water Standards), which typically include measures for BOD, TSS, TS, flow, nitrate, total nitrogen, pH, VOC, FC, phosphorus and surfactants.
 - Required monitoring includes UV disinfection intensity or chlorine residual (daily); phosphorus (measured two times monthly); heterotrophic plate count (measured quarterly); and MS-2 phage measured quarterly.
 - Limits are to be met at the point of discharge from the treatment facility.
 - Reclaimed water must be clear, odorless, and virtually pathogen and contaminant free.
- (• Toilet flushing allows higher BOD (30 mg/L), TSS (10 mg/L), turbidity (5 NTU), and fecal coliforms (not to exceed 100 cfu/100 mL).

MICHIGAN

- Fecal coliform concentrations must be ≤ 10 cfu/100 mL.
- Wastewater effluent and groundwater receiving the discharge must not exceed 5000 micrograms/L total inorganic nitrogen and not more than 500 micrograms/L nitrite OR, the wastewater effluent limits may be set in a permit such that they meet groundwater standards.
- Phosphorus in the effluent must be < 5000 micrograms/L unless surface water is within 1000 ft hydraulically down gradient of the discharge, in which case effluent must be < 1000 micrograms/L or at a permit limit set to maintain a concentration below this maximum in the groundwater.
- Other effluent standards include: aluminum ≤ 150 micrograms/L, chloride $\leq 250,000$ micrograms/L, sodium $\leq 150,000$ micrograms/L, sulfate $\leq 250,000$ micrograms/L, iron ≤ 300 micrograms/L, manganese ≤ 50 micrograms/L; THMs limits may also be set.
- Other chemical limits may also be set based on the effluent analyses submitted with the permit application. Some organic compounds may have treatment-technology-based standards set in the permit.
- Several conditions are stipulated in the regulations that may lead to changes in the stated water quality limits.
- Methods of monitoring, analytical methods, and sample collection are stipulated for a variety of circumstances.

MINNESOTA

MISSISSIPPI

MISSOURI

- The irrigation water must contain as few indicator organisms as possible, and in no case should fecal coliforms exceed 200 cfu/100 mL.
- Irrigation water must not exceed the trace element concentrations stipulated in the EPA Design Manual for Land Treatment of Municipal Wastewater (EPA 625-1/81-013).

MONTANA

- The mean turbidity must be ≤ 2 NTU; turbidity during any 24-h period must be ≤ 5 NTU at least 95% of the time.
- The mean fecal coliform concentration from the last seven days of analyses must be ≤ 2.2 cfu/100 mL; the maximum fecal coliform concentration in any sample must be ≤ 23 cfu/100 mL.
- Effluent must be monitored on a regular basis to show the biochemical and bacteriological quality of the applied wastewater. Required monitoring frequency is determined on a case-by-case basis.

NEBRASKA

- If there is a substantial odor or nuisance problem, an allowable BOD loading will be stipulated.
- A fecal coliform limit will be set on a case-by-case basis.
- The permit application must describe the expected total soluble salt (salinity) concentration, the sodium absorption ratio (SAR), the carbonate and bicarbonate anion concentrations related to calcium and magnesium, the concentration of toxic elements (if any), and the relative contributions of industrial waste.
- A plan for periodic monitoring of the wastewater, soils and groundwater should be provided. Monitoring programs are stipulated on a case-by-case basis.

NEVADA

- BOD₅ should be ≤ 30 mg/L.
- TSS should be ≤ 30 mg/L.
- The 30-day geometric mean total coliform concentration must be ≤ 2.2 cfu/100 mL; the maximum total coliform concentration for any one day must be ≤ 23 cfu/100 mL.
- Nitrogen forms and concentrations in the reclaimed water must be reported.
- Other recommended monitoring data includes metals, SAR, and other stipulated inorganics.

NEW HAMPSHIRE

NEW JERSEY

- TSS limitations (≤ 5 mg/L) must be met both before and after disinfection and prior to discharge to a reuse location.
- The fecal coliform 7-day median value must be ≤ 2.2 cfu/100 mL; the fecal coliform concentration in any sample must be ≤ 14 cfu/100 mL.
- A chlorine residual-produced oxidant of at least 1.0 mg/L must be maintained for a minimum contact time of 15 minutes at peak hourly flow.
- Total nitrogen should be ≤ 10 mg/L, although if the applicant can demonstrate that a higher limit is possible while still protecting the environment, this concentration limit can be modified.

NEW MEXICO

- (• BOD must be ≤ 10 mg/L, measured weekly.)
- (• Turbidity must be ≤ 2 NTU, measured continuously, or the TSS must be ≤ 5 mg/L, measured daily.)
- (• The median fecal coliform concentration must be ≤ 2.2 cfu/100 mL for the prior seven days, with no single daily sample for that period exceeding 23 cfu/100 mL, measured daily.)
- The fecal coliform concentration in any single sample should be ≤ 100 cfu/100 mL.
- (• pH between 6 and 9 (or between 6 and 10 for lagoon treatment), measured weekly.)
- (• If chlorination is used for disinfection, the total residual chlorine must be ≥ 0.2 mg/L, as measured at the end of the wastewater treatment process.)

NEW YORK

NORTH CAROLINA

- The monthly mean BOD5 must be ≤ 10 mg/L; the maximum daily BOD5 must be ≤ 15 mg/L.
- The monthly mean TSS must be ≤ 5 mg/L; the maximum daily TSS concentration must be ≤ 10 mg/L.
- The monthly geometric mean fecal coliform concentration must be ≤ 14 cfu/100 mL; the daily maximum fecal coliform concentration in any sample must be ≤ 25 cfu/100 mL.
- The monthly mean NH3 concentration must be ≤ 4 mg/L; the daily maximum must be ≤ 6 mg/L.

NORTH DAKOTA

- BOD5 should be ≤ 25 mg/L, monitored once every 2 weeks.
- TSS should be ≤ 30 mg/L, monitored once every 2 weeks.
- With chlorination, fecal coliforms must be monitored once every two weeks. Without chlorination:
 - effluent from mechanical plants should have fecal coliform concentrations ≤ 200 cfu/100 mL, monitored 2x/wk;
 - effluent from lagoon systems should have fecal coliform concentrations ≤ 200 cfu/100 mL, monitored 1x/wk.
- Grab samples are stipulated.
- The Health Department may adjust limits on a case-by-case basis.

OHIO

- BOD5 should ≤ 25 mg/L, monitored 1-2x weekly.
- The 30-day mean MPN for fecal coliforms should be $\leq 23/100$ mL, monitored 1-2x weekly.
- The chlorine residual should be monitored.
- Maximum allowable metal concentrations are stipulated for irrigation.
- Large facilities are required to monitor total inorganic nitrogen monthly.
- Effluent limits and monitoring requirements are set on a case-by-case basis.

OKLAHOMA

OREGON

- The 24-h mean turbidity should be ≤ 2 NTU, sampled hourly, 95% of the time during a 24-h period it should be ≤ 5 NTU.
- The median seven day total coliform concentration should be ≤ 2.2 cfu/100 mL; the maximum total coliform concentration should be ≤ 23 cfu/100 mL, monitored daily.
- When chlorine-based compounds are used for disinfection, a minimum contact time and minimal chlorine residual may be specified in the permit. Use of other disinfection methods may require additional monitoring.
- Permit proposals are also submitted to the Health Division for comment. Additional effluent limitations and permit conditions may be imposed.
- The sampling point for water quality limits will be stipulated in the permit.

PENNSYLVANIA

- The 30-day mean C-BOD5 must be ≤ 25 mg/L.
- The 30-day mean TSS must be ≤ 30 mg/L.
- The monthly geometric mean fecal coliform concentration must be ≤ 200 cfu/100 mL.
- Chemical parameters such as pH, phosphorus, nitrate, nitrite, ammonia, Kjeldahl nitrogen, chloride, sulfate, and sodium must be monitored during system operation. Metal analyses may also be required.
- pH must be 6-9.

RHODE ISLAND

SOUTH CAROLINA

- Monthly mean BOD5 must be ≤ 5 mg/L, and weekly mean must be ≤ 7.5 mg/L.
- Turbidity limits are those used for drinking water (SC Code of Reg. 61-58). One TU, as determined by a monthly average except that five or fewer turbidity units may be allowed if the supplier of water can demonstrate to the State that the higher turbidity does not interfere with disinfection; prevent maintenance of an effective residual disinfectant in the distribution system; or interfere with microbiological determinations. If 5 TUs is permitted, the levels reported should be based on an average for two consecutive days.
- Coliforms limits are those used for drinking water (SC Code of Reg. 61-58). The water quality limits are based on the presence or absence of total coliforms in a sample, rather than coliform density. The number of allowable positive test results is based on the number of samples collected per month, which is based on the size of the facility. For example, for a system that collects at least 40 samples per month, no more than 5% of the samples from the month may be total coliform-positive. Sampling must occur both in the effluent and in the distribution system. At least one measurement per day is required.
- Total residual chlorine should be maintained in a manner such that a detectable residual chlorine level is maintained in the distribution system and the fecal coliform limits are met. Specific residual limits will be based on the site conditions and the distribution system design.
- Nitrate nitrogen concentrations must be monitored and reported, although no specific limits need be set.

- Fecal coliforms should be ≤ 2.2 cfu/100 mL, analyzed weekly. If fecal coliform monitoring indicates noncompliance, daily or even more frequent monitoring should be initiated and the results reported to the permitting authority.
- Analyses are to be performed by the person who prepares the wastewater; Analyses should be performed on representative samples of the treated wastewater according to stipulated procedures. Weekly analyses are required for nitrate as N, ammonia as N, and pH. Other parameters may be included in a permit on a case-by-case basis.

SOUTH DAKOTA

- Geometric mean total coliform concentration must be ≤ 200 cfu/100 mL, which should be adequate to protect human health; the guidelines note that it should be realized that this level probably will not eliminate all pathogenic viruses.
- Chlorine residuals must be at levels non-toxic to grasses, plants, fisheries, or aquatic life. Most grasses can tolerate a 2.0 mg/L total residual chlorine concentration.
- One sample of treated effluent must be collected monthly and tested for total nitrogen, nitrate, nitrite, sulfate, chloride, pH, temperature, total dissolved solids and fecal coliforms; results must be submitted to SD DENR.

TENNESSEE

- BOD5 monthly mean concentration must be ≤ 30 mg/L
- TSS monthly mean monthly concentration must be ≤ 30 mg/L
- Fecal coliform concentration must be ≤ 23 cfu/100 mL
- A nitrified effluent should not be produced, since nitrate may leach into the groundwater from the application site.
- pH between 6.5 and 8.4
- Recommended maximum concentrations and problematic concentrations of a variety of anions, cations and trace metals are provided in the regulations to guide permitting decisions.

TEXAS

- Monthly mean BOD5 or CBOD5 concentration must be ≤ 5 mg/L, sampled at least twice weekly.
- Monthly mean turbidity must be ≤ 3 NTU, sampled at least twice weekly.
- Monthly geometric mean fecal coliform concentration must be ≤ 20 cfu/100 mL; fecal coliform concentration in any one sample must be ≤ 75 cfu/100 mL. Coliforms must be sampled at least twice weekly.

UTAH

- The monthly arithmetic mean BOD should be ≤ 10 mg/L after tertiary treatment and disinfection, as determined by daily composite sampling. Composite samples shall be comprised of at least six flow proportionate samples taken over a 24-hour period.
- The the daily mean turbidity should be ≤ 2 NTU, and the maximum turbidity at any time should be ≤ 5 NTU.
- The weekly median fecal coliform concentration must be "none detected", and no sample may exceed 14 cfu/100 mL. Daily grab samples are required.
- The total residual chlorine shall be measured continuously and shall at no time be below 1.0 mg/L after a 30-minute contact time at peak flow. If alternative disinfection is used, it must be demonstrated that the alternative process is comparable to that achieved by chlorination with a 1 mg/L residual after a 30-minute contact time. If the effectiveness cannot be related to chlorination, then the effectiveness of the alternative disinfection process must be demonstrated by testing for pathogen destruction. A 1 mg/L total chlorine residual is required after disinfection and before the reclaimed water goes into the distribution system.
- pH between 6 and 9, measured in daily grab samples or by continuous monitoring.

VERMONT

VIRGINIA

WASHINGTON

- The monthly mean filtered turbidity must be ≤ 2 NTU; maximum allowable is 5 NTU; DO must be present. Continuous turbidity readings are required, with readings at 4-hr intervals.
- Median total coliform for seven days must be ≤ 2.2 cfu/100 mL. Maximum total coliform concentration in any sample must be $\leq 23/100$. Grab samples must be collected at least daily and at a time when wastewater characteristics are most demanding on the treatment facilities and disinfection procedures.
- BOD 24-hr composite samples collected at least weekly.
- TSS 24-hr composite samples, collected daily and reported monthly. (If mean monthly TSS is ≤ 30 mg/L, then reduced TSS sampling can be permitted on a case-by-case basis.)
- Grab samples for DO measurement must be collected at least daily and at a time when wastewater characteristics are most demanding on the treatment facilities.
- When chlorination is used, a minimum residual of at least 1 mg/L after a contact time of at least 30 minutes is required.
 - If pipeline travel is considered part of the contact time, the pipes are considered part of the treatment process and subject to other reclamation facility requirements.
 - A chlorine residual of at least 0.5 mg/L must be maintained in the reclaimed water during conveyance from the reclamation plant to the use area.
 - Maintenance of a chlorine residual is not required in impoundments and storage ponds, and at the discretion of the DHE, a residual may not be required in reclaimed water distributed from a storage pond.
 - A CT value greater than provided in the standard regulations may be required if it is judged that a reuse projects needs additional public health protection.

WEST VIRGINIA

WISCONSIN

WYOMING

- Fecal coliform concentration must be ≤ 2.2 cfu/100 mL, analyzed weekly. If fecal coliform monitoring indicates noncompliance, daily or even more frequent monitoring should be initiated and the results reported to the permitting authority.
- Analyses are to be performed by the person who prepares the wastewater; Analyses should be performed on representative samples of the treated wastewater according to stipulated procedures. Weekly analyses are required for nitrate as N, ammonia as N, and pH. Other parameters may be included in a permit on a case-by-case basis.