Table of Contents

58.01.08 - Idaho Rules for Public Drinking Water Systems

000. Legal Authority. 4
001. Title And Scope. 4
002. Incorporation By Reference And Availability Of Referenced Materials. 4
003. Definitions. 7
004. Coverage. 21
005. General Provisions For Waivers, Variances, And Exemptions. 21
006. Siting Requirements. 22
007. Disapproval Designation. 22
008. Health Hazards. 23
009. Monitoring. 23
010. Fee Schedule For Public Drinking Water Systems. 23
011. Continuity Of Service. 25
012. Written Interpretations. 26
013. Use Of Guidance. 26
014. Administrative Provisions. 26
015. Confidentiality Of Records. 26
016. Office Hours -- Mailing Address And Street Address. 26
017. -- 049. (Reserved) 26
050. Maximum Contaminant Levels And Maximum Residual Disinfectant Levels. 26
051. -- 099. (Reserved) 27
100. Monitoring And Analytical Requirements. 27
101. -- 149. (Reserved) 29
150. Reporting, Public Notification, Recordkeeping. 29
151. Consumer Confidence Reports. 29
152. -- 199. (Reserved) 29
200. Special Regulations. 29
201. -- 249. (Reserved) 30
250. Maximum Contaminant Level Goals And Maximum Residual Disinfection Level Goals. 30
251. -- 299. (Reserved) 30
300. Filtration And Disinfection. 30
301. Enhanced Filtration And Disinfection - Systems Serving Ten Thousand Or More People. 35
302. Sanitary Surveys For Systems Using Surface Water Or Ground Water Under The Direct Influence Of Surface Water. 35
303. Sanitary Surveys For Public Water Systems Using Ground Water. 36
304. Composite Correction Program (CCP). 37
305. Coliform Treatment Technique Triggers And Assessment Requirements For Protection Against Potential Fecal Contamination. 37
306. -- 309. (Reserved) 40

310. Enhanced Filtration And Disinfection - Systems Serving Fewer Than Ten Thousand People. 40
311. Enhanced Treatment For Cryptosporidium -- Long Term 2 Enhanced Surface Water Treatment Rule. 40
312. -- 319. (Reserved) 40
320. Disinfectant Residuals, Disinfection Byproducts, And Disinfection Byproduct Precursors. 41
321. Initial Distribution System Evaluations. 41
322. Stage 2 Disinfection Byproducts Requirements. 41
323. Ground Water Rule. 41
324. -- 349. (Reserved) 42
350. Control Of Lead And Copper. 42
351. -- 399. (Reserved) 42
400. Secondary MCLS. 42
401. -- 449. (Reserved) 43
450. Use Of Non-Centralized Treatment Devices. 43
451. Treatment Techniques. 45
452. -- 499. (Reserved) 45
500. Facility And Design Standards: Demonstration Of Technical, Financial, And Managerial Capacity Of Public Drinking Water Systems. 45
501. Facility And Design Standards: General Design Requirements For Public Drinking Water Systems. 47
502. Facility And Design Standards: Facility Plans. 51
503. Facility And Design Standards: Preliminary Engineering Reports. 53
504. Facility And Design Standards: Review Of Plans And Specifications. 57
505. -- 509. (Reserved). 61
510. Facility And Design Standards: Siting And Construction Of Wells. 61
511. Facility And Design Standards: Well Pumps, Discharge Piping, And Appurtenances. 66
512. Facility And Design Standards: Well Lot. 69
513. Facility And Design Standards: Number Of Ground Water Sources Required – Existing Systems. 69
514. Facility And Design Standards: Spring Sources. 70
515. Facility And Design Standards: Surface Sources And Ground Water Sources Under The Direct Influence Of Surface Water. 70
516. -- 517. (Reserved) 72
518. Facility And Design Standards: Additional Design Criteria For Surface Water Treatment. 72
519. Facility And Design Standards: Surface Water Treatment; Design Standards For Microscreening. 74
520. Facility And Design Standards: Surface Water Treatment: Clarification Processes. 74
521. Facility And Design Standards: Surface Water Treatment: Filtration Using Rapid Rate Gravity Filters. 77
522. Facility And Design Standards: Surface Water Treatment: Filtration Using Diatomaceous Earth. 81

523. Facility And Design Standards: Surface Water Treatment: Slow Sand Filtration. 83
524. Facility And Design Standards: Surface Water Treatment: Direct Filtration. .. 85
525. Facility And Design Standards: Low Pressure Membrane Filtration. 85
526. -- 528. (Reserved) 90
529. Facility And Design Standards: Disinfection Of Drinking Water, Ultraviolet Light. 90
530. Facility And Design Standards: Disinfection Of Drinking Water, Disinfecting Agents. 94
531. Facility And Design Standards: Design Standards For Chemical Application. 100
532. Facility And Design Standards: Design Standards For Softening. 106
533. Facility And Design Standards: Design Standards For Taste And Odor Control. 108
534. Facility And Design Standards: Aeration Processes. 109
535. Facility And Design Standards: Design Standards For Iron And Manganese Control Systems. 112
536. Facility And Design Standards: Design Standards For Fluoridation. 114
537. Facility And Design Standards: Design Standards For Stabilization. 115
538. – 539. (Reserved) 116
540. Facility And Design Standards: Design Standards For Treatment And Disposal Of Treatment Plant Waste Residuals. 116
541. Facility And Design Standards: Pumping Facilities. 118
542. Facility And Design Standards - Distribution System. 121
543. Facility And Design Standards: Cross Connection Control. 125
544. Facility And Design Standards: General Design Of Finished Water Storage. 125
545. Facility And Design Standards: Treatment Plant Storage Facilities. 128
546. Facility And Design Standards: Distribution System Storage Facilities. 129
547. Facility And Design Standards: Hydropneumatic Tank Systems. 129
548. Facility And Design Standards: Disinfection Of Facilities Prior To Use. 130
549. -- 551. (Reserved) 130
552. Operating Criteria For Public Water Systems. 130
553. Classification Of Water Systems. 135
554. License Requirements. 135
555. -- 559. (Reserved) 136
560. Contracting For Services. 136
561. -- 562. (Reserved) 136
563. Advisory Group. 136
564. -- 899. (Reserved) 136
900. Tables. 136
901. -- 999. (Reserved) 138

IDAPA 58
TITLE 01
CHAPTER 08

58.01.08 - IDAHO RULES FOR PUBLIC DRINKING WATER SYSTEMS

000. LEGAL AUTHORITY.

The Idaho Legislature has given the Idaho Board of Environmental Quality the authority to promulgate rules governing quality and safety of drinking water, pursuant to Title 37, Chapter 21 and Title 39, Chapter 1, Idaho Code. (5-3-03)

001. TITLE AND SCOPE.

01. Title. These rules shall be cited in full as Idaho Department of Environmental Quality Rules, IDAPA 58.01.08, "Idaho Rules for Public Drinking Water Systems." (10-1-93)

02. Scope. The purpose of these rules is to control and regulate the design, construction, operation, maintenance, and quality control of public drinking water systems to provide a degree of assurance that such systems are protected from contamination and maintained free from contaminants which may injure the health of the consumer. (10-1-93)

002. INCORPORATION BY REFERENCE AND AVAILABILITY OF REFERENCED MATERIALS.

01. Incorporation by Reference. The following documents are incorporated by reference into these rules. (4-11-06)

a. 40 CFR Part 141, revised as of July 1, 2015 (excluding annual monitoring provisions in 40 CFR 141.854(a)(4),(d),(e),(f) and (h), and the Aircraft Drinking Water Rule in Subsection X), and 40 CFR Part 143, revised as of July 1, 2011. Any reference in these rules to requirements, procedures, or specific forms contained in any section or subsection of 40 CFR Parts 141 and 143 shall constitute the full adoption by reference of that section or subsection, including any notes and appendices therein, unless expressly provided otherwise in these rules. (3-25-16)

b. American Water Works Association (AWWA) Standards, effective December 2009, available for a fee from the AWWA, 6666 West Quincy Avenue, Denver, Colorado 80235, Telephone (800) 926-7337, http://apps.awwa.org/ebusmain/OnlineStore.aspx. (4-7-11)

02. Availability of Specific Referenced Material. Copies of specific documents referenced within these rules are available at the following locations: (4-11-06)

a. All federal regulations: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, Telephone (202)783-3238; U.S. Government Bookstore, Room 194, Federal Bldg., 915 Second Ave., Seattle, WA 98174, (206) 553-4270; or Online at http://www.gpoaccess.gov/ecfr/index.html. (4-7-11)

b. All documents incorporated by reference are available for review at the Department of Environmental Quality, 1410 N. Hilton, Boise, ID 83706-1255, (208) 373-0502. (4-7-11)

c. Recommended Standards for Water Works: a report of the Water Supply Committee of the Great Lakes -- Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, published by Health Education Services, P.O. Box 7126, Albany, New York 12224, Telephone (518) 439-7286. (4-7-11)

d. Manual of Individual and Non-Public Water Supply Systems (EPA 570/9-91-004), published by the U.S. Environmental Protection Agency, available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C.20402, Telephone (202) 782-3238. (5-3-03)

e. U.S. Department of Commerce, National Bureau of Standards Handbook, No. 69, "Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure" as amended in 1963,

NCRP Publications, P.O. Box 20175, Washington, D.C. 20014. (12-10-92)

f. Rules of the Idaho Water Resources Board are available at http://www.adminrules.idaho.gov/rules/37/37index.htm, or the Idaho Department of Water Resources, Idaho Water Center, 322 E. Front St., P.O. Box 83720, Boise, Idaho 83720-0098, Telephone (208) 287-4800. (3-30-07)

g. ANSI/NSF Standard 44-2002e -- 2004, Residential Cation Exchange Water Softeners, available from the National Sanitation Foundation, 789 N. Dixboro Road, Ann Arbor, Michigan 48105, Telephone (734) 769-8010. (4-6-05)

h. ANSI/NSF Standard 53-2002e -- 2003, Drinking Water Treatment Units -- Health Effects, available from the National Sanitation Foundation, 789 N. Dixboro Road, Ann Arbor, Michigan 48105, Telephone (734) 769-8010. (4-6-05)

i. ANSI/NSF Standard 55-2002 -- 2002, Ultraviolet Microbiological Water Treatment Systems, available from the National Sanitation Foundation, 789 N. Dixboro Road, Ann Arbor, Michigan 48105, Telephone (734) 769-8010. (4-6-05)

j. ANSI/NSF Standard 58-2003 -- 2004, Reverse Osmosis Drinking Water Treatment Systems, available from the National Sanitation Foundation, 789 N. Dixboro Road, Ann Arbor, Michigan 48105, Telephone (734) 769-8010. (4-6-05)

k. ANSI/NSF Standard 60-2000a -- 2000, Drinking Water Treatment Chemicals -- Health Effects, available from the National Sanitation Foundation, 789 N. Dixboro Road, Ann Arbor, Michigan 48105, Telephone (734) 769-8010. (4-6-05)

l. ANSI/NSF Standard 61-2000a -- 2000, Drinking Water System Components -- Health Effects, available from the National Sanitation Foundation, 789 N. Dixboro Road, Ann Arbor, Michigan 48105, Telephone (734) 769-8010. (4-6-05)

m. American Water Works Association (AWWA) Standards, available from the AWWA, 6666 West Quincy Avenue, Denver, Colorado 80235, (800) 926-7337, www.awwa.org. (3-30-07)

n. Cross Connection Control Manual, available from Pacific Northwest Section of the American Water Works Association, P.O. Box 19581, Portland, OR, 97280-0581, Telephone (503) 246-5845. (3-30-07)

o. Manual of Cross-Connection Control, Foundation for Cross-Connection Control and Hydraulic Research, University of Southern California, KAP-200 University Park MC-2531, Los Angeles, CA 90089-2531, (866)545-6340, www.usc.edu/dept/fccchr/. (3-30-07)

p. Manual on Slow Sand Filtration (1991), published by AWWA Research Foundation 6666 West Quincy Avenue, Denver, CO 80235, (800)926-7337, www.awwa.org. (3-30-07)

q. Slow Sand Filtration (1991), published by the American Society of Civil Engineers American Society of Civil Engineers,1801Alexander Bell Drive, Reston, VA 20191, (800)548-2723, www.asce.org. (3-30-07)

r. Slow Sand Filtration and Diatomaceous Earth Filtration for Small Water Systems, DOH Pub #331-204 (4/03), Washington State Department of Health, Division of Environmental Health, Office of Drinking Water, PO Box 47828, Olympia WA 98504-7828, (360)236-3100 or (800)521-0323, http://www.doh.wa.gov/ehp/dw/Programs/water_sys_design.htm. (3-30-07)

s. Water System Design Manual, DOH Pub #331-123 (Rev. 8/01), Washington State Department of Health, Division of Environmental Health, Office of Drinking Water, PO Box 47828, Olympia WA 98504-7828, (360)236-3100 or (800)521-0323, http://www.doh.wa.gov/ehp/dw/Programs/water_sys_design.htm. (3-30-07)

t. Submersible Motors: Application, Installation, Maintenance (Franklin Electric AIM manual), Franklin Electric, Bluffton, Indiana 46714, (800)348-2420, http://www.franklin-electric.com/aim-

manual.aspx. (3-30-07)

u. Guidance Manual for Compliance with the Filtration and Disinfection Requirements for Public Water Systems Using Surface Water Sources (March 1991 Edition), U.S. Environmental Protection Agency, http://water.epa.gov/lawsregs/rulesregs/sdwa/swtr/upload/guidsws.pdf. (3-30-07)

v. Standard Methods for the Examination of Water and Wastewater, a joint publication of the American Public Health Association, the Water Environment Federation, and the American Water Works Association, 6666 West Quincy Avenue, Denver, CO 80235, 800-926-7337, www.standardmethods.org (3-30-07)

w. F480-02 Standard Specification for Thermoplastic Well Casing Pipe and Couplings Made in Standard Dimension ratios (SDR), SCH 40 and SCH 80, American Society for Testing and Materials (ASTM Standard F480-02). (3-30-07)

x. "Idaho Standards for Public Works Construction," Local Highway Technical Assistance Council, 3330 Grace Street, Boise, ID 83605, (208)344-0565. (4-4-13)

y. Memorandum of Understanding between the Idaho Department of Environmental Quality and the Idaho Division of Building Safety Plumbing Bureau, Idaho Department of Environmental Quality, 1410 North Hilton, Boise, Idaho 83706, www.deq.idaho.gov. (3-30-07)

z. Idaho General Safety and Health Standards (IGSHS), available from the Idaho Division of Building Safety, 1090 E. Watertower St., Meridian, Idaho 83642, (208)334-3950, http://dbs.idaho.gov/. (3-30-07)

aa. Implementation Guidance for the Long Term 2 Enhanced Surface Water Treatment Rule, Idaho Department of Environmental Quality, 1410 North Hilton, Boise, Idaho 83706, www.deq.idaho.gov. (4-2-08)

bb. Implementation Guidance for the Stage 2 Disinfectants and Disinfection Byproducts Rule, Idaho Department of Environmental Quality, 1410 North Hilton, Boise, Idaho 83706, www.deq.idaho.gov. (4-2-08)

cc. Implementation Guidance for the Ground Water Rule, Idaho Department of Environmental Quality, 1410 North Hilton, Boise, Idaho 83706, www.deq.idaho.gov. (5-8-09)

dd. AWWA Recommended Practice for Backflow Prevention and Cross-Connection Control (M14), available from the AWWA, 6666 West Quincy Avenue, Denver, Colorado 80235, Telephone (800) 926-7337. (4-7-11)

ee. Membrane Filtration Guidance Manual (EPA 815-R-06-009) published by the U.S. Environmental Protection Agency, available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, Telephone (202) 782-3238, http://www.epa.gov/ogwdw/disinfection/lt2/pdfs/guide_lt2_membranefiltration_final.pdf. (4-4-13)

ff. Ultraviolet Disinfection Guidance Manual for the Final Long Term 2 Enhanced Surface water Treatment Rule (EPA 815-R-06-007) published by the U.S. Environmental Protection Agency, available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C.20402, Telephone (202) 782-3238, www.epa.gov/safewater/disinfection/lt2/pdfs/guide_lt2_uvguidance.pdf. (4-4-13)

gg. Improving Clearwell Design for CT Compliance, Report #90756, available from the Water Research Foundation, http://waterrf.org/ProjectsReports/PublicReportLibrary/RFR90756_2000_271.pdf. (4-4-13)

hh. Surface Water Treatment Rule Compliance Guidance, dated January 10, 1996, Idaho Department of Environmental Quality, www.deq.idaho.gov. (4-4-13)

ii. Uniform Plumbing Code, available at Division of Building Safety, 1090 E. Watertower St., Meridian, Idaho 83642; and at the Division of Building Safety, 1250 Ironwood Dr., Ste. 220, Coeur d'Alene, Idaho 83814, http://dbs.idaho.gov. (4-4-13)

03. Precedence. In the event of conflict or inconsistency between the language in these rules and that found in any document incorporated by reference, these rules shall prevail. (4-11-06)

003. DEFINITIONS.
The definitions set forth in 40 CFR 141.2 are herein incorporated by reference except for the definition of the terms "action level," "disinfection," "noncommunity water system," and "person." (4-4-13)

01. Action Level. The concentration of lead or copper in water that determines, in some cases, whether a water system must install corrosion control treatment, monitor source water, replace lead service lines, or undertake a public education program. (12-10-92)

02. Administrator. The Administrator of the United States Environmental Protection Agency.(4-5-00)

03. Annual Samples. Samples that are required once per calendar year. (12-10-92)

04. Annular Opening. As used in well construction, this term refers to the nominal inside diameter of the borehole minus the outside diameter of the casing divided by two (2). (3-30-07)

05. Aquifer. A geological formation of permeable saturated material, such as rock, sand, gravel, etc., capable of yielding an economic quantity of water to wells and springs. (5-3-03)

06. Average Day Demand. The volume of water used by a system on an average day based on a one (1) year period. See also the definition of Water Demand in these rules. (5-8-09)

07. Backflow. The reverse from normal flow direction in a plumbing system or water system caused by back pressure or back siphonage. (12-10-92)

08. Bag Filters. Pressure-driven separation devices that remove particulate matter larger than one (1) micrometer using an engineered porous filtration media. They are typically constructed of a non-rigid, fabric filtration media housed in a pressure vessel in which the direction of flow is from the inside of the bag to the outside. (4-2-08)

09. Bank Filtration. A water treatment process that uses a well to recover surface water that has naturally infiltrated into ground water through a river bed or bank(s). Infiltration is typically enhanced by the hydraulic gradient imposed by a nearby pumping water supply or other well(s). (4-2-08)

10. Board. The Idaho Board of Environmental Quality. (5-3-03)

11. Capacity. The capabilities required of a public drinking water system in order to achieve and maintain compliance with these rules and the requirements of the federal Safe Drinking Water Act. It is divided into three (3) main elements: (4-5-00)

a. Technical capacity means the system has the physical infrastructure to consistently meet drinking water quality standards and treatment requirements and is able to meet the requirements of routine and emergency operations. It further means the ability of system personnel to adequately operate and maintain the system and to otherwise implement technical knowledge. Training of operator(s) is required, as appropriate, for the system size and complexity. (4-6-05)

b. Financial capacity means the financial resources of the water system, including an appropriate budget; rate structure; cash reserves sufficient for current operation and maintenance, future needs and emergency situations; and adequate fiscal controls. (5-8-09)

c. Managerial capacity means that the management structure of the water system embodies the aspects of water system operations, including, but not limited to; (5-8-09)

i. Short and long range planning; (4-5-00)

ii. Personnel management; (4-5-00)

iii. Fiduciary responsibility; (4-5-00)

iv. Emergency response; (4-5-00)

v. Customer responsiveness; (4-5-00)

vi. Source water protection; (4-5-00)

vii. Administrative functions such as billing and consumer awareness; and (4-5-00)

viii. Ability to meet the intent of the federal Safe Drinking Water Act. (4-5-00)

12. Cartridge Filters. Pressure-driven separation devices that remove particulate matter larger than one (1) micrometer using an engineered porous filtration media. They are typically constructed as rigid or semi-rigid, self-supporting filter elements housed in pressure vessels in which flow is from the outside of the cartridge to the inside. (4-2-08)

13. Clean Compliance History. For the purposes of the Revised Total Coliform Rule in Subsection 100.01, clean compliance history means a record of no maximum contaminant level violations under Subsection 050.05, no monitoring violations under Subsection 100.01, and no coliform treatment technique trigger exceedances or treatment technique violations under Subsection 100.01. (3-25-16)

14. Combined Distribution System. The interconnected distribution system consisting of the distribution systems of wholesale systems and of the consecutive systems that receive finished water. (4-2-08)

15. Community Water System. A public water system which serves at least fifteen (15) service connections used by year-round residents or regularly serves at least twenty-five (25) year-round residents. See also the definition of a Public Drinking Water System in these rules. (5-8-09)

16. Components of Finished Water Storage. Storage is available to serve the system if the storage structure or facility is elevated sufficiently or is equipped with sufficient booster pumping capability to pressurize the system. Components of finished water storage are further defined as: (5-8-09)

a. Dead Storage. Storage that is either not available for use in the system or can provide only substandard flows and pressures. (3-30-07)

b. Effective Storage. Effective storage is all storage other than dead storage and is made up of the additive components described in Paragraphs c. through f. of this Subsection. (5-8-09)

c. Operational Storage. Operational storage supplies water when, under normal conditions, the sources are off. This component is the larger of; (3-30-07)

i. The volume required to prevent excess pump cycling and ensure that the following volume components are full and ready for use when needed; or (3-30-07)

ii. The volume needed to compensate for the sensitivity of the water level sensors. (3-30-07)

d. Equalization Storage. Storage of finished water in sufficient quantity to compensate for the difference between a water system's maximum pumping capacity and peak hour demand. (3-30-07)

e. Fire Suppression Storage. The water needed to support fire flow in those systems that provide it. (3-30-07)

f. Standby Storage. Standby storage provides a measure of reliability or safety factor should sources fail or when unusual conditions impose higher than anticipated demands. Normally used for emergency operation, if

standby power is not provided, to provide water for eight (8) hours of operation at average day demand. (5-8-09)

17. Composite Correction Program (CCP). A systematic approach to identifying opportunities for improving the performance of water treatment and implementing changes that will capitalize on these opportunities. The CCP consists of two (2) elements: (4-5-00)

a. Comprehensive Performance Evaluation (CPE). A thorough review and analysis of a treatment plant's performance-based capabilities and associated administrative, operation, and maintenance practices. It is conducted to identify factors that may be adversely impacting a plant's capability to achieve compliance and emphasizes approaches that can be implemented without significant capital improvements. The CPE must consist of at least the following components: assessment of plant performance; evaluation of major unit processes; identification and prioritization of performance limiting factors; assessment of the applicability of comprehensive technical assistance; and preparation of a CPE report. (4-5-00)

b. Comprehensive Technical Assistance (CTA). The implementation phase that is carried out if the CPE results indicate improved performance potential. During the CTA phase, the system must identify and systematically address plant-specific factors. The CTA consists of follow-up to the CPE results, implementation of process control priority setting techniques, and maintaining long term involvement to systematically train staff and administrators. (4-5-00)

18. Compositing of Samples. The mixing of up to five (5) samples by the laboratory. (4-5-00)

19. Confining Layer. A nearly impermeable subsurface stratum which is located adjacent to one (1) or more aquifers and does not yield a significant quantity of water to a well. (5-3-03)

20. Confirmation Sample. A sample of water taken from the same point in the system as the original sample and at a time as soon as possible after the original sample was taken. (12-10-92)

21. Connection. Each structure, facility, or premises which is connected to a water system, and which is or could be used for domestic purposes, is considered a single connection. A single family residence is considered to be a premises. Multi-family dwellings and apartment, condominium, and office complexes are considered single connections unless individual units are billed separately for water by the water system, in which case each such unit shall be considered a single connection. (4-7-11)

22. Consecutive System. A public water system that receives some or all of its finished water from one (1) or more wholesale systems. Delivery may be through a direct connection or through the distribution system of one (1) or more consecutive systems. (4-2-08)

23. Consumer. Any person served by a public water system. (12-10-92)

24. Consumer Confidence Report (CCR). An annual report that community water systems must deliver to their customers. The reports must contain information on the quality of the water delivered by the systems and characterize the risks (if any) from exposure to contaminants detected in the drinking water in an accurate and understandable manner. (4-5-00)

25. Contaminant. Any physical, chemical, biological, or radiological substance or matter in water. (12-10-92)

26. Cross Connection. Any actual or potential connection or piping arrangement between a public or a consumer's potable water system and any other source or system through which it is possible to introduce into any part of the potable water system used water, water from any source other than an approved public water system, industrial fluid, gas or substance other than the intended potable water with which the system is supplied. Cross connections include bypass arrangements, jumper connections, removable sections, swivel or change-over devices and other temporary or permanent devices which, or because of which "backflow" can or may occur. (10-1-93)

27. Dead End Main. A distribution main of any diameter and length that does not loop back into the distribution system. (3-30-07)

28. **Dead Storage**. Storage that is either not available for use in the system or can provide only substandard flows and pressures. See also the definition of Components of Finished Water Storage in these rules. (5-8-09)

29. **Department**. The Idaho Department of Environmental Quality. (12-10-92)

30. **Director**. The Director of the Department of Environmental Quality or his designee. (12-10-92)

31. **Direct Integrity Test (DIT)**. A physical test applied to a microfiltration or ultrafiltration membrane unit in order to identify integrity breaches. (4-4-13)

32. **Disinfection**. Introduction of chlorine, other agents, or processes that are approved by the Department (such as ultraviolet light) in sufficient concentration, dosage, or application, and for the time required to kill or inactivate pathogenic and indicator organisms. (4-4-13)

33. **Disinfection Profile**. A summary of daily Giardia lamblia inactivation through the drinking water treatment plant. The procedure for developing a disinfection profile is contained in 40 CFR 141.172 and 40 CFR 141.530-141.536. (5-3-03)

34. **Distribution System**. Any combination of pipes, tanks, pumps, and other equipment which delivers water from the source(s), treatment facility(ies), or a combination of source(s) and treatment facility(ies) to the consumer. Chlorination may be considered as a function of a distribution system. (5-8-09)

35. **Drinking Water**. Means "water for human consumption." (3-30-07)

36. **Drinking Water System**. All mains, pipes, and structures through which water is obtained and distributed, including wells and well structures, intakes and cribs, pumping stations, treatment plants, reservoirs, storage tanks and appurtenances, collectively or severally, actually used or intended for use for the purpose of furnishing water for drinking or general domestic use. (12-10-92)

37. **Dual Sample Set**. A set of two (2) samples collected at the same time and same location, with one (1) sample analyzed for TTHM and the other sample analyzed for HAA5. Dual sample sets are collected for the purposes of conducting an Initial Distribution System Evaluation (40 CFR Part 141, Subpart U) and for determining compliance with the TTHM and HAA5 MCLs under the Stage 2 Disinfection Byproducts Requirements (40 CFR Part 141, Subpart V). (4-2-08)

38. **Effective Contact Time**. For the purpose of these rules, effective contact time means the time in minutes that it takes for water to move from the point of completely mixed chemical application to the point where residual concentration is measured. It is the "T" in contact time (CT) calculations and is either "demonstrated" or "calculated." It is the contact time sufficient to achieve the inactivation of target pathogens under the expected range of raw water pH and temperature variation and must be demonstrated through tracer studies or other evaluations or calculations acceptable to the Department. "Improving Clearwell Design for CT Compliance," referenced in Subsection 002.02, contains information that may be used as guidance for these calculations. (4-4-13)

39. **Effective Storage**. Effective storage is all storage other than dead storage and is made up of the additive components described in Paragraphs c. through f. of the definition of Components of Finished Water Storage in these rules. (4-4-13)

40. **Enhanced Coagulation**. The addition of sufficient coagulant for improved removal of disinfection byproduct precursors by conventional filtration treatment. Conventional filtration treatment is defined in 40 CFR 141.2. (5-3-03)

41. **Enhanced Softening**. The improved removal of disinfection byproduct precursors by precipitative softening. (4-5-00)

42. **Equalization Storage**. Storage of finished water in sufficient quantity to compensate for the

difference between a water system's maximum pumping capacity and peak hour demand. See also the definition of Components of Finished Water Storage in these rules. (5-8-09)

43. Equivalent Dwelling Unit (EDU). A unit of measure that standardizes all land use types (housing, retail, office, etc.) to the level of demand created by a single-family detached housing unit within a water system. The demand for one (1) equivalent dwelling unit is equivalent to the amount of water provided to the average single-family detached housing unit within a water system. For example, a business designed to use three (3) times as much water as an average single-family detached housing unit would have a demand of three (3) equivalent dwelling units. (5-8-09)

44. Exemption. A temporary deferment of compliance with a maximum contaminant level or treatment technique requirement which may be granted only if the system demonstrates to the satisfaction of the Department that the system cannot comply due to compelling factors and the deferment does not cause an unreasonable risk to public health. (12-10-92)

45. Facility Plan. The facility plan for a public drinking water system describes the overall system, including sources of water, treatment processes and facilities, pumping stations and distribution piping, finished water storage, and waste disposal. It is a comprehensive planning document for infrastructure and includes a plan for the future of the system/facility, including upgrades and additions. It is usually updated on a regular basis due to anticipated or unanticipated growth patterns, regulatory requirements, or other infrastructure needs. A facility plan is sometimes referred to as a master plan or facilities planning study. In general, a facility plan is an overall system-wide plan as opposed to a project specific plan. (3-30-07)

46. Facility Standards and Design Standards. Facility standards and design standards are described in Sections 500 through 552 of these rules. Facility and design standards found in Sections 500 through 552 of these rules must be followed in the planning, design, construction, and review of public drinking water facilities. (3-30-07)

47. Fee Assessment. A charge assessed on public drinking water systems based on a rate structure calculated by system size. (10-1-93)

48. Filter Profile. A graphical representation of individual filter performance, based on continuous turbidity measurements or total particle counts versus time for an entire filter run, from startup to backwash inclusively, that includes an assessment of filter performance while another filter is being backwashed. (4-5-00)

49. Filtrate. As the term relates to microfiltration and ultrafiltration, the product water or the portion of the feed stream that has passed through the membrane. (4-4-13)

50. Finished Water. Water that is introduced into the distribution system of a public water system and is intended for distribution and consumption without further treatment, except as necessary to maintain water quality in the distribution system (e.g., booster disinfection, addition of corrosion control chemicals). (4-2-08)

51. Finished Water Storage Structures or Facilities. Finished water storage structures or facilities are defined as: (5-8-09)

a. Above-ground storage structure or facility. A finished water storage structure or facility with a bottom elevation above normal ground surface. (5-8-09)

b. Ground-level storage structure or facility. A finished water storage structure or facility with a bottom elevation at normal ground surface. (5-8-09)

c. Partially buried storage structure or facility. A finished water storage structure or facility with a bottom elevation below normal ground surface and any portion of the structure or facility above normal ground surface. (5-8-09)

d. Below-ground storage structure or facility. A finished water storage structure or facility with a bottom elevation and top elevation below normal ground surface. (5-8-09)

52. Fire Flow Capacity. The water system capacity, in addition to maximum day demand, that is available for fire fighting purposes within the water system or distribution system pressure zone. Adequacy of the water system fire flow capacity is determined by the local fire authority or through a hydraulic analysis performed by a licensed professional engineer to establish required fire flows in accordance with the International Fire Code as adopted by the State Fire Marshal. (4-4-13)

53. Fire Suppression Storage. The water needed to support fire flow in those systems that provide it. See also the definition of Components of Finished Water Storage in these rules. (5-8-09)

54. Fixture Protection. The practice of installing backflow prevention assemblies or devices to isolate one (1) or more cross connections within a customer's facility. (5-8-09)

55. Flowing Stream. As used in the Long Term 2 Enhanced Surface Water Treatment Rule (40 CFR Part 141, Subpart W), this term means a course of running water flowing in a definite channel. (4-2-08)

56. Flux. The throughput of a pressure-driven membrane filtration process expressed as flow per unit of membrane area, usually in gallons per square foot per day or liters per hour per square meter. (4-4-13)

57. Ground Water System. A public water system which is supplied exclusively by a ground water source or sources. (12-10-92)

58. Ground Water Under the Direct Influence of Surface Water (GWUDI). Any water beneath the surface of the ground with significant occurrence of insects or other macroorganisms, algae, or large diameter pathogens such as Giardia lamblia or Cryptosporidium, or significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH which closely correlate to climatological or surface water conditions. Direct influence shall be determined by the Department for individual sources. The determination of direct influence may be based on site-specific measurements of water quality, documentation of well construction characteristics and geology with field evaluation, a combination of water quality and documentation, or other information required by the Department. (4-4-13)

59. Haloacetic Acids (Five) (HAA5). The sum of the concentrations in milligrams per liter of the haloacetic acid compounds (monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid) rounded to two (2) significant figures after addition. (4-5-00)

60. Health Hazards. Any condition which creates, or may create, a danger to the consumer's health. Health hazards may consist of, but are not limited to, design, construction, operational, structural, collection, storage, distribution, monitoring, treatment or water quality elements of a public water system. See also the definition of Significant Deficiency, which refers to a health hazard identified during a sanitary survey. (5-3-03)

61. Indirect Integrity Monitoring. Monitoring some aspect of filtrate water quality that is indicative of the removal of particulate matter. (4-4-13)

62. Inorganic. Generally refers to compounds that do not contain carbon and hydrogen. (12-10-92)

63. Internal or In-Plant Isolation. The practice of installing backflow prevention assemblies to protect an area within a water customer's structure, facility, or premises from contaminating another part of the structure, facility, or premises. (4-7-11)

64. Lake/Reservoir. As used in the Long Term 2 Enhanced Surface Water Treatment Rule (40 CFR Part 141, Subpart W), this term means a natural or man-made basin or hollow on the Earth's surface in which water collects or is stored that may or may not have a current or single direction of flow. (4-2-08)

65. Level 1 Assessment. A Level 1 Assessment is an evaluation to identify the possible presence of sanitary defects, defects in distribution system coliform monitoring practices, and (when possible) the likely reason that the system triggered the assessment. It is conducted by the system operator or owner. Minimum elements include review and identification of atypical events that could affect distributed water quality or indicate that distributed water quality was impaired; changes in distribution system maintenance and operation that could affect distributed

water quality (including water storage); source and treatment considerations that bear on distributed water quality, where appropriate (e.g., whether a ground water system is disinfected); existing water quality monitoring data; and inadequacies in sample sites, sampling protocol, and sample processing. The system must conduct the assessment consistent with any Department directives that tailor specific assessment elements with respect to the size and type of the system and the size, type, and characteristics of the distribution system. (3-25-16)

66. Level 2 Assessment. A Level 2 Assessment is an evaluation to identify the possible presence of sanitary defects, defects in distribution system coliform monitoring practices, and (when possible) the likely reason that the system triggered the assessment. A Level 2 assessment provides a more detailed examination of the system (including the system's monitoring and operational practices) than does a Level 1 assessment through the use of more comprehensive investigation and review of available information, additional internal and external resources, and other relevant practices. It is conducted by an individual approved by the Department in accordance with Subsection 305.03, which may include the system operator. Minimum elements include review and identification of atypical events that could affect distributed water quality or indicate that distributed water quality was impaired; changes in distribution system maintenance and operation that could affect distributed water quality (including water storage); source and treatment considerations that bear on distributed water quality, where appropriate (e.g., whether a ground water system is disinfected); existing water quality monitoring data; and inadequacies in sample sites, sampling protocol, and sample processing. (3-25-16)

67. License. A physical document issued by the Idaho Bureau of Occupational Licenses certifying that an individual has met the appropriate qualifications and has been granted the authority to practice in Idaho under the provisions of Chapter 24, Title 54, Idaho Code. (4-6-05)

68. Locational Running Annual Average (LRAA). The average of sample analytical results for samples taken at a particular monitoring location during the previous four (4) calendar quarters, as set forth in the Stage 2 Disinfection Byproducts Requirements (40 CFR Part 141, Subpart V). (4-2-08)

69. Log. Logarithm to the base ten (10). In the context of these rules, it is used in the determination of removal or inactivation efficiencies. It is expressed as the logarithm to the base ten (10) or "log" of the concentration of the feed or raw water minus the log of the concentration in the filtrate or product water. For example, if the incoming feed or raw water concentration is one hundred (100), and the outgoing filtrate or product water concentration is ten (10), a 10-fold reduction was attained; or 1-log removal. 1-log removal also equates to ninety percent (90%) removal, as ninety (90) of the original feed concentration counts had been removed, leaving ten (10) in the filtrate. Similarly, 2-log equates to ninety-nine percent (99%) removal. (4-4-13)

70. Log Removal Value (LRV). LRV is a measure of filtration removal efficiency for a target organism, particulate, or surrogate expressed as Logarithm to the base ten (10). (4-4-13)

71. Material Deviation. A change from the design plans that significantly alters the type or location of facilities, requires engineering judgment to design, or impacts the public safety or welfare. (4-11-06)

72. Material Modification. Those modifications of an existing public water system that are intended to increase system capacity or alter the methods or processes employed. Any project that adds source water to a system, increases the pumping capacity of a system, increases the potential population served by the system or the number of service connections within the system, adds new or alters existing drinking water system components, or affects the water demand of the system is considered to be increasing system capacity or altering the methods or processes employed. Maintenance and repair performed on the system and the replacement of valves, pumps, or other similar items with new items of the same size and type are not considered a material modification. (5-8-09)

73. Maximum Contaminant Level (MCL). The maximum permissible level of a contaminant in water which is delivered to any user of a public water system. (3-30-07)

74. Maximum Day Demand. The average rate of consumption for the twenty-four (24) hour period in which total consumption is the largest for the design year. See also the definition of Water Demand in these rules. (5-8-09)

75. Maximum Pumping Capacity. The pumping capacity with the largest source or pump out of

service. (5-8-09)

76. Maximum Residual Disinfectant Level (MRDL). A level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap without an unacceptable possibility of adverse health effects. For chlorine and chloramines, a public water system is in compliance with the MRDL, when the running annual average of monthly averages of samples taken in the distribution system, computed quarterly, is less than or equal to the MRDL. For chlorine dioxide, a public water system is in compliance with the MRDL when daily samples are taken at the entrance to the distribution system and no two (2) consecutive daily samples exceed the MRDL. MRDLs are enforceable in the same manner as maximum contaminant levels under Section 1412 of the Safe Drinking Water Act. There is convincing evidence that addition of a disinfectant is necessary for control of waterborne microbial contaminants. Notwithstanding the MRDLs listed in 40 CFR 141.65, operators may increase residual disinfectant levels of chlorine or chloramines (but not chlorine dioxide) in the distribution system to a level and for a time necessary to protect public health to address specific microbiological contamination problems caused by circumstances such as distribution line breaks, storm runoff events, source water contamination, or cross-connections. (4-4-13)

77. Maximum Residual Disinfectant Level Goal (MRDLG). The maximum level of a disinfectant added for water treatment at which no known or anticipated adverse effect on the health of persons would occur, and which allows an adequate margin of safety. MRDLGs are nonenforceable health goals and do not reflect the benefit of the addition of the chemical for control of waterborne microbial contaminants. (4-5-00)

78. Membrane Filtration. A pressure or vacuum driven separation process in which particulate matter larger than one (1) micrometer (µm) is rejected by an engineered barrier, primarily through a size-exclusion mechanism. This definition includes the common membrane technologies of microfiltration, ultrafiltration, nanofiltration, and reverse osmosis. (4-4-13)

79. Membrane Unit. A group of treatment systems or membrane modules that usually share common control and valving so that the group can be isolated for testing or cleaning. (4-4-13)

80. Method Detection Limit (MDL). The lowest concentration which can be determined to be greater than zero with ninety-nine percent (99%) confidence, for a particular analytical method. (12-10-92)

81. Microfiltration (MF). A low pressure membrane filtration process with pore diameter normally in the range of 0.1 to 0.5 µm. (4-4-13)

82. Module. As the term relates to membrane filtration, it is the smallest component of a membrane unit in which a specific membrane surface area is housed. The component is typically equipped with a feedwater inlet, a filtrate outlet, and concentrate or backwash outlet structure. (4-4-13)

83. Nanofiltration (NF). A membrane filtration process that removes dissolved constituents from water. Nanofiltration is similar to reverse osmosis but allows a higher percentage of certain ions to pass through the membrane. These systems typically operate under higher pressure than microfiltration and ultrafiltration. (4-4-13)

84. New System. Any water system that meets, for the first time, the definition of a public water system provided in Section 1401 of the federal Safe Drinking Water Act (42 U.S.C. Section 300f). This includes systems that are entirely new construction and previously unregulated systems that are expanding. (4-5-00)

85. Noncommunity Water System. A public water system that is not a community water system. A non-community water system is either a transient noncommunity water system or a non-transient noncommunity water system. See also the definition of a Public Drinking Water System in these rules. (5-8-09)

86. Non-Potable Fluids. Any fluids that do not meet the definition of potable water. This definition also includes any gases that are heavier than air such as propane. (4-4-13)

87. Non-Potable Mains. Pipelines that collect, deliver, or otherwise convey non-potable fluids. (4-4-13)

88. Non-Potable Services or Lines. Pipelines that collect, deliver, or otherwise convey non-potable fluids to or from a non-potable main. These pipelines connect individual facilities to the non-potable main. This term also refers to pipelines that convey non-potable fluids from a pressurized irrigation system, reclaimed wastewater system, and other non-potable systems to individual consumers. (4-4-13)

89. Nontransient Noncommunity Water System. A public water system that is not a community water system and that regularly serves at least twenty-five (25) of the same persons over six (6) months per year. See also the definition of a Public Drinking Water System in these rules. (5-8-09)

90. Operating Shift. That period of time during which water system operator decisions that affect public health are necessary for proper operation of the system. (4-5-00)

91. Operational Storage. Operational storage supplies water when, under normal conditions, the sources are off. This component is the larger of the volume required to prevent excess pump cycling and ensure that the following volume components are full and ready for use when needed or the volume needed to compensate for the sensitivity of the water level sensors. See also the definition of Components of Finished Water Storage in these rules. (5-8-09)

92. Operation and Maintenance Manual. An operation and maintenance manual typically covers three main subjects: a water system specific operations plan (see definition of Operations Plan); maintenance information and checklists; and manufacturer's product information (including trouble shooting information, a parts list and parts order form, special tools, spare parts list, etc.). An operation and maintenance manual may cover every aspect of the water system or any part of the water system, including but not limited to the following: treatment, pump stations, storage reservoirs, distribution system, pressure reducing valve stations, etc. (4-4-13)

93. Operations Plan. The operations plan is part of an operation and maintenance manual. Depending on which facilities of the water system are being addressed, the operations plan may cover many types of information including but not limited to the following: daily, weekly, monthly, and yearly operating instructions; information specific to a particular type of treatment; location of valves and other key distribution system features; pertinent telephone and address contact information including the responsible charge water system operator and water system owner; operator safety procedures; alarm system; emergency procedures; trouble-shooting advice; water quality testing; depressurization events; customer service; and response to customer complaints. (4-4-13)

94. Owner/Purveyor of Water/Supplier of Water. The person, company, corporation, association, or other organizational entity which holds legal title to the public water system, who provides, or intends to provide, drinking water to the customers, and who is ultimately responsible for the public water system operation. (5-8-09)

95. Peak Hour Demand. The highest hourly flow, excluding fire flow, that a water system or distribution system pressure zone is likely to experience in the design year. See also the definition of Water Demand in these rules. (5-8-09)

96. Person. A human being, municipality, or other governmental or political subdivision or other public agency, or public or private corporation, any partnership, firm, association, or other organization, any receiver, trustee, assignee, agent or other legal representative of the foregoing or other legal entity. (12-10-92)

97. Pesticides. Substances which meet the criteria for regulation pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as amended, and any regulations adopted pursuant to FIFRA. For example, pesticides include, but are not limited to insecticides, fungicides, rodenticides, herbicides, and algaecides. (12-10-92)

98. Plant Design Capacity. The maximum design flow through treatment units. The minimum plant design capacity could be equal to peak hour demand but could also be equal to the maximum day demand if equalization storage is provided. (4-4-13)

99. Plant. A physical facility where drinking water or wastewater is treated or processed. (3-30-07)

100. Point of Use (POU) Treatment Device. A treatment device applied to a single tap used for the purpose of reducing contaminants in drinking water at that one tap. (3-30-07)

101. Point of Use (POU) Treatment System. A collection of POU treatment devices. (3-30-07)

102. Potable Mains. Pipelines that deliver potable water to multiple service connections. (3-30-07)

103. Potable Services. Pipelines that convey potable water from a connection to the potable water main to individual consumers. (3-30-07)

104. Potable Water. Water for human consumption. See the definition of Water for Human Consumption in Section 003. (4-4-13)

105. Preliminary Engineering Report. The preliminary engineering report for a public drinking water system facility is a report that addresses specific portions of the system or facility for which modifications are being designed. Modifications may include, but are not limited to, significant changes to existing processes or facilities, system expansion, addition of treatment, or installation of other processes and facilities. This report addresses specific purpose and scope, design requirements, alternative solutions, costs, operation and maintenance requirements, and other requirements as described in Section 503. Preliminary engineering reports are generally project specific as opposed to an overall system-wide plan, such as a facility plan. (4-4-13)

106. Premises Isolation or Containment. The practice of separating the customer's structure, facility, or premises from the purveyor's system by means of a backflow prevention assembly installed on the service line before any distribution takes place. (4-7-11)

107. Presedimentation. A preliminary treatment process used to remove gravel, sand, and other particulate material from the source water through settling before the water enters the primary clarification and filtration processes in a treatment plant. (4-2-08)

108. Protected Water Source. For the purposes of the Revised Total Coliform Rule (40 CFR Part 141, Subpart Y), a protected water source is a ground water well that is not susceptible to contamination on the basis of well construction, hydrologic data, or contamination history. (3-25-16)

109. Public Notice. The notification of public water system consumers of information pertaining to that water system including information regarding water quality or compliance status of the water system. (12-10-92)

110. Public Drinking Water System. A system for the provision to the public of water for human consumption through pipes or, after August 5, 1998, other constructed conveyances, if such system has at least fifteen (15) service connections, regardless of the number of water sources or configuration of the distribution system, or regularly serves an average of at least twenty-five (25) individuals daily at least sixty (60) days out of the year. Such term includes: any collection, treatment, storage, and distribution facilities under the control of the operator of such system and used primarily in connection with such system; and any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system. Such term does not include any "special irrigation district." A public water system is either a "community water system" or a "noncommunity water system" as further defined as: (5-8-09)

a. Community water system. A public water system which serves at least fifteen (15) service connections used by year-round residents or regularly serves at least twenty-five (25) year-round residents. (5-8-09)

b. Noncommunity water system. A public water system that is not a community water system. A non-community water system is either a transient noncommunity water system or a non-transient noncommunity water system. (5-8-09)

c. Nontransient noncommunity water system. A public water system that is not a community water system and that regularly serves at least twenty-five (25) of the same persons over six (6) months per year. (5-8-09)

d. Transient noncommunity public water system. A noncommunity water system which does not regularly serve at least twenty-five (25) of the same persons over six (6) months per year. (5-8-09)

111. Public Water System/Water System/System. Means "public drinking water system." (4-5-00)

112. Pump House. A structure containing important water system components, such as a well, hydropneumatic tank, booster pump, pump controls, flow meter, well discharge line, or a treatment unit. Pump houses are often called well houses in common usage, even though in modern construction these structures may not contain either a well or a pump. These terms are used interchangeably in national standards and trade publications. (4-4-13)

113. Qualified Licensed Professional Engineer (QLPE). A professional engineer licensed by the state of Idaho; qualified by education or experience in the specific technical fields involved in these rules; and retained or employed by a city, county, quasi-municipal corporation, or regulated public utility for the purposes of plan and specification review. (5-8-09)

114. Quasi-Municipal Corporation. A public entity, other than community government, created or authorized by the legislature to aid the state in, or to take charge of, some public or state work for the general welfare. For the purpose of these rules, this term refers to drinking water districts. (4-11-06)

115. Raw Water. Raw water is any ground water, spring water, or surface water utilized as source water prior to treatment for the purpose of producing potable water. (4-4-13)

116. Redundancy. The installation of duplicate components or backup systems that are designed to maintain minimum pressure and capacity of the system should any component fail or otherwise be out of service for maintenance or repair. (4-4-13)

117. Regulated Public Utility. For the purpose of these rules, any public water system that falls under the jurisdiction of the Idaho Public Utilities Commission and is subject to the rules thereof. (3-30-07)

118. Reverse Osmosis (RO). A membrane filtration process that removes dissolved constituents from water. Reverse osmosis is similar to nanofiltration but allows a lower percentage of certain ions to pass through the membrane. These systems typically operate under higher pressure than microfiltration and ultrafiltration. (4-4-13)

119. Repeat Compliance Period. Any subsequent compliance period after the initial compliance period. (12-10-92)

120. Resolution. As the term relates to membrane treatment, it is the size of the smallest integrity breach that contributes to a response from a direct integrity test when testing low pressure membranes. (4-4-13)

121. Responsible Charge (RC). Responsible Charge means active, daily on-site or on-call responsibility for the performance of operations or active, on-going, on-site, or on-call direction of employees and assistants. (5-8-09)

122. Responsible Charge Operator. An operator of a public drinking water system, designated by the system owner, who holds a valid license at a class equal to or greater than the drinking water system classification, who is in responsible charge of the public drinking water system. (4-6-05)

123. Reviewing Authority. For those projects requiring preconstruction approval by the Department, the Department is the reviewing authority. For those projects allowing for preconstruction approval by others, pursuant to Subsection 504.03.b. of these rules, the qualified Idaho licensed professional engineer (QLPE) is also the reviewing authority. (5-8-09)

124. Sampling Point. The location in a public water system from which a sample is drawn. (12-10-92)

125. Sanitary Defect. 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. Examples of sanitary defects include but are not limited to: cross connections, inadequate distribution system pressures, inadequate or missing sanitary seal, improperly screened storage tank vents, inadequate protection from contamination during flooding, history of treatment failures, deterioration of system components, and water main leaks or breaks. (3-25-16)

126. **Sanitary Survey**. An onsite review of the water source, facilities, equipment, operation and maintenance of a public water system for the purpose of evaluating the adequacy of such source, facilities, equipment, operation and maintenance for producing and distributing safe drinking water. The sanitary survey will include, but is not limited to the following elements: (4-5-00)

a. Source; (4-5-00)

b. Treatment; (4-5-00)

c. Distribution system; (4-5-00)

d. Finished water storage; (4-5-00)

e. Pumps, pump facilities, and controls; (4-5-00)

f. Monitoring and reporting and data verification; (4-5-00)

g. System management and operation; and (4-5-00)

h. Operator compliance with state requirements. (4-5-00)

127. **SDWIS-State**. An acronym that stands for "Safe Drinking Water Information System-State Version." It is a software package developed under contract to the U.S. Environmental Protection Agency and used by a majority of U.S. states to collect, maintain, and report data about regulated public water systems. (4-4-13)

128. **Seasonal System**. A noncommunity water system that is not operated as a public water system on a year-round basis and starts up and shuts down at the beginning and end of each operating season. (3-25-16)

129. **Sensitivity**. As the term relates to membrane treatment, it is the maximum log removal value (LRV) for a specific resolution that can be reliably verified by the direct integrity test associated with a given low pressure membrane filtration system. (4-4-13)

130. **Sewage**. The water-carried human or animal waste from residences, buildings, industrial establishments or other places, together with such ground water infiltration and surface water as may be present. (3-30-07)

131. **Significant Deficiency**. As identified during a sanitary survey, any defect in a system's design, operation, maintenance, or administration, as well as any failure or malfunction of any system component, that the Department or its agent determines to cause, or have potential to cause, risk to health or safety, or that could affect the reliable delivery of safe drinking water. See also the definition of Health Hazards. (5-3-03)

132. **Simple Water Main Extension**. New or replacement water main(s) that require plan and specification review by a qualified licensed professional engineer (QLPE) or by the Department per these rules and that is connected to existing water main facilities and does not require the addition of system components designed to control quantity or pressure, including, but not limited to, booster stations, new sources, pressure reducing valve stations, or reservoirs; and continues to provide the pressure and quantity requirements of Subsection 552.01. (4-4-13)

133. **Special Irrigation District**. An irrigation district in existence prior to May 18, 1994 that provides primarily agricultural service through a piped water system with only incidental residential or similar use where the system or the residential or similar users of the system comply with the exclusion provisions in Section 1401(4)(B)(i)(II) or (III) of the Safe Drinking Water Act. (4-6-05)

134. **Spring**. A source of water which flows from a laterally percolating water table's intersection with the surface or from a geological fault that allows the flow of water from an artesian aquifer. (12-10-92)

135. Standby Storage. Standby storage provides a measure of reliability or safety factor should sources fail or when unusual conditions impose higher than anticipated demands. See also the definition of Components of Finished Water Storage in these rules. (5-8-09)

136. Substantially Modified. The Department shall consider a public water system to be substantially modified when, as the result of one (1) or more projects, there is a combined increase of twenty-five percent (25%) or more above the system's existing configuration in the population served or number of service connections, the total length of transmission and distribution water mains, and the peak or average water demand. (5-8-09)

137. Substitute Responsible Charge Operator. An operator of a public drinking water system who holds a valid license at a class equal to or greater than the drinking water system classification, designated by the system owner to replace and to perform the duties of the responsible charge operator when the responsible charge operator is not available or accessible. (4-6-05)

138. Surface Water System. A public water system which is supplied by one (1) or more surface water sources or ground water sources under the direct influence of surface water. Also called subpart H systems in applicable sections of 40 CFR Part 141. (4-5-00)

139. Total Organic Carbon (TOC). Total organic carbon in mg/l measured using heat, oxygen, ultraviolet irradiation, chemical oxidants, or combinations of these oxidants that convert organic carbon to carbon dioxide, rounded to two (2) significant figures. (4-5-00)

140. Total Trihalomethanes (TTHM). The sum of the concentration in milligrams per liter of the trihalomethane compounds (trichloromethane [chloroform], dibromochloromethane, bromodichloromethane and tribromomethane [bromoform]), rounded to two (2) significant figures. (4-2-08)

141. Transient Noncommunity Public Water System. A noncommunity water system which does not regularly serve at least twenty-five (25) of the same persons over six (6) months per year. See also the definition of a Public Drinking Water System in these rules. (5-8-09)

142. Treatment Facility. Any place(s) where a public drinking water system or nontransient noncommunity water system alters the physical or chemical characteristics of the drinking water. Chlorination may be considered as a function of a distribution system. (4-5-00)

143. Turbidity. A measure of the interference of light passage through water, or visual depth restriction due to the presence of suspended matter such as clay, silt, nonliving organic particulates, plankton and other microscopic organisms. Operationally, turbidity measurements are expressions of certain light scattering and absorbing properties of a water sample. Turbidity is measured by the Nephelometric method. (12-10-92)

144. Ultrafiltration (UF). A low pressure membrane filtration process with pore diameter normally in the range of five thousandths to one tenth micrometer (0.005 to 0.1 μm). (4-4-13)

145. Ultraviolet (UV) Light Technology. A physical disinfection process that has proven effective against common pathogens in drinking water. (4-4-13)

146. UV Transmittance (UVT). A measure of the fraction of incident light transmitted through a material (e.g., water sample or quartz). The UVT is usually reported for a wavelength of two hundred fifty-four (254) nm and a pathlength of one (1) cm. It is often represented as a percentage. (4-4-13)

147. Unregulated Contaminant. Any substance that may affect the quality of water but for which a maximum contaminant level or treatment technique has not been established. (12-10-92)

148. Use Assessment. For the purpose of obtaining a waiver from certain monitoring requirements, a use assessment is an evaluation as to whether synthetic organic contaminants are being or have been used, manufactured, transported, stored, or disposed of in the watershed for surface water or the zone of influence for ground water. (5-8-09)

149. Variance. A temporary deferment of compliance with a maximum contaminant level or treatment technique requirement which may be granted only when the system demonstrates to the satisfaction of the Department that the raw water characteristics prevent compliance with the MCL or requirement after installation of the best available technology or treatment technique and the determent does not cause an unreasonable risk to public health. (12-10-92)

150. Very Small Public Drinking Water System. A Community or Nontransient Noncommunity Public Water System that serves five hundred (500) persons or less and has no treatment other than disinfection or has only treatment which does not require any chemical treatment, process adjustment, backwashing or media regeneration by an operator (e.g. calcium carbonate filters, granular activated carbon filters, cartridge filters, ion exchangers). (4-5-00)

151. Volatile Organic Chemicals (VOCs). VOCs are lightweight organic compounds that vaporize or evaporate easily. (10-1-93)

152. Vulnerability Assessment. A determination of the risk of future contamination of a public drinking water supply. (12-10-92)

153. Waiver. (12-10-92)

a. For the purposes of these rules, except Sections 500 through 552, "waiver" means the Department approval of a temporary reduction in sampling requirements for a particular contaminant. (3-30-07)

b. For purposes of Sections 500 through 552, "waiver" means a dismissal of any requirement of compliance. (3-30-07)

c. For the purposes of Section 010, "waiver" means the deferral of a fee assessment for a public drinking water system. (10-1-93)

154. Wastewater. Any combination of liquid or water and pollutants from activities and processes occurring in dwellings, commercial buildings, industrial plants, institutions and other establishments, together with any ground water, surface water, and storm water that may be present; liquid or water that is chemically, biologically, physically or rationally identifiable as containing blackwater, gray water or commercial or industrial pollutants; and sewage. See IDAPA 58.01.16, "Wastewater Rules," for additional information. (4-7-11)

155. Water for Human Consumption. Water that is used by humans for drinking, bathing for purposes of personal hygiene (including hand-washing), showering, cooking, dishwashing, and maintaining oral hygiene. In common usage, the terms "culinary water," "drinking water," and "potable water" are frequently used as synonyms. (5-3-03)

156. Water Demand. The volume of water requested by system users to satisfy their needs. Water demand can be further categorized as: (5-8-09)

a. Average day demand. The volume of water used by a system on an average day based on a one (1) year period. (5-8-09)

b. Maximum day demand. The average rate of consumption for the twenty-four (24) hour period in which total consumption is the largest for the design year. (5-8-09)

c. Peak hour demand. The highest hourly flow, excluding fire flow, that a water system or distribution system pressure zone is likely to experience in the design year. (5-8-09)

157. Water Main. A pipe within a public water system which is under the control of the system operator and conveys water to two (2) or more service connections or conveys water to a fire hydrant. The collection of water mains within a given water supply is called the distribution system. (5-8-09)

158. Watershed. The land area from which water flows into a stream or other body of water which

drains the area. (3-30-07)

159. Wholesale System. A public water system that treats source water as necessary to produce finished water and then delivers some or all of that finished water to another public water system. Delivery may be through a direct connection or through the distribution system of one (1) or more consecutive systems. (4-2-08)

004. COVERAGE.
40 CFR 141.3 is herein incorporated by reference. (10-1-93)

005. GENERAL PROVISIONS FOR WAIVERS, VARIANCES, AND EXEMPTIONS.
40 CFR 141.4 is herein incorporated by reference. (4-4-13)

01. Waivers. (12-10-92)

a. The Department may waive any requirement of Sections 500 through 552 that is not explicitly imposed by Idaho Statute, if it can be shown to the satisfaction of the Department that the requirement is not necessary for the protection of public health, protection from contamination, and satisfactory operation and maintenance of a public water system. (3-30-07)

b. The Department may at its discretion waive the requirements outlined in Section 010. (10-1-93)

c. Waiver of monitoring requirements is addressed in Subsection 100.07. (5-3-03)

02. Variances. (5-3-03)

a. General Variances. A variance may be granted by the Department if a public water system submits an application and demonstrates to the satisfaction of the Department that the following minimum requirements as required by 42 USC Section 1415(a) (The Safe Drinking Water Act) are met. These include but are not limited to: (5-3-03)

i. The system has installed the best available technology, treatment techniques, or other means to comply with the maximum contaminant level; and (5-3-03)

ii. Alternative sources of water are not reasonably available to the system. (5-3-03)

iii. For provisions of a national primary drinking water regulation which requires the use of a specific treatment technique with respect to a contaminant, the system must demonstrate that the technique is not necessary to protect the health of the system's customers. (5-3-03)

b. Small System Variances. A small system variance for a maximum contaminant level or treatment technique may be granted by the Department if a public water system submits an application and demonstrates to the satisfaction of the Department that the following minimum requirements as required by 42 USC Section 1415(e) are met. These include, but are not limited to: (5-3-03)

i. The system serves three thousand three hundred (3,300) or fewer persons; (5-3-03)

ii. If the system serves more than three thousand three hundred (3,300) persons but fewer than ten thousand (10,000) persons, the application shall be approved by the U.S. Environmental Protection Agency; (5-3-03)

iii. The U.S. Environmental Protection Agency has identified a variance technology that is applicable to the size and source water quality conditions of the public water system; (5-3-03)

iv. The system installs, operates and maintains such treatment technology, treatment technique, or other means; and (5-3-03)

v. The system cannot afford to comply with a national primary drinking water regulation in accordance with affordability criteria established by the Department, including compliance through treatment,

alternative source of water supply, restructuring or consolidation. (4-4-13)

03. Exemptions. An exemption may be granted by the Department if a public water system submits an application and demonstrates to the satisfaction of the Department that the following minimum requirements as required by 42 USC Section 1416(a) are met. These include but are not limited to: (5-3-03)

a. The system is unable to comply with a maximum contaminant level or treatment technique due to compelling factors, which may include economic factors; (5-3-03)

b. The system was in operation by the effective date of such contaminant level or treatment technique and no reasonable source of water is available to the system; or (5-3-03)

c. If the system was not in operation by the effective date of such contaminant level or treatment technique, then no reasonable alternative source of water is available to the system; and (5-3-03)

d. The granting of an exemption will not result in an unreasonable risk to health; (5-3-03)

e. Management or restructuring changes cannot reasonably be made to comply with the contaminant level or treatment technique to improve the quality of the drinking water; (5-3-03)

f. The system cannot meet the standard without capital improvements which cannot be completed prior to the date established pursuant to 42 USC Section 1412b(10); (5-3-03)

g. If the system needs financial assistance, the system has entered into an agreement to obtain such financial assistance; or (5-3-03)

h. The system has entered into an enforceable agreement to become a part of a regional public water system and is taking all practical steps to meet the standard. (5-3-03)

04. Conditions. A waiver, exemption or variance may be granted upon any conditions that the Department, in its discretion, determines are appropriate. Failure by the public water system to comply with any condition voids the waiver, variance or exemption. (12-10-92)

05. Public Hearing. The Department shall provide public notice and an opportunity for public hearing in the area served by the public water system before any exemption or variance under Section 005 is granted by the Department. At the conclusion of the hearing, the Department shall record the findings and issue a decision approving, denying, modifying, or conditioning the application. (5-3-03)

06. Exceptions. Any person aggrieved by the Department's decision on a request for a waiver, variance or exemption may file a petition for a contested case with the Board. Such petitions shall be filed with the Board, as prescribed in, IDAPA 58.01.23, "Rules of Administrative Procedure Before the Board of Environmental Quality." (3-15-02)

07. Surface Water Variances. Variances from the requirements of Sections 300 through 303 are not allowed. (4-5-00)

08. Surface Water Exemptions. Exemptions from 40 CFR 141.72(a)(3) and 40 CFR 141.72(b)(2) are not allowed. (4-4-13)

006. SITING REQUIREMENTS.
40 CFR 141.5 is herein incorporated by reference. (10-1-93)

007. DISAPPROVAL DESIGNATION.
The Department or its agent may assign a disapproved designation to a public water system when: (5-3-03)

01. Defects. There are design or construction defects, or some combination of design and construction defects; or (5-8-09)

02. Operating Procedures. Operating procedures constitute a health hazard; or (12-10-92)

03. Quality. Physical, chemical, microbiological or radiological quality does not meet the requirements of these rules; or (10-1-93)

04. Monitoring. The required monitoring as specified in these rules has not been conducted; or (10-1-93)

05. Unapproved Source. An unapproved source of drinking water is used or the system is interconnected with a disapproved water system. (12-10-92)

06. Non-Payment of Annual Fee Assessment. The annual drinking water system fee assessment is not paid as set forth in Section 010. (7-1-97)

07. Public Notification. The Department may require the owner of a water system that has been given a disapproval designation to notify the public. The manner, content, and timing of this notification will be determined by the Department. This requirement is in addition to any public notification requirements set forth in Section 150 that may also apply to the disapproved system. (5-3-03)

008. HEALTH HAZARDS.

01. Prohibited. (10-1-93)

a. No public water system, or portion of a public water system, shall constitute a health hazard, as determined by the Department and defined in Section 003 of these rules. (5-3-03)

b. No public water system, or portion of a public water system, shall create a condition which prevents, or may prevent, the detection of a health hazard, as determined by the Department. (5-3-03)

02. Schedule. Health hazards and conditions which prevent, or may prevent, the detection of a health hazard must be mitigated as required by the Department and terminated within a time schedule established by the Department. (5-3-03)

03. Standards. Design and construction revisions necessary to correct a health hazard or conditions which prevent, or may prevent, the detection of a health hazard, must be reviewed and approved by the Department, and comply with Sections 501 through 552, unless otherwise specified by the Department. (3-30-07)

009. MONITORING.
The Department may, in its discretion, alter the monitoring or sampling requirements for any contaminant otherwise specified in these rules if the Department determines that such alteration is necessary to adequately assess the level of such contamination. (10-1-93)

010. FEE SCHEDULE FOR PUBLIC DRINKING WATER SYSTEMS.
All regulated public drinking water systems shall pay an annual drinking water system fee. The fee shall be assessed to regulated public drinking water systems as provided in this section. (10-1-93)

01. Effective Date. Annual fees shall be paid for each fee year beginning October 1, 1993, and continuing for each succeeding year. (10-1-93)

02. Fee Schedule. (10-1-93)

a. Community and Nontransient noncommunity public drinking water systems shall pay an annual fee according to the following fee schedule:

Number of Connections	Fee
1 to 20	$100
21 to 184	$5 per connection, not to exceed a total of $735 per system
185 to 3,663	$4 per connection, not to exceed a total of $10,988 per system
3,664 or more	$3 per connection

(7-1-97)

b. The annual fee for transient public drinking water systems is twenty-five dollars ($25). (10-1-93)

c. New public drinking water systems formed after October 1 will not pay a fee until the following October. (10-1-93)

03. Fee Assessment. (10-1-93)

a. An annual fee assessment will be generated for each community and nontransient noncommunity public drinking water system listed in the Department's Safe Drinking Water Information System (SDWIS). (4-4-13)

b. Community and nontransient noncommunity public drinking water systems will be notified each year of the official number of connections listed in SDWIS. Systems will have at least one (1) month to notify the Department if the number of connections listed in SDWIS is not in agreement with the system's records. (4-4-13)

c. The official number of connections listed in SDWIS following each yearly update, as required in Subsection 010.03.b., will be used to calculate the annual fee for community and nontransient noncommunity public drinking water systems for the next fee year of October 1 through September 30. (4-4-13)

04. Billing. An annual fee shall be assessed and a statement will be mailed to all community, nontransient noncommunity, and transient public drinking water systems listed in SDWIS by the Department on or before September 1 of each year. (4-4-13)

05. Payment. (10-1-93)

a. Payment of the annual fee shall be due on October 1, unless it is a Saturday, a Sunday, or a legal holiday, in which event the payment shall be due on the successive business day. Fees paid by check or money order shall be made payable to the Idaho Department of Environmental Quality and sent to 1410 North Hilton Street, Boise, ID 83706-1255. (10-1-93)

b. If a public water system consists of two hundred fifty (250) connections or more, the system may request to divide its annual fee payment into equal monthly or quarterly installments by submitting a request to the Department on the proper request form provided with the initial billing statement. (10-1-93)

c. The Department will notify applicable systems, in writing, of approval or denial of a requested monthly or quarterly installment plan within ten (10) business days of the Department receiving such a request. (10-1-93)

d. If a public water system has been approved to pay monthly installments then each installment shall be due by the first day of each month, unless it is a Saturday, a Sunday, or a legal holiday, in which event the installment shall be due on the successive business day. (10-1-93)

e. If a public water system has been approved to pay quarterly installments then each installment shall be due by the first day of the month of each quarter (October 1, January 1, April 1, and July 1), unless it is a Saturday, a Sunday, or a legal holiday, in which event the installment shall be due on the first successive business day.

(10-1-93)

06. Delinquent Unpaid Fees. A public water system will be delinquent in payment if its annual fee assessment has not been received by the Department by November 1; or if having first opted to pay monthly or quarterly installments, its monthly or quarterly installment has not been received by the Department by the last day of the month in which the monthly or quarterly payment is due. (10-1-93)

07. Suspension of Services and Disapproval Designation. (7-1-97)

a. For any system delinquent in payment of fee assessed under Subsections 010.02 and 010.06, in excess of ninety (90) days, technical services provided by the Department may be suspended except for the following: (7-1-97)

i. Issuance of monitoring waivers; (7-1-97)

ii. Review and processing of engineering reports; and (7-1-97)

iii. Review of plans and specifications for design and construction as set forth in Sections 501 through 552. (3-30-07)

b. For any system delinquent in payment of fee assessed under Subsections 010.02 and 010.06, in excess of one hundred and eighty (180) days, the Department may suspend all technical services provided by the Department including any of the following: (7-1-97)

i. Review and processing of engineering reports; (7-1-97)

ii. Review of plans and specifications for design and construction as set forth in Sections 501 through 552; (3-30-07)

iii. Renewal of monitoring waivers; or (7-1-97)

iv. Granting of new monitoring waivers. (7-1-97)

c. For any system delinquent in payment of fee assessed under Subsections 010.02 and 010.06, in excess of one hundred and eighty (180) days, the Department may disapprove the public water system pursuant to Subsection 007.06. (7-1-97)

08. Reinstatement of Suspended Services and Approval Status. For any public water system for which delinquency of fee payment, pursuant to Subsection 010.07, has resulted in the suspension of technical services, the disapproval of a public water system, or both, continuation of technical services, reinstatement of public water system approval, or both, will occur upon payment of delinquent annual fee assessments. (5-8-09)

09. Enforcement Action. Nothing in Section 010 waives the Department's right to undertake an enforcement action at any time, including seeking penalties, as provided in Section 39-108, Idaho Code. (7-1-97)

10. Responsibility to Comply. Subsection 010.07 shall in no way relieve any system from its obligation to comply with all applicable state and federal drinking water statutes, rules, regulations, or orders. (7-1-97)

011. CONTINUITY OF SERVICE.

01. Transfer of Ownership. No owner shall transfer system ownership without providing written notice to the Department and all customers. Notification shall include a schedule for transferring responsibilities and identification of the new owner. (5-3-03)

02. Maintenance of Standards. The system transferring ownership shall ensure that all health related standards are met during transfer and shall ensure that water rights, operation and maintenance manuals, and all other

pertinent documentation is transferred to the new owner. (5-3-03)

012. WRITTEN INTERPRETATIONS.
The Department of Environmental Quality may have written statements in the form of guidance and policy documents that pertain to the interpretation of the rules of this chapter. Such written statements may be inspected and copies obtained at the Department of Environmental Quality, 1410 North Hilton, Boise, Idaho 83706-1255. (5-3-03)

013. USE OF GUIDANCE.
Guidance documents referenced in these rules are to be used to assist both designers and reviewers in determining a reasonable way to achieve compliance with the rules. Nothing in these rules makes the use of a particular guidance or guidance document mandatory. If the plans and specifications comply with applicable facility and design standards as set out in these rules, Section 39-118, Idaho Code, requires that the Department not substitute its judgment for that of the design engineer concerning the manner of compliance. If the design engineer needs assistance as to how to comply with a particular rule, the design engineer may use the referenced guidance documents for that assistance. However, the design engineer may also use other guidance or provide documentation to substantiate his or her own professional judgment. (5-8-09)

014. ADMINISTRATIVE PROVISIONS.
Persons may be entitled to appeal agency actions authorized under these rules pursuant to IDAPA 58.01.23, "Rules of Administrative Procedure Before the Board of Environmental Quality." (3-15-02)

015. CONFIDENTIALITY OF RECORDS.
Information obtained by the Department under these rules is subject to public disclosure pursuant to the provisions of Chapter 1, Title 74, Idaho Code. Information submitted under a trade secret claim may be entitled to confidential treatment by the Department as provided in Section 74-114, Idaho Code, and IDAPA 58.01.21, "Rules Governing the Protection and Disclosure of Records in the Possession of the Department of Environmental Quality." (3-15-02)

016. OFFICE HOURS -- MAILING ADDRESS AND STREET ADDRESS.
The state office of the Department of Environmental Quality and the office of the Board of Environmental Quality are located at 1410 N. Hilton, Boise, Idaho 83706-1255, telephone number (208) 373-0502. The office hours are 8 a.m. to 5 p.m. Monday through Friday. (4-11-06)

017. -- 049. (RESERVED)

050. MAXIMUM CONTAMINANT LEVELS AND MAXIMUM RESIDUAL DISINFECTANT LEVELS.

01. Maximum Contaminant Levels for Inorganic Contaminants. (4-4-13)

a. 40 CFR 141.11 is herein incorporated by reference. (4-4-13)

b. 40 CFR 141.62 is herein incorporated by reference. (4-4-13)

c. The maximum contaminant level for cyanide is two-tenths milligram per liter (0.2 mg/l). (12-10-92)

02. Maximum Contaminant Levels for Organic Contaminants. 40 CFR 141.61 is herein incorporated by reference, except that the best available technology (BAT) treatment listed in 40 CFR 141.61(b) shall be changed to reflect that packed tower aeration will not be listed for toxaphene but will be listed for toluene. (4-4-13)

03. Maximum Contaminant Levels for Turbidity. 40 CFR 141.13 is herein incorporated by reference. (4-4-13)

04. Maximum Contaminant Levels for Radionuclides. 40 CFR 141.66 is herein incorporated by reference. (4-4-13)

05. Maximum Contaminant Levels for Microbiological Contaminants. 40 CFR 141.63 is herein

incorporated by reference. (4-4-13)

06. Maximum Contaminant Levels for Disinfection Byproducts. 40 CFR 141.64 is herein incorporated by reference. (4-4-13)

07. Maximum Residual Disinfectant Levels. 40 CFR 141.65 is herein incorporated by reference. (4-4-13)

08. Effective Dates. Effective date information provided in 40 CFR 141.6 and 40 CFR 141.60 is applicable. (4-4-13)

051. -- 099. (RESERVED)

100. MONITORING AND ANALYTICAL REQUIREMENTS.

01. Total Coliform Sampling and Analytical Requirements. The Total Coliform Rule, 40 CFR 141.21, is herein incorporated by reference. The Revised Total Coliform Rule, 40 CFR Part 141, Subpart Y, is herein incorporated by reference, excluding the annual monitoring provisions in 40 CFR 141.854 (a)(4), (d), (e), (f) and (h). (3-25-16)

a. Routine monitoring requirements for public water systems serving more than one thousand (1,000) people. 40 CFR 141.857 is herein incorporated by reference. (3-25-16)

b. Routine monitoring requirements for community water systems serving one thousand (1,000) or fewer people using only ground water. 40 CFR 141.855 is herein incorporated by reference. (3-25-16)

c. Routine monitoring requirements for subpart H public water system serving one thousand (1,000) or fewer people. 40 CFR 141.856 is herein incorporated by reference. (3-25-16)

d. Routine monitoring requirements for non-community water system serving one thousand (1,000) or fewer people using only ground water. 40 CFR 141.854 is herein incorporated by reference, excluding the annual monitoring provisions in 40 CFR 141.854 (a)(4), (d), (e), (f), and (h). (3-25-16)

02. Turbidity Sampling and Analytical Requirements. 40 CFR 141.22 is herein incorporated by reference. (4-4-13)

03. Inorganic Chemical Sampling and Analytical Requirements. 40 CFR 141.23 is herein incorporated by reference. (4-4-13)

04. Organic Chemicals, Sampling and Analytical Requirements. 40 CFR 141.24 is herein incorporated by reference. (4-4-13)

05. Analytical Methods for Radioactivity. 40 CFR 141.25 is herein incorporated by reference. (4-4-13)

06. Monitoring Frequency and Compliance Requirements for Radioactivity in Community Water Systems. 40CFR 141.26 is herein incorporated by reference. (4-4-13)

07. Monitoring Waivers. 40 CFR 141.23(b) 141.23(c), 141.24(f), 141.24(h) are herein incorporated by reference. (4-4-13)

a. Waivers from sampling requirements in Subsections 100.03, 100.04, 200.01, and 503.03.e.v. may be available to all systems for all contaminants except nitrate, nitrite, and disinfection byproducts and are based upon a vulnerability assessment, use assessment, the analytical results of previous sampling, or some combination of vulnerability assessment, use assessment, and analytical results. (4-4-13)

b. There are two (2) general types of monitoring waivers: (12-10-92)

i. Waivers based exclusively upon previous analytical data (12-10-92)

ii. Waivers based on a use or vulnerability assessment. (12-10-92)

c. Waivers are to be made by the Department on a contaminant specific basis and must be in writing. (12-10-92)

d. Vulnerability assessments may be conducted by the Department, the water system, or a third party organization. The Department shall approve or disapprove all vulnerability assessments in writing. (12-10-92)

e. Water systems which do not receive waivers shall sample at the required initial and repeat monitoring frequencies. (12-10-92)

f. If a system elects to request a waiver from monitoring, it shall do so in writing at least sixty (60) days prior to the required monitoring deadline date. (10-1-93)

08. Initial Monitoring Schedule. In addition to the requirements specified in 40 CFR 141.23, 40 CFR 141.24, and 40 CFR 141.40, initial monitoring must be completed according to the following schedule unless otherwise specified by the Department: (4-4-13)

a. Public water systems serving more than one hundred (100) people must conduct initial monitoring before January 1, 1995 except that: (10-1-93)

i. Initial monitoring for nitrate and nitrite must be completed before January 1, 1994 for all surface water sources serving transient noncommunity public water systems and for all ground water sources serving any public water system. (10-1-93)

ii. Initial monitoring for nitrate and nitrite must be completed before April 1, 1993 for all surface water sources serving community or nontransient noncommunity public water systems. (10-1-93)

iii. Initial monitoring required under 40 CFR 141.23(c) must be completed before January 1, 1994 for all surface water sources serving community or nontransient noncommunity public water systems. (10-1-93)

b. Public water systems serving one hundred (100) or less people must conduct initial monitoring before January 1, 1996 except that: (10-1-93)

i. Initial monitoring for nitrate and nitrite must be completed before January 1, 1994 for all surface water sources serving transient noncommunity public water systems and for all ground water sources serving a public water system. (10-1-93)

ii. Initial monitoring for nitrate and nitrite must be completed before April 1, 1993 for all surface water sources serving community or nontransient noncommunity public water systems. (10-1-93)

iii. Initial monitoring required under 40 CFR 141.23(c) must be completed before January 1, 1994 for all surface water sources serving community or nontransient noncommunity public water systems. (10-1-93)

09. Alternate Analytical Techniques. 40 CFR 141.27 is herein incorporated by reference. (10-1-93)

10. Approved Laboratories. 40 CFR 141.28 and 40 CFR 141.852(b) are herein incorporated by reference. All analyses conducted pursuant to these rules, except those listed below, shall be performed in laboratories certified or granted reciprocity by the Idaho Department of Health and Welfare, Bureau of Laboratories, as provided in IDAPA 16.02.13, "Rules Governing Certification of Idaho Water Quality Laboratories." The following analyses may be performed by any person acceptable to the Department of Environmental Quality: (3-25-16)

a. pH; (12-10-92)

b. Turbidity (Nephelometric method only); (12-10-92)

c. Daily analysis for fluoride; (12-10-92)

d. Temperature; (5-8-09)

e. Disinfectant residuals, except ozone, which shall be analyzed using the Indigo Method or an acceptable automated method pursuant to Subsection 300.05.d.; (3-25-16)

f. Alkalinity; (5-8-09)

g. Calcium; (5-8-09)

h. Conductivity; (5-8-09)

i. Silica; and (5-8-09)

j. Orthophosphate. (5-8-09)

11. **Monitoring of Consecutive Water Systems**. 40 CFR 141.29 is herein incorporated by reference. (4-4-13)

12. **Disinfection Residuals, Disinfection Byproducts, and Disinfection Byproduct Precursors**. 40 CFR Part 141, Subpart L is herein incorporated by reference. (4-4-13)

101. -- 149. **(RESERVED)**

150. REPORTING, PUBLIC NOTIFICATION, RECORDKEEPING.

01. **Reporting Requirements**. 40 CFR 141.31 is herein incorporated by reference. (4-4-13)

02. **Public Notification of Drinking Water Violations**. 40 CFR Part 141, Subpart Q is herein incorporated by reference. (4-4-13)

03. **Record Maintenance**. 40 CFR 141.33 is herein incorporated by reference. (4-4-13)

04. **Reporting for Unregulated Contaminant Monitoring Results**. 40 CFR 141.35 is herein incorporated by reference. (4-4-13)

05. **Reporting and Record Keeping Requirements for the Interim Enhanced Surface Water Treatment Rule**. 40 CFR 141.175 is herein incorporated by reference. (4-4-13)

06. **Reporting and Record Keeping Requirements for the Disinfectants and Disinfectant Byproducts Rule**. 40 CFR 141.134 is herein incorporated by reference. (4-4-13)

07. **Reporting and Record Keeping Requirements for the Revised Total Coliform Rule**. 40 CFR 141.861 is herein incorporated by reference. (3-25-16)

151. CONSUMER CONFIDENCE REPORTS.
40 CFR Part 141, Subpart O is herein incorporated by reference. (4-4-13)

152. -- 199. **(RESERVED)**

200. SPECIAL REGULATIONS.

01. **Monitoring Requirements for Unregulated Contaminants**. 40 CFR 141.40 is herein incorporated by reference. (4-4-13)

02. Special Monitoring for Sodium. 40 CFR 141.41 is herein incorporated by reference. (4-4-13)

03. Special Monitoring for Corrosively Characteristics. 40 CFR 141.42 is herein incorporated by reference. (10-1-93)

04. Prohibition on Use of Lead Pipes, Solder, and Flux. 40 CFR 141.43 is herein incorporated by reference. (4-4-13)

201. -- 249. (RESERVED)

250. MAXIMUM CONTAMINANT LEVEL GOALS AND MAXIMUM RESIDUAL DISINFECTION LEVEL GOALS.

01. Maximum Contaminant Level Goals for Organic Contaminants. 40 CFR 141.50 is herein incorporated by reference. (4-4-13)

02. Maximum Contaminant Level Goals for Inorganic Contaminants. 40 CFR 141.51 is herein incorporated by reference. (4-4-13)

03. Maximum Contaminant Level Goals for Microbiological Contaminants. 40 CFR 141.52 is herein incorporated by reference. (4-4-13)

04. Maximum Contaminant Level Goals for Disinfection Byproducts. 40 CFR 141.53 is herein incorporated by reference. (4-4-13)

05. Maximum Residual Disinfectant Level Goals for Disinfectants. 40 CFR 141.54 is herein incorporated by reference. (4-4-13)

06. Maximum Contaminant Level Goals for Radionuclides. 40 CFR 141.55 is herein incorporated by reference. (4-4-13)

251. -- 299. (RESERVED)

300. FILTRATION AND DISINFECTION.

01. General Requirements. 40 CFR 141.70 is herein incorporated by reference. Each public water system using a surface water source or ground water source directly influenced by surface water shall be operated by personnel, as specified in Sections 553 and 554, who have met state requirements for licensing of water system operators. (4-4-13)

02. Filtration. 40 CFR 141.73 is herein incorporated by reference. (4-4-13)

a. Each system which provides filtration treatment shall submit engineering evaluations, other documentation, or some combination of engineering evaluations and other documentation as required by the Department to demonstrate ongoing compliance with these rules. (4-7-11)

b. The Department will establish filtration removal credit on a system-by-system basis. Unless otherwise demonstrated to the satisfaction of the Department, the maximum log removal credit allowed for filtration is as follows:

Maximum Log Removal			
Filtration Type	**Giardia lamblia**	**Viruses**	**Cryptosporidium**
Conventional	2.5	2.0	2.5

Maximum Log Removal			
Filtration Type	**Giardia lamblia**	**Viruses**	**Cryptosporidium**
Direct	2.0	1.0	2.0
Slow sand	2.0	2.0	2.0
Diatomaceous earth	2.0	1.0	2.0
Microfiltration	3.0	0.5	3.0
Ultrafiltration	3.5	2.0	3.5
Nanofiltration	4.0	3.0	4.0
Reverse Osmosis	4.0	3.0	4.0
Alternate technology	2.0	0	2.0

(4-4-13)

c. Filtration removal credit shall be granted for filtration treatment provided the system is: (4-7-11)

i. Operated in accordance with the Operations Plan specified in Subsection 552.03.a.; and (4-7-11)

ii. The system is in compliance with the turbidity performance criteria specified under 40 CFR 141.73; and (4-7-11)

iii. Coagulant chemicals must be added and coagulation and flocculation unit process must be used at all times during which conventional and direct filtration treatment plants are in operation; and (4-7-11)

iv. Slow sand filters are operated at rates not to exceed one-tenth (0.1) gallons per minute per square foot or as approved by the Department; and (3-25-16)

v. Diatomaceous earth filters are operated at a rate not to exceed one point five (1.5) gallons per minute per square foot. (4-7-11)

03. Criteria for Avoiding Filtration. 40 CFR 141.71 is herein incorporated by reference. (4-4-13)

04. Disinfection. 40 CFR 141.72 is herein incorporated by reference. (10-1-93)

a. In addition to the disinfection requirements in 40 CFR 141.72, each system with a surface water source or ground water source directly influenced by surface water shall maintain a minimum of at least two-tenths (0.2) parts per million of chlorine in the treated water after an effective contact time of at least thirty (30) minutes at peak hour demand before delivery to the first customer. Effective contact time is either demonstrated or calculated. (3-25-16)

i. Demonstrated effective contact time is generally determined by tracer studies on a completed contact basin. Prior to conducting a tracer study, a testing plan shall be submitted to the Department for review and approval. The tracer chemical shall not be reactive with anything in the water or be consumed in the process. (3-25-16)

ii. Calculated effective contact time for tank type contact basins is based on tank baffling and inlet/outlet configurations for the maximum hourly flow rate through that contact basin. Calculated effective contact time in a “pipeline type contact basin” (often called a pipeline contactor) is calculated by dividing the internal volume of the pipe by the maximum hourly flow rate through that pipeline contactor. (3-25-16)

b. The Department may allow a system to utilize automatic shut-off of water to the distribution system whenever total disinfectant residual is less than two-tenths (0.2) mg/l rather than provide redundant

disinfection components and auxiliary power as required in 40 CFR 141.72(a)(2). An automatic water shut-off may be used if the system demonstrates to the satisfaction of the Department that, at all times, a minimum of twenty (20) psi pressure and adequate fire flow can be maintained in the distribution system when water delivery is shut-off to the distribution system and, at all times, minimum Giardia lamblia and virus inactivation removal rates can be achieved prior to the first customer. (12-10-92)

c. Each system which is required to provide filtration must provide disinfection treatment such that filtration plus disinfection provide at least 3-Log or ninety-nine and nine tenths percent (99.9%) inactivation/removal of Giardia lamblia cysts and at least 4-Log or ninety-nine and ninety-nine hundredths percent (99.99%) inactivation/removal of viruses as specified in 40 CFR 141.72 and Section 300, and at least 2-Log or ninety-nine percent (99%) removal of Cryptosporidium as required by 40 CFR Part 141, Subpart P or Subpart T. However, in all cases the disinfection portion of the treatment train shall be designed to provide not less than five tenths (0.5) log Giardia lamblia inactivation, irrespective of the Giardia lamblia removal credit awarded to the filtration portion of the treatment train. (4-4-13)

05. Analytical and Monitoring Requirements. 40 CFR 141.74 is herein incorporated by reference. (4-4-13)

a. Each public water system which is required to provide disinfection shall monitor as follows: (4-4-13)

i. Each day the system is in operation, the purveyor shall determine the total level of inactivation of Giardia lamblia cysts and viruses achieved through disinfection based on CT99.9 values provided in 40 CFR 141.74(b)(3) (Tables 1.1 through 1.6, 2.1 and 3.1). (12-10-92)

ii. At least once per day, the system shall monitor the following parameters to determine the total inactivation ratio achieved through disinfection: (12-10-92)

(1) Temperature of the disinfected water at each residual disinfectant concentration sampling point; and (12-10-92)

(2) If using chlorine, the pH of the disinfected water at each chlorine residual sampling point. (12-10-92)

(3) The effective contact time, "T," must be determined each day during peak hour demand. Disinfectant contact time, "T," in pipelines used for Giardia lamblia and virus inactivation shall be calculated by dividing the internal volume of the pipe by the peak hour flow rate through that pipe. Effective contact time, "T," for all other system components used for Giardia lamblia and virus inactivation shall be determined by tracer studies or other evaluations or calculations acceptable to the Department. (4-4-13)

(4) The residual disinfectant concentrations at each residual disinfectant sampling point at or before the first customer, must be determined each day during peak hour demand, or at other times approved by the Department. (5-8-09)

iii. The purveyor may demonstrate to the Department, based on a Department approved on-site disinfection challenge study protocol, that the system is achieving disinfection requirements specified in Subsection 300.04 utilizing CT99.9 values other than those specified in 40 CFR 141.74(b)(3) (Tables 2.1 and 3.1) for ozone, chlorine dioxide, and chloramine. (4-4-13)

iv. The total inactivation ratio shall be calculated as follows: (12-10-92)

(1) If the system applies disinfectant at only one (1) point, the system shall determine the total inactivation ratio by either of the two (2) following methods: (12-10-92)

(a) One inactivation ratio (CTcalc/CT99.9) is determined at/or before the first customer during peak hour demand; or (5-8-09)

(b) Sequential inactivation ratios are calculated between the point of disinfectant application and a point at or before the first customer during peak hour demand. The following method must be used to calculate the total inactivation ratio: (5-8-09)

(i) Step 1: Determine (CTcalc/CT99.9) for each sequence. (12-10-92)

(ii) Step 2: Add the (CTcalc/CT99.9) values for all sequences. The result is the total inactivation ratio. (12-10-92)

(2) If the system uses more than one point of disinfectant application at or before the first customer, the system must determine the CT value of each disinfection sequence immediately prior to the next point of disinfectant application during peak hour demand. The sum of the (CTcalc/CT99.9) values from all sequences is the total inactivation ratio. (CTcalc/CT99.9) must be determined by the methods described in 40 CFR 141.74(b)(4)(i)(B). (5-8-09)

v. Log removal credit for disinfection shall be determined by multiplying the total inactivation ratio by three (3). (12-10-92)

vi. The Department may reduce the CT monitoring requirements specified under Section 300, for any system which demonstrates that the required inactivation levels are consistently exceeded. Reduced CT monitoring shall be allowed only where the reduction in monitoring will not endanger the health of consumers served by the water system. (12-10-92)

b. Residual disinfectant concentrations for ozone must be measured using the Indigo Method, or automated methods may be used if approved by the Department as provided for in 40 CFR 141.74(a)(2). (3-25-16)

c. Unfiltered Subpart H systems. 40 CFR 141.857(c) is herein incorporated by reference. (3-25-16)

d. As provided for in 40 CFR 141.74(b), the Department may specify interim monitoring requirements for unfiltered systems notified by the Department or U.S. Environmental Protection Agency that filtration treatment must be installed. Until filtration is installed, systems shall conduct monitoring for turbidity and disinfectant residuals as follows unless otherwise specified by the Department. (3-25-16)

i. Disinfectant residual concentrations entering the distribution system shall be measured at the following minimum frequencies, and samples must be taken at evenly spaced intervals throughout the workday.

Minimum Frequencies	
Population	**Samples/day**
Less than 500	1
501 - 1000	2
1,001 - 2,500	3
Greater than 2501	4

(12-10-92)

ii. Turbidity shall be measured at least once per day at the entry point to the distribution system. (12-10-92)

iii. The Department may, at its discretion, reduce the turbidity monitoring frequency for any noncommunity system which demonstrates to the satisfaction of the Department: (12-10-92)

(1) A free chlorine residual of two-tenths (0.2) part per million is maintained throughout the distribution system; (12-10-92)

(2) The water source is well protected; (12-10-92)

(3) The total coliform MCL is not exceeded or a Level 1 or Level 2 Assessment has not been triggered in accordance with 40 CFR 141.859; and (3-25-16)

(4) No significant health risk is present. (12-10-92)

e. The Department may allow systems with surface water sources or ground water sources under the direct influence of surface water, to substitute continuous turbidity monitoring for grab sample monitoring as specified in 40 CFR 141.74(b)(2) and 40 CFR 141.74(c)(1) and Subsection 300.05. The Department may allow continuous turbidity monitoring provided the continuous turbidimeter is operated, maintained, standardized and calibrated per the manufacturer's recommendations. For purposes of determining compliance with turbidity performance criteria, discrete values must be recorded every four (4) hours water is supplied to the distribution system. (10-1-93)

f. The Department may allow systems using both a surface water source(s), or ground water source(s) under the direct influence of surface water, and one (1) or more ground water sources, to measure disinfectant residual at points other than the total coliform sampling points, as specified in 40 CFR 141.74(b)(6)(i) and 40 CFR 141.74(c)(3)(i) and Subsection 300.05. The Department may allow alternate sampling points provided the system submits an alternate monitoring plan to the Department for approval in advance of the monitoring requirement that demonstrates the alternative points are more representative of treated (disinfected) water quality within the distribution system. Heterotrophic bacteria, measured as heterotrophic plate count (HPC) as specified in 40 CFR 141.74(a)(1), may be measured in lieu of residual disinfectant concentration as outlined in 40 CFR 141.74(b)(6)(i). (3-25-16)

g. The Department may allow a reduced turbidity monitoring frequency for systems using slow sand filtration or technology other than conventional, direct, or diatomaceous earth filtration, as specified in 40 CFR 141.74(c)(1) and Subsection 300.05. To be considered for a reduced turbidity monitoring frequency, a system must submit a written request to the Department in advance of the monitoring requirement. (12-10-92)

06. Reporting and Recordkeeping Requirements. 40 CFR 141.75 is herein incorporated by reference. (4-4-13)

a. As provided in 40 CFR 141.75(a) and Section 300, the Department may establish interim reporting requirements for systems notified by the Department or U.S. Environmental Protection Agency that filtration treatment must be installed as specified in 40 CFR 141.75(a) and as referred to in Subsection 300.06. Until filtration treatment is installed, systems required to install filtration treatment shall report as follows: (4-4-13)

i. The purveyor shall immediately report to the Department via telephone or other equally rapid means, but no later than the end of the next business day, the following information: (12-10-92)

(1) The occurrence of a waterborne disease outbreak potentially attributable to that water system; (12-10-92)

(2) Any turbidity measurement which exceeds five (5) NTU; and (12-10-92)

(3) Any result indicating that the disinfectant residual concentration entering the distribution system is below two-tenths (0.2) mg/l free chlorine. (12-10-92)

ii. The purveyor shall report to the Department within ten (10) days after the end of each month the system serves water to the public the following monitoring information using a Department-approved form: (12-10-92)

(1) Turbidity monitoring information; and (12-10-92)

(2) Disinfectant residual concentrations entering the distribution system. (12-10-92)

iii. Personnel qualified under Subsection 300.01 shall complete and sign the monthly report forms submitted to the Department as required in Subsection 300.06. (12-10-92)

b. In addition to the reporting requirements in 40 CFR 141.75(b) pertaining to systems with filtration treatment, each public water system which provides filtration treatment must report the level of Giardia lamblia and virus inactivation/removal achieved each day by filtration and disinfection. (4-4-13)

07. Recycle Provisions. 40 CFR 141.76 is herein incorporated by reference. (4-4-13)

a. The Department shall evaluate recycling records kept by water systems pursuant to 40 CFR 141.76 during sanitary surveys, comprehensive performance evaluations, or other inspections. (5-3-03)

b. The Department may require a system to modify recycling practices if it can be shown that these practices adversely affect the ability of the system to meet surface water treatment requirements. (5-3-03)

301. ENHANCED FILTRATION AND DISINFECTION - SYSTEMS SERVING TEN THOUSAND OR MORE PEOPLE.
This Section incorporates, 40 CFR Part 141, Subpart P, of the National Primary Drinking Water Regulations, known as the Interim Enhanced Surface Water Treatment Rule. (4-5-00)

01. General Requirements. 40 CFR 141.170 is herein incorporated by reference. (4-4-13)

02. Criteria for Avoiding Filtration. 40 CFR 141.171 is herein incorporated by reference. (4-4-13)

03. Disinfection Profiling and Benchmarking. 40 CFR 141.172 is herein incorporated by reference. (4-4-13)

04. Filtration. 40 CFR 141.173 is herein incorporated by reference. (4-4-13)

05. Filtration Sampling Requirements. 40 CFR 141.174 is herein incorporated by reference. (4-4-13)

302. SANITARY SURVEYS FOR SYSTEMS USING SURFACE WATER OR GROUND WATER UNDER THE DIRECT INFLUENCE OF SURFACE WATER.
The Department shall conduct a sanitary survey of all public water systems which use surface water or ground water under the direct influence of surface water. (4-5-00)

01. Frequency. For noncommunity water systems, a sanitary survey shall be conducted every five (5) years. For community water systems, a sanitary survey shall be conducted every three (3) years, except that a community water system that has been determined to have outstanding performance, according to criteria established by the Department, may have a sanitary survey conducted every five (5) years. (4-5-00)

02. Report. A report describing the results of the sanitary survey will be provided to the water system. (4-5-00)

a. As part of the sanitary survey report or as an independent action, the Department shall provide written notice to the water system describing any significant deficiency within thirty (30) days after the Department identifies the significant deficiency. The notice may specify corrective actions and deadlines for completion of corrective actions. (5-8-09)

b. The Department may, at its discretion, provide this written notice at the time of the sanitary survey. (5-8-09)

03. Response Required. The owner of a public water system must respond in writing, describing how and on what schedule the system will address all significant deficiencies, not later than forty-five (45) days after receiving notification from the Department. (4-4-13)

04. Consultation with the Department. Public water systems shall consult with the Department prior to taking specific corrective actions in response to significant deficiencies identified during a sanitary survey, unless such corrective actions are specified in detail by the Department in its written notification under Subsection 302.02. (5-8-09)

05. Violation. Failure to address significant deficiencies identified in a sanitary survey that are within the control of the public water system and its governing body shall constitute a violation of these rules. (4-5-00)

303. SANITARY SURVEYS FOR PUBLIC WATER SYSTEMS USING GROUND WATER.
The Department shall conduct a sanitary survey of all public water systems that use ground water. 40 CFR Part 141, Subpart S, is herein incorporated by reference. (4-4-13)

01. Frequency. For non-community water systems, a sanitary survey shall be conducted every five (5) years. For community water systems, a sanitary survey shall be conducted every three (3) years, except as provided below. (5-8-09)

a. A community water system may have a sanitary survey conducted every five (5) years if the system provides at least a four (4)-log treatment of viruses (using inactivation, removal, or a Department approved combination of 4-log inactivation and removal) before or at the first customer for all of its ground water sources. (5-8-09)

b. A community water system may have a sanitary survey conducted every five (5) years if it has an outstanding performance record, as determined by the Department and documented in previous sanitary surveys, and has no history of Total Coliform Rule or Revised Total Coliform Rule MCL or monitoring violations under Subsection 100.01 since the last sanitary survey. (3-25-16)

02. Report. A report describing the results of the sanitary survey shall be provided to the water system. (5-8-09)

a. As part of the sanitary survey report or as an independent action, the Department shall provide written notice to the water system describing any significant deficiency within thirty (30) days after the Department identifies the significant deficiency. The notice may specify corrective actions and deadlines for completion of corrective actions. (5-8-09)

b. The Department may, at its discretion, provide this written notice at the time of the sanitary survey. (5-8-09)

03. Significant Deficiencies. For each of the eight (8) elements of a sanitary survey of a ground water system, the following deficiencies shall in all cases be considered significant for the purposes of the notice required in Subsection 303.02. Decisions about the significance of other deficiencies identified during the sanitary survey shall be at the Department's discretion, as indicated in the Department's sanitary survey protocol. (5-8-09)

a. Source: Lack of a sanitary well cap as specified in Subsection 511.06.b. (5-8-09)

b. Treatment: (4-4-13)

i. Chemical addition lacks emergency shut-off as specified in Subsection 531.02.b.ii. (4-4-13)

ii. Chemical addition is not flow proportioned where the rate of flow or chemical demand is not reasonably constant, as specified in Subsection 531.02.b.ii. (4-4-13)

c. Distribution system: No means for flushing dead end water mains, as specified in Subsection 542.09. (5-8-09)

d. Finished water storage: Roof leaking, as specified in Subsections 544.09 and 544.09.c. (5-8-09)

e. Pumps, pump facilities, and controls: No accessible check valve between pump and shut-off valve, as specified in Subsection 511.04. (5-8-09)

f. Monitoring, reporting, and data verification: Repeated failure to collect the required number and type of Total Coliform Rule or the Revised Total Coliform Rule samples during the most recent two (2) year period, as specified in Subsection 100.01. (3-25-16)

g. System management and operation: History of frequent depressurization in the distribution system in violation of Subsection 552.01. (5-8-09)

h. Operator compliance with state licensing requirements: Responsible charge operator is not licensed as required in Subsection 554.02. (5-8-09)

04. Response Required. The owner of a public water system must respond in writing, describing how and on what schedule the system will address all significant deficiencies, not later than thirty (30) days after receiving notification from the Department. (4-4-13)

05. Consultation with the Department. Public water systems shall consult with the Department prior to taking specific corrective actions in response to significant deficiencies identified during a sanitary survey unless such corrective actions are specified in detail by the Department in its written notification under Subsection 303.02. (5-8-09)

06. Violation. Failure to address significant deficiencies identified in a sanitary survey that are within the control of the public water system and its governing body shall constitute a violation of these rules. (5-8-09)

304. COMPOSITE CORRECTION PROGRAM (CCP).
In accordance with 40 CFR 142.16(g)(1), the Department may require a public water system to conduct a composite correction program, as defined in Section 003 of these rules, for the purpose of identifying and correcting deficiencies in water treatment and distribution. Composite Correction Programs consist of a Comprehensive Performance Evaluation (CPE) and Comprehensive Technical Assistance (CTA). Failure to implement any Department-required performance improvement factors identified through the CCP constitutes a violation of these rules. (4-4-13)

01. Comprehensive Performance Evaluation (CPE). If required, the CPE must be conducted to identify factors that may be adversely impacting a plant's capability to achieve compliance. It must emphasize approaches that can be implemented without significant capital improvements and must consist of at least the following components: assessment of plant performance; evaluation of major unit processes; identification and prioritization of performance limiting factors; assessment of the applicability of comprehensive technical assistance; and preparation of a CPE report. (4-4-13)

02. Comprehensive Technical Assistance (CTA). During the CTA phase, the system must identify and systematically address plant-specific factors. The CTA consists of follow-up to the CPE results, implementation of process control priority setting techniques, and maintaining long term involvement to systematically train staff and administrators. (4-4-13)

305. COLIFORM TREATMENT TECHNIQUE TRIGGERS AND ASSESSMENT REQUIREMENTS FOR PROTECTION AGAINST POTENTIAL FECAL CONTAMINATION.
40 CFR 141.859, excluding 40 CFR 141.859(a)(2)(iii), is herein incorporated by reference. (3-25-16)

01. Treatment Technique Triggers. Systems owners and operators must ensure that assessments are conducted in accordance with Subsection 305.02 after exceeding treatment technique triggers in this subsection. (3-25-16)

a. Level 1 treatment technique triggers: (3-25-16)

i. For systems taking forty (40) or more samples per month, the system exceeds five percent (5.0%) total coliform-positive samples for the month. (3-25-16)

ii. For systems taking fewer than forty (40) samples per month, the system has two (2) or more total coliform positive samples in the same month. (3-25-16)

iii. The system owner or operator fails to take every required repeat sample after any single total coliform-positive sample. (3-25-16)

b. Level 2 treatment technique triggers: (3-25-16)

i. An E.coli MCL violation, as specified in Subsection 050.05 and Subsection 100.01 of these rules; or (3-25-16)

ii. A second or any additional Level 1 triggers as defined in Subsection 305.01.a. within a rolling 12-month period, unless the Department has determined a likely reason that the samples that caused the first Level 1 treatment technique trigger were total coliform-positive and has established that the system has corrected the problem. (3-25-16)

02. Requirements For Assessments. (3-25-16)

a. System owners and operators must ensure that Level 1 and 2 assessments are conducted in order to identify the possible presence of sanitary defects and defects in distribution system coliform monitoring practices. The assessment must be conducted consistent with any Department directives that tailor specific assessment elements with respect to the size and type of the system and the size, type, and characteristics of the distribution system. (3-25-16)

b. When conducting assessments, owners and operators must ensure that the assessor evaluates minimum elements that include review and identification of inadequacies in sample sites; sampling protocol; sample processing; atypical events that could affect distributed water quality or indicate that distributed water quality was impaired; changes in distribution system maintenance and operation that could affect distributed water quality (including water storage); source and treatment considerations that bear on distributed water quality, where appropriate (e.g., small ground water systems); and existing water quality monitoring data. The system owner or operator must ensure the assessments are consistent with the elements in the Department provided forms for Level 1 and Level 2 assessments. (3-25-16)

c. Level 1 Assessments. A system owner or operator must conduct a Level 1 assessment if the system exceeds one of the treatment technique triggers in Subsection 305.01.a. as soon as practical after any trigger level is identified and submit a completed Level 1 assessment report or form to the Department within thirty (30) days after the system learns that it has exceeded a trigger. (3-25-16)

i. The completed assessment report or form must describe sanitary defects detected, corrective actions completed, and a proposed timetable for any corrective actions not already completed. The assessment report or form may also note that no sanitary defects were identified. (3-25-16)

ii. If the Department reviews the completed Level 1 report or form and determines that the assessment is not sufficient (including any proposed timetable for any corrective actions not already completed), the Department will consult with the owner or operator of the system. If the Department requires revisions after consultation, the system owner or operator must submit a revised assessment report or form to the Department on an agreed-upon schedule not to exceed thirty (30) days from the date of consultation. (3-25-16)

iii. Upon completion and submission of the assessment report or form by the system owner or operator, the Department will determine if the system has identified a likely cause for the Level 1 trigger and, if so, establish that the system has corrected the problem, or has included a schedule acceptable to the Department for correcting the problem. (3-25-16)

d. Level 2 Assessments. A system owner or operator must ensure that a Level 2 assessment is conducted if the system exceeds one of the treatment technique triggers in Subsection 305.01.b. The owner or operator must comply with any expedited actions or additional action required by the Department in the case of an E.coli MCL violation. (3-25-16)

i. The system owner or operator must ensure that a Level 2 assessment is conducted by the Department or a party approved by the Department as described in Subsection 305.03 as soon as practical after any trigger in Subsection 305.01.b. and must submit a completed Level 2 assessment report or form to the Department within 30 (thirty) days after the system learns that it has exceeded a trigger if the assessment was conducted by a party other than the Department. (3-25-16)

ii. The Department will schedule and conduct Level 2 assessments for an E.coli treatment technique trigger in Subsection 305.01.b.i. unless the Department approves another party to conduct the assessment as outlined in Subsection 305.03. (3-25-16)

iii. A second or any additional triggered Level 2 Assessment within a rolling twelve-month period must be conducted by a Department approved third party even if the public water system has staff or management approved under Subsection 305.03. (3-25-16)

iv. The completed assessment report or form must describe sanitary defects detected, corrective actions completed, and a proposed timetable for any corrective actions not already completed. The assessment report or form may also note that no sanitary defects were identified. (3-25-16)

v. If the Department reviews the completed Level 2 report or form and determines that the assessment is not sufficient (including any proposed timetable for any corrective actions not already completed), the Department will consult with the owner or operator of the system. If the Department requires revisions after consultation, the system owner or operator must submit a revised assessment report or form to the Department on an agreed-upon schedule not to exceed 30 (thirty) days from the date of consultation. (3-25-16)

vi. Upon completion and submission of the assessment report or form by the system owner or operator, the Department will determine if the system has identified a likely cause for the Level 2 trigger and, if so, establish that the system has corrected the problem, or has included a schedule acceptable to Department for correcting the problem. (3-25-16)

e. Corrective action. Systems must correct sanitary defects found through either Level 1 or Level 2 assessments conducted under this section. For corrections not completed by the time of submission of the assessment report or form, the system must complete the corrective action(s) in compliance with a timetable approved by the Department in consultation with the system. The system must notify the Department when each scheduled corrective action is completed. (3-25-16)

f. Consultation. At any time during the assessment or corrective action phase, either the water system or the Department may request a consultation with the other party to determine the appropriate actions to be taken. The system may consult with the Department on all relevant information that may impact its ability to comply with a requirement of this Section, including the method of accomplishment, an appropriate timeframe, and other relevant information. (3-25-16)

03. Approved Parties for Level 2 Assessments. The system may conduct a Level 2 assessment if the system has staff or management with the certification or qualifications outlined in this Subsection or if the system hires parties that meet the qualifications in this Subsection. The following parties are approved by the Department to conduct Level 2 assessments: (3-25-16)

a. The Department or persons contracted with the Department who are trained to conduct sanitary surveys; (3-25-16)

b. Currently licensed operators in good standing that are licensed through the Idaho Bureau of Occupational Licensing with a drinking water classification of Distribution I through IV or Treatment I through IV and that are licensed at least to the classification level of the public water system requiring the Level 2 assessment; or (3-25-16)

c. Licensed professional engineers licensed by the state of Idaho and qualified by education and experience in the specific technical fields involved in these rules. (3-25-16)

306. -- 309. (RESERVED)

310. ENHANCED FILTRATION AND DISINFECTION - SYSTEMS SERVING FEWER THAN TEN THOUSAND PEOPLE.
40 CFR 141, Subpart T is herein incorporated by reference. (4-4-13)

311. ENHANCED TREATMENT FOR CRYPTOSPORIDIUM -- LONG TERM 2 ENHANCED SURFACE WATER TREATMENT RULE.
40 CFR Part 141, subpart W is herein incorporated by reference. (4-4-13)

01. Cryptosporidium Treatment Credit for Approved Watershed Control Program. The Department shall award 0.5 (zero point five) logs cryptosporidium removal credit to systems that have a Department approved Watershed Control Program. Requirements for a watershed control program are set forth in 40 CFR 141, Subpart W. Guidance on how to develop a watershed control program and obtain Department approval is provided in "Implementation Guidance for the Long Term 2 Enhanced Surface Water Treatment Rule," as referenced in Section 002. (4-2-08)

02. Assessment of Significant Changes in the Watershed. As part of the sanitary survey process set forth in Section 302, the Department, or an agent approved by the Department, shall assess significant changes in the watershed of a surface water system that have occurred since the system conducted source water monitoring. If changes in the watershed have the potential to significantly increase contamination of the source water with cryptosporidium, the Department shall consult with the water system owner on follow-up actions that may be required under 40 CFR 141, Subpart W, including, but not limited to, source water monitoring and/or additional treatment requirements. "Implementation Guidance for the Long Term 2 Enhanced Surface Water Treatment Rule," as referenced in Section 002, provides a description of factors that will be considered by the Department when making an assessment of changes in the watershed. These factors include, but are not limited to the following: (4-2-08)

a. New NPDES permits or changes in existing NPDES permits that involve increased loading of contaminants. (4-2-08)

b. Changes in land use patterns. (4-2-08)

c. Changes in agricultural cropping, chemical application, or irrigation practices. (4-2-08)

d. Changes in other non-point discharge source activities (such as grazing, manure application, commercial or residential development). (4-2-08)

e. Stream or riverbed modifications. (4-2-08)

f. NPDES permit violations at wastewater treatment plants and confined animal feedlot operations. (4-2-08)

g. Dramatic natural events such as floods, forest fires, earthquakes, and landslides that may transport or expose contaminants. (4-2-08)

h. Prolonged drought conditions that may warrant special preparatory measures to minimize impacts from waste accumulations that are washed into source waters when precipitation returns. (4-2-08)

i. Status of the water system's emergency response plan. (4-2-08)

j. Accidental or illegal waste discharges and spills. (4-2-08)

312. -- 319. (RESERVED)

320. DISINFECTANT RESIDUALS, DISINFECTION BYPRODUCTS, AND DISINFECTION BYPRODUCT PRECURSORS.
This Section incorporates 40 CFR Part 141, Subpart L, of the National Primary Drinking Water Regulations, known as the Disinfectants and Disinfection Byproducts Rule. (4-5-00)

01. General Requirements. 40 CFR 141.130 is herein incorporated by reference. (4-4-13)

02. Analytical Requirements. 40 CFR 141.131 is herein incorporated by reference. DPD colorimetric test kits may be used to measure residual disinfectant concentrations for chlorine, chloramines, and chlorine dioxide. (4-4-13)

03. Monitoring Requirements. 40 CFR 141.132 is herein incorporated by reference. (4-4-13)

04. Compliance Requirements. 40 CFR 141.133 is herein incorporated by reference. (4-4-13)

05. Treatment Techniques for Control of Disinfection Byproduct (DBP) Precursors. 40 CFR 141.135 is herein incorporated by reference. (4-4-13)

321. INITIAL DISTRIBUTION SYSTEM EVALUATIONS.
40 CFR Part 141, Subpart U is herein incorporated by reference. "Implementation Guidance for the Stage 2 Disinfectants and Disinfection Byproducts Rule," as referenced in Section 002, provides assistance to public water system owners and operators in understanding and achieving compliance with the requirements of 40 CFR 141, Subpart U. (4-4-13)

322. STAGE 2 DISINFECTION BYPRODUCTS REQUIREMENTS.
40 CFR Part 141, Subpart V is herein incorporated by reference. "Implementation Guidance for the Stage 2 Disinfectants and Disinfection Byproducts Rule," as referenced in Section 002, provides assistance to public water system owners and operators in understanding and achieving compliance with the requirements of 40 CFR Part 141, Subpart V. (4-4-13)

323. GROUND WATER RULE.
40 CFR 141, Subpart S is herein incorporated by reference. "Implementation Guidance for the Ground Water Rule," as referenced in Section 002, provides assistance to public water system owners and operators in understanding and achieving compliance with the requirements of 40 CFR 141, Subpart S. (4-4-13)

01. Discontinuation of Treatment. Systems that wish to discontinue four (4)-log virus treatment at a ground water source must meet the following criteria. Ground water sources on which treatment has been discontinued shall be subject to the triggered source water monitoring requirements of 40 CFR 141, Subpart S. (5-8-09)

a. Demonstration that any known source of contamination has been removed. (5-8-09)

b. Demonstration that structural deficiencies of the well have been rehabilitated and no longer exist. (5-8-09)

c. Provide evidence that the well is drawing from a protected or confined aquifer. (5-8-09)

d. Submit results of one (1) year of monthly monitoring for a fecal indicator organism during which no positive results occurred. (5-8-09)

02. Chlorine Purging Prior to Triggered Source Sampling. 40 CFR 141.402(e) requires that ground water source samples be collected at a location prior to any treatment. Pursuant to this requirement, systems that add chlorine to a source, either in the well bore or near enough to the wellhead that chlorinated water could backflow into the well, shall ensure that all chlorine residual has been purged prior to taking a triggered source water sample. This shall be accomplished by measuring chlorine residual in the source water until a reading of zero is obtained and be recorded in the space provided for chlorine residual on the sample submittal form. (4-4-13)

324. -- 349. (RESERVED)

350. CONTROL OF LEAD AND COPPER.

01. General Requirements. 40 CFR 141.80, revised as of July 1, 2008, is herein incorporated by reference. (5-8-09)

02. Applicability of Corrosion Control Treatment Steps to Small, Medium-Size, and Large Water Systems. 40 CFR 141.81, revised as of July 1, 2008, is herein incorporated by reference. (5-8-09)

03. Description of Corrosion Control Treatment Requirements. (12-1-92)

a. 40 CFR 141.82, revised as of July 1, 2008, is herein incorporated by reference. (5-8-09)

b. The Department may modify its determination of the optimal corrosion control treatment or optimal water quality control parameters where it concludes that such changes are necessary to optimize corrosion control treatment as specified in 40 CFR 141.82(h) and as referred to in Subsection 350.03. The Department may also modify its determination of the optimal corrosion control treatment or water quality control parameters where it finds such changes will provide equivalent or improved treatment in a manner which is simpler or less costly to operate. (12-10-92)

04. Source Water Treatment Requirements. 40 CFR 141.83, revised as of July 1, 2008, is herein incorporated by reference. The Department may modify its determination of optimal source treatment or maximum permissible lead and copper concentrations where it concludes that such changes are necessary as specified in 40 CFR 141.83(b)(6). (5-8-09)

05. Lead Service Line Replacement Requirements. 40 CFR 141.84, revised as of July 1, 2008, is herein incorporated by reference. (5-8-09)

06. Public Education and Supplemental Monitoring Requirements. 40 CFR 141.85, revised as of July 1, 2008, is herein incorporated by reference. (5-8-09)

07. Monitoring Requirements for Lead and Copper in Tap Water. 40 CFR 141.86, revised as of July 1, 2008, is herein incorporated by reference. (5-8-09)

08. Monitoring Requirements for Water Quality Parameters. 40 CFR 141.87, revised as of July 1, 2008, is herein incorporated by reference. (5-8-09)

09. Monitoring Requirements for Lead and Copper in Source Water. 40 CFR 141.88, revised as of July 1, 2008, is herein incorporated by reference. (5-8-09)

10. Analytical Methods. 40 CFR 141.89, revised as of July 1, 2008, is herein incorporated by reference. (5-8-09)

11. Reporting Requirements. 40 CFR 141.90, revised as of July 1, 2008, is herein incorporated by reference. (5-8-09)

12. Recordkeeping Requirements. 40 CFR 141.91, revised as of July 1, 2008, is herein incorporated by reference. (5-8-09)

351. -- 399. (RESERVED)

400. SECONDARY MCLS.

01. Purpose. 40 CFR 143.1, revised as of July 1, 2003, is herein incorporated by reference. (3-20-04)

02. Definitions. 40 CFR 143.2, revised as of July 1, 2003, is herein incorporated by reference.

(3-20-04)

03. Secondary Maximum Contaminant Levels. 40 CFR 143.3, revised as of July 1, 2003, is herein incorporated by reference. (3-20-04)

04. Monitoring. 40 CFR 143.4, revised as of July 1, 2010, is herein incorporated by reference. (4-7-11)

401. -- 449. (RESERVED)

450. USE OF NON-CENTRALIZED TREATMENT DEVICES.

01. Criteria and Procedures for Public Water Systems Using Point of Entry Devices. 40 CFR 141.100 is herein incorporated by reference. (4-4-13)

02. Point of Use (POU) Treatment Devices. (3-30-07)

a. A public water system may use point of use (POU) treatment in order to achieve compliance with certain maximum contaminant levels (MCL) or treatment techniques, in accordance with Subsection 450.02.b., when the following conditions are met: (3-30-07)

i. A program for long-term operation, maintenance, and monitoring of the POU treatment system is approved by the Department, pursuant to Section 450.02.d. (3-30-07)

ii. The public water system or a vendor of POU treatment devices under contract with the public water system shall own, control, and maintain the POU treatment system to ensure proper operation and maintenance and compliance with the MCL or treatment technique. (3-30-07)

iii. Each POU treatment device is equipped with a mechanical warning mechanism to ensure that customers are automatically notified of operational problems. (3-30-07)

iv. The POU treatment device must be certified by an accredited American National Standards Institute (ANSI) certification body to meet applicable ANSI/National Sanitation Foundation (NSF) Standards. (3-30-07)

b. POU treatment devices shall not be used to achieve compliance with a MCL or treatment technique requirement for a microbial contaminant or an indicator of a microbial contaminant. Community water systems may not use POU treatment devices to achieve compliance with a nitrate MCL. (3-30-07)

c. The Department will waive the plan and specification requirements of Section 504 relating to material modifications for the following systems only to the extent that the material modification proposed is limited to the installation or use of a POU treatment device(s): (4-4-13)

i. Community water systems serving two hundred (200) or fewer service connections. (3-30-07)

ii. Non-transient non-community water systems. (3-30-07)

iii. Transient non-community water systems. (3-30-07)

iv. Community water systems serving more than two hundred (200) service connections if approved by the Department through the waiver process outlined in Subsection 005.01.a. (3-30-07)

d. A public water system must obtain written approval by the Department before installation of a POU treatment device for the purpose of achieving compliance with a MCL or treatment technique. The public water system shall submit the following documentation for approval to the Department: (3-30-07)

i. Information identifying the public water system name and number, total number of service

connections, contaminant(s) to be treated, type of POU treatment device to be installed, manufacturer and model number of the POU treatment device, type and function of the mechanical warning mechanism (performance indicator) on the POU treatment device, certification verification for ANSI/NSF, installer qualifications, and a proposed date for installation of the POU treatment device(s). (3-30-07)

ii. The manufacturer's specifications for the POU treatment device including demonstration that the POU treatment device is suited for the water chemistry of the public water system and contaminant(s) of concern and is of sufficient design and capacity for the particular application. (3-30-07)

iii. Information relating to how other drinking water dispensing units, such as instant hot water dispensers and refrigerator water and ice dispensers, whose primary function is to provide drinking water, will be provided with treated water. If water is transported from a POU treatment device to another drinking water dispensing unit, the conducting tube shall be of non-reactive material. (3-30-07)

iv. For non-transient non-community water systems and transient non-community water systems, demonstration that the drinking water dispensing units are located in areas adequate to protect public health. (3-30-07)

v. Demonstration that all POU treatment devices are owned, controlled, and maintained by the public water system or by a vendor of POU treatment devices under contract with the public water system. (3-30-07)

vi. A sampling plan identifying the location of all service connections and demonstrating how the system will ensure that all POU treatment devices are sampled for compliance with the contaminant(s) being treated during every compliance period or at a frequency designated by the Department. (4-4-13)

vii. Documentation that a customer at each service connection has agreed to installation and use of a POU treatment device and has granted access for installation, maintenance, and sampling. (3-30-07)

viii. A plan that describes how the public water system will address any non-compliance with Subsection 450.02.d.vii. (3-30-07)

ix. A maintenance plan that demonstrates how on-going maintenance activities will be performed and on what frequency, including: frequency of treatment media replacements, frequency of POU treatment device replacements, periodic verification that the mechanical warning device is functional, schedule of planned maintenance activities, plan of how the system will address unscheduled maintenance problems, and a plan and method of waste disposal. (3-30-07)

x. Documentation that the system meets the current requirements for a certified operator pursuant to Section 554. (3-30-07)

xi. A plan for on-going education and outreach to the customers of the public water system, including rental customers, on POU treatment and health effects of the contaminant(s) of concern. (3-30-07)

xii. A plan for how the system will ensure real estate disclosures for the POU treatment system. (3-30-07)

xiii. A statement of recognition that failure to maintain compliance with the MCL, or the failure to operate and maintain compliance with a POU treatment system as approved by the Department, may necessitate installation of centralized treatment. (3-30-07)

e. Within thirty (30) days of installing the approved POU treatment system, the public water system shall notify the Department in writing that the POU treatment system was installed as approved by the Department. (3-30-07)

f. Within thirty (30) days of installing the approved POU treatment system, the public water system shall submit samples from each POU treatment device to a certified laboratory for the contaminant(s) being treated by the POU treatment device. The samples shall be used to demonstrate initial compliance with the MCL. (3-30-07)

g. The water system owner or operator must maintain records for a POU treatment system. Records shall be submitted to the Department at a frequency and in a format specified by the Department. Records to maintain shall include: (3-30-07)

i. Requirements of Subsection 450.02.d.; (3-30-07)

ii. All sampling performed on the POU treatment devices; (3-30-07)

iii. Maintenance logs and schedules; (3-30-07)

iv. Log of installed units; and (3-30-07)

v. Contracts, lease agreements, or other legal documents with vendors and consumers. (3-30-07)

03. Use of Bottled Water. 40 CFR 141.101 is herein incorporated by reference. (4-4-13)

451. TREATMENT TECHNIQUES.

01. General Requirements. 40 CFR 141.110 is herein incorporated by reference. (10-1-93)

02. Treatment Techniques for Acrylamide and Epichlorohydrin. 40 CFR 141.111 is herein incorporated by reference. (4-4-13)

452. -- 499. (RESERVED)

500. FACILITY AND DESIGN STANDARDS: DEMONSTRATION OF TECHNICAL, FINANCIAL, AND MANAGERIAL CAPACITY OF PUBLIC DRINKING WATER SYSTEMS.
No person shall proceed, or cause to proceed, with construction of a new or substantially modified community or nontransient, noncommunity drinking water system until it has been demonstrated to the Department that the water system will have adequate technical, financial, and managerial capacity, as defined in Section 003 of these rules. With the exception of water sources, demonstration of capacity shall be submitted to the Department prior to or concurrent with the submittal of plans and specifications, as required in Section 39-118, Idaho Code, and Subsection 504.03 of these rules. Plans and specifications for water sources may be submitted to the Department prior to demonstration of capacity for the water system. The Department shall issue its approval of the new system capacity demonstration in writing. (4-4-13)

01. Technical Capacity. In order to meet this requirement, the public water system shall submit documentation to demonstrate the following: (4-5-00)

a. The system meets the relevant design, construction, and operating requirements of these rules; (5-8-09)

b. The system has an adequate and consistent source of water; (4-5-00)

c. A plan is in place to protect the water source and deal with emergencies; (4-5-00)

d. A plan exists for replacement or improvement of infrastructure as necessary; and (4-5-00)

e. The system has trained personnel with an understanding of the technical and operational characteristics of the system. (5-3-03)

02. Financial Capacity. A demonstration of financial capacity must include but is not limited to the following information: (4-5-00)

a. Documentation that organizational and financial arrangements are adequate to construct and operate the public water system in accordance with these rules. This information can be provided by submitting

estimated construction, operation, and maintenance costs, letters of credit, or other access to financial capital through public or private sources and, if available, a certified financial statement; (5-8-09)

b. Demonstration of revenue sufficiency, that includes but is not limited to billing and collection procedures; a proposed rate structure which demonstrates the availability of operating funds, revenues for depreciation and reserves, and the ability to accrue a capital replacement fund. A preliminary operating budget shall be provided; and (5-8-09)

c. Adequate fiscal controls must be demonstrated. (4-5-00)

03. Managerial Capacity. In order to demonstrate adequate managerial capacity, the owner or operator of a new drinking water system shall submit at least the following information to the Department: (5-8-09)

a. Clear documentation of legal ownership and any plans that may exist for transfer of that ownership upon completion of construction or after a period of operation; (5-8-09)

b. The name, address, and telephone number of the person who will be accountable for ensuring that the water system is in compliance with these rules; (4-5-00)

c. The name, address, and telephone number of the responsible charge operator; (5-8-09)

d. A description of the manner in which the water system will be managed. Information such as by-laws, restrictive covenants, articles of incorporation, or procedures and policy manuals which describe the management organizational structure shall be provided; (5-8-09)

e. A recommendation of staff qualifications, including training, experience, certification or licensing, and continuing education; (5-8-09)

f. An explanation of how the water system will establish and maintain effective communications and relationships between the water system management, its customers, professional service providers, and any applicable regulatory agencies; and (4-5-00)

g. Evidence of planning for future growth, equipment repair and maintenance, and long term replacement of system components. (4-5-00)

04. Submittal Form. The Department shall provide a standard form to be used in preparing a new system capacity demonstration. The submittal form and general guidance on how to prepare a new system capacity document is provided in, "How to Demonstrate Financial, Technical, and Managerial Capacity in New Public Water Systems." This document may be requested from the Department and is available on the DEQ website at http://www.deq.idaho.gov. (5-8-09)

05. Expanding Systems. A public water system which comes into existence as a result of growth in population or number of service connections within a previously unregulated system will be considered a new system under these rules and is subject to all design, construction and operating requirements herein. (4-5-00)

06. Consolidation. In demonstrating new system capacity, the owner of the proposed new system must investigate the feasibility of obtaining water service from an established public water system. If such service is available, but the owner elects to proceed with an independent system, the owner must explain why this choice is in the public interest in terms of environmental protection, affordability to water users, and protection of public health. (4-5-00)

07. Exclusion. New public water systems which are public utilities as defined in Sections 61-104 (Corporation), 61-124 (Water System), 61-125 (Water Corporation), and 61-129 (Public Utility), Idaho Code, must meet the regulatory requirements of the Idaho Public Utilities Commission (IPUC) in Chapter 1, Title 61, Idaho Code, Public Utilities Law, and IDAPA 31.01.01, "Rules of Procedure of the Idaho Public Utilities Commission." Such water systems will not be required to meet any requirements of this Section which are in conflict with the provisions and requirements of the IPUC. (4-5-00)

501. FACILITY AND DESIGN STANDARDS: GENERAL DESIGN REQUIREMENTS FOR PUBLIC DRINKING WATER SYSTEMS.
Unless otherwise specified by the Department, the design of new drinking water systems, or modifications to existing, public drinking water systems, shall be in conformance with the facility and design standards set forth in Sections 006 and 500 through 552 of these rules. The following general design requirements shall apply as applicable for the type of water system and the treatment or other processes employed. (3-30-07)

01. Materials Used in Construction. Products that are used to construct public drinking water systems and have water contact surfaces shall conform to applicable AWWA standards and be certified by an accredited ANSI certification body to meet applicable ANSI/NSF standards, where products meeting such AWWA and ANSI/NSF standards exist. In the absence of such products, products meeting applicable product standards and acceptable to the reviewing authority may be selected. Corrosion control shall be taken into account during all aspects of public water system design. (5-8-09)

02. Additives Used in Operation. No chemical or other substance shall be added to drinking water, nor shall any process be utilized to treat drinking water, unless specifically approved by the Department. All chemicals shall conform to applicable AWWA standards and be certified by an accredited ANSI certification body to meet ANSI/NSF Standard 60, referenced in Subsection 002.02. (3-30-07)

03. Design Basis. The system, including the water source and treatment facilities, shall be designed to provide either peak hour demand of the system or maximum day demand plus equalization storage at the design year. (5-8-09)

04. Design of Treatment Facilities. Design of treatment facilities shall address: (3-30-07)

a. Functional aspects of facility layout and provisions for future facility expansion; (3-30-07)

b. Provision for expansion of waste treatment and disposal facilities (see Section 540); (4-4-13)

c. Roads constructed to provide year-round access by vehicles and equipment needed for repair and maintenance; (3-30-07)

d. Site grading and drainage; and (3-30-07)

e. Chemical Feed or Injection. Unless otherwise approved by the Department based on documentation provided by the design engineer, all chemical feed or injection systems must be designed to ensure complete mixing through rapid mix devices or other measures. (4-4-13)

f. Redundancy. Unless otherwise approved by the Department or as specified in other sections of these rules, to ensure that minimum quality, quantity, and pressure requirements of these rules are continuously met during maintenance, breakdowns, structural failures, emergencies, or other periods when components must be out of service, water system treatment, filtration, and disinfection components for all new or substantially modified community or nontransient, noncommunity drinking water systems shall be designed such that plant design capacity can be maintained with any component out of service. Raw water intake structures are excluded from the general redundancy requirement but shall be designed to ensure that plant design capacity will be maintained. (4-4-13)

05. Design of Buildings. The design of buildings that are a part of public drinking water systems shall provide for: (3-30-07)

a. Adequate ventilation, lighting, heating, and air conditioning; (3-30-07)

b. Adequate drainage; (3-30-07)

c. Dehumidification equipment, if necessary; (3-30-07)

d. Accessibility of equipment for operation, servicing, and removal; (3-30-07)

e. Flexibility and convenience of operation and safety of operators; and (3-30-07)

f. Separate room(s) for chemical storage and feed equipment that may be required based on type of chemicals and associated hazards. (5-8-09)

06. Electrical. Main switch gear electrical controls shall be located above grade, in areas not subject to flooding. All electrical work shall conform to the requirements of the National Electrical Code or to relevant state/local codes. The National Electrical Code is available from the National Fire Protection Association, 1 Batterymarch Park, Quincy, Massachusetts 02169-7471, (617)770-3000, http://www.nfpa.org. (5-8-09)

07. Reliability and Emergency Operation. New community water systems constructed after April 15, 2007 are required to have sufficient dedicated on-site standby power, with automatic switch-over capability, or standby storage so that water may be treated and supplied to pressurize the entire distribution system during power outages. During a power outage, the water system shall be able to meet the operating pressure requirements of Subsection 552.01.b. for a minimum of eight (8) hours at average day demand plus fire flow where provided. A minimum of eight (8) hours of fuel storage shall be located on site unless an equivalent plan is authorized by the Department. Standby power provided in a public drinking water system shall be coordinated with the standby power that is provided in the wastewater collection and treatment system. (5-8-09)

a. The Department may require the installation of standby power or storage facilities in existing systems if the frequency and duration of power outages a system experiences constitute a health hazard. (3-30-07)

b. Existing community public water systems that are substantially modified after April 15, 2007 shall meet the requirements of Subsection 501.07. in those portions of the system affected by the modifications. (3-30-07)

c. New sources and booster pumps intended to increase system capacity shall be provided with standby power or equivalent unless, during a power outage, the public water system or distribution system pressure zone can already meet the minimum operating capacity and pressure requirements in Subsection 501.07 for a minimum of eight (8) hours at average day demand plus fire flow where provided for each pressure zone. (4-4-13)

d. For both new and existing public water systems, the Department may reduce the requirements of Subsection 501.07 if the system can demonstrate the capacity to adequately protect public health during a power outage. Any decision by the Department will be based on, but not limited to, the following considerations: (3-30-07)

i. An adequate emergency response and operation plan and the capacity to implement that plan. (3-30-07)

ii. The adequacy of the system's cross connection control program and the capacity to protect public health in the event of a system wide depressurization. (3-30-07)

iii. Demonstration of historical and projected reliability of the electrical power supplied to the water system. (3-30-07)

iv. A strategy for providing information to the public during power outages, including instructions to stop irrigation, boil water, etc., until notified otherwise. (3-30-07)

v. The level of reliability acceptable to consumers. This can be accomplished with either a vote of the majority of consumers for privately owned and operated systems or a decision by the governing body for publicly governed systems. (3-30-07)

vi. Other considerations that may be pertinent, including connections to other public water systems, agreements to provide water in emergency situations, and the availability of dedicated portable auxiliary power. (3-30-07)

08. On-Site Analysis and Testing Capabilities. Each public water system shall have equipment and facilities for routine testing necessary to ensure proper operation. Equipment selection shall be based on the

characteristics of the raw water source and the complexity of the treatment process involved. (3-30-07)

09. Sample Taps. Sample taps shall be provided so that water samples can be obtained from each water source and from appropriate locations in each unit operation of treatment, and from the finished water. Taps shall be consistent with sampling needs and shall not be of the petcock type. Taps owned by the water system and used for obtaining samples for bacteriological analysis shall be of the smooth-nosed type without interior or exterior threads, shall not be of the mixing type, and shall not have a screen, aerator, or other such appurtenance. (3-30-07)

10. Facility Potable Water Supply. The facility water supply service line and the plant finished water sample tap shall be supplied from a source of finished water at a point where all chemicals have been thoroughly mixed, and the required disinfectant contact time, if applicable, has been achieved. There shall be no cross connections between the facility water supply service line and any piping, troughs, tanks, or other treatment units containing wastewater, treatment chemicals, raw or partially treated water. (3-30-07)

11. Meters. All water supplies shall have an acceptable means of measuring the flow from each source, the wash water, the recycled water, any blended water of different quality, and the finished water. (3-30-07)

12. Operation and Maintenance Manual. A new or updated operation and maintenance manual that addresses all water system facilities shall be submitted to the Department for review and approval prior to start-up of the new or materially modified public water system unless the same system components are already covered in an existing operation and maintenance manual. For existing systems with continual operational problems as determined by the Department, the Department may require that an operation and maintenance manual be submitted to the Department for review and approval. The operator shall ensure that the system is operated in accordance with the approved operation and maintenance manual. (4-4-13)

13. Start-Up Training. Provisions shall be made for operator instruction at the start-up of a new plant or pumping station. (3-30-07)

14. Safety. Consideration shall be given to the protection of maintenance personnel and visitors from typical and foreseeable hazards in accordance with the engineering standards of care. The design shall comply with all applicable safety codes and regulations that may include the Uniform Building Code, International Fire Code, National Fire Protection Association Standards, and state and federal OSHA standards. Items to be considered include, but are not limited to, noise arresters, noise protection, confined space entry, protective equipment and clothing, gas masks, safety showers and eye washes, handrails and guards, warning signs, smoke detectors, toxic gas detectors and fire extinguishers. (4-4-13)

15. Security. Appropriate design measures to help ensure the security of water system facilities shall be incorporated. Such measures, at a minimum, shall include means to lock all exterior doorways, windows, gates and other entrances to source, treatment, pumping stations, and water storage facilities. (3-30-07)

16. Other Regulations. Consideration must be given to the design requirements of other federal, state, and local regulatory agencies for items such as safety requirements, special designs for the handicapped, plumbing and electrical codes, and construction in the flood plain. (3-30-07)

17. Ground Water Source Redundancy. New community water systems served by ground water shall have a minimum of two (2) sources if they are intended to serve more than twenty-five (25) connections or equivalent dwelling units (EDUs). Under normal operating conditions, with any source out of service, the remaining source(s) shall be capable of providing either the peak hour demand of the system or a minimum of the maximum day demand plus equalization storage. See Subsection 501.18 for general design and redundancy requirements concerning fire flow capacity. (5-8-09)

18. Redundant Fire Flow Capacity. (3-30-07)

a. Public water systems that provide fire flow shall be designed to provide maximum day demand plus fire flow. Fire flow requirements and system adequacy shall be determined by the local fire authority or by a hydraulic analysis by a licensed professional engineer to establish required fire flows in accordance with the International Fire Code as adopted by the State Fire Marshal. Pumping systems supporting fire flow capacity must be

designed so that fire flow may be provided with any pump out of service. (4-4-13)

b. The requirement for redundant pumping capacity specified in Subsection 501.18.a. may be reduced to the extent that fire suppression storage is provided in sufficient quantity to meet some or all of fire flow demands. Where fire suppression storage is not provided, the requirement for fire flow pumping redundancy may be reduced or eliminated if the following conditions are met: (5-8-09)

i. The local fire authority justifies that the fire flow capacity of the system is acceptable and is compatible with the water demand of existing and planned fire-fighting equipment and fire-fighting practices in the area served by the system. (4-4-13)

ii. In a manner appropriate to the system type and situation, notification is provided to customers that describes the design of the system's fire-fighting capability and explains how it differs from the requirements of Subsection 501.18.a. (4-4-13)

19. Pilot Studies. Unless otherwise approved by the Department based on documentation provided by the design engineer, pilot studies are required for treatment processes other than chlorine disinfection or point of use installations. Pilot studies may be performed in the field using the proposed source water or in conjunction with bench scale testing in the lab using the proposed source water. The system shall obtain the Department's approval of a pilot study plan before the pilot study is implemented. A pilot study shall be conducted for a period that shall be determined by the design engineer and approved by the Department. A final pilot study report with results shall be submitted to the Department for review and approval. Upon completion of the pilot study, final approval of equipment and treatment processes is subject to the applicable requirements of Sections 500 through 552. (4-4-13)

a. Pilot Study Plan. A pilot study plan shall include the following and any other items required by the Department: (4-4-13)

i. Introduction and Background. The plan shall discuss general information about the project including the existing system, the reason for conducting the pilot study, and anticipated results of a successful pilot study. (4-4-13)

ii. Alternative Processes. Provide a brief description of alternative processes that could be used if the proposed process is shown to be ineffective from the study. (4-4-13)

iii. Procedures and Methods. The procedures and methods section shall discuss how the pilot study will be conducted, the time frame of the study, source water quality, how source water may be altered to mimic various source water quality conditions, and the water quality parameters that are monitored and evaluated to determine if the treatment process was effective. (4-4-13)

b. Pilot Study Report. The pilot study report shall include the following and any other items required by the Department: (4-4-13)

i. Introduction and Background. (4-4-13)

ii. Results. A discussion of the overall pilot study progress, including any issues or problems and a general discussion of results of the study and what the results indicate. This discussion should determine parameters necessary for full scale implementation. (4-4-13)

iii. Conclusions. Conclusions and recommendation to proceed with the treatment process if the results of the study proved successful. (4-4-13)

c. Additional specific pilot study requirements in Sections 500 through 552 shall be included in pilot study plans and reports. (4-4-13)

d. Engineer's Seal Required. Pilot study plans and pilot study reports submitted to the Department shall bear the imprint of an Idaho licensed professional engineer's seal that is both signed and dated by the engineer. (4-4-13)

502. FACILITY AND DESIGN STANDARDS: FACILITY PLANS.
See the definition of Facility Plan in Section 003. (3-30-07)

01. Facility Plans Required. All new public drinking water systems, and existing public drinking water systems undergoing material modification or expansion, are required to have a current facility plan that shall address all applicable issues specifically required in Sections 500 through 552 of these rules including, but not limited to, hydraulic capacity, treatment capacity, standby power, redundancy, fire flows, project financing, and operation and maintenance considerations sufficiently to determine the effects of the project on the overall infrastructure. Facility plans must address the entire potential service area of the project. Facility plans may not be required for simple water main extension projects as detailed in Subsections 502.01.a. and 502.01.b. (5-8-09)

a. Department-reviewed simple water main extension projects. A facility plan is not required if the Department is provided documentation supporting the ability of the purveyor to provide service for the simple water main extension without adding system components designed to control quantity or pressure to the system and while continuing to provide the pressure and quantity requirements of Subsection 552.01. Documentation may be in the form of: (5-8-09)

i. Hydraulic modeling; (5-8-09)

ii. Usage data and flow calculations; (5-8-09)

iii. Declining balance reports that demonstrate the system has the capacity to supply the service area of the system served by the extension; or (5-8-09)

iv. Other documentation acceptable to the Department. (5-8-09)

b. Qualified Licensed Professional Engineer (QLPE)-reviewed Simple Water Main Extension Projects. A Department-approved facility plan is not required to be in place prior to the QLPE approving a simple water main extension pursuant to Subsection 504.03.b., provided that the service area of the system served by the extension is in compliance with the facility and design standards in Sections 500 through 552 of these rules. If the Department has not approved a facility plan for the system which includes the proposed simple water main extension, then the system purveyor or the QLPE shall provide with the transmittal letter documentation supporting the ability of the purveyor to provide service for the simple water main extension without adding system components designed to control quantity or pressure to the system and while continuing to provide the pressure and quantity requirements of Subsection 552.01. The purveyor shall provide this documentation to the QLPE as necessary. Documentation may be in the form of: (5-8-09)

i. Hydraulic modeling; (5-8-09)

ii. Usage data and flow calculations; (5-8-09)

iii. Declining balance reports that demonstrate the system has the capacity to supply the service area of the system served by the extension; or (5-8-09)

iv. Other documentation acceptable to the Department. (5-8-09)

02. Submittal to the Department. When required, facility plans shall be submitted to the Department for review and approval prior to the submission of plans and specifications for a project related to the facility plan. (5-8-09)

03. Engineer's Seal Required. Facility plans submitted to the Department shall bear the imprint of an Idaho licensed professional engineer's seal that is both signed and dated by the engineer. (5-8-09)

04. Facility Plan Contents. The facility plan shall include basic information, criteria and assumptions, and alternative solutions with preliminary layouts and cost estimates as applicable. The facility plan is intended to address system wide growth, to identify system deficiencies, and to lay out a plan for system upgrades and expansion.

(5-8-09)

a. New public water system facility plan. The minimum requirements for a facility plan for a new public water system are listed in Subsections 502.04.a.i. through 502.04.a.viii. If specific items listed in Subsections 502.04.a.i. through 502.04.a.viii. are not applicable to a particular system, then the submitting engineer shall state this in the facility plan and state the reason why the requirement is not applicable. The facility plan must also include sufficient detail to support applicable requirements of Sections 501 through 552. (5-8-09)

i. Location. A general description and location of the system. (5-8-09)

ii. Population. The estimated design population of the system including the number of connections and the number of EDUs proposed. (5-8-09)

iii. Sources of Water. Adequacy, quality, and availability of sources of water for potable use and a description of the non-potable irrigation system. (5-8-09)

iv. Treatment. Identify and describe any anticipated treatment. (5-8-09)

v. Water Quantity. Design data for domestic, irrigation, fire fighting, commercial, or industrial water uses, including peak hour, maximum day, and average day demands. (5-8-09)

vi. Storage. Include the size and location of any anticipated storage structures. (5-8-09)

vii. Operating Pressure. Pressure ranges for all flow conditions prescribed by these rules. (5-8-09)

viii. Sewage. Describe the sewage collection system and sewage treatment works, with reference to their relationship to existing or proposed water works structures which may affect the operation of the water supply system, or which may affect the quality of the supply. (5-8-09)

b. Existing public water system facility plan. The minimum requirements for a facility plan for an existing public water system must include Subsections 502.04.b.i. through 502.04.b.vii. as well as Subsections 502.04.a.i. through 502.04.a.viii. If specific items listed in Subsections 502.04.b.i. through 502.04.b.vii. or Subsections 502.04.a.i. through 502.04.a.viii. are not applicable to a particular facility plan, then the submitting engineer shall state this in the facility plan and state the reason why the requirement is not applicable. The facility plan must also include sufficient detail to support applicable requirements of Sections 501 through 552. (5-8-09)

i. Hydraulic analysis. A computer analysis of the hydraulics of the distribution system if requested by the Department; any analysis of an existing distribution system shall be properly calibrated. The type or sophistication of analysis shall be dependent on the type of system. (5-8-09)

ii. Identify and evaluate problems related to the drinking water system. (5-8-09)

iii. Describe financing methods. (5-8-09)

iv. Set forth anticipated charges for users. (5-8-09)

v. Review organizational and staffing requirements. (5-8-09)

vi. Offer a project(s) recommendation for client consideration. (5-8-09)

vii. Outline official actions and procedures to implement the project. (5-8-09)

c. **Public Water System Facility Plan funded by the State Revolving Fund**. If the project is funded by the state revolving fund or a state grant, the facility plan must meet the requirements of Subsections 502.04.a. and 502.04.b., and other requirements that may also apply. See IDAPA 58.01.20, "Rules for Administration of Drinking Water Loan Program," and IDAPA 58.01.22, "Rules for Administration of Planning Grants for Public Drinking Water Facilities." (5-8-09)

d. Facility Plan Guidance. A checklist, which can be used as guidance, can be found on the DEQ website at http://www.deq.idaho.gov. The guidance document is for Department grant and loan projects, but may be used in part or in whole as a guide to assist in the development of any facility plan. (5-8-09)

503. FACILITY AND DESIGN STANDARDS: PRELIMINARY ENGINEERING REPORTS.
See the definition of Preliminary Engineering Report in Section 003. Preliminary engineering reports are required for all new water systems or material modifications to existing water systems that require plan and specification review and approval pursuant to Subsection 504.03. The preliminary engineering report shall be in conformance with the approved facility plan or shall describe any modifications to the facility plan. Preliminary engineering reports must be completed for all major water system projects including, but not limited to, source, pump station, pressure control, storage, and treatment projects. Preliminary engineering reports are not required for simple water main extensions that are approved in accordance with Subsections 502.01.a. or 502.01.b. (4-4-13)

01. Submittal to Reviewing Authority. Preliminary engineering reports shall be submitted to the Department for review and must be approved by the Department prior to the submission of plans and specifications. The Department may allow well construction plans and specifications to be submitted concurrently with a preliminary engineering report for these projects. (5-8-09)

02. Seal Required. Preliminary engineering reports submitted to the Department shall bear the imprint of an Idaho licensed professional engineer's seal that is both signed and dated by the engineer. The Department will accept the seal and signature of an Idaho licensed professional geologist on preliminary reports for well source, spring source, or infiltration gallery site reports, and for well construction. (4-4-13)

03. Preliminary Engineering Report Contents. The preliminary engineering report must include sufficient detail to demonstrate that the proposed project meets applicable criteria. The items included in Subsections 503.03.a. through 503.03.e., and all applicable issues and items specifically required in Sections 500 through 552, shall be addressed in detail. As required, a preliminary engineering report shall also identify and evaluate drinking water related problems, assemble basic information, present criteria and assumptions, examine alternative solutions with preliminary layouts and cost estimates, offer a conclusion with a proposed project, and outline official actions and procedures to implement the project. If specific items in Subsections 503.03.a. through 503.03.e. are not applicable to a particular design, then the designer shall state this in the preliminary engineering report and state the reason why it is not applicable. Items adequately addressed in the facility plan under which the project is being designed may be addressed by reference for purposes of the preliminary engineering report. (4-4-13)

a. All preliminary engineering reports shall include items in Subsection 503.03.a. and the applicable items from Subsections 503.03.b. through 503.03.e. (4-4-13)

i. General information. The preliminary engineering report general information shall include, but is not limited to: (4-4-13)

(1) Project description. A detailed description of the proposed project; (4-4-13)

(2) Site selection. A general description of the location of the project and justification of the site selection; (4-4-13)

(3) Access and utilities. A general discussion of adequacy of local roadways and availability of power or other utilities; (4-4-13)

(4) Surrounding land use. A general discussion of surrounding land use, including any potential sources of contamination; and (4-4-13)

(5) Security. A general discussion of planned security features such as fencing, lighting, alarm systems, etc. (4-4-13)

ii. Coordination with facility plan. The preliminary engineering report shall discuss or reference items provided in the Department-approved facility plan. These items include, but are not limited to: (4-4-13)

(1) Existing System. A general description of the existing system and how the project fits into the overall system and facility plan; (4-4-13)

(2) Size. The estimated system size based on number of persons, number of connections, or number of EDUs served or impacted by the project; (4-4-13)

(3) Water Quantity. Design data for domestic, irrigation, fire fighting, commercial and industrial water uses, including peak hour, maximum day, and average day demands; (4-4-13)

(4) Storage. How the project will affect various storage requirements. See definition of Components of Finished Water Storage in Section 003; (4-4-13)

(5) Operating Pressure. Pressure ranges for all flow conditions prescribed by these rules; (4-4-13)

(6) Hydraulic Analysis. A computer analysis of the hydraulics of the distribution system if requested by the Department; any analysis of an existing distribution system shall be properly calibrated. The type and sophistication of analysis shall be dependent on the type of system; (4-4-13)

(7) Sources of Water. A general discussion of the adequacy, quality and availability of source of water. A water system that is to be served by a separate non-potable irrigation system must provide documentation to demonstrate the actual availability of water in sufficient quantity to ensure that the irrigation system will not compete with or in any way diminish the source of water for the potable water system; (4-4-13)

(8) Sewage. Describe the sewage collection system and sewage treatment works, with special reference to their relationship to existing or proposed water works structures which may affect the operation of the water supply system, or which may affect the quality of the supply; (4-4-13)

(9) Treatment wastes. Assesses and characterize all anticipated waste discharges generated by the project and any activities that could impact the water supply. The location of each waste handling area or discharge point shall be shown on a scale map; (4-4-13)

(10) Financing methods. Provide brief discussion of financing options investigated or planned; and (4-4-13)

(11) Flooding. Discuss mechanisms for protection of the system from flooding. (4-4-13)

iii. Code provisions. The preliminary engineering report shall include a summary of applicable codes and standards that apply to the proposed project. (4-4-13)

iv. Cost estimate. The preliminary engineering report shall provide, as applicable, estimated construction costs for public works projects or projects funded through public monies. (4-4-13)

v. Construction schedule. The preliminary engineering report shall include the proposed construction schedule. (4-4-13)

vi. Potential sources of contamination. Identify sources of contamination and describe how the drinking water sources will be protected. (4-4-13)

vii. Soils and ground water levels. Generally discuss soil, ground water conditions, and potential building foundation problems, including a description of: (4-4-13)

(1) The character of the soil through which water mains are to be laid; (4-4-13)

(2) Characteristics of the soil, water table, and geological substrate that may affect the design and construction of the foundations of proposed structures; and (4-4-13)

(3) The approximate elevation of ground water in relation to subsurface structures. (4-4-13)

b. Drinking water wells and spring construction projects. In addition to items listed in Subsection 503.03.a., a preliminary engineering report for source water construction projects shall include all items listed in Subsection 503.03.b., applicable items in Sections 510 through 514, and Sections 500 to 552 should be evaluated for their relevance to the project. (4-4-13)

i. Anticipated geology and hydrogeology. Include geological data and existing well logs. (4-4-13)

ii. Drilling methodology. Describe the anticipated drilling method and well construction. (4-4-13)

iii. Water quality. Anticipated potability and water quality including monitoring results required for new sources by these rules. (4-4-13)

iv. Water rights. Provide the appropriate documentation for the water rights for the drinking water source. (4-4-13)

v. Dimensions of the well lot and location of source. Include geographical coordinates of the source location. (4-4-13)

vi. Evaluation of surface water influence. For all new ground water sources, including but not limited to wells, springs, and infiltration galleries, systems shall supply information as required by the Department to determine if these sources are under the direct influence of surface water. (4-4-13)

vii. Provide a site evaluation report as required by Section 510 for wells and 514 for springs. (4-4-13)

c. Well and pump house construction projects. In addition to items listed in Subsection 503.03.a., preliminary engineering reports for well and pump house construction projects shall include all items listed in Subsection 503.03.c., applicable items in Sections 511, 541, 547, and Sections 500 to 552 should be evaluated for their relevance to the project. (4-4-13)

i. Well house. Include information on the anticipated construction and well house equipment such as heating, ventilation, interior lighting, and drain(s). (4-4-13)

ii. Water Level. Provide a brief description of the means for measuring the water level in the well. (4-4-13)

iii. Well pump. Include information on the proposed or planned pump, including the pump curve. (4-4-13)

iv. Controls. Describe the equipment and controls for the well and pump house. This includes but is not limited to system control and data acquisition, variable frequency drive, and other manual or automated controls within the well house. (4-4-13)

v. Piping and appurtenances including but not limited to sample taps, discharge piping, flow meters, check valves, and pressure gauges. Describe the receiving system for the pump to waste volume of water including an evaluation of the capacity of the receiving system and, if applicable, provide documentation that the system owner will accept the estimated volume of water and any limitations the owner places upon that acceptance. (4-4-13)

vi. Well vent. Describe the well vent if applicable. (4-4-13)

vii. Casings and well caps. Describe the anticipated casing and well cap type and materials. (4-4-13)

viii. Pitless adapters and units. Describe the anticipated pitless adapter for the well. (4-4-13)

ix. Soil and water conditions. Describe the soil and ground water conditions that may affect the design and construction of proposed structure(s). (4-4-13)

d. Reservoir and storage construction projects. In addition to items listed in Subsection 503.03.a., preliminary engineering reports for reservoir and storage construction projects shall include all items listed in Subsection 503.03.d., applicable items in Sections 544, and Sections 500 to 552 should be evaluated for their relevance to the project. (4-4-13)

i. Sizing. Describe the required storage capacity and the related components of finished water storage. (4-4-13)

ii. Overflow. Describe the anticipated overflow system for the water storage project and where the overflow will discharge. (4-4-13)

iii. Vents. Describe the venting system used for the water storage project if applicable. (4-4-13)

iv. Construction materials. Describe the construction materials used for the storage project. (4-4-13)

v. Protection from freezing. Describe the protection of storage facility features from freezing especially riser pipes, overflows, and vents. (4-4-13)

vi. Grading. Describe any site work or grading that may be necessary. (4-4-13)

vii. Corrosion prevention. Provide a discussion on methods to prevent corrosion such as coatings, cathodic protection, corrosion resistant materials, and encasement. (4-4-13)

viii. Disinfection. Describe the methods to be used to disinfect the storage facility and the testing to check for proper disinfection. (4-4-13)

e. Surface water and ground water under the direct influence of surface water (GWUDI) treatment construction projects. In addition to items listed in Subsection 503.03.a., preliminary engineering reports for surface water treatment and GWUDI construction projects shall include all items listed in Sections 503.03.e., applicable items in Sections 515 through 540, and Sections 500 to 552 should be evaluated for their relevance to the project. (4-4-13)

i. Intake structures. Describe the intake structures that will be used. (4-4-13)

ii. Off-stream raw water storage. If applicable, describe the proposed off-stream raw water storage. (4-4-13)

iii. Treatment methods. Describe the treatment methods and potential alternatives including the removal of pathogens, disinfection, enhanced disinfection, water quality monitoring, and redundancy provisions. (4-4-13)

iv. Treatment Wastes. Characterize the various wastes from the water treatment processes and, if applicable, their volumes, constituents, and proposed treatment and disposal. If discharging to a sanitary sewage system, verify that the system is capable of handling the flow to the treatment works and that the treatment works is capable and willing to accept the additional loading. (4-4-13)

v. Monitoring Results. Provide applicable raw water monitoring results as required by these rules including anticipated turbidity ranges, microbiological, physical, chemical, radiological, and other parameters as determined by the Department. (4-4-13)

vi. Potential contamination. An assessment of the degree of hazard to the supply by agricultural, industrial, recreational, and residential activities in the watershed, and by accidental spillage of materials that may be toxic, harmful or detrimental to treatment processes. (4-4-13)

vii. Waste discharge. Assess all waste discharges and activities that could impact the water supply. The location of each waste discharge shall be shown on a scale map. (4-4-13)

viii. Hydrological and historical stream flow data. Provide any available records and data. (4-4-13)

ix. Water rights and water quantity. A copy of the appropriate permit(s) or application(s) from the Idaho Department of Water Resources regarding authorization to appropriate public waters of the state of Idaho in sufficient quantity to meet the design requirements of the system. (4-4-13)

x. Turbidity. Anticipated turbidity range. (4-4-13)

xi. Watershed. Assessment of the degree of control the water system will be able to exercise over the watershed. (4-4-13)

xii. Projected future uses of impoundments or reservoirs within the watershed. (4-4-13)

xiii. Water quality. Submit source water sample data over a sufficient period of time to assess the microbiological, physical, chemical and radiological characteristics of the water. (4-4-13)

xiv. Stream characteristics. Provide consideration of currents, wind and ice conditions, and the effect of confluent streams. (4-4-13)

504. FACILITY AND DESIGN STANDARDS: REVIEW OF PLANS AND SPECIFICATIONS.
The facility and design standards set forth in these rules shall be applied in the review of plans and specifications for public water system facilities. If design issues are not addressed by the facility and design standards set out in these rules, then guidance documents, some of which are listed in Subsection 002.02, shall be used as guidance in the design and review of plans and specifications for public drinking water facilities. See also Section 013. (3-30-07)

01. Ownership. Documentation of the ownership and responsibility for operating the proposed system shall be made available to the Department prior to or concurrent with the submittal of plans and specifications as required in Subsection 504.03. The documentation must show organization and financial arrangements adequate to assure construction, operation and maintenance of the system according to these rules. Documentation shall also include the name of the water system, the name, address, and phone number of the supplier of water, the system size, and the name, address, and phone number of the system operator. (3-30-07)

02. Connection to an Existing System. If the proposed project is to be connected to an existing public water system, a letter from the purveyor must be submitted to the Department stating that the purveyor will be able to provide services to the proposed project. The Department may require documentation supporting the ability of the purveyor to provide service to the new system without diminishing quality of service to existing customers. This letter must be submitted prior to or concurrent with the submittal of plans and specifications as required in Subsection 504.03. (3-30-07)

03. Plans and Specifications Required. (3-30-07)

a. Prior to construction of new public drinking water systems, new drinking water systems designed to serve fifteen (15) or more service connections, or material modifications of existing public water systems, plans and specifications must be submitted to the Department for review and approval. Construction should commence as soon as practical after approval, and if construction is not completed within twelve (12) months of the Department's final approval, an extension or re-approval must be obtained from the Department. The Department may require re-submittal of all or part of the plans and specifications prior to issuing an extension or re-approving the plans and specifications. (4-7-11)

b. Plans and specifications for simple water main extensions shall not require pre-construction approval by the Department when such extensions will be owned and operated by a city, county, quasi-municipal corporation or regulated public utility, provided that such plans and specifications are reviewed and approved by a QLPE who was not involved in the preparation of the plans and specifications being reviewed to verify compliance with the requirements of these rules prior to initiation of construction. Any plans and specifications approved pursuant to Subsection 504.03.b. shall be transmitted to the Department at the time construction is authorized and shall be marked or stamped as "Approved for Construction." Along with the plans and specifications, the transmittal

must include the items listed in Subsections 504.03.b.i. through 504.03.b.vii. The plans and specifications must bear the imprint of an Idaho licensed professional engineer's seal that is both signed and dated by the engineer, and the approval or transmittal letter must be sealed, signed, and dated by the QLPE that is approving the plans and specifications. (4-4-13)

i. A statement that the author of the transmittal letter is the QLPE representing the city, county, quasi-municipal corporation or regulated public entity. (5-8-09)

ii. A statement that the extension project complies with the current facility plan or preliminary engineering report, or a statement that the water system has adequate capacity. Please see Subsection 502.01.b. for further information. (5-8-09)

iii. A statement from the city, county, quasi-municipal corporation or regulated public entity or its authorized agent that the water system purveyor will serve the project. (5-8-09)

iv. A statement from the city, county, quasi-municipal corporation or regulated public entity or its authorized agent that the water system purveyor will own and operate the project after construction is complete. (5-8-09)

v. A statement by the QLPE that the plans and specifications are approved for construction. (5-8-09)

vi. A statement by the QLPE that the plans and specifications comply with the facility standards within these rules. (5-8-09)

vii. A statement recommending whether sanitary restrictions can be released or should remain in force. (5-8-09)

c. Subsections 504.03.c.i. through 504.03.c.vi. outline the projects which QLPEs may approve and which QLPEs may not approve. (5-8-09)

i. A QLPE may approve plans and specifications for simple water main extensions that are able to connect to an existing water system owned by a city, county, quasi-municipal corporation, or regulated public utility at the time the extension is approved for construction by the QLPE. (5-8-09)

ii. A QLPE may approve plans for simple water main extensions which will connect to an existing water system, but are unable to connect to the system at the time the extension is approved for construction by the QLPE, provided sanitary restrictions remain in force for the proposed extension. (5-8-09)

iii. A QLPE may not approve plans and specifications which include mechanical systems such as booster stations. (5-8-09)

iv. A QLPE may not approve plans and specifications for projects which the QLPE was the design engineer or otherwise involved in the design. (5-8-09)

v. A QLPE employed by a city, county, quasi-municipal corporation, or regulated public utility may approve a design that was prepared by a subordinate engineer or an engineer from a separate design group within the city, county, quasi-municipal corporation, or regulated public utility. (5-8-09)

vi. A QLPE who is not employed by a city, county, quasi-municipal corporation, or regulated public utility, but is retained by a city, county, quasi-municipal corporation, or regulated public utility for the purpose of plan and specification review may not approve projects designed by the company with which the QLPE is employed. (5-8-09)

d. At the discretion of the city, county, quasi-municipal corporation or regulated public utility, the plans addressed by Subsection 504.03.b. may be referred to the Department for review and approval prior to initiation of construction. (3-30-07)

04. Criteria for Review. The Department shall review plans and specifications to determine compliance with these rules and engineering standards of care. If the plans and specifications comply with these rules and engineering standards of care, the Department shall not substitute its judgment for that of the owner's design engineer concerning the manner of compliance with the rule. (3-30-07)

05. Schedule for Review. The Department shall review plans and specifications and endeavor to resolve design issues within forty-two (42) calendar days of submittal such that approval can be granted. If the Department and applicant have not resolved design issues within forty-two (42) calendar days or at any time thereafter, the applicant may file a written demand to the Department for a decision. Upon receipt of such written demand, the Department shall deliver a written decision to the applicant within no more than seven (7) calendar days explaining any reasons for disapproval. The Department shall maintain records of all written demands for decision made pursuant to Subsection 504.05 with such records including the final decision rendered and the timeliness thereof. (3-30-07)

06. Engineer's Seal Required. Plans and specifications submitted to the Department shall bear the imprint of an Idaho licensed professional engineer's seal; except that the Department will accept the seal of an Idaho licensed professional geologist on the following: (3-30-07)

a. Well source, spring source, or infiltration gallery site evaluation reports, as specified in Subsections 510 and 514. (3-30-07)

b. Plans and specifications for well construction and results of field inspection and testing, as specified in Section 510. (3-30-07)

07. Contents of Plans and Specifications. Plans and specifications shall, where pertinent, provide the following: (3-30-07)

a. General layout, including: (3-30-07)

i. Suitable title. (3-30-07)

ii. Name of municipality or other entity or person responsible for the water supply. (3-30-07)

iii. Area or institution to be served. (3-30-07)

iv. Scale of drawings. (3-30-07)

v. North arrow. (3-30-07)

vi. Datum used. (3-30-07)

vii. General boundaries of municipality or area to be served. (3-30-07)

viii. Date, name, and address of the designing engineer. (3-30-07)

ix. Legible prints suitable for reproduction. (3-30-07)

x. Location and size of existing water mains, if applicable. (3-30-07)

xi. For systems undergoing material modification, location and nature of existing water works structures and appurtenances affecting the proposed improvements. (3-30-07)

b. Detailed plans, including: (3-30-07)

i. Stream crossings, providing profiles with elevations of the stream bed and the estimated normal and extreme high and, where appropriate, low water levels. (3-30-07)

ii. Location and size of the property to be used for the development with respect to known references such as roads, streams, section lines, or streets. (3-30-07)

iii. Topography and arrangement of present or planned wells or structures. (3-30-07)

iv. Elevations of the one hundred (100) year flood level in relation to the floor of structures, upper termination of protective casings, and grade surrounding facilities. (3-30-07)

v. Details of well construction, including diameter and depth of drill holes, casing and liner diameters and depths, grouting depths, elevations, and designation of geological formations, water levels and other data as specified in Section 510. (3-30-07)

vi. Location of all known existing and potential sources of pollution within five hundred (500) feet of water sources or underground treated storage facilities. (3-30-07)

vii. Size, length, and materials of proposed water mains. (3-30-07)

viii. Location of existing or proposed streets; water sources, ponds, lakes, and drains; storm sanitary, combined and house sewers; septic tanks, disposal fields and cesspools. (3-30-07)

ix. Schematic flow diagrams and hydraulic profiles showing the flow through various plant units. (3-30-07)

x. Piping in sufficient detail to show flow through the plant including waste lines. (3-30-07)

xi. Locations of all chemical storage areas, chemical feeding equipment, and points of chemical application. (3-30-07)

xii. All appurtenances, specific structures, equipment, water treatment plant waste disposal units and points of discharge having any relationship to the plans for water mains or water works structures. (3-30-07)

xiii. Locations of sanitary or other facilities, such as lavatories, showers, toilets, and lockers, when applicable or required by the Department. (3-30-07)

xiv. Locations, dimensions, and elevations of all proposed plant facilities. (3-30-07)

xv. Locations of all sampling taps owned by the water system. (3-30-07)

xvi. Adequate description of any significant features not otherwise covered by the specifications that may impact public safety or welfare. (3-30-07)

c. Complete, detailed technical specifications shall be supplied for the proposed project, including: (3-30-07)

i. A program for keeping existing water works facilities in operation during construction of additional facilities so as to minimize interruption of service. (3-30-07)

ii. Laboratory facilities and equipment. (3-30-07)

iii. Description of chemical feeding equipment. (3-30-07)

iv. Procedures for flushing, disinfection and testing, as needed, prior to placing the project in service. All wells, pipes, tanks, and equipment which can convey or store potable water shall be disinfected in accordance with AWWA Standards, incorporated into these rules at Subsection 002.01. Plans or specifications shall outline the procedure and include the disinfectant dosage, contact time, and method of testing the results of this procedure. (3-30-07)

v. Materials or proprietary equipment for sanitary or other facilities, including any necessary backflow or back-siphonage protection. (3-30-07)

d. Complete design criteria, as set forth in these rules. (3-30-07)

e. The Department may require additional information which is not part of the construction drawings, including, but not limited to, head loss calculations, proprietary technical data, and copies of contracts. (3-30-07)

08. Notification of Material Deviations. As set forth in Subsection 504.03, during construction or modification, the reviewing authority must be notified of any material deviation from the approved plans. The reviewing authority's prior written approval is required before any material deviation is allowed. (3-30-07)

09. Record Plans and Specifications Required. (5-8-09)

a. Within thirty (30) calendar days of the completion of construction of facilities for which plans are required to be reviewed pursuant to Subsection 504.03, record plans and specifications based on information provided by the construction contractor and field observations made by the engineer or the engineer's designee depicting the actual construction of facilities performed, must be submitted to the Department by the engineer representing the city, county, quasi-municipal corporation or regulated public utility that owns the project, or by the design engineer or owner-designated substitute engineer if the facilities will not be owned and operated by a city, county, quasi-municipal corporation or regulated public utility. Such submittal by the professional engineer must confirm material compliance with the approved plans and specifications or disclose any material deviations therefrom. If the construction does not materially deviate from the approved plans and specifications, the owner may have a statement to that effect prepared by an Idaho licensed professional engineer and filed with the Department in lieu of submitting a complete and accurate set of record drawings. (3-30-07)

b. Record plans and specifications, or a statement submitted in lieu of record plans and specifications, must bear the imprint of an Idaho licensed professional engineer's seal that is both signed and dated by the engineer. (4-4-13)

c. The Department will accept the seal and signature of an Idaho licensed professional geologist on record plans and specifications, or a statement bearing the seal and signature of an Idaho licensed professional geologist in lieu of record plans and specifications, for record plans and specifications for well construction and results of field inspection and testing, as specified in Section 510. (4-4-13)

10. Exception. The Department may waive the plan and specification approval required of any particular facility or category of facilities when doing so will have no significant impact on public health or the environment. (3-30-07)

11. Requirement to Have Approved Plans and Specifications and Approval Letter On-Site During Construction. It is the responsibility of the owner to maintain one (1) copy of the approved plans and specifications and the approval letter from the reviewing authority on-site during construction at all times. (3-30-07)

12. Construction. Except as provided in Subsection 504.03.b., no construction shall commence until all of the necessary approvals have been received from the Department. The owner shall provide for the inspection of the construction of a public drinking water system facility by an Idaho licensed professional engineer to the extent required to confirm material compliance with the approved plans and to produce accurate record documents as required by Subsection 504.09. (3-30-07)

505. -- 509. (RESERVED).

510. FACILITY AND DESIGN STANDARDS: SITING AND CONSTRUCTION OF WELLS.
Written approval by the Department is required before water from any new or reconstructed well may be served to the public. Any supplier of water for a public water system served by one (1) or more wells shall ensure that the following requirements are met: (3-30-07)

01. Site Approval. Prior to drilling, the site of a public water system well must be approved in writing

by the Department. The Department shall require the supplier of water to submit a well site evaluation report that takes into account the proposed size, depth, and location of the well. The evaluation may include, but is not limited to the following types of information: (3-30-07)

a. An evaluation of the quality of anticipated ground water. (4-4-13)

b. Identification of the known aquifers and the extent of each aquifer, based on the stratigraphy, sedimentation, and geologic structure beneath the proposed well site. (5-3-03)

c. An estimate of hydrologic and geologic properties of each aquifer and confining layers. (5-3-03)

d. Prediction of the sources of water to be extracted by the well and the drawdown of existing wells, springs, and surface water bodies that may be caused by pumping the proposed well. This prediction may be based on analytical or numerical models as determined by the Idaho Department of Water Resources permitting process. (3-30-07)

e. Demonstration of the extent of the capture zone of the well, based on the well's design discharge and on aquifer geology, using estimates of hydraulic conductivity and storativity. (5-3-03)

f. Description of potential sources of contamination within five hundred (500) feet of the well site. (5-3-03)

02. Location. Each well shall be staked by the design engineer or licensed professional geologist prior to drilling, be located a minimum of fifty (50) feet from the nearest property line, be located a minimum of fifty (50) feet from any potential source of contamination, and be no closer to specified sources of contamination than set forth in Subsection 900.01. In vulnerable settings, the Department may require engineering or hydrologic analysis to determine if the required setback distance is adequate to prevent contamination. (5-8-09)

03. Construction Standards. In addition to meeting the requirements of these rules, all wells shall be constructed in accordance with IDAPA 37.03.09, "Well Construction Standards Rules," and related rules and laws administered by the Idaho Department of Water Resources. All wells shall comply with the drilling permit requirements of Section 42-235, Idaho Code. (5-3-03)

a. Casing that meets the requirements set forth in Subsection 900.02 (Table 2). The use of plastic well casing for public water system wells may be considered on a case-by-case basis. Plastic casing shall meet or exceed ASTM Standard F480-02 and ANSI/NSF Standard 61. (5-8-09)

b. Public water system wells shall have no less than fifty-eight (58) feet of annular seal of not less than one and one-half (1 ½) inches thickness as measured from land surface to the bottom of the seal unless: (3-30-07)

i. It can be demonstrated to the Department's satisfaction that there is a confining layer at lesser depth that is capable of preventing unwanted water from reaching the intake zone of the well; or (5-3-03)

ii. The best and most practical aquifer at a particular site is less than fifty-eight (58) feet deep; or; (5-3-03)

iii. The Department specifies a different annular seal depth based on local hydrologic conditions. (5-3-03)

iv. More stringent standards are required by applicable Rules of the Idaho Water Resources Board, referenced in Subsection 002.02. (3-30-07)

c. Specifications shall include allowable tolerances for plumbness and alignment in accordance with AWWA Standards, incorporated by reference into these rules at Subsection 002.01, or as otherwise approved by the Department. If the well fails to meet these requirements, it may be accepted by the Department if it does not interfere with the installation or operation of the pump or uniform placement of grout. (3-30-07)

d. Geological data shall be collected at each pronounced change in formation and shall be recorded in the driller's log. Supplemental data includes, but is not limited to, accurate geographical location such as latitude and longitude or GIS coordinates, and other information on accurate records of drillhole diameters and depths, assembled order of size and length of casing, screens and liners, grouting depths, formations penetrated, and water levels. (3-30-07)

e. The owner of each well shall retain all records pertaining to each well until the well has been properly abandoned. (3-30-07)

f. Wells with intake screens shall: (3-30-07)

i. Be constructed of materials resistant to damage by chemical action of ground water or cleaning operations. (3-30-07)

ii. Have openings based on sieve analysis of formation or gravel pack materials. (5-8-09)

iii. Have sufficient length and diameter to provide adequate specific capacity and aperture entrance velocity not to exceed point three (0.3) feet per second, or as otherwise approved by the Department. (3-30-07)

iv. Be installed so that the pumping water level remains above the screen under all operating conditions, or otherwise approved by the Department. Where a bottom plate or sump is utilized, it shall be of the same material as the screen, or as otherwise approved by the Department. Where a washdown assembly, tailpipe or sump is used below the screen, it may be made of a different material than the screen. (3-30-07)

g. Permanent well casing shall be surrounded by a minimum of one and one-half (1 ½) inches of grout to the depth required by Subsection 510.03.b. of these rules, or by the Rules of the Idaho Water Resources Board referenced in Subsection 002.02, whichever is greater. All casing identified in plans and specifications as temporary casing shall be removed prior to well completion. (5-8-09)

i. Neat cement grout consisting of cement that conforms to AWWA Standard A-100, and water, with not more than six (6) gallons of water per ninety-four (94) pounds of cement, shall be used for one and one-half (1 ½) inch openings. Additives may be used to enhance effectiveness and are subject to approval by the reviewing authority and the Idaho Department of Water Resources on a case-by-case basis. (3-30-07)

ii. Bentonite grout shall have a solids content not less than twenty-five (25) percent by weight when mixed with water and be specifically manufactured for use in sealing of well casing. Bentonite grout shall not contain weighting agents to increase solids content. Bentonite grout shall not be used above the water table. All bentonite grout shall be installed by positive displacement from the bottom up through a tremmie or float shoe. (3-30-07)

iii. Where a dry annular space is to be sealed, a minimum of two (2) inches on all sides of the casing shall be required to place bentonite to depths not greater than one hundred (100) feet, using #8 mesh granular bentonite. All dry pour granular bentonite shall be tagged at appropriate intervals to verify placement. If a bridge occurs, a tremmie pipe shall be washed or jetted through the bridge to allow for pumping of grout. Bentonite chips shall be of sufficient size to accommodate proper placement for the existing subsurface conditions. (3-30-07)

iv. Dry granular bentonite used in wells where a dry annular space is to be sealed with depths greater than one hundred (100) feet shall require an annulus of at least three (3) inches on all sides of the casing, or as approved by the reviewing authority and the Idaho Department of Water Resources. If a bridge occurs, a tremmie pipe shall be washed or jetted through the bridge to allow for pumping of grout. Bentonite chips shall be of sufficient size to accommodate proper placement for the existing subsurface conditions. (3-30-07)

v. All chip bentonite seals installed through water shall only be used in annular spaces of at least four (4) inches on all sides of the casing. If a bridge occurs, a tremmie pipe shall be washed or jetted through the bridge to allow for pumping of grout. Bentonite chips shall be of sufficient size to accommodate proper placement for the existing subsurface conditions. Chip bentonite seals installed through water shall be: (3-30-07)

(1) Installed in accordance with manufacturer's specifications; or (3-30-07)

(2) Installed by pouring chips over a one-quarter (1/4) inch mesh screen for three-eighths (3/8) inch chips to remove fines to prevent bridging at the water table; or (3-30-07)

(3) Installed using coated pellets to retard hydration if approved by the reviewing authority and the Idaho Department of Water Resources. (3-30-07)

vi. Concrete may be approved on a case-by-case basis by the reviewing authority and the Idaho Department of Water Resources. Upon such approval, the approved method shall use a six (6) sack minus one-half (1/2) inch Portland cement concrete and shall be installed by positive displacement from the bottom up through a tremmie pipe. (3-30-07)

04. Disinfection. All tools, bits, pipe, and other materials to be inserted in the borehole shall be cleaned and disinfected in accordance with the Well Construction Standards and permitting requirements of the Idaho Water Resources Board, referenced in Subsection 002.02 This applies to new well construction and repair of existing wells. (3-30-07)

05. Well Completion Report Required. Upon completion of a well, and prior to its use as a drinking water source, the following information and data must be submitted by the water system to the Department. The well completion report must be submitted to the Department prior to or concurrent with the submittal of the preliminary engineering report for well house construction/modification. The well completion report shall bear the imprint of an Idaho licensed professional engineer's or an Idaho licensed professional geologist's seal that is both signed and dated by the engineer or geologist: (4-7-11)

a. A copy of all well logs; (12-10-92)

b. Results of test pumping, as specified in Subsection 510.06; (4-7-11)

c. As constructed plans showing at least the following: (12-10-92)

i. Annular seal, including depth and sealant material used and method of application; (5-3-03)

ii. Casing perforations, results of sieve analysis used in designing screens installed in sand or gravel aquifers, gravel packs; and (5-3-03)

iii. Recommended pump location. (4-4-13)

d. Other information as may be specified by the Department. (12-10-92)

e. Sampling results for iron, manganese, corrosivity, and other secondary contaminants specified by the Department. Other monitoring requirements are specified in Subsections 510.05.e.i. through 510.05.e.iii. (5-8-09)

i. Community Systems. Results of analysis for total coliform, inorganic chemical contaminants, organic chemicals, and radionuclide contaminants set forth in Subsections 050.01, 050.02, 050.05, 100.01, 100.03, 100.04, 100.05, and 100.06, unless analysis is waived pursuant to Subsection 100.07. (5-8-09)

ii. Nontransient Noncommunity Systems. Results of analysis for total coliform and inorganic and organic chemical contaminants listed in Subsections 050.01, 050.02, 100.01, 100.03, 100.04, unless analysis is waived pursuant to Subsection 100.07. (5-8-09)

iii. Transient Noncommunity Systems. Results of a total coliform, nitrite, and nitrate analysis listed in Subsections 050.01, 100.01 and 100.03. (5-8-09)

06. Test Pumping. Upon completion of a ground water source, test pumping shall be conducted in accordance with the following procedures to meet the specified requirements: (12-10-92)

a. The well shall be test pumped at the desired yield (design capacity) of the well for at least twenty-four (24) consecutive hours after the drawdown trend has stabilized, as determined by the supervising engineer or geologist. Alternatively, the well may be pumped at a rate of one hundred fifty percent (150%) of the desired yield for at least six (6) continuous hours after the drawdown trend has stabilized, as determined by the supervising engineer or geologist. The field pumping equipment must be capable of maintaining a constant rate of discharge during the test. Discharge water must be piped an adequate distance to prevent recharge of the well during the test. If the well fails the test protocol, design of the water system shall be re-evaluated and submitted to the Department for approval. (3-30-07)

b. Upon completion of well development, the well shall be tested for sand production. Fifteen (15) minutes after the start of the test pumping (at or above the design production rate), the sand content of a new well shall not be more than five (5) parts per million. Sand production shall be measured by a centrifugal sand sampler or other means acceptable to the Department. If sand production exceeds five (5) ppm, the well shall be screened gravel packed, or re-developed. (3-30-07)

c. The following data shall be provided: (5-3-03)

i. Static water level in the well prior to test pumping; (5-3-03)

ii. Well yield in gpm and duration of the pump test, including a discussion of any discrepancy between the desired yield and the yield observed during the test; (5-3-03)

iii. Water level in the well recorded at regular intervals during pumping; (5-3-03)

iv. Profile of water level recovery from the pumping level projected to the original static water level. (5-3-03)

v. Depth at which the test pump was positioned in the well; (5-3-03)

vi. Test pump capacity and head characteristics; (5-3-03)

vii. Sand production data. (5-3-03)

viii. Results of analysis based on the drawdown and recovery test pertaining to aquifer properties, long term sustained yield, and boundary conditions affecting drawdown. (4-7-11)

d. The Department may allow the use of other pump test protocols that are generally accepted by engineering firms with specialized experience in well construction, by the well drilling industry, or as described in national standards (such as ANSI/AWWA A100-97), as long as the minimum data specified in Subsection 510.06.c. are provided. The Department welcomes more extensive data about the well, such as step-drawdown evaluations used in determining well capacity for test pumping purposes, zone of influence calculations, and any other information that may be of use in source protection activities or in routine water system operations. (3-30-07)

e. Where aquifer yield, sustainability, or water quality are questionable, the Department, at its discretion, may require additional site specific investigations that could include test well construction, long-term pumping tests, or other means to demonstrate that the aquifer yield is sufficient to meet the long-term water requirements of the project. (4-4-13)

07. Conversion of Non-Public Water System Wells for Public Water System Use. Any existing well constructed for use other than as a public water system source may be considered for use as a public water system source on a case-by-case basis. The owner of such a well must demonstrate to the Department's satisfaction that the well site conforms to the requirements of Subsections 510.01, 510.02, and Section 512, the well is constructed in a manner that is protective of public health and that both the quantity and quality of water produced by the well meet public water system standards set forth in these rules. (5-8-09)

08. Observation Wells. If observation wells are used and are intended to remain in service after completion of the water supply well, the observation wells shall be constructed in accordance with the requirements

for permanent wells and be protected at the upper terminal to preclude entrance of foreign materials. See Rules of the Idaho Water Resources Board referenced in Subsection 002.02. (3-30-07)

09. Well Abandonment. Any water supply well that will no longer be used must be abandoned by sealing the borehole carefully to prevent pollution of the ground water, eliminate any physical hazard, conserve aquifer yield, maintain confined head conditions in artesian wells, and prevent mixing of waters from different aquifers. The objective of proper well abandonment procedures is to restore, as far as possible, the original hydrogeologic conditions. The services of a licensed well driller are required. Instructions for abandoning various types of wells may be obtained from the Idaho Department of Water Resources. See Rules of the Idaho Water Resources Board referenced in Subsection 002.02. (3-30-07)

511. FACILITY AND DESIGN STANDARDS: WELL PUMPS, DISCHARGE PIPING, AND APPURTENANCES.

01. Sample Tap Required. A sample tap suitable for collecting bacteriological samples shall be provided on the discharge piping from every well at a point where pressure is maintained but prior to any treatment. This sample tap shall be of the smooth-nosed type without interior or exterior threads, shall not be of the mixing or petcock type, and shall not have a screen, aerator, or other such appurtenance. The sample tap for collecting bacteriological samples may be used for other sampling purposes. In addition, threaded hose bib taps may also be used for collecting samples, other than bacteriological samples, if equipped with an appropriate backflow prevention device as may be necessary to protect the public water system from contamination. (5-8-09)

02. Discharge Piping. The discharge line shall be equipped with the necessary valves and appurtenances to allow a well to be pumped to waste at the design capacity of the well via an approved air gap through an approved non-corrodible screen at a location prior to the first service connection, and shall meet the following requirements: (4-4-13)

a. Be designed to minimize friction loss. (3-30-07)

b. Have control valves and appurtenances located above the pump house floor when an above-ground discharge is provided. (3-30-07)

c. Be protected against contamination. (3-30-07)

d. Vertical turbine pumps shall be equipped with an air release-vacuum relief valve, or equivalent, located upstream from the check valve, with exhaust/relief piping terminating in a down-turned position at least eighteen (18) inches above the floor and covered with a twenty-four (24) mesh corrosion resistant screen. (3-30-07)

e. Have all exposed piping, valves and appurtenances protected against physical damage and freezing. (3-30-07)

f. Be properly anchored to prevent movement, and protected against surge or water hammer. (3-30-07)

g. The pump to waste discharge piping shall be valved to ensure that other system components that could be negatively affected by the quality of the discharged water are not pressurized by the water that is being pumped to waste. (4-4-13)

h. Where two (2) or more wells are connected to a common well house, the discharge piping shall be designed to ensure that each well can be pumped to waste independently without affecting the ability of the other well or wells to pressurize the system. (4-4-13)

03. Pressure Gauge Required. A pressure gauge shall be provided on all discharge piping. (4-7-11)

04. Flow Meter and Check Valve. Unless otherwise approved by the Department based on documentation provided by the design engineer, an instantaneous and totalizing flow meter equipped with nonvolatile memory shall be installed on the discharge line of each well in accordance with the manufacturer's specifications.

Meters installed on systems with variable frequency drives shall be capable of accurately reading the full range of flow rates. An accessible check valve, which is not located in the pump column, shall be installed in the discharge line of each well between the pump and the shut-off valve. Additional check valves shall be located in the pump column as necessary. (4-4-13)

05. **Well Vent**. All wells shall be vented, unless it can be demonstrated that the drawdown under maximum pumping conditions will not exceed ten (10) feet. (4-4-13)

a. For wells not in a pump house, the open end of the vent shall be screened with a twenty-four (24) mesh or similar non-corrodible screen and terminated downward at least eighteen (18) inches above the final ground surface. (4-4-13)

b. If the well is in a pump house, the open end of the vent shall be screened with a twenty-four (24) mesh or similar non-corrodible screen and must terminate at least twelve (12) inches above the pump house floor. (4-4-13)

c. Artesian wells equipped with pumps may need venting or an air valve as determined by the Department. (4-4-13)

06. **Casings and Sanitary Well Caps**. The following requirements apply to well casings and sanitary caps: (3-30-07)

a. Casings shall extend at least eighteen (18) inches above the final ground surface. If the well is located within a pump house, casings shall extend least twelve (12) inches above the pump house floor. For a well located in an area subject to flooding, the Department may require an extension of the casing above the one hundred (100) year or highest known flood level, whichever is higher. (4-4-13)

b. Wells shall be cased and provided with an approved cap in such a manner that surface water cannot enter the well. (4-7-11)

c. For community water systems, a permanent means for measuring water level within the casing must be provided. For other water systems, a temporary means to measure water levels should be made available. All equipment required for conducting water level measurements shall be purchased and made available to the water system operator at the time the well is put into service. Where pneumatic or electronic water level measuring equipment is used, it shall be made using corrosion resistant materials attached firmly to the drop pipe or pump column and in such a manner as to prevent entrance of foreign materials. (4-4-13)

07. **Well Houses**. For regulatory purposes, a well house is considered a pump house as defined in Section 003. Well houses must meet the requirements for pump houses as set forth in Section 541. All above ground discharge piping shall be contained in a well house or otherwise protected from freezing. (4-7-11)

08. **Pitless Adapters and Units**. Pitless adapters or pitless units: (3-30-07)

a. Shall be of the type marked approved by the National Sanitation Foundation or Pitless Adapter Division of the Water Systems Council. (12-10-92)

b. Shall be designed, constructed and installed to be watertight including the cap, cover, casing extension and other attachments. (12-10-92)

c. Shall be field tested for leaks before being put into service. The procedure outlined in "Manual of Individual and Non-Public Water Supply Systems," referenced in Subsection 002.02, or other procedure approved by the Department shall be followed. (3-30-07)

d. Pitless adapters with a two (2) inch or smaller discharge line shall be provided with a swing joint outside the pitless adapter unit to reduce strain, deformation, and possible leakage of the pitless seal caused by settling soils in the trench. The orientation of swing joints shall be such that any settling that occurs will tighten the threads. The hole in the casing shall be cut with a saw rather than a torch with an opening large enough to allow

seating of gaskets. (3-30-07)

e. Shall be provided with a contamination-proof entrance connection for electrical cable. (3-30-07)

f. In the case of pitless adapters: (3-30-07)

i. Threaded adapters shall be installed by drilling a hole not more than one quarter (1/4) inch larger than the outer diameter of the pitless shank. No torch-cut holes shall be accepted. The orientation of swing joints shall be such that any settling that occurs will tighten the threads. (3-30-07)

ii. The only field welding permitted will be that needed to connect a pitless adapter to the casing. (3-30-07)

g. In the case of pitless units: (3-30-07)

i. Shall be shop-fabricated from the point of connection with the well casing to the unit cap or cover. (3-30-07)

ii. Shall be constructed of materials and weight at least equivalent to and compatible with the well casing. (3-30-07)

iii. Shall be threaded or welded to the well casing. Threaded units shall be installed by drilling a hole not more than one quarter (¼) inch larger than the outer diameter of the pitless shank. No torch-cut holes shall be accepted. If the connection to the casing is by field weld, the shop-assembled unit must be designed specifically for field welding to the casing. (3-30-07)

iv. Shall terminate at least eighteen (18) inches above final ground elevation or three (3) feet above the 100-year flood level or the highest known flood elevation, whichever is higher, or as otherwise approved by the Department. (3-30-07)

v. Shall be provided with access to disinfect the well. (3-30-07)

vi. Shall have field connection to the lateral discharge from the pitless unit of threaded, flanged, or mechanical joint connection. (3-30-07)

h. After installation of a pitless adapter or unit, the disturbed well seal shall be repaired or replaced to meet original seal specifications unless otherwise proposed by the design engineer and approved by the Department. The engineering proposal shall ensure that the material surrounding the final seal is moisture controlled and compacted such that it equals or exceeds the characteristics of the native soil prior to being disturbed. (4-4-13)

09. Wells Not Allowed in Pits. Wells shall not be located in pits. Exceptions to this requirement will be granted by the Department if the well was constructed prior to November 5, 1964, and the installation is constructed or reconstructed in accordance with the requirements of the Department to provide watertight construction of pit walls and floors, floor drains and acceptable pit covers. (3-30-07)

10. Discharge Pumps. Discharge pumps shall be subject to the following requirements: (3-30-07)

a. Line shaft pumps shall. (3-30-07)

i. Have the casing firmly connected to the pump structure or have the casing inserted into a recess extending at least one-half (1/2) inch into the pump base. (3-30-07)

ii. Have the pump foundation and base designed to prevent water from coming into contact with the joint. (3-30-07)

iii. Use lubricants that meet ANSI/NSF Standard 61. (3-30-07)

b. When a submersible pump is used: (3-30-07)

i. The top of the casing shall be effectively sealed against the entrance of water under all conditions of vibration or movement of conductors or cables. (3-30-07)

ii. The electrical cable shall be firmly attached to the drop pipe at twenty-one (21) foot intervals or less, or at each coupling or joint. (3-30-07)

512. FACILITY AND DESIGN STANDARDS: WELL LOT.
A well lot shall be provided for wells constructed after November 1, 1977. The well lot shall be owned in fee simple by the supplier of water or controlled by lease or easement with a term of not less than the useful life of the well and be large enough to provide a minimum distance of fifty (50) feet between the well and the nearest property line. (3-30-07)

01. Use of Chemicals on the Well Lot. No pesticides, herbicides, or fertilizers shall be applied to a well lot without prior approval from the Department. (3-30-07)

02. Storage of Hazardous Materials on the Well Lot. No pesticides, herbicides, fertilizers, portable containers of petroleum products, or other materials known to be toxic or hazardous shall be stored on a well lot, except that: (3-30-07)

a. An internal combustion engine to drive either a generator for emergency standby power or a pump to provide fire flows, and an associated fuel tank, may be placed on the well lot. (5-3-03)

b. A propane or natural gas powered generator is preferable to reduce risk of fuel spillage. (5-3-03)

c. If a diesel or gasoline-fueled engine is used, the fuel tank and connecting piping must be approved by the Underwriter's Laboratory, Inc., double-walled, meet the requirements of the local fire jurisdiction, and include both spill prevention and overfill protection features. The tank must be above ground and may be contained within the structural base of the generator unit. A licensed water system operator shall be present during filling of the tank following a period of usage, or during periodic extraction and replacement of outdated fuel. (4-6-05)

d. Should the internal combustion engine be located within the pump house, the floor of the pump house shall be constructed so as to contain all petroleum drips and spills so that they will not be able to reach the floor drain(s). Engine exhaust shall be directly discharged outside the pump house. (3-30-07)

e. A spill containment structure shall surround all fuel tanks and be sized to contain at least one hundred ten percent (110%) of the fuel tank volume. The Department may require additional containment capacity in settings where accumulation of snow, ice, or rain water could be expected to diminish the usable capacity of the structure. (4-6-05)

03. Location of Hydrants. Hydrants of the frost free type shall be placed in the buried piping system at a minimum of five (5) feet away from the well casing to prevent drain water from accumulating and compromising the grout seal surrounding the well casing. (5-8-09)

04. Parking Lots and Vehicle Storage. No public parking or vehicle storage shall be allowed on the well lot, except that operation/maintenance vehicles may be temporary parked on the well lot during the normal course of business. (4-7-11)

513. FACILITY AND DESIGN STANDARDS: NUMBER OF GROUND WATER SOURCES REQUIRED – EXISTING SYSTEMS.
Existing community water systems served by ground water and intending to serve more than twenty-five (25) connections or equivalent dwelling units are subject to the following requirements for the number of ground water sources required. (5-8-09)

01. Existing System with All Sources Constructed Prior to July 1, 1985. A community water system served by ground water and with all existing sources constructed prior to July 1, 1985 will be required to

comply with Subsection 501.17 upon substantially modifying the system after July 2002. (5-8-09)

02. Existing System with Any Sources Constructed After July 1, 1985. A community water system served by ground water with any sources constructed after July 1, 1985 is required to comply with Subsection 501.17 when a modification is made to the system which increases the population served or number of service connections, increases the length of transmission and distribution water mains, or increases the peak or average water demand. (5-8-09)

514. FACILITY AND DESIGN STANDARDS: SPRING SOURCES.
Written approval by the Department is required before water from any new or reconstructed spring source may be served to the public. For new spring sources, the Department shall require a site evaluation report containing applicable required information listed in Subsection 510.01. This information includes, but is not limited to, the following: an evaluation of the potability and quality of anticipated spring water; an estimate of hydrologic and geologic properties of the aquifer; and a description of potential sources of contamination within five hundred (500) feet of the spring. Any supplier of water for a public water system served by one (1) or more springs shall ensure that the following requirements are met: (4-7-11)

01. Protection of the Spring. Springs shall be housed in a permanent structure and protected from contamination including the entry of surface water, animals, and dust. (4-4-13)

02. Spring Box or Combined Spring Box/Finished Water Storage Design. To facilitate efficient design and review of spring box or combined spring box/finished water storage designs, these site-specific designs should be coordinated in advance with the Department. Specific issues to be addressed are: (4-4-13)

a. The inlet shall be screened as determined by the Department and located above the floor of the collection chamber. (4-4-13)

b. Unless otherwise approved by the Department based on documentation provided by the design engineer, the spring box or combined spring box/finished water storage tank shall meet the applicable design requirements of Section 544 - Facility and Design Standards: General Design of Finished Water Storage. (4-4-13)

03. Sample Tap Required. A sample tap suitable for collecting bacteriological samples shall be provided. This sample tap shall be of the smooth-nosed type without interior or exterior threads, shall not be of the mixing or petcock type, and shall not have a screen, aerator, or other such appurtenance. The sample tap for collecting bacteriological samples may be used for other sampling purposes. In addition, threaded hose bib taps may also be used for collecting samples, other than bacteriological samples, if equipped with an appropriate backflow prevention device as may be necessary to protect the public water system from contamination. (5-8-09)

04. Flow Measurement. A flow meter or other flow measuring device shall be provided. (3-30-07)

05. Protected Area. The entire area within a one hundred (100) foot radius of the spring box shall be owned by the supplier of water or controlled by a long term lease, fenced to prevent trespass of livestock and void of buildings, dwellings and sources of contamination. Surface water shall be diverted from this area. (3-30-07)

515. FACILITY AND DESIGN STANDARDS: SURFACE SOURCES AND GROUND WATER SOURCES UNDER THE DIRECT INFLUENCE OF SURFACE WATER.
Written approval by the Department is required before water from any new surface source or ground water source that is under the direct influence of surface water may be served to the public. Infiltration collection lines or galleries are considered ground water under the direct influence of surface water unless demonstrated otherwise. Infiltration galleries that are not directly influenced by surface water shall meet the requirements of Section 514. The area around infiltration lines shall be under the control of the water purveyor for a distance acceptable to the Department. (3-30-07)

01. Intake Structures. Design of intake structures shall provide for: (3-30-07)

a. Withdrawal of water from more than one (1) level if quality varies with depth. (3-30-07)

b. Separate facilities for release of less desirable water held in storage. (3-30-07)

c. Where frazil ice may be a problem, holding the velocity of flow into the intake structure to a minimum, generally not to exceed point five (0.5) feet per second. Frazil ice is made up of randomly distributed ice crystals that are formed in flowing water that has cooled below thirty-two (32) degrees Fahrenheit and is prevented from forming into ice sheets by the movement of the water. (3-30-07)

d. Inspection manholes every one thousand (1000) feet for pipe sizes large enough to permit visual inspection. (3-30-07)

e. Cleaning the intake line as needed. (3-30-07)

f. Adequate protection against rupture by dragging anchors, ice, or other hazards. (3-30-07)

g. Ports located above the bottom of the stream, lake or impoundment, but at sufficient depth to be kept submerged at low water levels. (3-30-07)

h. Where shore wells are not provided, a diversion device capable of keeping large quantities of fish or debris from entering an intake structure. (3-30-07)

i. If necessary, provisions shall be made in the intake structure to control the influx of nuisance aquatic organisms. Specific control methods must be approved by the reviewing authority. (3-30-07)

j. When buried surface water collectors are used, sufficient intake opening area must be provided to minimize inlet headloss. Particular attention shall be given to the selection of backfill material in relation to the collector pipe slot size and gradation of the native material over the collector system. (3-30-07)

02. Raw Water Pumps. Raw water pumping wells shall: (3-30-07)

a. Have motors and electrical controls located above grade (except for submersible pumps), and protected from flooding as required by the reviewing authority. (3-30-07)

b. Be accessible and designed to prevent flotation. (3-30-07)

c. Be equipped with removable or traveling screens before the pump suction well. (3-30-07)

d. Provide for introduction of chlorine or other chemicals in the raw water transmission main if necessary for quality control. (3-30-07)

e. Where practical, have intake valves and provisions for back flushing or cleaning by a mechanical device and testing for leaks. (3-30-07)

f. Have provisions for withstanding surges where necessary. (3-30-07)

03. Offstream Raw Water Storage. An off-stream raw water storage reservoir is a facility into which water is pumped during periods of good quality and high stream flow for future release to treatment facilities. These off-stream raw water storage reservoirs shall be constructed to assure that: (3-30-07)

a. Water quality is protected by controlling runoff into the reservoir. (3-30-07)

b. Dikes are structurally sound and protected against wave action and erosion. (3-30-07)

c. Intake structures and devices meet requirements of Subsection 515.01. (3-30-07)

d. Point of influent flow is separated from the point of withdrawal. (3-30-07)

e. Separate pipes are provided for influent to and effluent from the reservoir. (3-30-07)

04. **Reservoirs**. Impoundments and reservoirs shall provide, where applicable: (3-30-07)

a. Removal of brush and trees to high water elevation. (3-30-07)

b. Protection from floods during construction. (3-30-07)

c. Abandonment of all wells which will be inundated, in accordance with requirements of the Idaho Department of Water Resources. See Rules of the Idaho Water Resources Board referenced in Subsection 002.02. (3-30-07)

516. -- 517. (RESERVED)

518. FACILITY AND DESIGN STANDARDS: ADDITIONAL DESIGN CRITERIA FOR SURFACE WATER TREATMENT.
Performance criteria for surface water treatment facilities are specified in National Primary Drinking Water Regulations, as set forth in Sections 300, 301, and 310 of these rules. Surface water treatment systems must comply with applicable general design requirements in Section 503. In addition, the following design requirements apply specifically to surface water treatment facilities: (3-30-07)

01. **Engineering Design Requirements**. The system shall ensure that filtration and disinfection facilities for surface water or ground water directly influenced by surface water sources are designed, constructed and operated in accordance with all applicable engineering practices designated by the Department. The design of the water treatment plant must consider the worst raw water quality conditions that are likely to occur during the life of the facility. (3-30-07)

02. **Removal of Pathogens**. Filtration facilities (excluding disinfection) shall be designed, constructed and operated to achieve at least two (2) log removal of Giardia lamblia cysts, two (2) log removal of Cryptosporidium oocysts, and one (1) log removal of viruses, except as allowed under Subsection 518.09.b. (3-30-07)

03. **Disinfection**. Disinfection facilities shall be designed, constructed and operated so as to achieve at least point five zero (0.50) log inactivation of Giardia lamblia cysts; and (3-30-07)

a. Two (2) log inactivation of viruses if using conventional and slow sand filtration technology; or (12-10-92)

b. Three (3) log inactivation of viruses if using direct and diatomaceous earth filtration technology; or (12-10-92)

c. Four (4) log inactivation of viruses if using alternate filtration technology. (12-10-92)

d. Four (4) log inactivation of viruses if filtration treatment is not used. (10-1-93)

04. **Enhanced Disinfection**. Higher levels of disinfection than specified under Subsection 518.03 may be required by the Department in order to provide adequate protection against Giardia lamblia and viruses. (4-4-13)

05. **Filter to Waste**. For plants constructed after December 31, 1992, each filter unit must be capable of filter to waste. For plants constructed prior to December 31, 1992, each filter unit must be capable of filter to waste unless the system demonstrates through continuous turbidity monitoring or other means acceptable to the Department that water quality is not adversely affected following filter backwashing, cleaning or media replacement. (3-30-07)

06. **Continuous Turbidity Monitoring**. For conventional, direct, membrane, and diatomaceous earth filtration technology, equipment must be provided to continuously measure the turbidity of each filter unit. (3-30-07)

07. **Continuous Monitoring of Disinfectant**. Equipment must be provided and operated for continuous measurement of disinfectant residual prior to entry to the distribution system, unless the system serves fewer than three thousand three hundred (3,300) people. (3-30-07)

08. Continuous Operation Required. Diatomaceous earth filtration facilities shall include an alternate power source with automatic startup and alarm, or be designed in a manner to ensure continuous operation. (3-30-07)

09. Acceptable Technology. The purveyor shall select a filtration technology acceptable to the Department. (3-30-07)

a. Conventional, direct, membrane, slow sand, diatomaceous earth, and membrane filtration technologies are generally acceptable to the Department on a case-by-case basis. (4-4-13)

b. Alternate filtration technologies may be acceptable if the purveyor demonstrates all of the following to the satisfaction of the Department: (12-10-92)

i. That the filtration technology: (12-10-92)

(1) Is certified and listed by the National Sanitation Foundation (NSF) under Standard 53, Drinking Water Treatment Units - Health Effects, as achieving the NSF criteria for cyst reduction; or (12-10-92)

(2) Removes at least ninety-nine percent (99%) (two (2) logs) of Cryptosporidium oocysts or surrogate particles and removes or inactivates at least ninety-nine percent (99%) (two (2) logs) of Giardia lamblia cysts or Giardia lamblia cyst surrogate particles in a challenge study acceptable to the Department. (3-30-07)

ii. Based on field studies or other means acceptable to the Department, it must be demonstrated that the filtration technology has the following capabilities: (3-30-07)

(1) In combination with disinfection treatment, consistently achieves at least ninety-nine percent (99%) (two (2) logs) removal of Cryptosporidium oocysts or surrogate particles and at least ninety-nine and nine tenths percent (99.9%) (three (3) logs) removal or inactivation of Giardia lamblia cysts and ninety-nine and ninety-nine hundredths percent (99.99%) (four (4) logs) removal or inactivation of viruses; and (3-30-07)

(2) Meets the turbidity performance requirements of 40 CFR 141.73 (b). (12-10-92)

10. Pilot Studies. The system shall conduct pilot studies in accordance with the following requirements and in accordance with Subsection 501.19 for all proposed filtration facilities and structural modifications to existing filtration facilities, unless the Department modifies the requirements in writing: (4-4-13)

a. The system shall obtain the Department's approval of the pilot study plan before the pilot filter is constructed and before the pilot study is undertaken. (12-10-92)

b. The design and operation of the pilot study shall be overseen by an Idaho licensed professional engineer. (3-30-07)

c. The system's pilot study plan shall identify at a minimum: (12-10-92)

i. The objectives of the pilot study; (12-10-92)

ii. Pilot filter design; (12-10-92)

iii. Water quality and operational parameters to monitor; (12-10-92)

iv. Amount of data to collect; and (12-10-92)

v. Qualifications of the pilot plant operator. (10-1-93)

d. The system shall ensure that the pilot study is: (12-10-92)

i. Conducted to simulate conditions of the proposed full-scale design; (12-10-92)

ii. Conducted for at least twelve (12) consecutive months or for a shorter period upon approval by the Department; (5-3-03)

iii. Conducted to evaluate the reliability of the treatment system to achieve applicable water quality treatment criteria specified for filtration systems in 40 CFR 141.72 and 40 CFR 141.73; and (12-10-92)

iv. Designed and operated in accordance with good engineering practices documented in references acceptable to the Department. (12-10-92)

11. Redundant Disinfection. Surface water systems constructed after July 1, 1985, are required to install redundant disinfection components or maintain a backup unit on site as required to maintain constant application of disinfectant whenever water is being delivered to the distribution system. (3-30-07)

519. FACILITY AND DESIGN STANDARDS: SURFACE WATER TREATMENT; DESIGN STANDARDS FOR MICROSCREENING.

A microscreen may be used to reduce nuisance organisms and organic loadings. It shall not be used in place of filtration or coagulation in the preparation of water for filtration. (3-30-07)

01. Design Considerations. The following shall be taken into account during design: (3-30-07)

a. The nature of the suspended matter to be removed. (3-30-07)

b. The corrosiveness of the water. (3-30-07)

c. The effect of chlorination, when required as pre-treatment. (3-30-07)

d. The duplication of units for continuous operation during equipment maintenance. (3-30-07)

e. Automated backflushing operation when used in conjunction with microfiltration treatment. (3-30-07)

02. Design Requirements. Design shall provide the following: (3-30-07)

a. A durable, corrosion-resistant screen. (3-30-07)

b. A by-pass arrangement. (3-30-07)

c. Protection against back-siphonage when potable water is used for washing. (3-30-07)

d. Proper disposal of water used to wash the microscreen. (3-30-07)

520. FACILITY AND DESIGN STANDARDS: SURFACE WATER TREATMENT: CLARIFICATION PROCESSES.

Treatment facilities designed to include clarification for processing surface water shall meet the following requirements: (3-30-07)

01. Two Units Required. A minimum of two (2) units for redundancy shall be provided for flocculation and sedimentation such that plant design capacity can be maintained with any component out of service for maintenance or repairs. (4-4-13)

02. Parallel or Serial Operation. The units shall be capable of being operated either in series or parallel where softening is performed. (3-30-07)

03. Independent Units. The units shall be constructed in such a way that each can be taken out of service without disrupting operation, and with drains or pumps sized to allow dewatering in a reasonable period of

time. (3-30-07)

04. **Manual Start-Up**. The units shall be started manually following shutdown. (3-30-07)

05. **Pre-Treatment**. Waters exhibiting high turbidity may require pretreatment, usually sedimentation with or without the addition of coagulation chemicals. When presedimentation is provided, the following requirements must be met: (3-30-07)

a. Incoming water shall be dispersed across the full width of the line of travel as quickly as possible. Short circuiting must be prevented. (3-30-07)

b. Provisions for bypassing pre-sedimentation basins shall be included. (3-30-07)

c. The need for redundant pretreatment components shall be evaluated according to the type and necessity of the pretreatment. (4-4-13)

06. **Rapid Mix**. Unless otherwise approved by the Department based on documentation provided by the design engineer, a rapid mix device or chamber is required prior to flocculation, clarification, sedimentation, and settler units. The need for redundant rapid mix components shall be evaluated. Rapid mix shall mean the rapid dispersion of chemicals throughout the water to be treated, usually by violent agitation. The engineer shall submit the design basis for the velocity gradient (G value) selected, considering the chemicals to be added and water temperature, color and other related water quality parameters. Basins or mixing chambers shall be equipped with devices capable of providing adequate mixing for all treatment flow rates. (4-4-13)

07. **Flocculation**. Flocculation shall mean the gathering together of fine particles in water by gentle mixing after the addition of coagulant chemicals to form larger particles. (3-30-07)

a. Basin inlet and outlet design shall minimize short-circuiting and destruction of floc. A drain, pumps, or a combination of both drain and pumps shall be provided to accomplish dewatering and sludge removal. (5-8-09)

b. The flow-through velocity shall not be less than one-half (0.5) nor greater than one and one-half (1.5) feet per minute with a detention time for floc formation of at least thirty (30) minutes unless otherwise approved by the Department. (3-30-07)

c. Agitators shall be driven by variable speed drives. (3-30-07)

d. Flocculation and sedimentation basins shall be as close together as possible. The velocity of flocculated water through pipes or conduits to settling basins shall be not less than one-half (0.5) nor greater than one and one-half (1.5) feet per second. Allowances must be made to minimize turbulence at bends and changes in direction. (3-30-07)

08. **Small Systems May Use Baffling**. Baffling may be used to provide for flocculation in small plants upon approval by the Department. (3-30-07)

09. **Sedimentation Units**. The following criteria apply to conventional sedimentation units: (3-30-07)

a. A minimum of two (2) hours of settling time shall be provided following flocculation unless adequate settling in less time can be demonstrated. (3-30-07)

b. Inlets shall be designed to distribute the water equally and at uniform velocities. (3-30-07)

c. Outlet weirs or submerged orifices shall maintain velocities suitable for settling in the basin and minimize short-circuiting. Outlet weirs shall be designed so that the rate of flow over the outlet weirs or through the submerged orifices shall not exceed twenty-thousand (20,000) gallons per day per foot of the outlet launder. The entrance velocity through the submerged orifices shall not exceed one-half (0.5) feet per second. (3-30-07)

d. The velocity through settling basins shall not exceed one-half (0.5) feet per minute. The basins must be designed to minimize short-circuiting. Fixed or adjustable baffles must be provided as necessary to achieve the maximum potential for clarification. (3-30-07)

e. When an overflow weir or pipe is provided the overflow shall discharge by gravity with a free fall at a location where the discharge will be noted. (3-30-07)

f. Adequate sludge collection equipment that ensures proper basin coverage shall be provided and basins must be provided with a means for dewatering. (3-30-07)

g. Flushing lines or hydrants shall be provided and must be equipped with backflow prevention devices acceptable to the Department. (3-30-07)

h. Sludge removal design shall provide that sludge pipes are not less than three (3) inches in diameter and arranged so as to facilitate cleaning. Entrance to sludge withdrawal piping shall be designed to prevent clogging. Provision shall be made for the operator to observe and sample sludge being withdrawn from the unit. (3-30-07)

i. Sludge shall be disposed of in accordance with applicable regulations, as set forth in Section 540. (3-30-07)

10. Solids Contact Clarifiers. Solids contact clarifiers are generally acceptable for combined softening and clarification where water characteristics, especially temperature, do not fluctuate rapidly, flow rates are uniform and operation is continuous. A minimum of two (2) units are required for surface water treatment as required in Subsection 520.01. (4-4-13)

a. Chemicals shall be applied at such points and by such means as to ensure satisfactory mixing of the chemicals with the water. (3-30-07)

b. Unless otherwise approved by the Department based on documentation provided by the design engineer, a rapid mix device or chamber ahead of the solids contact clarifier is required to assure proper mixing of the chemicals applied. Mixing devices employed shall be constructed so as to provide good mixing of the raw water with previously formed sludge particles and prevent deposition of solids in the mixing zone. (4-4-13)

c. Flocculation equipment shall be adjustable as to speed, pitch, or a combination of speed and pitch and must provide for coagulation in a separate chamber or baffled zone within the unit. (5-8-09)

d. Sludge removal design shall provide that sludge pipes are not less than three (3) inches in diameter and arranged so as to facilitate cleaning. Entrance to sludge withdrawal piping shall be designed to prevent clogging. Provision shall be made for the operator to observe and sample sludge being withdrawn from the unit. (3-30-07)

e. Blow-off outlets and drains must terminate and discharge at places acceptable to the Department in regard to control of potential cross connections. Cross connection control must be included for the potable water lines used to backflush sludge lines. (3-30-07)

f. The detention time shall be established on the basis of the raw water characteristics and other local conditions that affect the operation of the unit. The Department may request data to support decisions made with respect to detention times. The Department may alter detention time requirements. (3-30-07)

g. Controls for sludge withdrawal which minimize water losses shall be provided. (3-30-07)

h. Unless otherwise approved by the Department based on documentation provided by the design engineer, weirs shall be adjustable and at least equivalent in length to the perimeter of the tank. Weir loading shall not exceed ten (10) gallons per minute per foot of weir length for units used as clarifiers or twenty (20) gallons per minute per foot of weir length for units used for softening. Where orifices are used, the loading rates per foot of launder rates shall be equivalent to weir loadings. Either shall produce uniform rising rates over the entire area of the tank. (4-4-13)

i. Upflow rates shall not exceed one (1) gallon per minute per square foot of area at the sludge separation line for units used as clarifiers or one and three-quarters (1.75) gallons per minute per foot of area at the slurry separation line for units used as softeners. The Department may consider higher rates if supporting data is provided. (3-30-07)

11. Settler Units. Settler units consisting of variously shaped tubes or plates installed in multiple layers and at an angle to the flow may be used for sedimentation following flocculation. (3-30-07)

a. Inlets and outlets shall be designed to maintain velocities suitable for settling in the basin and to minimize short-circuiting. Plate units shall be designed to minimize unequal distribution across the units. (3-30-07)

b. Drain piping from the settler units must be sized to facilitate a quick flush of the settler units and to prevent flooding other portions of the plant. (3-30-07)

c. Although most units will be located within a plant, outdoor installations must provide sufficient freeboard above the top of settlers to prevent freezing in the units. (3-30-07)

d. Water shall be applied to tube settlers at a maximum rate of two (2) gallons per minute per square foot of cross-sectional area for tube settlers, unless higher rates are justified through pilot plant or in-plant demonstration studies. See Subsection 501.19 for general information on conducting pilot studies. (4-4-13)

e. Water shall be applied to plate settlers at a maximum plate loading rate of one-half (0.5) gallons per minute per square foot, based on eighty (80) percent of the projected horizontal plate area. (3-30-07)

f. Flushing lines shall be provided to facilitate maintenance and must be properly protected against backflow or back siphonage. (3-30-07)

12. High Rate Clarification. High rate clarification processes may be approved upon demonstrating satisfactory performance under on-site pilot plant conditions or documentation of full scale plant operation with similar raw water quality conditions. Reductions in detention times and/or increases in weir loading rates shall be justified. See Subsection 501.19 for general information on conducting pilot studies. Examples of such processes include dissolved air flotation, ballasted flocculation, contact flocculation/clarification, and helical upflow. (4-4-13)

521. FACILITY AND DESIGN STANDARDS: SURFACE WATER TREATMENT: FILTRATION USING RAPID RATE GRAVITY FILTERS.

01. Pretreatment. The use of rapid rate gravity filters shall require pretreatment in the form of coagulation, flocculation, and sedimentation. (3-30-07)

02. Rate of Filtration. The filter rate must be proposed and justified by the design engineer to the satisfaction of the Department prior to the preparation of final plans and specifications. (3-30-07)

03. Number of Units. A minimum of two (2) units for redundancy shall be provided for filtration such that plant design capacity can be maintained with any component out of service for maintenance or repairs. Where declining rate filtration is provided, the variable aspect of filtration rates, and the number of filters must be considered when determining the design capacity for the filters. (4-4-13)

04. Structure and Hydraulics. The filter structure shall be designed to provide for: (3-30-07)

a. Vertical walls within the filter. There shall be no protrusion of the filter walls into the filter media. (3-30-07)

b. Cover by superstructure with sufficient headroom to permit normal inspection and operation. (3-30-07)

c. Minimum depth of filter box of eight and one-half (8.5) feet. (3-30-07)

d. Minimum water depth over the surface of the filter media of three (3) feet. (3-30-07)

e. Trapped effluent to prevent backflow of air to the bottom of the filters. (3-30-07)

f. Prevention of floor drainage to the filter with a minimum four (4) inch curb around the filters. (3-30-07)

g. Prevention of flooding by providing overflow. (3-30-07)

h. Maximum velocity of treated water entering the filters of two (2) feet per second. (3-30-07)

i. Cleanouts and straight alignment for influent pipes or conduits where solids loading is heavy, or following lime-soda softening. (3-30-07)

j. Washwater drain capacity to carry maximum flow. (3-30-07)

k. Walkways around filters to be not less than twenty-four (24) inches wide and equipped with safety handrails or walls. (3-30-07)

l. Construction so as to prevent cross connections and common walls between potable water and non-potable fluids. (4-4-13)

05. Washwater Troughs. Washwater troughs shall be constructed to have: (3-30-07)

a. The bottom elevation above the maximum level of expanded media during washing. (3-30-07)

b. A two (2) inch freeboard at the maximum rate of wash. (3-30-07)

c. The top edge level and all at the same elevation. (3-30-07)

d. Spacing so that each trough serves the same number of square feet of filter area. (3-30-07)

e. Maximum horizontal travel of suspended particles to reach the trough not to exceed three (3) feet. (3-30-07)

06. Filter Material. The media shall be clean silica sand or other natural or synthetic media free from detrimental chemical or bacterial contaminants, approved by the Department, and having the following characteristics: (3-30-07)

a. A total depth of not less than twenty-four (24) inches and generally not more than thirty (30) inches. (3-30-07)

b. An effective size range of the smallest material no greater than forty-five hundredths (0.45) of a millimeter to fifty-five hundredths (0.55) of a millimeter. (3-30-07)

c. A uniformity coefficient of the smallest material not greater than one and sixty-five hundredths (1.65). (3-30-07)

d. A minimum of twelve (12) inches of media with an effective size range no greater than forty-five hundredths (0.45) of a millimeter to fifty-five hundredths (0.55) of a millimeter and a specific gravity greater than other filtering materials within the filter. (3-30-07)

e. Types of filter media are as follows: (3-30-07)

i. Clean, crushed anthracite or a combination of anthracite and other media may be considered on the basis of experimental data specific to the project. The anthracite shall have the following characteristics: (3-30-07)

(1) Effective size of forty-five hundredths (0.45) of a millimeter to fifty-five hundredths (0.55) of a millimeter with uniformity coefficient not greater than sixty-five hundredths (1.65) when used alone. (3-30-07)

(2) Effective size of eight tenths (0.8) of a millimeter to one and two-tenths (1.2) millimeters with a uniformity coefficient not greater than one and eighty-five hundredths (1.85) when used as a cap. (3-30-07)

(3) Effective size for anthracite used as a single media on potable ground water for iron and manganese removal only shall be a maximum of eight tenths (0.8) of a millimeter (effective sizes greater than this may be approved based upon onsite pilot plant studies or other demonstration acceptable to the Department). See Subsection 501.19 for general information on conducting pilot studies. (4-4-13)

ii. Sand media shall have the following characteristics: (3-30-07)

(1) Effective size of forty-five hundredths (0.45) of a millimeter to fifty-five hundredths (0.55) of a millimeter. (3-30-07)

(2) Uniformity coefficient of not greater than one and sixty-five hundredths (1.65). (3-30-07)

(3) Larger size sand media may be allowed by the Department where full-scale tests have demonstrated that treatment goals can be met under all conditions. (3-30-07)

iii. Granular activated carbon (GAC) as a single media may be considered for filtration only after pilot or full-scale testing and with prior approval of the Department. See Subsection 501.19 for general information on conducting pilot studies. The design shall include the following: (4-4-13)

(1) The media must meet the basic specifications for filter media as given in Subsections 521.06.a. through d., except that larger size media may be allowed where full scale tests have demonstrated that treatment goals can be met under all conditions. (4-4-13)

(2) There must be a means for periodic treatment of filter material for control of bacterial and other growth. (3-30-07)

(3) Provisions must be made for frequent replacement or regeneration. (3-30-07)

iv. Other media will be considered based on experimental data and operating experience. (3-30-07)

v. A three (3) inch layer of torpedo sand shall be used as a supporting media for filter sand where supporting gravel is used, and shall have an effective size of eight-tenths (0.8) millimeters to two (2.0) millimeters, and a uniformity coefficient not greater than one and seven-tenths (1.7). (3-30-07)

vi. Gravel, when used as the supporting media, shall consist of cleaned and washed, hard, durable, rounded silica particles and shall not include flat or elongated particles. The coarsest gravel shall be two and one-half (2.5) inches in size when the gravel rests directly on a lateral system and must extend above the top of the perforated laterals. Not less than four (4) layers of gravel shall be provided in accordance with the size and depth distribution specified in the table below. Reduction of gravel depths and other size gradations may be considered upon justification to the reviewing authority for slow sand filtration or when proprietary filter bottoms are specified.

Size of Gravel	Depth
2 ½ to 1 ½ inches	5 to 8 inches
1 ½ to ¾ inches	3 to 5 inches
¾ to ½ inches	3 to 5 inches
½ to 3/16 inches	2 to 3 inches

Size of Gravel	Depth
3/16 to 3/32 inches	2 to 3 inches

(3-30-07)

07. Filter Bottoms and Strainer Systems. Departure from the standards set out in Subsection 521.07 may be acceptable for high rate filters and for proprietary bottoms. Porous plate bottoms shall not be used where iron or manganese may clog them or with waters softened by lime. The design of manifold-type collection systems shall: (3-30-07)

a. Minimize loss of head in the manifold and laterals. (3-30-07)

b. Ensure even distribution of wash water and even rate of filtration over the entire area of the filter. (3-30-07)

c. Provide the ratio of the area of the final openings of the strainer systems to the area of the filter at about three-thousandths (0.003), (3-30-07)

d. Provide the total cross-sectional area of the laterals at about twice the total area of the final openings. (3-30-07)

e. Provide the cross-sectional area of the manifold at one and one-half (1.5) to two (2) times the total area of the laterals. (3-30-07)

f. Lateral perforations without strainers shall be directed downward. (3-30-07)

08. Surface or Subsurface Wash. Surface or subsurface wash facilities are required except for filters used exclusively for iron or manganese removal, and may be accomplished by a system of fixed nozzles or a revolving-type apparatus. All devices shall be designed with: (3-30-07)

a. Provision for water pressures of at least forty-five (45) pounds per square inch. (3-30-07)

b. A properly installed vacuum breaker or other approved device to prevent back siphonage if connected to the treated water system. (3-30-07)

c. Rate of flow of two (2.0) gallons per minute per square foot of filter area with fixed nozzles or one-half (0.5) gallon per minute per square foot with revolving arms. (3-30-07)

d. Air wash can be considered based on experimental data and operating experiences. (3-30-07)

09. Air Scouring. Air scouring can be considered in place of surface wash provided the following conditions are met: (3-30-07)

a. Air flow for air scouring the filter must be three (3) to five (5) standard cubic feet per minute square foot of filter area when the air is introduced in the underdrain; a lower air rate must be used when the air scour distribution system is placed above the underdrains. (3-30-07)

b. A method for avoiding excessive loss of the filter media during backwashing must be provided. (3-30-07)

c. Air scouring must be followed by a fluidization wash sufficient to restratify the media. (3-30-07)

d. Air must be free from contamination. (3-30-07)

e. Air scour distribution systems shall be placed below the media and supporting bed interface with the following exception: if placed at the interface the air scour nozzles shall be designed to prevent media from

clogging the nozzles or entering the air distribution system. (3-30-07)

f. Piping for the air distribution system shall not be flexible hose which will collapse when not under air pressure and shall not be a relatively soft material which may erode at the orifice opening with the passage of air at high velocity. (3-30-07)

g. Air delivery piping shall not pass down through the filter media nor shall there be any arrangement in the filter design which would allow short circuiting between the applied unfiltered water and the filtered water. (3-30-07)

h. The backwash water delivery system must be capable of fifteen (15) gallons per minute per square foot of filter surface area (37 m/hr); however, when air scour is provided the backwash water rate must be variable and should not exceed eight (8) gallons per minute per square foot (20 m/hr) unless operating experience shows that a higher rate is necessary to remove scoured particles from filter media surfaces. (3-30-07)

i. The filter underdrains shall be designed to accommodate air scour piping when the piping is installed in the underdrain. (3-30-07)

10. **Filter Appurtenances**. The following shall be provided for every filter: (3-30-07)

a. Influent and effluent sampling taps. (3-30-07)

b. A gauge capable of indicating loss of head. (3-30-07)

c. A meter indicating rate-of flow. A modified rate controller which limits the rate of filtration to a maximum rate may be used. However, equipment that simply maintains a constant water level on the filters is not acceptable, unless the rate of flow onto the filter is properly controlled. A pump or a flow meter in each filter effluent line may be used as the limiting device for the rate of filtration only if approved by the Department on a site-specific basis. (3-30-07)

11. **Backwash**. Provisions shall be made for washing filters as follows: (3-30-07)

a. A minimum backwash rate such that a fifty (50) percent expansion of the filter bed is achieved. (3-30-07)

b. Filtered water provided at the required rate by wash water tanks, a wash water pump, from the high service main, or a combination of these. (3-30-07)

c. Wash water pumps in duplicate unless an alternate means of obtaining wash water is available. (3-30-07)

d. Not less than fifteen (15) minutes wash of one filter at the design rate of wash. (3-30-07)

e. A wash water regulator or valve on the main wash water line to obtain the desired rate of filter wash with the wash water valves on the individual filters open wide. (3-30-07)

f. A rate-of-flow indicator, preferably with a totalizer, on the main wash water line, located so that it can be easily read by the operator during the washing process. (3-30-07)

g. Design to prevent rapid changes in backwash water flow. Backwash shall be operator initiated. Automated systems shall be operator adjustable. (3-30-07)

12. **Roof Drainage**. Roof drains shall not discharge into the filters or basins and conduits preceding the filters. (3-30-07)

522. FACILITY AND DESIGN STANDARDS: SURFACE WATER TREATMENT: FILTRATION USING DIATOMACEOUS EARTH.

The use of these filters may be considered for application to surface waters with low turbidity and low bacterial contamination, and may be used for iron removal for ground waters providing the removal is effective and the water is of satisfactory sanitary quality before treatment. (3-30-07)

01. **Conditions of Use**. Diatomaceous earth filters are expressly excluded from consideration for the following conditions: (3-30-07)

a. Bacteria removal; (3-30-07)

b. Color removal; (3-30-07)

c. Turbidity removal where either the gross quantity of turbidity is high or the turbidity exhibits poor filterability characteristics; or (3-30-07)

d. Filtration of waters with high algae counts. (3-30-07)

02. **Treated Water Storage**. Treated water storage capacity in excess of normal requirements shall be provided to allow operation of the filters at a uniform rate during all conditions of system demand at or below the approved filtration rate, and guarantee continuity of service during adverse raw water conditions without by-passing the system. (3-30-07)

03. **Number of Units**. A minimum of two (2) units for redundancy shall be provided for filtration such that plant design capacity can be maintained with any component out of service for maintenance or repairs. (4-4-13)

04. **Precoat**. A uniform precoat shall be applied hydraulically to each septum by introducing a slurry to the tank influent line and employing a filter-to-waste recirculation system. (3-30-07)

05. **Body Feed**. A body feed system to apply additional amounts of diatomaceous earth slurry during the filter run is required to avoid short filter runs or excessive head losses. (3-30-07)

a. The rate of body feed is dependent on raw water quality and characteristics and must be determined in the pilot plant study. See Subsection 501.19 for general information on conducting pilot studies. (4-4-13)

b. Continuous mixing of the body feed slurry is required. (3-30-07)

06. **Filtration Requirements**. (3-30-07)

a. Rate of filtration shall be controlled by a positive means. (3-30-07)

b. Head loss shall not exceed thirty (30) psi for pressure diatomaceous earth filters, or a vacuum of fifteen (15) inches of mercury for a vacuum system. (3-30-07)

c. A recirculation or holding pump shall be employed to maintain differential pressure across the filter when the unit is not in operation in order to prevent the filter cake from dropping off the filter elements. A minimum recirculation rate of one-tenth (0.1) gallon per minute per square foot of filter area shall be provided. (3-30-07)

d. The septum or filter elements shall be structurally capable of withstanding maximum pressure and velocity variations during filtration and backwash cycles, and shall be spaced such that no less than one (1) inch is provided between elements or between any element and a wall. (3-30-07)

e. The filter influent shall be designed to prevent scour of the diatomaceous earth from the filter element. (3-30-07)

07. **Backwash**. A satisfactory method to thoroughly remove and dispose of spent filter cake shall be provided. (3-30-07)

08. **Appurtenances**. The following shall be provided for every filter: (3-30-07)

a. Sampling taps for raw and filtered water. (3-30-07)

b. Loss of head or differential pressure gauge. (3-30-07)

c. Rate-of-flow indicator. (3-30-07)

d. A throttling valve used to reduce rates below normal during adverse raw water conditions. (3-30-07)

e. Evaluation of the need for body feed, recirculation, and any other pumps. (3-30-07)

f. Provisions for filtering to waste with appropriate measures for backflow prevention. (3-30-07)

09. Monitoring. A continuous monitoring turbidimeter with recorder is required on each filter effluent for plants treating surface water. (3-30-07)

523. FACILITY AND DESIGN STANDARDS: SURFACE WATER TREATMENT: SLOW SAND FILTRATION.

The use of these filters shall require prior engineering studies to demonstrate the adequacy and suitability of this method of filtration for the specific water supply. Slow Sand Filtration and Diatomaceous Earth Filtration for Small Water Systems, Manual on Slow Sand Filtration, and Slow Sand Filtration referenced in Subsection 002.02, may be used as guidance in design of slow sand filtration facilities. (3-30-07)

01. Quality of Raw Water. Slow rate gravity filtration shall be limited to waters having maximum turbidities of ten (10) nephelometric units and maximum color of fifteen (15) units; such turbidity must not be attributable to colloidal clay. Raw water quality data must include examinations for algae. For source water having variable turbidity, the potential use of a roughing filter or other pretreatment technology should be evaluated. The Department may allow the use of a pretreatment technology on raw waters that exceed the normal limits for turbidity and color, if it can demonstrated to the Department's satisfaction that pretreatment will enable slow sand filtration to properly operate and comply with these Rules. (4-4-13)

02. Number of Units. A minimum of two (2) units for redundancy shall be provided for filtration such that plant design capacity can be maintained with any component out of service for maintenance or repairs. The Department may allow a single bed filter if it can be demonstrated to the Department's satisfaction that an alternative water source is available such that the water system can provide plant design capacity with the filter taken out of service for maintenance and repairs. (4-4-13)

03. Structural Details and Hydraulics. Slow rate gravity filters shall be so designed as to provide a cover, unless otherwise approved by the Department based on documentation provided by the design engineer, headroom to permit normal movement by operating personnel for scraping and sand removal operations, adequate access hatches and access ports for handling of sand and for ventilation, filtration to waste, an overflow at the maximum filter water level, and protection from freezing. A permanent means of determining sand depth shall be provided. (4-4-13)

04. Underdrains. Each filter unit shall be equipped with a main drain and an adequate number of lateral underdrains to collect the filtered water. The underdrains shall be so spaced that the maximum velocity of the water flow in the underdrain will not exceed three-fourths (0.75) feet per second. The maximum spacing of laterals shall not exceed three (3) feet if pipe laterals are used. (3-30-07)

05. Filter Material. The following requirements apply: (3-30-07)

a. A minimum depth of thirty (30) inches of filter sand shall be placed on graded gravel layers. (5-8-09)

b. The effective size shall be between fifteen hundredths (0.15) of a millimeter and thirty-five hundredths (0.35) of a millimeter. Larger sizes may be considered by the Department based on the results of a pilot

study. See Subsection 501.19 for general information on conducting pilot studies. (4-4-13)

c. The uniformity coefficient shall not exceed three point zero (3.0). (3-30-07)

d. The sand shall be cleaned and washed free from foreign matter. (3-30-07)

e. The sand shall be rebedded to the original minimum depth of thirty (30) inches when scraping has reduced the bed depth to no less than twenty-four (24) inches. Where sand is to be reused in order to provide biological seeding and shortening of the ripening process, rebedding shall utilize a "throw over" technique whereby new sand is placed on the support gravel and existing sand is replaced on top of the new sand. The maximum filtration rate shall not exceed zero point one (0.1) gallon per minute per square foot for each individual bed. (4-4-13)

06. Filter Sand Support. (5-8-09)

a. A three (3)-inch layer of sand shall be used as a supporting media for filter sand. The supporting sand shall have an effective size of zero point eight (0.8) millimeters to two point zero (2.0) millimeters and a uniformity coefficient not greater than one point seven (1.7). (5-8-09)

b. Gravel shall consist of cleaned and washed, hard, durable, rounded rock particles and shall not include flat or elongated particles. The coarsest gravel shall be two and one-half (2.5) inches in size when the gravel rests directly on a lateral system and must extend above the top of the perforated laterals. Not less than four (4) layers of gravel shall be provided in accordance with the size and depth distribution specified in the table below. Reduction of gravel depths and other size gradations may be considered upon justification to the Department.

Size of Gravel	Depth
2 1/2 to 1 1/2 inches	5 to 8 inches
1 1/2 to 3/4 inches	3 to 5 inches
3/4 to 1/2 inches	3 to 5 inches
1/2 to 3/16 inches	2 to 3 inches
3/16 to 3/32 inches	2 to 3 inches

(5-8-09)

07. Depth of Water Over Filter Beds. The design shall provide a depth of at least three (3) to six (6) feet of water over the sand. Influent water shall not scour the sand surface. (3-30-07)

08. Control Appurtenances. Each filter shall be equipped with a loss of head gauge, an orifice, Venturi meter, or other suitable means of discharge measurement installed on each filter to control the rate of filtration, and an effluent pipe designed to maintain the water level above the top of the filter sand. The effluent piping must not be directly interconnected with the other filter beds. A sample tap shall be provided for each filter bed. (4-4-13)

09. Ripening. Slow sand filters must be filtered-to-waste until they are biologically mature before being put into service following construction, scraping, re-sanding, or reopening after extended shutdown. The period of filter-to-waste shall be as follows: (4-4-13)

a. Filters shall be filtered-to-waste after scraping or cleaning until the effluent turbidity falls consistently below the pre-cleaning level, unless otherwise approved by the Department based on documentation provided by the design engineer. (4-4-13)

b. Filters shall be filtered-to-waste following construction, re-sanding, or extended shutdown based on project specific protocols that have been approved by the Department and then incorporated into a Department

approved operation and maintenance manual. These protocols may be based on factors from standard literature such as those listed in Subsection 002.02 but typically include factors such as minimum filter-to-waste time periods, bacteriological testing, and effluent turbidity. Sampling results from the filter-to-waste period shall be provided to the Department for review and the Department must provide authorization prior to restarting service to the public. (4-4-13)

10. Supernatant Drain Required. Filter beds shall be equipped with a supernatant drain to allow for quick removal of water standing over sand that has become impermeable because it requires scraping or rebedding. (3-30-07)

11. Filter Bed Control and Minimum Rate of Flow. Each filter bed shall be controlled separately and filters must be operated at a constant filtration rate with any changes made gradually. The minimum rate of filtration shall be at least two hundredths (0.02) gallons per minute per square foot. (4-4-13)

524. FACILITY AND DESIGN STANDARDS: SURFACE WATER TREATMENT: DIRECT FILTRATION.

Direct filtration, as used herein, refers to the filtration of a surface water following chemical coagulation and possibly flocculation but without prior settling. The nature of the treatment process will depend upon the raw water quality. A full scale direct filtration plant shall not be constructed without prior pilot studies which are acceptable to the reviewing authority. In-plant demonstration studies are required where conventional treatment plants are converted to direct filtration. Where direct filtration is proposed, an engineering report shall be submitted prior to conducting pilot plant or in-plant demonstration studies. See Subsection 501.19 for general information on conducting pilot studies. (4-4-13)

01. Filtration Requirements. (3-30-07)

a. Filters shall be rapid rate gravity filters with dual or mixed media. The final filter design shall be based on the pilot plant or in-plant demonstration studies, and all portions of Section 518 apply. Pressure filters or single media sand filters shall not be used. (3-30-07)

b. A continuous recording turbidimeter shall be installed on each filter effluent line and on the composite filter effluent line. (3-30-07)

c. Additional continuous monitoring equipment such as particle counting or streaming current metering to assist in control of coagulant dose may be required by the reviewing authority. (3-30-07)

02. Siting Requirements. The plant design and land ownership surrounding the plant shall allow for modifications of the plant. (3-30-07)

03. Redundancy. A minimum of two (2) units shall be provided for filtration such that plant capacity can be maintained with any component out of service for maintenance or repairs. (4-4-13)

525. FACILITY AND DESIGN STANDARDS: LOW PRESSURE MEMBRANE FILTRATION.

Low pressure filtration, as used herein, refers to microfiltration or ultrafiltration processes. Low pressure membrane systems can provide greater than 3-log removal of Giardia lamblia and Cryptosporidium, and ultrafiltration systems can also provide up to 2-log virus removal. The Department will determine maximum available removal credits for the specific membrane under consideration. The actual log removal credit that a low pressure membrane filtration system will receive is the lower of the values determined by the following: the removal efficiency demonstrated during challenge testing, or the maximum log removal that can be verified by direct integrity testing required during the course of normal operation. Membrane systems shall contain sufficient design to allow for offline direct integrity testing of all units or modules at the required interval while retaining the capability to supply maximum day demand to the water system. Membrane systems shall have at least two (2) units unless it can be demonstrated to the satisfaction of the Department that a secondary source or treatment component can supply the required minimum plant design capacity. (4-4-13)

01. Membrane Selection and Design Considerations. (4-4-13)

a. Challenge Testing. Challenge testing involves seeding feed water with an organism or particulate and measuring the log reduction of the organism or particulate between the feed and filtrate. It is a one-time product-specific test event performed by an approved third party designed to demonstrate the removal ability of the membrane. Challenge testing shall be conducted by the third party entity in general conformance with the USEPA Membrane Filtration Guidance Manual referenced in Subsection 002.02 (Membrane Filtration Guidance Manual). The challenge test report shall be submitted to the Department along with the preliminary engineering report for the project. The Department may accept another state's challenge test report approval. (4-4-13)

b. Water Quality Considerations for Design. A review of historical source water data shall be conducted to determine the degree of pretreatment needed if any, the feasibility of membrane filtration, and an estimated cost of the system. At a minimum, the following parameters shall be investigated: Seasonal temperature and turbidity profiles, total organic loading, occurrence of algae, microbial activity, iron, manganese, and hardness levels, and any other inorganic or physical parameters determined to be necessary by the Department. The data shall be used to determine anticipated fouling and scaling, backwash and cleaning cycles and regimens, acceptable trans-membrane pressure differentials, and design flux, especially during lowest anticipated water temperature. (4-4-13)

c. Pilot Study. A pilot study shall be conducted for a period that shall be determined by the design engineer and approved by the Department. The duration should include the season of lowest water temperatures and the season including the highest anticipated turbidity, algal bloom, TOC, and iron/manganese event or otherwise cover four seasons of source water quality conditions. The Department may approve a shorter duration proof pilot to verify design criteria that affect the reliable production capacity of the membrane system. The Department may approve the use of a full scale pilot study where the full scale facility will act as the pilot study. The Department may also waive the pilot study requirement. Proof pilot studies, full scale pilot studies, and the waiving of the pilot study requirement will only be approved in circumstances where source water conditions and fouling characteristics are already well understood. Such source waters include but are not limited to ground water under the influence of surface water, waters with existing membrane plants, waters where sufficient pilot test data has already been generated, and extensively used or tested membrane products where production or test data on similar waters is available (i.e., same lake, reservoir, or same reach for stream sources). In addition to the requirements in Subsection 501.19, the pilot study shall include: (4-4-13)

i. A means to identify the best membrane to use for the anticipated water quality; (4-4-13)

ii. Analysis of any need for pretreatment; (4-4-13)

iii. Range of anticipated flux rates; (4-4-13)

iv. Operating and transmembrane pressure; (4-4-13)

v. Fouling and scaling potential; (4-4-13)

vi. Backwash and recovery cleaning, cleaning processes, and intervals; (4-4-13)

vii. Efficiency and process mass balance; (4-4-13)

viii. Waste stream volume, characterization, and disposal method; (4-4-13)

xi. Turbidity; and (4-4-13)

x. Integrity testing results and procedures. (4-4-13)

02. Monitoring and Compliance Requirements for Membranes. Public drinking water systems that use low pressure membrane filtration must comply with the following requirements. (4-4-13)

a. Initial Start-Up. (4-4-13)

i. The Department shall be notified at least one (1) week in advance of the planned start-up date. (4-4-13)

ii. The design engineer shall oversee start-up procedures. (4-4-13)

iii. All monitoring equipment shall be calibrated prior to start-up. (4-4-13)

iv. The system shall pass direct integrity testing prior to going on-line and producing water for distribution. (4-4-13)

v. A method for the disposal of start-up water shall be approved by the Department prior to start-up. (4-4-13)

b. Direct Integrity Testing. (4-4-13)

i. Scale of Testing. Testing must be conducted on each membrane skid in service at least daily for the first year of operation. (4-4-13)

ii. Resolution. The test method used must have a resolution of three (3) µm or less for Cryptosporidium and Giardia lamblia removal credit. (4-4-13)

iii. Sensitivity. The test method used must have sensitivity sufficient to verify the ability of the membrane filtration system to remove the constituent at a level commensurate with the credit awarded by the Department. (4-4-13)

(1) Formulae for sensitivity calculation for pressure-based tests are available in the Membrane Filtration Guidance Manual referenced in Subsection 002.02. The volumetric concentration factor used in the calculation may be either calculated or determined experimentally. (4-4-13)

(2) Formulae for sensitivity calculation for marker-based tests are available in the Membrane Filtration Guidance Manual referenced in Subsection 002.02. (4-4-13)

iv. Control Limit. A control limit must be established within the sensitivity limits of the direct integrity test that is indicative of an integral membrane unit capable of achieving the log removal credit awarded by the Department. (4-4-13)

(1) If the direct integrity test results exceed the control limit for any membrane unit, that unit must be removed from service. (4-4-13)

(2) Any unit taken out of service for exceeding a direct integrity test control limit cannot be returned to service until repairs are confirmed by subsequent direct integrity test results that are within the control limit. (4-4-13)

v. Frequency. Direct integrity testing must be conducted on each membrane unit at a frequency of at least once per day that the unit is in operation. The Department may extend testing frequency up to a duration of once per week after one (1) year of daily testing showing a less than five percent (5%) testing failure rate for the previous year. During weekly testing, if at any time the system fails more than two (2) direct integrity tests within a three (3) month period, the system shall return to daily testing. (4-4-13)

c. Indirect Integrity Monitoring. (4-4-13)

i. Scale of Testing. Testing must be conducted on each membrane unit in service. (4-4-13)

ii. Monitoring Method. Continuous indirect integrity monitoring must be conducted using turbidity monitoring unless the Department approves an alternative method. (4-4-13)

iii. Frequency. Continuous indirect integrity monitoring must be conducted at a frequency of at least one (1) reading every fifteen (15) minutes. The Department may allow a time delay in reporting compliance turbidity measurements if it can be demonstrated that elevated turbidity readings above fifteen hundredths (0.15) NTU

immediately following direct integrity testing or maintenance are the result of factors related to entrained air or membrane wettability and are not related to membrane integrity. (4-4-13)

iv. Control Limit. If the continuous indirect integrity monitoring results exceed the specified control limit for any membrane unit for a period greater than fifteen (15) minutes (i.e., two (2) consecutive readings at fifteen (15) minute intervals), direct integrity testing must be immediately conducted on that unit. (4-4-13)

(1) The control limit for turbidity monitoring is fifteen hundredths (0.15) NTU. (4-4-13)

(2) Control limits for Department approved alternative methods shall be established by the Department. (4-4-13)

d. Operations Plan. A project specific operation and maintenance manual shall be provided as required in Subsection 501.12. See definition of Operation and Maintenance Manual in Section 003 for the typical contents of an operation and maintenance manual and the included operations plan. The operations plan in the operation and maintenance manual for membrane systems shall include, but is not limited to the following information: (4-4-13)

i. Filtration: (4-4-13)

(1) Control of feed flow to the membrane system; (4-4-13)

(2) Measurement of inlet/outlet pressures and filtrate flows; (4-4-13)

(3) Measurement of transmembrane pressure changes during filter run; and (4-4-13)

(4) Feed flow control in response to temperature changes. (4-4-13)

ii. Membrane backwashing: (4-4-13)

(1) Programming automated frequency; (4-4-13)

(2) Proper backwash venting and disposal; see Section 540; (4-4-13)

(3) Appropriate backwash rate; and (4-4-13)

(4) Monitoring during return of filter to service. (4-4-13)

iii. Chemical cleaning: (4-4-13)

(1) Selection of proper chemical washing sequence; (4-4-13)

(2) Proper procedures for dilution of chemicals; (4-4-13)

(3) Monitoring of pH through chemical cleaning cycle; (4-4-13)

(4) Rinsing of membrane system following chemical clean; and (4-4-13)

(5) Return of filter to service. (4-4-13)

iv. Chemical feeders (in the case that chemical pretreatment is applied): (4-4-13)

(1) Calibration check; (4-4-13)

(2) Settings and adjustments (how they should be made); and (4-4-13)

(3) Dilution of chemicals and polymers (proper procedures). (4-4-13)

iv. Monitoring and observing operation: (4-4-13)

(1) Observation of feed water or pretreated water turbidity; (4-4-13)

(2) Observation of trans-membrane pressure increase between backwashes; (4-4-13)

(3) Filtered water turbidity; (4-4-13)

(4) Procedures to follow if turbidity breakthrough occurs. (4-4-13)

vi. Troubleshooting. A troubleshooting checklist or guide shall be included. Suggested troubleshooting items include but are not limited to the following: (4-4-13)

(1) No raw water (feed water) flow to plant; (4-4-13)

(2) Can't control rate of flow of water through equipment; (4-4-13)

(3) Valving configuration for direct flow and cross-flow operation modes; (4-4-13)

(4) Poor raw water quality (raw water quality falls outside the performance range of the equipment); (4-4-13)

(5) Poor filtrate quality; (4-4-13)

(6) Failed membrane integrity test; (4-4-13)

(7) Low pump feed pressure; (4-4-13)

(8) Automatic operation (if provided) not functioning; (4-4-13)

(9) Filtered water turbidity too high; (4-4-13)

(10) Head loss builds up excessively rapidly; (4-4-13)

(11) Reduced flux; (4-4-13)

(12) Machine will not start and "Power On" indicator off; (4-4-13)

(13) Machine will not start and "Power On" indicator on; (4-4-13)

(14) Pump cavitation; (4-4-13)

(15) Valve stuck or won't operate; and (4-4-13)

(16) No electric power. (4-4-13)

e. Reporting. The sensitivity, resolution, and frequency of the direct integrity test proposed for use with the full-scale facility must be reported to the Department prior to initial operation. The following shall be reported to the Department on a monthly basis: (4-4-13)

i. Any direct integrity test results exceeding the control limit, as well as the corrective action taken in response, must be reported to the Department within ten (10) days of the end of the monthly monitoring cycle on a Department reporting form. The form is available at www.deq.idaho.gov; (4-4-13)

ii. Any continuous indirect integrity monitoring results triggering direct integrity testing, as well as any corrective action taken in response, must be reported to the Department within ten (10) days of the end of the

monthly monitoring cycle on a Department reporting form. The form is available at www.deq.idaho.gov; (4-4-13)

iii. Any additional information considered necessary by the Department on a case-specific basis to verify proper operation and maintenance of the membrane filtration process; and (4-4-13)

iv. All direct integrity test results and continuous indirect integrity monitoring results must be retained for a minimum of three (3) years. (4-4-13)

526. -- 528. (RESERVED)

529. FACILITY AND DESIGN STANDARDS: DISINFECTION OF DRINKING WATER, ULTRAVIOLET LIGHT.

01. General. (4-4-13)

a. Ultraviolet (UV) light technology is a primary disinfectant typically used for Cryptosporidium, Giardia lamblia, and virus inactivation of both surface water and ground water supplies. Reactor performance in terms of inactivation of any particular organism is a function of the delivered dose which is determined by validation testing. (4-4-13)

b. UV disinfection credit will be awarded for filtered systems and unfiltered systems if the system meets the requirements for unfiltered systems in 40 CFR 141.71. Systems will receive Cryptosporidium, Giardia lamblia, and virus treatment credits by achieving the corresponding UV dose values for the appropriate target pathogen and log reduction shown in Subsection 529.03, calculated to take into account the validation factor and reduction equivalent dose. The target pathogen and the target log inactivation shall be used to identify the corresponding required UV dose. (4-4-13)

c. For water systems using UV light to meet microbial treatment requirements, at least ninety-five percent (95%) of the water delivered to the public every month must be treated by UV reactors operating within validated conditions for the required UV dose. (4-4-13)

d. When reviewing proposed UV disinfection projects, the Department will use the USEPA UV Disinfection Guidance Manual for the Final Long Term 2 Enhanced Surface Water Treatment Rule referenced in Subsection 002.02 (UV Disinfection Guidance Manual) for guidance. (4-4-13)

02. Pilot Studies and Validation. (4-4-13)

a. The Department may allow on-site pilot studies on a case by case basis. Pilot studies are usually used to determine how much fouling occurs on site, to evaluate UV system reliability (e.g. UV sensors, UV transmittance (UVT) monitors, ballast reliability) and to provide operators experience running a UV system. They may also be used to assess lamp aging or impacts of power quality. See Subsection 501.19 for general information on conducting pilot studies. (4-4-13)

b. Validation testing determines the operating conditions and monitoring algorithms that the UV system will use to define how much UV dose is being delivered by the reactor during operation. The validated dose as determined through validation testing is compared to the required dose in the UV Dose Table (Subsection 529.03) to determine inactivation credit. The validated dose is calculated by dividing the determined reduction equivalent dose by a validation factor to account for biases and experimental uncertainty. UV light treatment reactors shall be validated by a third party entity approved by the Department. At a minimum, validation testing must account for the following: UV absorbance of the water; lamp fouling and aging; measurement uncertainty of on-line UV sensors; UV dose distributions arising from the velocity profiles through the reactor; failure of UV lamps and other critical system components; inlet and outlet piping configuration of the UV reactor; lamp and UV sensor locations; and other parameters required by the Department. The Department may allow alternative test microbes such as MS2 phage where the UV dose response better matches that of Cryptosporidium and Giardia lamblia to provide more accurate and efficient UV dose monitoring. Additional guidance is available in the UV Disinfection Guidance Manual, referenced in Subsection 002.02, or another validation standard as approved by the Department. (4-4-13)

c. Validation testing shall be conducted on full scale testing of a reactor that conforms uniformly to the UV reactors used by the system and inactivation of a test microorganism whose dose response characteristics have been quantified with a low pressure mercury vapor lamp. (4-4-13)

d. Validation testing must determine and establish validated operating conditions under which the reactor delivers the required UV dose in Subsection 529.03. Validated operating conditions include: (4-4-13)

i. Flow rate; (4-4-13)

ii. UV Intensity as measured by a UV sensor; (4-4-13)

iii. UV lamp operating status. (4-4-13)

e. The department may approve an alternative approach to validation testing. (4-4-13)

03. UV Dose Table. The treatment credits listed in the dose table are based on UV light at a wavelength of two hundred fifty-four (254) nm as produced by a low pressure mercury vapor lamp. To receive treatment credit for other lamp types, the system shall demonstrate an equivalent germicidal dose through validation testing.

UV Dose Table (millijoules per square centimeter)			
Log	**Cryptosporidium**	**Giardia lamblia**	**Virus**
0.5	1.6	1.5	39
1.0	2.5	2.1	58
1.5	3.9	3.0	79
2.0	5.8	5.2	100
2.5	8.5	7.7	121
3.0	12	11	143
3.5	15	15	163
4.0	22	22	186

(4-4-13)

04. Reactor Design. Inlet and outlet conditions shall ensure that UV dose delivery at the plant is equal to or exceeds that utilized during validation. At a minimum, design criteria shall address target pathogen(s), required log inactivation and UV dose, flow rate, UVT, and lamp aging and fouling factors. UVT and flow rate shall be selected to account for seasonal changes in UVT. Lamp aging and fouling factors shall be supported by documentation or pilot study data. Recommended approaches of the UV Disinfection Guidance Manual, referenced in Subsection 002.02, shall be used in meeting this requirement. (4-4-13)

a. The reactor systems must be designed to monitor and record parameters to verify the operation within the validated operating conditions approved by the Department. The system must be equipped with facilities to monitor and record UV intensity as measured by a UV sensor, flow rate, lamp status, UVT, and other parameters designated by the Department. (4-4-13)

b. The ultraviolet treatment device shall be designed to provide a UV light dose equal to or greater than that specified in the UV Dose Table for the required log reduction. The UV Disinfection Guidance Manual, referenced in Subsection 002.02, shall be utilized in evaluating the appropriate dose required for the target microbe. The reactor shall also deliver the target dose while operating within the validated operating conditions for that particular unit. (4-4-13)

c. The ultraviolet treatment assemblies shall be designed to allow for cleaning and replacement of the lamp, lamp sleeves, and sensor window or lens. (4-4-13)

d. All ultraviolet treatment device designs shall evaluate lamp fouling and aging issues and manufacturer's recommendations regarding fouling, aging, and replacement shall be discussed in the Operation and Maintenance Manual. (4-4-13)

e. For in-situ cleaning of the lamp sleeve, the design shall protect the potable water from cleaning solutions. (4-4-13)

f. When off-line chemical cleaning systems are used, the UV enclosure shall be removed from service, drained, flushed with an NSF/ANSI Standard 60 certified solution, drained, and rinsed before being placed back in service. (4-4-13)

g. On-line systems that use wipers or brushes may use chemical solutions provided they are NSF/ANSI Standard 60 certified. (4-4-13)

h. An automatic shutdown valve shall be installed in the water supply line from the ultraviolet treatment device such that if power is not provided to the reactor or valve, the valve shall be in the closed position. (4-4-13)

i. The design of the inlet and outlet piping configuration and the locations of expansions, bends, tees and valves shall assure that the UV dose delivery is equal to or greater than the required UV dose. Approach length prior to each reactor included in the credited dose calculations, downstream length following each reactor, and locations of any cleaning device/mechanism shall be based on validation testing. (4-4-13)

j. For parallel trains, the flow to each reactor shall be equally distributed and metered or otherwise account for uneven flows in the design to ensure that the required UV dose is delivered to each train under varying flow conditions. (4-4-13)

k. Valves shall be provided to allow isolating and removing from service each UV reactor. (4-4-13)

l. Reactors shall be provided with air relief and pressure control valves per manufacturer requirements. (4-4-13)

m. UVT analyzers shall be provided if UVT is part of the dose monitoring strategy. It is recommended that UVT be monitored on a regular basis for all systems to assess UVT variability. (4-4-13)

n. A single train with a standby reactor or a sufficient number of parallel ultraviolet treatment devices shall be installed to ensure that adequate disinfection is provided when one unit is out of service. The Department may approve an alternate method that provides adequate disinfection such as standby chlorination. Any system that produces water on an irregular schedule may provide documentation for the Department's review and approval that a single reactor would be an acceptable design by demonstrating there would be adequate for time for maintenance and cleaning during operation shutdowns. (4-4-13)

o. No bypass of the ultraviolet treatment process may be installed unless an alternate method of providing adequate disinfection is provided. (4-4-13)

05. Controls. (4-4-13)

a. A delay mechanism shall be installed to provide sufficient lamp warm-up prior to allowing water to flow from the ultraviolet treatment unit. (4-4-13)

b. An automatic shutdown shall be designed to activate the shutdown valve in cases where the ultraviolet light dose falls below the approved design dose or outside of the validated specifications. (4-4-13)

06. Reliability. The system must be capable of producing the plant design capacity at all times.

(4-4-13)

a. Standby equipment. Unless otherwise approved by the Department based on documentation provided by the design engineer and in accordance with Subsection 529.04.n., a minimum of two (2) reactors is required to maintain disinfection when one unit is taken out of service. Each reactor must be sized to deliver the required UV dose under the operating conditions of flow and UVT that occur at the plant. The conditions shall fall within the validated range of the reactor as determined during validation testing. (4-4-13)

b. Power supply. The quality and reliability of the power supply shall be analyzed and back-up power supplies shall be discussed in the contingency plan. (4-4-13)

c. Validated operating conditions. If UVT is above the validated range of UVT, the UV dose monitoring algorithm shall default to the maximum of the validated range. If UVT is below the validated range, the UV system operation shall be recorded as outside of the validated operating conditions. When UVT falls outside of ranges identified in the validated operating conditions, the contingency plan shall be enacted if UVT is part of the dose monitoring strategy. (4-4-13)

d. Contingency plan. A contingency plan for total UV disinfection failure, loss of power, or in the event that water quality changes produce water quality unsuitable for UV disinfection shall be described in the preliminary engineering report. (4-4-13)

07. Monitoring. Water systems using UV light must monitor for the parameters necessary to demonstrate operation within the validated conditions of the required UV dose. PWSs must check the calibration of UV sensors and online UVT monitors and recalibrate in accordance with a protocol approved by the Department. At a minimum, the following parameters must be monitored: (4-4-13)

a. Flow rate. If the flow rate is below the validated range, then the UV dose monitoring algorithm shall default to the validated range. If the flow rate is above the validated range, then the UV system operation shall be recorded as outside of the validated operating conditions; (4-4-13)

b. UV intensity as measured by UV sensors; (4-4-13)

c. UVT if UVT is part of the dose monitoring strategy; and (4-4-13)

d. Lamp status. (4-4-13)

08. Alarms. The settings or predetermined set points for the alarms shall be specified in the preliminary engineering report. The report shall also specify the alarms that shall activate the contingency plan response. At a minimum, the following alarms are required: (4-4-13)

a. Low UV intensity; (4-4-13)

b. High turbidity if required by the Department; (4-4-13)

c. Low UVT; (4-4-13)

d. Low UV dose; (4-4-13)

e. Lamp failure; (4-4-13)

f. UVT monitor failure; (4-4-13)

g. UV sensor failure; (4-4-13)

h. Low water level; and (4-4-13)

i. High flow rate. (4-4-13)

09. Initial Startup. The following items shall be tested and verified before UV disinfected water is distributed: (4-4-13)

a. Electrical components; (4-4-13)

b. Water level; (4-4-13)

c. Flow split between reactor trains if applicable; (4-4-13)

d. Controls and alarms; and (4-4-13)

e. Instrument calibration. (4-4-13)

10. Operation and Maintenance Manual. A project specific operation and maintenance manual shall be provided as required in Subsection 501.12. See definition of Operation and Maintenance Manual in Section 003 for the typical contents of an operation and maintenance manual and the included operations plan. The operations plan in the operation and maintenance manual shall include, but is not limited to the following information: (4-4-13)

a. Lamp aging and replacement intervals. Lamp replacement intervals may be based on the degree of lamp aging as indicated by the UV sensors; (4-4-13)

b. Lamp fouling analysis and cleaning procedures; (4-4-13)

c. Lamp replacement; and (4-4-13)

d. Lamp breakage. (4-4-13)

530. FACILITY AND DESIGN STANDARDS: DISINFECTION OF DRINKING WATER, DISINFECTING AGENTS.

Disinfection may be accomplished with gas and liquid chlorine, calcium or sodium hypochlorites, chlorine dioxide, ozone, or ultraviolet light. Other disinfecting agents will be considered, providing reliable application equipment is available and testing procedures for a residual are recognized in "Standard Methods for the Examination of Water and Wastewater," referenced in Subsection 002.02, or an equivalent means of measuring effectiveness exists. The required amount of primary disinfection needed shall be specified by the Department. Consideration must be given to the formation of disinfection by-products (DBP) when selecting the disinfectant. See Section 531, Facility Design Standards - Design Standards for Chemical Application. For public water systems using only ground water and that voluntarily chlorinate, see Subsection 552.04. (4-4-13)

01. Chlorination. (3-30-07)

a. In addition to the requirements of Section 531, chlorination equipment shall meet the following requirements: (4-4-13)

i. Solution-feed gas chlorinators or hypochlorite feeders of the positive displacement type must be provided. (3-30-07)

ii. Standby or backup equipment of sufficient capacity shall be available to replace the largest unit. Spare parts shall be on hand to replace parts subject to wear and breakage. (5-8-09)

iii. Automatic proportioning chlorinators are required where the rate of flow or chlorine demand is not reasonably constant. (4-4-13)

iv. Each eductor (submerged jet pump) must be selected for the point of application with particular attention given to the quantity of chlorine to be added, the maximum injector waterflow, the total discharge back pressure, the injector operating pressure, and the size of the chlorine solution line. (3-30-07)

v. The chlorine solution injector/diffuser must be compatible with the point of application to provide a rapid and thorough mix with all the water being treated. (3-30-07)

vi. Automatic switch-over of chlorination treatment units shall be provided, where necessary, to assure continuous disinfection. (5-8-09)

b. Effective contact time and point of application requirements are as follows: (4-4-13)

i. Effective contact time sufficient to achieve the inactivation of target pathogens under the expected range of raw water pH and temperature variation must be demonstrated through tracer studies or other evaluations or calculations acceptable to the Department. Improving Clearwell Design for CT Compliance, referenced in Section 002.02, contains information that may be used as guidance for these calculations. Additional baffling can be added to new or existing basins to minimize short circuiting and increase contact time. (4-4-13)

ii. At least two (2) contactors shall be provided which are each capable of providing the required effective contact time at one-half (1/2) of the plant design capacity. Alternatively, a single contactor that can provide effective contact time at plant design capacity may be designed with separate sections and bypass piping to allow sections to be cleaned or maintained individually during low flow conditions. Any system that produces water on an irregular schedule may provide documentation for the Department's review and approval that a single contactor would be an acceptable design by demonstrating there would be adequate time for maintenance and cleaning during operation shutdowns. (4-4-13)

iii. At plants treating surface water, except slow sand filtration systems: (4-4-13)

(1) Unless otherwise approved by the Department, in addition to the injection point prior to the disinfection contact tank, injection points shall also be provided for applying the disinfectant to the raw water, settled water, and water entering the distribution system. (4-4-13)

(2) Unless otherwise approved by the Department, chemical piping or tubing shall be installed from the disinfectant feed system to each injection system during the initial construction. (4-4-13)

iv. For pipeline contactors, provision shall be made to drain accumulated sediment from the bottom of the contactor if the discharge from the contactor is not located at the bottom. (4-4-13)

c. Chlorine residual test equipment recognized in the "Standard Methods for the Examination of Water and Wastewater," referenced in Subsection 002.02, shall be provided for use by the operator. All surface water treatment plants that serve a population greater that three thousand three hundred (3,300) must have equipment to measure chlorine residuals continuously entering the distribution system. A sample tap shall be provided to measure chlorine residual and shall be located at a point after receiving the required contact time and at or prior to the first service connection. (5-8-09)

d. Chlorinator piping requirements: (3-30-07)

i. Cross connection protection: The chlorinator water supply piping shall be designed to prevent contamination of the treated water supply by sources of questionable quality. At all facilities treating surface water, pre- and post-chlorination systems must be independent to prevent possible siphoning of partially treated water into the clear well. The water supply to each eductor shall have a separate shut-off valve. No master shut-off valve will be allowed. (3-30-07)

ii. The pipes carrying elemental liquid or dry gaseous chlorine under pressure must be Schedule 80 seamless steel tubing or other materials recommended by the Chlorine Institute (never use PVC). Rubber, PVC, polyethylene, or other materials recommended by the Chlorine Institute must be used for chlorine solution piping and fittings. Nylon products are not acceptable for any part of the chlorine solution piping system. (3-30-07)

02. Disinfection with Ozone. Systems that are required to maintain a disinfectant residual in the distribution system shall supplement ozone disinfection with a chemical disinfectant. (3-30-07)

a. The following are requirements for feed gas preparation: (3-30-07)

i. Feed gas can be air, oxygen enriched air, or high purity oxygen. Sources of high purity oxygen include purchased liquid oxygen conforming with AWWA Standard B-304; on site generation using cryogenic air separation; or temperature, pressure or vacuum swing (adsorptive separation) technology. In all cases, the design engineer must ensure that the maximum dew point of -76°F (-60°C) will not be exceeded at any time. (3-30-07)

ii. Air compression: (3-30-07)

(1) Air compressors shall be of the liquid-ring or rotary lobe, oil-less, positive displacement type for smaller systems or dry rotary screw compressors for larger systems. (3-30-07)

(2) The air compressors shall have the capacity to simultaneously provide for maximum ozone demand, provide the air flow required for purging the desiccant dryers (where required) and allow for standby capacity. (3-30-07)

(3) Air feed for the compressor shall be drawn from a point protected from rain, condensation, mist, fog and contaminated air sources to minimize moisture and hydrocarbon content of the air supply. (3-30-07)

(4) A compressed air after-cooler, entrainment separator, or a combination of the two (2) with automatic drain shall be provided prior to the dryers to reduce the water vapor. (5-8-09)

(5) A back-up air compressor must be provided so that ozone generation is not interrupted in the event of a break-down. (3-30-07)

iii. Air drying: (3-30-07)

(1) Dry, dust-free and oil-free feed gas must be provided to the ozone generator. Dry gas is essential to prevent formation of nitric acid, to increase the efficiency of ozone generation and to prevent damage to the generator dielectrics. Sufficient drying to a maximum dew point of -76°F (-60°C) must be provided at the end of the drying cycle. (3-30-07)

(2) Drying for high pressure systems may be accomplished using heatless desiccant dryers only. For low pressure systems, a refrigeration air dryer in series with heat-reactivated desiccant dryers shall be used.(3-30-07)

(3) A refrigeration dryer capable of reducing inlet air temperature to 40°F (4°C) shall be provided for low pressure air preparation systems. The dryer can be of the compressed refrigerant type or chilled water type. (3-30-07)

(4) For heat-reactivated desiccant dryers, the unit shall contain two (2) desiccant filled towers complete with pressure relief valves, two (2) four-way valves and a heater. In addition, external type dryers shall have a cooler unit and blowers. The size of the unit shall be such that the specified dew point will be achieved during a minimum adsorption cycle time of sixteen (16) hours while operating at the maximum expected moisture loading conditions. (3-30-07)

(5) Multiple air dryers shall be provided so that the ozone generation is not interrupted in the event of dryer breakdown. (3-30-07)

(6) Each dryer shall be capable of venting “dry” gas to the atmosphere, prior to the ozone generator, to allow start-up when other dryers are “on-line.” (3-30-07)

iv. Air filters: (3-30-07)

(1) Air filters shall be provided on the suction side of the air compressors, between the air compressors and the dryers and between the dryers and the ozone generators. (3-30-07)

(2) The filter before the desiccant dryers shall be of the coalescing type and be capable of removing aerosol and particulates larger than 0.3 microns in diameter. The filter after the desiccant dryer shall be of the particulate type and be capable of removing all particulates greater than 0.1 microns in diameter, or smaller if specified by the generator manufacturer. (3-30-07)

v. Piping in the air preparation system can be common grade steel, seamless copper, stainless steel or galvanized steel. The piping must be designed to withstand the maximum pressures in the air preparation system. (3-30-07)

b. The following requirements apply to the ozone generator: (3-30-07)

i. Capacity. (3-30-07)

(1) The production rating of the ozone generators shall be stated in pounds per day and kWhr per pound at a maximum cooling water temperature and maximum ozone concentration. (3-30-07)

(2) The design shall ensure that the minimum concentration of ozone in the generator exit gas will not be less than one (1) percent (by weight). (3-30-07)

(3) Generators shall be sized to have sufficient reserve capacity so that the system does not operate at peak capacity for extended periods of time resulting in premature breakdown of the dielectrics. (3-30-07)

(4) The production rate of ozone generators will decrease as the temperature of the coolant increases. If there is to be a variation in the supply temperature of the coolant throughout the year, then pertinent data shall be used to determine production changes due to the temperature change of the supplied coolant. The design shall ensure that the generators can produce the required ozone at maximum coolant temperature. (3-30-07)

(5) Appropriate ozone generator backup equipment must be provided. (3-30-07)

ii. Electrical. The generators can be low, medium or high frequency type. Specifications shall require that the transformers, electronic circuitry and other electrical hardware be proven, high quality components designed for ozone service. (3-30-07)

iii. Cooling. Adequate cooling shall be provided. The cooling water must be properly treated to minimize corrosion, scaling and microbiological fouling of the water side of the tubes. Where cooling water is treated, cross connection control shall be provided to prevent contamination of the potable water supply. (3-30-07)

iv. Materials. To prevent corrosion, the ozone generator shell and tubes shall be constructed of Type 316L stainless steel. (3-30-07)

c. The following requirements apply to ozone contactors: (3-30-07)

i. Bubble diffusers. (3-30-07)

(1) Where disinfection is the primary application, a minimum of two (2) contact chambers, each equipped with baffles to prevent short circuiting and induce countercurrent flow, shall be provided. Ozone shall be applied using porous-tube or dome diffusers. (3-30-07)

(2) The minimum contact time shall be ten (10) minutes. A shorter contact time (CT) may be approved by the Department if justified by appropriate design and “CT” considerations. (3-30-07)

(3) Where taste and odor control is of concern, multiple application points and contactors shall be considered. (3-30-07)

(4) Contactors shall be separate closed vessels that have no common walls with adjacent rooms. The contactor must be kept under negative pressure and sufficient ozone monitors shall be provided to protect worker safety. (3-30-07)

(5) Contact vessels can be made of reinforced concrete, stainless steel, fiberglass or other material which will be stable in the presence of residual ozone and ozone in the gas phase above the water level. If contact vessels are made of reinforced concrete, all reinforcement bars shall be covered with a minimum of one and one-half (1.5) inches of concrete. (3-30-07)

(6) Where necessary, a system shall be provided between the contactor and the off-gas destruct unit to remove froth from the air and return the other to the contactor or other location acceptable to the reviewing authority. If foaming is expected to be excessive, then a potable water spray system shall be placed in the contactor head space. (3-30-07)

(7) All openings into the contactor for pipe connections, hatchways, etc. shall be properly sealed using welds or ozone resistant gaskets such as Teflon or Hypalon. (3-30-07)

(8) Multiple sampling ports shall be provided to enable sampling of each compartment's effluent water and to confirm "CT" calculations. (3-30-07)

(9) A pressure/vacuum relief valve shall be provided in the contactor and piped to a location where there will be no damage to the destruction unit. (3-30-07)

(10) The depth of water in bubble diffuser contactors shall be a minimum of eighteen (18) feet. The contactor shall also have a minimum of three (3) feet of freeboard to allow for foaming. (3-30-07)

(11) All contactors shall have provisions for cleaning, maintenance and drainage of the contactor. Each contactor compartment shall also be equipped with an access hatchway. (3-30-07)

(12) Aeration diffusers shall be fully serviceable by either cleaning or replacement. (3-30-07)

ii. Other contactors, such as the venturi or aspirating turbine mixer contactor, may be approved by the Department provided adequate ozone transfer is achieved and the required contact times and residuals can be met and verified. (3-30-07)

d. The following requirements apply to ozone destruction units: (3-30-07)

i. A system for treating the final off-gas from each contactor must be provided in order to meet safety and air quality standards. Acceptable systems include thermal destruction and thermal/catalytic destruction units. (3-30-07)

ii. The maximum allowable ozone concentration in the discharge is 0.1 ppm (by volume). (3-30-07)

iii. At least two (2) units shall be provided which are each capable of handling the entire gas flow. (3-30-07)

iv. Exhaust blowers shall be provided in order to draw off-gas from the contactor into the destruct unit. (3-30-07)

v. Catalysts must be protected from froth, moisture and other impurities which may harm the catalyst. (3-30-07)

vi. The catalyst and heating elements shall be located where they can easily be reached for maintenance. (3-30-07)

e. Piping materials: Only low carbon 304L and 316L stainless steels shall be used for ozone service with 316L preferred. (3-30-07)

f. The following requirements apply to joints and connections: (3-30-07)

i. Connections on piping used for ozone service are to be welded where possible. (3-30-07)

ii. Connections with meters, valves or other equipment are to be made with flanged joints with ozone resistant gaskets, such as Teflon or Hypalon. Screwed fittings shall not be used because of their tendency to leak. (3-30-07)

iii. A positive closing plug or butterfly valve plus a leak-proof check valve shall be provided in the piping between the generator and the contactor to prevent moisture reaching the generator. (3-30-07)

g. The following requirements apply to instrumentation: (3-30-07)

i. Pressure gauges shall be provided at the discharge from the air compressor, at the inlet to the refrigeration dryers, at the inlet and outlet of the desiccant dryers, at the inlet to the ozone generators and contactors, and at the inlet to the ozone destruction unit. (3-30-07)

ii. Each generator shall have a trip which shuts down the generator when the wattage exceeds a certain preset level. (3-30-07)

iii. Dew point monitors shall be provided for measuring the moisture of the feed gas from the desiccant dryers. Where there is potential for moisture entering the ozone generator from downstream of the unit or where moisture accumulation can occur in the generator during shutdown, post-generator dew point monitors shall be used. (3-30-07)

iv. Air flow meters shall be provided for measuring air flow from the desiccant dryers to each of the other ozone generators, air flow to each contactor, and purge air flow to the desiccant dryers. (3-30-07)

v. Temperature gauges shall be provided for the inlet and outlet of the ozone cooling water and the inlet and outlet of the ozone generator feed gas and, if necessary, for the inlet and outlet of the ozone power supply cooling water. (3-30-07)

vi. Water flow meters shall be installed to monitor the flow of cooling water to the ozone generators and, if necessary, to the ozone power supply. (3-30-07)

vii. Ozone monitors shall be installed to measure zone concentration in both the feed-gas and off-gas from the contactor and in the off-gas from the destruct unit. For disinfection systems, monitors shall also be provided for monitoring ozone residuals in the water. The number and location of ozone residual monitors shall be such that the amount of time that the water is in contact with the ozone residual can be determined. (3-30-07)

viii. A minimum of one ambient ozone monitor shall be installed in the vicinity of the contactor and a minimum of one shall be installed in the vicinity of the generator. Ozone monitors shall also be installed in any areas where ozone gas may accumulate. (3-30-07)

h. Safety requirements are as follows: (3-30-07)

i. The maximum allowable ozone concentration in the air to which workers may be exposed must not exceed one-tenth part per million (0.1 ppm) by volume. (3-30-07)

ii. Noise levels resulting from the operating equipment of the ozonation system shall be controlled to within acceptable limits by special room construction and equipment isolation. (3-30-07)

iii. Emergency exhaust fans must be provided in the rooms containing the ozone generators to remove ozone gas if leakage occurs. (3-30-07)

iv. A sign shall be posted indicating “No smoking, oxygen in use” at all entrances to the treatment plant. In addition, no flammable or combustible materials shall be stored within the oxygen generator areas. (3-30-07)

03. Disinfection with Chlorine Dioxide. Chlorine dioxide may be considered as a primary and residual disinfectant, a pre-oxidant to control tastes and odors, to oxidize iron and manganese, and to control hydrogen sulfide and phenolic compounds. When choosing chlorine dioxide, consideration must be given to formation of the regulated by-products, chlorite and chlorate. (3-30-07)

a. Chlorine dioxide generation equipment shall be factory assembled pre-engineered units with a minimum efficiency of ninety-five (95) percent. The excess free chlorine shall not exceed three (3) percent of the theoretical stoichiometric concentration required. (3-30-07)

b. Other design requirements include: (3-30-07)

i. The design shall comply with all applicable portions of Subsections 530.01.a. through 530.01.d. (3-30-07)

ii. The maximum residual disinfectant level allowed shall be zero point eight (0.8) milligrams per liter (mg/l), even for short term exposures. (3-30-07)

iii. Notification of a change in disinfection practices and the schedule for the changes shall be made known to the public; particularly to hospitals, kidney dialysis facilities and fish breeders, as chlorine dioxide and its by-products may have effects similar to chloramines. (3-30-07)

04. Other Disinfecting Agents. Proposals for use of disinfecting agents other than those listed shall be submitted to the Department for approval prior to preparation of final plans and specifications. (3-30-07)

531. FACILITY AND DESIGN STANDARDS: DESIGN STANDARDS FOR CHEMICAL APPLICATION.

01. General Equipment Design. General equipment design shall be such that: (3-30-07)

a. Feeders will be able to supply, at all times, the necessary amounts of chemicals at an accurate rate, throughout the range of feed. (3-30-07)

b. Chemical-contact materials and surfaces are resistant to the aggressiveness of the chemical solution. (3-30-07)

c. Corrosive chemicals are introduced in such a manner as to minimize potential for corrosion. (3-30-07)

d. Chemicals that are incompatible are not stored or handled together. At facilities where more than one (1) chemical is stored or handled, tanks and pipelines shall be clearly labeled to identify the chemical they contain. (3-30-07)

e. All chemicals are conducted from the feeder to the point of application in separate conduits. (3-30-07)

f. Chemical feeders are as near as practical to the feed point. (3-30-07)

g. Chemical feeders and pumps shall operate at no lower than twenty percent (20%) of the feed range unless two fully independent adjustment mechanisms such as pump pulse rate and stroke length are fitted when the pump shall operate at no lower than ten percent (10%) of the rated maximum. (3-30-07)

h. Spare parts shall be on hand for parts of feeders that are subject to frequent wear and damage. (5-8-09)

i. Redundant chemical feeders with automatic switchover shall be provided when necessary to ensure adequate treatment. If the water treatment system includes at least two (2) process trains of equipment so that the plant design capacity can be maintained with any component out of service, redundant chemical feeders are not

required on each process train. (4-4-13)

02. Facility Design. (3-30-07)

a. Where chemical feed is necessary for the protection of the supply, such as disinfection, coagulation or other essential processes, a minimum of two feeders shall be provided and a separate feeder shall be used for each chemical applied. (3-30-07)

b. Chemical application control systems shall meet the following requirements: (3-30-07)

i. Feeders may be manually or automatically controlled, with automatic controls being designed so as to allow override by manual controls. (3-30-07)

ii. Chemical feeders shall be controlled by a flow sensing device so that injection of the chemicals will not continue when the flow of water stops. (3-30-07)

iii. Automatic proportioning chlorinators are required where the rate of flow or chlorine demand is not reasonably constant. (4-4-13)

iv. A means to measure water flow must be provided in order to determine chemical feed rates. (3-30-07)

v. Provisions shall be made for measuring the quantities of chemicals used. (3-30-07)

vi. Weighing scales shall be provided for weighing cylinders at all plants utilizing chlorine gas, fluoride solution feed. (3-30-07)

vii. Weighing scales shall be capable of providing reasonable precision in relation to average daily dose. (5-8-09)

viii. Where conditions warrant, for example with rapidly fluctuating intake turbidity, coagulant and coagulant aid addition may be made according to turbidity, streaming current or other sensed parameter. (3-30-07)

c. Dry chemical feeders shall measure chemicals volumetrically or gravimetrically, provide adequate solution water and agitation of the chemical in the solution pot, and completely enclose chemicals to prevent emission of dust to the operating room. (3-30-07)

d. Positive displacement type solution feed pumps must be capable of operating at the required maximum head conditions found at the point of injection. (3-30-07)

e. Liquid chemical feeders shall be such that chemical solutions cannot be siphoned or overfed into the water supply, by assuring discharge at a point of positive pressure, or providing vacuum relief, or providing a suitable air gap, or providing other suitable means or combinations as necessary. (3-30-07)

f. Cross connection control must be provided to assure that the following requirements are satisfied. (3-30-07)

i. The service water lines discharging to solution tanks shall be properly protected from backflow. (5-8-09)

ii. No direct connection exists between any sewer and a drain or overflow from the feeder, solution chamber or tank by providing that all drains terminate at least six (6) inches or two pipe diameters, whichever is greater, above the overflow rim of a receiving sump, conduit or waste receptacle. (3-30-07)

g. Chemical feed equipment shall be readily accessible for servicing, repair, and observation of operation. (3-30-07)

h. In-plant water supply for chemical mixing shall be: (3-30-07)

i. Ample in quantity and adequate in pressure. (3-30-07)

ii. Provided with means for measurement when preparing specific solution concentrations by dilution. (3-30-07)

iii. Properly treated for hardness, when necessary. (3-30-07)

iv. Properly protected against backflow. (3-30-07)

v. Obtained from a location sufficiently downstream of any chemical feed point to assure adequate mixing. (3-30-07)

i. Chemical storage facilities shall satisfy the following requirements: (3-30-07)

i. Storage tanks and pipelines for liquid chemicals shall be specified for use with individual chemicals and not used for different chemicals. Off-loading areas must be clearly labeled to prevent accidental cross-contamination. (3-30-07)

ii. Chemicals shall be stored in covered or unopened shipping containers, unless the chemical is transferred into an approved storage unit. (3-30-07)

j. Bulk liquid storage tanks shall comply with the following requirements: (5-8-09)

i. A means which is consistent with the nature of the chemical solution shall be provided in a solution tank to maintain a uniform strength of solution. Continuous agitation shall be provided to maintain slurries in suspension. (3-30-07)

ii. Means shall be provided to measure the liquid level in the tank. (3-30-07)

iii. Bulk liquid storage tanks shall be kept covered. Bulk liquid storage tanks with access openings shall have such openings curbed and fitted with overhanging covers. (5-8-09)

iv. Subsurface locations for bulk liquid storage tanks shall be free from sources of possible contamination, and assure positive drainage for ground waters, accumulated water, chemical spills and overflows. (5-8-09)

v. Bulk liquid storage tanks shall be vented, but shall not vent through vents common with day tanks. Acid storage tanks must be vented to the outside atmosphere, but not through vents in common with day tanks. (5-8-09)

vi. Each bulk liquid storage tank shall be provided with a valved drain, protected against backflow. (5-8-09)

vii. Bulk liquid storage tanks shall have an overflow that is turned downward with the end screened with a twenty-four (24) mesh or similar non-corrodible screen, have a free fall discharge, and be located where noticeable. (4-7-11)

viii. Bulk liquid storage tanks shall be provided with secondary containment so that chemicals from equipment failure, spillage, or accidental drainage shall be fully contained. A common receiving basin may be provided for each group of compatible chemicals. The bulk liquid storage tank basin or the common receiving basin shall provide a secondary containment volume sufficient to hold one hundred ten percent (110%) of the volume of the largest storage tank. Piping shall be designed to minimize or contain chemical spills in the event of pipe ruptures. (4-4-13)

ix. Where chemical feed is necessary for the protection of the supply, a means to assure continuity of

chemical supply while servicing a bulk liquid storage tank shall be provided. (5-8-09)

k. Day tanks are subject to the requirements in Subsections 531.02.k.i. through 531.02.k.iv. For the purposes of Section 531, day tanks are defined as liquid chemical tanks holding no more than a thirty (30) hour chemical supply. (5-8-09)

i. Day tanks shall be provided where bulk storage of liquid chemicals are provided. The Department may allow chemicals to be fed directly from shipping containers no larger than fifty-five (55) gallons. (5-8-09)

ii. Day tanks shall meet all the requirements of Subsection 531.02.j., with the exception of Subsection 531.02.j.viii. Shipping containers do not require overflow pipes or drains as required by Subsection 531.02.j. and are not subject to the requirements of Subsection 531.02.j.viii. (5-8-09)

iii. Where feasible, secondary containment shall be provided so that chemicals from equipment failure, spillage, or accidental drainage of day tanks shall be fully contained. A common receiving basin may be provided for each group of compatible chemicals. The common receiving basin shall provide a secondary containment volume sufficient to hold the volume of the largest storage tank. If secondary containment is not feasible, day tanks shall be located and protective curbings provided so that chemicals from equipment failure, spillage, or accidental drainage of day tanks shall not enter the water in conduits, treatment, or storage basins. Secondary containment is not required for a day tank if an Idaho licensed professional engineer demonstrates to the Department that the chemical concentration and volume, if spilled, will not be a safety hazard to employees, will not be hazardous to the public health, and will not harm the environment. (5-8-09)

iv. Day tanks and the tank refilling line entry points shall be clearly labeled with the name of the chemical contained. (5-8-09)

l. Provisions shall be made for measuring quantities of chemicals used to prepare feed solutions. (3-30-07)

m. Vents from feeders, storage facilities and equipment exhaust shall discharge to the outside atmosphere above grade and remote from air intakes. (3-30-07)

03. Chemicals. Chemical shipping containers shall be fully labeled to include chemical name, purity and concentration, supplier name and address, and evidence of ANSI/NSF certification where applicable. (3-30-07)

04. Safety Requirements for Chemical Facilities. (3-30-07)

a. The following requirements apply to chlorine gas feed and storage rooms: (3-30-07)

i. Each storage room shall be enclosed and separated from other operating areas. They shall be constructed in such a manner that all openings between the chlorine room and the remainder of the plant are sealed, and provided with doors equipped with panic hardware, assuring ready means of exit and opening outward only to the building exterior. (3-30-07)

ii. Each room shall be provided with a shatter resistant inspection window installed in an interior wall. (3-30-07)

iii. Each room shall have a ventilating fan with a capacity which provides one (1) complete air change per minute when the room is occupied. Where this is not appropriate due to the size of the room, a lesser rate may be allowed by the Department on a site specific basis. (3-30-07)

iv. The ventilating fan shall take suction near the floor as far as practical from the door and air inlet, with the point of discharge so located as not to contaminate air inlets to any rooms or structures. Air inlets shall be through louvers near the ceiling. (3-30-07)

v. Louvers for chlorine room air intake and exhaust shall facilitate airtight closure. (3-30-07)

vi. Separate switches for the fan and lights shall be located outside of the chlorine room and at the inspection window. Outside switches shall be protected from vandalism. A signal light indicating fan operation shall be provided at each entrance when the fan can be controlled from more than one (1) point. (3-30-07)

vii. Vents from feeders and storage shall discharge to the outside atmosphere, above grade. (3-30-07)

viii. Where provided, floor drains shall discharge to the outside of the building and shall not be connected to any internal drainage systems or external drainage systems unless the external drainage systems drain to an approved discharge point. (4-4-13)

ix. Chlorinator rooms shall be heated to sixty degrees Fahrenheit (60°F) and be protected from excessive heat. Cylinders and gas lines shall be protected from temperatures above that of the feed equipment. (3-30-07)

x. Pressurized chlorine feed lines shall not carry chlorine gas beyond the chlorinator room. (3-30-07)

xi. Critical isolation valves shall be conspicuously marked and access kept unobstructed. (3-30-07)

xii. All chlorine rooms, buildings, and areas shall be posted with a prominent danger sign warning of the presence of chlorine. (3-30-07)

xiii. Full and empty cylinders of chlorine gas shall be isolated from operating areas and stored in definitely assigned places away from elevators, stairs, or gangways. They shall be restrained in position to prevent being knocked over or damaged by passing or falling objects. In addition, they shall be stored in rooms separate from ammonia storage, out of direct sunlight, and at least twenty (20) feet from highly combustible materials. Cylinders shall not be kept in unventilated enclosures such as lockers and cupboards. (3-30-07)

b. Where acids and caustics are used, they shall be kept in closed corrosion-resistant shipping containers or storage units. Acids and caustics shall not be handled in open vessels, but shall be pumped in undiluted form from original containers through suitable hose to the point of treatment or to a covered day tank. (3-30-07)

c. Sodium chlorite for chlorine dioxide generation. Proposals for the storage and use of sodium chlorite shall be approved by the Department prior to the preparation of final plans and specifications. Provisions shall be made for proper storage and handling of sodium chlorite to eliminate any danger of fire or explosion associated with its oxidizing nature. (3-30-07)

i. Chlorite (sodium chlorite) shall be stored by itself in a separate room. It must be stored away from organic materials. The storage structure shall be constructed of noncombustible materials. If the storage structure must be located in an area where a fire may occur, water must be available to keep the sodium chlorite area cool enough to prevent heat-induced explosive decomposition of the chlorite. (3-30-07)

ii. Care shall be taken to prevent spillage. An emergency plan of operation shall be available for the clean up of any spillage. Storage drums shall be thoroughly flushed prior to recycling or disposal. (3-30-07)

d. Where ammonium hydroxide is used, an exhaust fan shall be installed to withdraw air from high points in the room and makeup air shall be allowed to enter at a low point. The feed pump, regulators, and lines shall be fitted with pressure relief vents discharging outside the building away from any air intake and with water purge lines leading back to the headspace of the bulk storage tank. (3-30-07)

e. Where anhydrous ammonia is used, the storage and feed systems (including heaters where required) shall be enclosed and separated from other work areas and constructed of corrosion resistant materials. (3-30-07)

i. Pressurized ammonia feed lines shall be restricted to the ammonia room. (3-30-07)

ii. An emergency air exhaust system, as described in Subsection 531.04.a., but with an elevated intake, shall be provided in the ammonia storage room. (3-30-07)

iii. Leak detection systems shall be fitted in all areas through which ammonia is piped. (3-30-07)

iv. Special vacuum breaker/regulator provisions must be made to avoid potentially violent results of backflow of water into cylinders or storage tanks. (3-30-07)

v. Consideration shall be given to the provision of an emergency gas scrubber capable of absorbing the entire contents of the largest ammonia storage unit whenever there is a risk to the public as a result of potential ammonia leaks. (3-30-07)

05. Operator Safety. The Idaho General Safety and Health Standards, referenced in Subsection 002.02, may be used as guidance in designing facilities to ensure the safety of operators. The following requirements are in addition to the requirements of Subsection 501.12. (3-30-07)

a. Respiratory protection equipment, meeting the requirements of the National Institute for Occupational Safety and Health (NIOSH) shall be available where chlorine gas is handled, and shall be stored at a convenient heated location, but not inside any room where chlorine is used or stored. The units shall use compressed air, have at least a thirty (30) minute capacity, and be compatible with or exactly the same as units used by the fire department responsible for the plant. (3-30-07)

b. Chlorine leak detection. A bottle of concentrated ammonium hydroxide (fifty-six (56) per cent ammonia solution) shall be available for chlorine leak detection. Where ton containers are used, a leak repair kit approved by the Chlorine Institute shall be provided. (3-30-07)

c. Protective equipment. (3-30-07)

i. At least one pair of rubber gloves, a dust respirator of a type certified by NIOSH for toxic dusts, an apron or other protective clothing, and goggles or face mask shall be provided for each operator. (3-30-07)

ii. A deluge shower and eyewashing device shall be installed where strong acids and alkalis are used or stored. A water holding tank that will allow water to come to room temperature shall be installed in the water line feeding the deluge shower and eyewashing device. Other methods of water tempering will be considered on an individual basis. (5-8-09)

iii. For chemicals other than strong acids and alkalis, an appropriate eye washing device or station shall be provided. (5-8-09)

iv. Other protective equipment shall be provided as necessary. (3-30-07)

06. Design Requirements for Specific Applications. In addition to Subsection 531.01 through 531.03, the following design requirements apply for the specific applications within Subsection 531.06 of this rule. (5-8-09)

a. Sodium chlorite for chlorine dioxide generation. Positive displacement feeders shall be provided. Tubing for conveying sodium chlorite or chlorine dioxide solutions shall be Type 1 PVC, polyethylene or materials recommended by the manufacturer. Chemical feeders may be installed in chlorine rooms if sufficient space is provided. Otherwise, facilities meeting the requirements of chlorine rooms shall be provided. Feed lines shall be installed in a manner to prevent formation of gas pockets and shall terminate at a point of positive pressure. Check valves shall be provided to prevent the backflow of chlorine into the sodium chlorite line. (3-30-07)

b. Hypochlorite facilities shall meet the following requirements: (5-8-09)

i. Hypochlorite shall be stored in the original shipping containers or in hypochlorite compatible containers. Storage containers or tanks shall be sited out of the sunlight in a cool and ventilated area. (5-8-09)

ii. Stored hypochlorite shall be pumped undiluted to the point of addition. Where dilution is unavoidable, deionized or softened water shall be used. (3-30-07)

iii. Storage areas, tanks, and pipe work shall be designed to avoid the possibility of uncontrolled discharges and a sufficient amount of appropriately selected spill absorbent shall be stored on-site. (3-30-07)

iv. Hypochlorite feeders shall be positive displacement pumps with compatible materials for wetted surfaces. (5-8-09)

v. To avoid air locking in smaller installations, small diameter suction lines shall be used with foot valves and degassing pump heads. In larger installations flooded suction shall be used with pipe work arranged to ease escape of gas bubbles. Calibration tubes or mass flow monitors which allow for direct physical checking of actual feed rates shall be fitted. (3-30-07)

vi. Injectors shall be made removable for regular cleaning where hard water is to be treated. (3-30-07)

c. When ammonium sulfate is used, the tank and dosing equipment contact surfaces shall be made of corrosion resistant non-metallic materials. Provision shall be made for removal of the agitator after dissolving the solid. The tank shall be fitted with a lid and vented outdoors. Injection of the solution should take place in the center of treated water flow at a location where there is high velocity movement. (3-30-07)

d. When aqua ammonia (ammonium hydroxide) is used, the feed pumps and storage shall be enclosed and separated from other operating areas. The aqua ammonia room shall be equipped as required for chlorinator rooms with the following changes: (3-30-07)

i. A corrosion resistant, closed, unpressurized tank shall be used for bulk storage, vented through an inert liquid trap to a high point outside and an incompatible connector, or lockout provisions shall be made to prevent accidental addition of other chemicals to the storage tank. (3-30-07)

ii. The storage tank shall be designed to avoid conditions where temperature increases cause the ammonia vapor pressure over the aqua ammonia to exceed atmospheric pressure. This capability can be provided by cooling/refrigeration or diluting or mixing the contents with water without opening the system. (5-8-09)

iii. The aqua ammonia shall be conveyed direct from storage to the treated water stream injector without the use of a carrier water stream unless the carrier stream is softened. (3-30-07)

iv. The point of delivery to the main water stream shall be placed in a region of turbulent water flow. (3-30-07)

v. Provisions shall be made for easy access for removal of calcium scale deposits from the injector. (3-30-07)

532. FACILITY AND DESIGN STANDARDS: DESIGN STANDARDS FOR SOFTENING.
The softening process selected must be based upon the mineral qualities of the raw water and the desired finished water quality in conjunction with requirements for disposal of sludge or brine waste (see Section 540), cost of plant, cost of chemicals, and plant location. Applicability of the process chosen shall be demonstrated. (4-4-13)

01. Lime or Lime-Soda Process. Rapid mix, flocculation, and sedimentation processes shall meet the requirements of Section 520. In addition the following requirements must be met: (3-30-07)

a. When split treatment is used, an accurate means of measuring and splitting the flow must be provided. (3-30-07)

b. Rapid mix basins must provide not more than thirty (30) seconds detention time with adequate velocity gradients to keep the lime particles dispersed. (3-30-07)

c. Equipment for stabilization of water softened by the lime or lime-soda process is required, see Section 537. (3-30-07)

d. Mechanical sludge removal equipment shall be provided in the sedimentation basin. (3-30-07)

e. Provisions must be included for proper disposal of softening sludges; see Section 540. (3-30-07)

f. The plant processes must be manually started following shut-down. (3-30-07)

02. Cation Exchange Process. (3-30-07)

a. Pre-treatment is required when the content of iron, manganese, or a combination of the two, is one milligram per liter (1 mg/l) or more. (3-30-07)

b. The units may be of pressure or gravity type, of either an upflow or downflow design. Automatic regeneration based on volume of water softened shall be used unless manual regeneration is justified and is approved by the Department. A manual override shall be provided on all automatic controls. (3-30-07)

c. Rate-of-flow controllers or the equivalent shall be used to control the hydraulic loading of cation exchange units. (3-30-07)

d. The bottoms, strainer systems and support for the exchange resin shall conform to the criteria provided for rapid rate gravity filters in Section 521. (3-30-07)

e. Cross Connection Control. Backwash, rinse and air relief discharge pipes shall be installed in such a manner as to prevent any possibility of back-siphonage. (3-30-07)

f. A bypass must be provided around softening units to produce a blended water of desirable hardness. Totalizing meters must be installed on the bypass line and on each softener unit. The bypass line must have a shutoff valve. (3-30-07)

g. When the applied water contains a chlorine residual, the cation exchange resin shall be a type that is not damaged by residual chlorine. (3-30-07)

h. Smooth-nose sampling taps must be provided for the collection of representative samples. The taps shall be located to provide for sampling of the softener influent, effluent, blended water, and on the brine tank discharge piping. The sampling taps for the blended water shall be at least twenty (20) feet downstream from the point of blending. Petcocks are not acceptable as sampling taps. (3-30-07)

i. Brine and salt storage tanks shall meet the following requirements: (3-30-07)

i. Salt dissolving or brine tanks and wet salt storage tanks must be covered and must be corrosion-resistant. (3-30-07)

ii. The make-up water inlet must be protected from back-siphonage. (3-30-07)

iii. Wet salt storage basins must be equipped with manholes or hatchways for access and for direct dumping of salt from truck or railcar. Openings must be provided with raised curbs and watertight covers having overlapping edges similar to those required for finished water reservoirs. (3-30-07)

iv. Overflows, where provided, must be protected with twenty-four (24) mesh or similar non-corrodible screens, and must terminate with either a turned downed bend having a proper free fall discharge or a self-closing flap valve. (4-7-11)

v. The salt shall be supported on graduated layers of gravel placed over a brine collection system. (3-30-07)

vi. Alternative designs which are conducive to frequent cleaning of the wet salt storage tank may be considered. (3-30-07)

vii. An eductor may be used to transfer brine from the brine tank to the softeners. If a pump is used, a brine measuring tank or means of metering shall be provided to obtain the proper dilution. (3-30-07)

j. Suitable disposal must be provided for brine waste; see Section 540. Where the volume of spent brine must be reduced, consideration may be given to using a part of the spent liquid concentrate for a subsequent regeneration. (3-30-07)

k. Pipes and contact materials must be resistant to the aggressiveness of salt. Plastic and red brass are acceptable piping materials. Steel and concrete must be coated with a non-leaching protective coating which is compatible with salt and brine. (3-30-07)

l. Bagged salt and dry bulk salt storage shall be enclosed and separated from other operating areas in order to prevent damage to equipment. (3-30-07)

533. FACILITY AND DESIGN STANDARDS: DESIGN STANDARDS FOR TASTE AND ODOR CONTROL.

Provision shall be made for the control of taste and odor. Chemicals shall be added sufficiently ahead of other treatment processes to assure adequate contact time for an effective and economical use of the chemicals. Where severe taste and odor problems are encountered, in-plant studies, pilot plant studies, or both in-plant and pilot plant studies may be required. See Subsection 501.19 for general information on conducting pilot studies. (4-4-13)

01. Chlorination. When using chlorination as a method of taste and odor control adequate contact time must be provided to complete the chemical reactions involved. (3-30-07)

02. Chlorine Dioxide. Provisions shall be made for proper storing and handling of the sodium chlorite, so as to eliminate any danger of explosion. (3-30-07)

03. Powdered Activated Carbon. (3-30-07)

a. The carbon can be added as a pre-mixed slurry or by means of a dry-feed machine as long as the carbon is properly wetted. (3-30-07)

b. Continuous agitation or resuspension equipment is necessary to keep the carbon from depositing in the slurry storage tank. (3-30-07)

c. Provision shall be made for adequate dust control. (3-30-07)

d. Powdered activated carbon shall be handled as a potentially combustible material. (3-30-07)

04. Granular Activated Carbon. Replacement of anthracite with GAC may be considered as a control measure for geosmin and methyl isoborneol (MIB) taste and odors from algae blooms in surface water applications. Demonstration studies are required by the Department. (3-30-07)

05. Copper Sulfate and Other Copper Compounds. Continuous or periodic treatment of surface water with copper compounds to kill algae or other growths shall be controlled to prevent copper in excess of one point zero (1.0) milligrams per liter as copper in the plant effluent or distribution system. Care shall be taken to assure an even distribution of the chemical within the treatment area. (3-30-07)

06. Potassium Permanganate. Application of potassium permanganate may be considered, providing the treatment shall be designed so that the products of the reaction are not visible in the finished water. (3-30-07)

07. Ozone. Ozonation may be used as a means of taste and odor control. Adequate contact time must be provided to complete the chemical reactions involved. (3-30-07)

08. Other Methods. Other methods of taste and odor control shall be made only after pilot plant tests and approval of the Department. (3-30-07)

534. FACILITY AND DESIGN STANDARDS: AERATION PROCESSES.
Public water systems that install aeration treatment are subject to the Rules of the Department of Environmental Quality, IDAPA 58.01.01, "Rules for the Control of Air Pollution in Idaho." The system owner or the design engineer shall contact one of the Department's regional offices for information on obtaining a permit or an exemption for the emissions resulting from the aeration process. General information may be found on the DEQ website http://www.deq.idaho.gov. (3-30-07)

01. Natural Draft Aeration. Design shall provide: (3-30-07)

a. Perforations in the distribution pan three sixteenths to one-half (3/16 – ½) inches in diameter, spaced one to three (1-3) inches on centers to maintain a six (6) inch water depth. (3-30-07)

b. For distribution of water uniformly over the top tray. (3-30-07)

c. Discharge through a series of three (3) or more trays with separation of trays not less than twelve (12) inches. (3-30-07)

d. Loading at a rate of one to five (1-5) gallons per minute for each square foot of total tray area. (3-30-07)

e. Trays with slotted, heavy wire (1/2 inch openings) mesh or perforated bottoms. (3-30-07)

f. Construction of durable material resistant to aggressiveness of the water and dissolved gases. (3-30-07)

g. Protection from insects by twenty-four (24) mesh or similar non-corrodible screen. (4-7-11)

02. Forced or Induced Draft Aeration. Devices shall be designed to: (3-30-07)

a. Include a blower with a weatherproof motor in a tight housing and screened enclosure. (3-30-07)

b. Ensure adequate counter current of air through the enclosed aerator column. (3-30-07)

c. Exhaust air directly to the outside atmosphere. (3-30-07)

d. Include a down-turned and twenty-four (24) mesh or similar non-corrodible screened air outlet and inlet. (4-7-11)

e. Be such that air introduced in the column shall be as free from obnoxious fumes, dust, and dirt as possible. (3-30-07)

f. Be such that sections of the aerator can be easily reached or removed for maintenance of the interior or installed in a separate aerator room. (3-30-07)

g. Provide loading at a rate of one to five (1-5) gallons per minute for each square foot of total tray area. (3-30-07)

h. Ensure that the water outlet is adequately sealed to prevent unwarranted loss of air. (3-30-07)

i. Discharge through a series of five (5) or more trays with separation of trays not less than six (6) inches or as approved by the Department. (3-30-07)

j. Provide distribution of water uniformly over the top tray. (3-30-07)

k. Be of durable material resistant to the aggressiveness of the water and dissolved gases. (3-30-07)

03. Spray Aeration. Design shall provide: (3-30-07)

a. A hydraulic head of between five (5) and twenty-five (25) feet. (3-30-07)

b. Nozzles, with the size, number, and spacing of the nozzles being dependent on the flowrate, space, and the amount of head available. (3-30-07)

c. Nozzle diameters in the range of one (1) to one and one-half (1.5) inches to minimize clogging. (3-30-07)

d. An enclosed basin to contain the spray. Any openings for ventilation must be protected with a twenty-four (24) mesh or similar non-corrodible screen. (4-7-11)

04. Pressure Aeration. Pressure aeration may be used for oxidation purposes only if the pilot plant study indicates the method is applicable; it is not acceptable for removal of dissolved gases. See Subsection 501.19 for general information on conducting pilot studies. Filters following pressure aeration must have adequate exhaust devices for release of air. Pressure aeration devices shall be designed to give thorough mixing of compressed air with water being treated and provide twenty-four (24) mesh or similar non-corrodible screened and filtered air, free of obnoxious fumes, dust, dirt and other contaminants. (4-4-13)

05. Packed Tower Aeration. Packed tower aeration may be used for the removal of volatile organic chemicals, trihalomethanes, carbon dioxide, and radon. Final design shall be based on the results of pilot studies and be approved by the Department. (3-30-07)

a. Process design criteria. (3-30-07)

i. Justification for the design parameters selected (i.e., height and diameter of unit, air to water ratio, packing depth, surface loading rate, etc.) shall be provided to the Department for review. The pilot study shall evaluate a variety of loading rates and air to water ratios at the peak contaminant concentration. Special consideration shall be given to removal efficiencies when multiple contaminations occur. Where there is considerable past performance data on the contaminant to be treated and there is a concentration level similar to previous projects, the Department may approve the process design based on use of appropriate calculations without a pilot study. (4-4-13)

ii. The tower shall be designed to reduce contaminants to below the maximum contaminant level and to the lowest practical level. (3-30-07)

iii. The type and size of the packing used in the full scale unit shall be the same as that used in the pilot study. (3-30-07)

iv. The maximum air to water ratio for which credit will be given is 80:1. (3-30-07)

v. The design shall consider potential fouling problems from calcium carbonate and iron precipitation and from bacterial growth. It may be necessary to provide pretreatment. Disinfection capability shall be provided prior to and after packed tower aeration. (3-30-07)

vi. The effects of temperature shall be considered. (3-30-07)

vii. Redundant packed tower aeration capacity at the design flowrate shall be provided. (3-30-07)

b. The tower may be constructed of stainless steel, concrete, aluminum, fiberglass or plastic. Uncoated carbon steel is not allowed. Towers constructed of light-weight materials shall be provided with adequate support to prevent damage from wind. Packing materials shall be resistant to the aggressiveness of the water, dissolved gases and cleaning materials and shall be suitable for contact with potable water. (3-30-07)

c. Water flow system. (3-30-07)

i. Water shall be distributed uniformly at the top of the tower using spray nozzles or orifice-type distributor trays that prevent short circuiting. (3-30-07)

ii. A mist eliminator shall be provided above the water distributor system. (3-30-07)

iii. A side wiper redistribution ring shall be provided at least every ten (10) feet in order to prevent water channeling along the tower wall and short circuiting. (3-30-07)

iv. Sample taps shall be provided in the influent and effluent piping. The sample taps shall satisfy the requirements of Subsection 501.09. (5-8-09)

v. The effluent sump, if provided, shall have easy access for cleaning purposes and be equipped with a drain valve. The drain shall not be connected directly to any storm or sanitary sewer. (3-30-07)

vi. The design shall prevent freezing of the influent riser and effluent piping when the unit is not operating. (3-30-07)

vii. The water flow to each tower shall be metered. (3-30-07)

viii. An overflow line shall be provided which discharges twelve (12) to fourteen (14) inches above a splash pad or drainage inlet. Proper drainage shall be provided to prevent flooding of the area. (3-30-07)

ix. Means shall be provided to prevent flooding of the air blower. (3-30-07)

d. Air flow system. (3-30-07)

i. The air inlet to the blower and the tower discharge vent shall be down-turned and protected with a non-corrodible twenty-four (24) mesh screen to prevent contamination from extraneous matter. (3-30-07)

ii. The air inlet shall be in a protected location. (3-30-07)

iii. An air flow meter shall be provided on the influent air line or an alternative method to determine the air flow shall be provided. (3-30-07)

iv. A positive air flow sensing device and a pressure gauge must be installed on the air influent line. The positive air flow sensing device must be a part of an automatic control system which will turn off the influent water if positive air flow is not detected. The pressure gauge will serve as an indicator of fouling buildup. (3-30-07)

v. A backup motor for the air blower must be readily available. (3-30-07)

e. Other features that shall be provided: (3-30-07)

i. A sufficient number of access ports with a minimum diameter of twenty-four (24) inches to facilitate inspection, media replacement, media cleaning and maintenance of the interior. (3-30-07)

ii. A method of cleaning the packing material when iron, manganese, or calcium carbonate fouling may occur. (3-30-07)

iii. Tower effluent collection and pumping wells constructed to clearwell standards. (3-30-07)

iv. Provisions for extending the tower height without major reconstruction. (3-30-07)

v. No bypass shall be provided unless specifically approved by the Department. (3-30-07)

vi. Disinfection and adequate contact time after the water has passed through the tower and prior to the distribution system. (3-30-07)

vii. Adequate packing support to allow free flow of water and to prevent deformation with deep packing heights. (3-30-07)

viii. Operation of the blower and disinfectant feeder equipment during power failures. (3-30-07)

ix. Adequate foundation to support the tower and lateral support to prevent overturning due to wind loading. (3-30-07)

x. Fencing and locking gate to prevent vandalism. (3-30-07)

xi. An access ladder with safety cage for inspection of the aerator including the exhaust port and demister. (3-30-07)

xii. Electrical interconnection between blower, disinfectant feeder and supply pump. (3-30-07)

06. Other Methods of Aeration. Other methods of aeration may be used if applicable to the treatment needs. Such methods include but are not restricted to spraying, diffused air, cascades and mechanical aeration. The treatment processes are subject to the approval of the Department. (3-30-07)

07. Protection of Aerators. All aerators except those discharging to lime softening or clarification plants shall be protected from contamination by birds, insects, wind borne debris, rainfall and water draining off the exterior of the aerator. (3-30-07)

08. Disinfection. Ground water supplies exposed to the atmosphere by aeration must receive disinfection as described in Section 530 as the minimum additional treatment. (4-4-13)

535. FACILITY AND DESIGN STANDARDS: DESIGN STANDARDS FOR IRON AND MANGANESE CONTROL SYSTEMS.

Iron and manganese control, as used herein, refers solely to treatment processes designed specifically for this purpose. The treatment process used will depend upon the character of the raw water. The selection of one (1) or more treatment processes must meet specific local conditions as determined by engineering investigations, including chemical analyses of representative samples of water to be treated, and receive the approval of the Department. The Department may require a pilot plant study in order to gather all information pertinent to the design. See Subsection 501.19 for general information on conducting pilot studies. (4-4-13)

01. Removal by Oxidation, Detention and Filtration. (3-30-07)

a. Oxidation may be by aeration or by chemical oxidation with chlorine, potassium permanganate, ozone or chlorine dioxide. (3-30-07)

b. Detention time: (3-30-07)

i. A minimum detention time of thirty (30) minutes shall be provided following aeration to ensure that the oxidation reactions are as complete as possible. This minimum detention may be omitted only where a pilot plant study indicates no need for detention. The detention basin may be designed as a holding tank without provisions for sludge collection but with sufficient baffling to prevent short circuiting. (3-30-07)

ii. Sedimentation basins shall be provided when treating water with high iron or manganese content, or where chemical coagulation is used to reduce the load on the filters. Provisions for sludge removal shall be made. (5-8-09)

c. Filtration. Rapid rate pressure filters are normally used for iron and manganese removal. Pressure filters shall not be used in the filtration of surface or other polluted waters or following lime-soda softening. (3-30-07)

i. The rate of filtration shall not exceed three (3) gallons per minute per square foot of filter area except where in-plant testing as approved by the Department has demonstrated satisfactory results at higher rates. (3-30-07)

ii. The filters shall be designed to provide for: (3-30-07)

(1) Loss of head gauges on the inlet and outlet pipes of each battery of filters. (3-30-07)

(2) An easily readable meter or flow indicator on each battery of filters. (3-30-07)

(3) Filtration and backwashing of each filter individually with an arrangement of piping as simple as possible to accomplish these purposes. (3-30-07)

(4) Minimum side wall shell height of five (5) feet. A corresponding reduction in side wall height is acceptable where proprietary bottoms permit reduction of the gravel depth. (3-30-07)

(5) The top of the wash water collectors to be at least eighteen (18) inches above the surface of the media, (3-30-07)

(6) The underdrain system to efficiently collect the filtered water and to uniformly distribute the backwash water at a rate not less than fifteen (15) gallons per minute per square foot of filter area. (3-30-07)

(7) Backwash flow indicators and controls that are easily readable while operating the control valves. (3-30-07)

(8) An air release valve on the highest point of each filter. (3-30-07)

(9) An accessible manhole to facilitate inspection and repairs for filters thirty-six (36) inches or more in diameter. Sufficient handholds shall be provided for filters less than thirty-six (36) inches in diameter. (3-30-07)

(10) A means to observe the wastewater during backwashing and construction to prevent cross connection. (3-30-07)

02. Removal by Manganese Coated Media Filtration. This process consists of a continuous or batch feed of potassium permanganate to the influent of a manganese coated media filter. (3-30-07)

a. Other oxidizing agents or processes such as chlorination or aeration may be used prior to the permanganate feed to reduce the cost of the chemical. (3-30-07)

b. An anthracite media cap of at least six (6) inches or more as required by the Department shall be provided over manganese coated media. (3-30-07)

c. Normal filtration rate shall be three (3) gallons per minute per square foot. (3-30-07)

d. Normal wash rate shall be eight (8) to ten (10) gallons per minute per square foot with manganese greensand and fifteen (15) to twenty (20) gallons per minute with manganese coated media. (3-30-07)

e. Sample taps shall be provided prior to application of permanganate, immediately ahead of filtration, at points between the anthracite media, and at the filter effluent. The sample taps shall satisfy the requirements of Subsection 501.09. (5-8-09)

03. Removal by Ion Exchange. This process is not acceptable where either the raw water or wash water contains dissolved oxygen or other oxidants. (3-30-07)

04. Biological Removal. Biofiltration to remove manganese, iron, or a combination of manganese and iron requires on-site piloting testing to establish effectiveness. The final filter design shall be based on the on-site pilot plant studies. (5-8-09)

05. Sequestration by Polyphosphates. This process shall not be used when iron, manganese or a combination thereof exceeds one point zero (1.0) mg/l. The total phosphate applied shall not exceed ten (10) mg/l as PO_4. Where phosphate treatment is used, satisfactory chlorine residuals shall be maintained in the distribution

system. Possible adverse affects on corrosion must be addressed when phosphate addition is proposed for iron sequestering. (3-30-07)

a. Stock phosphate solution must be kept covered and disinfected by carrying approximately ten (10) mg/l free chlorine residual unless it is demonstrated to the satisfaction of the Department that the phosphate solution is not able to support bacterial growth and the phosphate solution is being fed from the covered shipping container or an approved disinfected tank. Phosphate solutions having a pH of two point zero (2.0) or less may also be exempted from this requirement by the Department. (4-4-13)

b. Polyphosphates shall not be applied ahead of iron and manganese removal treatment. The point of application shall be prior to any aeration, oxidation or disinfection if no iron or manganese removal treatment is provided. (3-30-07)

06. Sequestration by Sodium Silicates. Sodium silicate sequestration of iron and manganese is allowed only for ground water supplies prior to air contact. On-site pilot studies are required to determine the suitability of sodium silicate for the particular water and the minimum feed needed. Rapid oxidation of the metal ions such as by chlorine or chlorine dioxide must accompany or closely precede the sodium silicate addition. (4-4-13)

a. Sodium silicate addition is applicable to waters containing up to two (2) mg/l of iron, manganese or combination thereof. (3-30-07)

b. Chlorine residuals shall be maintained throughout the distribution system to prevent biological breakdown of the sequestered iron. (3-30-07)

c. The amount of silicate added shall be limited to twenty (20) mg/l as SiO_2, but the amount of added and naturally occurring silicate shall not exceed sixty (60) mg/l as SiO_2. (3-30-07)

d. Sodium silicate shall not be applied ahead of iron or manganese removal treatment. (3-30-07)

07. Sampling Taps. Smooth-nosed sampling taps shall be provided for control purposes. Taps shall be located on each raw water source, each treatment unit influent and each treatment unit effluent. The sample taps shall satisfy the requirements of Subsection 501.09. (5-8-09)

536. FACILITY AND DESIGN STANDARDS: DESIGN STANDARDS FOR FLUORIDATION.

01. Chemical Feed Equipment and Methods. In addition to the requirements in Section 531, fluoride feed equipment shall meet the following requirements: (3-30-07)

a. Scales, loss-of-weight recorders or liquid level indicators, as appropriate, accurate to within five (5) percent of the average daily change in reading shall be provided for chemical feeds. (3-30-07)

b. The accuracy of chemical feeders used for fluoridation shall be plus or minus five (5) percent of the intended dose. (3-30-07)

c. Unsealed storage units for fluorosilicic acid shall be vented to the atmosphere at a point outside any building. (3-30-07)

d. Fluoride compound shall not be added before lime-soda softening or ion exchange softening. (3-30-07)

e. The point of application of fluorosilicic acid, if into a horizontal pipe, shall be in the lower half of the pipe. (3-30-07)

f. A fluoride solution shall be applied by a positive displacement pump having a stroke rate not less than twenty (20) strokes per minute, and at a feed rate not less than twenty (20) percent of the rated capacity of the feed pump. (3-30-07)

g. A spring opposed diaphragm type anti-siphon device shall be provided for all fluoride feed lines and dilution water lines. (3-30-07)

h. Except for constant flow systems, a device to measure the flow of water to be treated is required. (3-30-07)

i. The dilution water pipe shall terminate at least two (2) pipe diameters above the solution tank. (3-30-07)

j. Water used for sodium fluoride dissolution shall be softened if hardness exceeds seventy-five (75) mg/l as calcium carbonate. (3-30-07)

k. Fluoride solutions shall be injected at a point of continuous positive pressure or a suitable air gap provided. (3-30-07)

l. The electrical outlet used for the fluoride feed pump shall be interconnected with the well or service pump. (3-30-07)

m. Consideration shall be given to providing a separate room for fluorosilicic acid storage and feed. (3-30-07)

02. Secondary Controls. Secondary control systems for fluoride chemical feed devices shall be provided as a means of reducing the possibility for overfeed; these may include flow or pressure switches or other devices. (3-30-07)

03. Dust Control. Provision must be made for the transfer of dry fluoride compounds from shipping containers to storage bins or hoppers in such a way as to minimize the quantity of fluoride dust which may enter the room in which the equipment is installed. The enclosure shall be provided with an exhaust fan and dust filter which places the hopper under a negative pressure. Air exhausted from fluoride handling equipment shall discharge through a dust filter to the outside atmosphere of the building. (3-30-07)

537. FACILITY AND DESIGN STANDARDS: DESIGN STANDARDS FOR STABILIZATION.
Water that is unstable due either to natural causes or to subsequent treatment shall be stabilized. The expected treated water quality shall be evaluated to determine what, if any, treatment is necessary. (3-30-07)

01. Carbon Dioxide Addition. (3-30-07)

a. Recarbonation basin design shall provide the following: (3-30-07)

i. A total detention time of twenty (20) minutes. (3-30-07)

ii. A mixing compartment having a detention time of at least three (3) minutes. (3-30-07)

iii. A reaction compartment. (3-30-07)

iv. The mixing and reaction compartments shall have a depth sufficient to provide a diffuser submergence of not less than seven and one-half (7.5) feet and no greater than the manufacturer's recommendation. (3-30-07)

b. Where liquid carbon dioxide is used, adequate precautions must be taken to prevent carbon dioxide from entering the plant from the recarbonation process. (3-30-07)

c. Recarbonation tanks shall be located outside or be sealed and vented to the outside with adequate seals and adequate purge flow of air to ensure workers safety. (3-30-07)

d. Provisions shall be made for draining the recarbonation basin and removing sludge. (3-30-07)

02. Phosphates. The feeding of phosphates may be used for sequestering calcium, for corrosion control, and in conjunction with alkali feed following ion exchange softening. (3-30-07)

a. Stock phosphate solution must be kept covered and disinfected by carrying approximately ten (10) mg/l free chlorine residual unless the phosphate is not able to support bacterial growth and the phosphate is being fed from the covered shipping container. Phosphate solutions having a pH of two point zero (2.0) or less are exempted from this requirement. (3-30-07)

b. Satisfactory chlorine residuals shall be maintained in the distribution system when phosphates are used. (3-30-07)

03. Split Treatment. Raw water may be blended with lime-softened water to partially stabilize the water prior to secondary clarification and filtration. Treatment plants designed to utilize split treatment shall also contain facilities for further stabilization by other methods. (3-30-07)

04. Water Unstable Due to Biochemical Action in Distribution System. Unstable water resulting from the bacterial decomposition of organic matter in water (especially in dead end mains), the biochemical action within tubercles, and the reduction of sulfates to sulfides shall be prevented by the maintenance of a free or combined chlorine residual throughout the distribution system. (5-8-09)

538. – 539. (RESERVED)

540. FACILITY AND DESIGN STANDARDS: DESIGN STANDARDS FOR TREATMENT AND DISPOSAL OF TREATMENT PLANT WASTE RESIDUALS.
Provisions must be made for proper disposal of water treatment plant waste such as sanitary, laboratory, clarification sludge, softening sludge, iron sludge, filter backwash water, and liquid concentrates. In locating waste disposal facilities, due consideration shall be given to preventing potential contamination of the water supply. (3-30-07)

01. Sanitary Waste. The sanitary waste from water treatment plants, pumping stations, and other waterworks installations must receive treatment. Waste from these facilities shall be discharged directly to a sanitary sewer system, when available and feasible, or to an adequate on-site waste treatment facility approved under the provisions of IDAPA 58.01.03, "Individual/Subsurface Sewage Disposal Rules." (3-30-07)

02. Liquid Concentrates. (3-30-07)

a. Waste from ion exchange plants, demineralization plants, reverse osmosis, on-site chlorine generators, or other plants which produce liquid concentrates may be disposed of by the following methods: (4-4-13)

i. Liquid concentrates that contain radionuclides must be further treated to remove the radioactive constituents as sludge. See Subsection 540.03.e. for disposal requirements for sludge that contains radionuclides. The residual liquids from which radionuclides have been removed may be disposed of in accordance with Subsections 540.02.a.ii. through 540.02.a.iv. (4-4-13)

ii. Controlled discharge to a stream or other receiving water body if adequate dilution is available. Such discharge will require a National Pollution Elimination System Permit from the U.S. Environmental Protection Agency, Region 10, 1200 Sixth Avenue, Seattle, WA 98101, Telephone (206) 553-1200. (3-30-07)

iii. Liquid concentrates may be discharged to a sanitary sewer, if available and feasible. Acceptance of such waste must be approved by the sewer authority. (3-30-07)

iv. Subsurface disposal or land application of liquid concentrates may be permitted, but only if such discharge meets the requirements of IDAPA 58.01.03, "Individual/Subsurface Sewage Disposal Rules" for subsurface disposal or the requirements of IDAPA 58.01.17, "Recycled Water Rules" for land application. (5-8-09)

b. Should the nature of the liquid concentrate cause it to be ineligible for permitted discharge as described in Subsection 540.02.a., further onsite treatment of the liquid concentrate may be required in order to

produce sludge and liquid waste that will meet the permit criteria for one (1) or more of the disposal options. (3-30-07)

03. Sludge Waste. Sludge is the solid waste resulting from coagulation, precipitation, or passive settling of liquid concentrates. Depending on composition, liquids remaining after sludge removal may be disposed of by methods described in Subsection 540.02, recycled through the treatment plant, or may be pure enough to be unregulated. The following methods of treatment and disposal apply to sludge: (3-30-07)

a. Precipitative Softening Sludge. (3-30-07)

i. At least two (2) temporary storage lagoons must be provided in order to give flexibility in operation. Provisions must be made for convenient cleaning. An acceptable means of final sludge disposal must be provided. (3-30-07)

ii. Liquid or dewatered precipitative softening sludge may be applied to farm land if heavy metals or other contaminants do not exceed the requirements of IDAPA 58.01.02, "Water Quality Standards." (3-30-07)

iii. Dewatered precipitative softening sludge may be disposed of in a sanitary landfill in accordance with the requirements of IDAPA 58.01.06, "Solid Waste Management Rules." Acceptance of such waste is at the discretion of the landfill authority. (3-30-07)

b. Alum or Ferric Sludge. (3-30-07)

i. Temporary storage lagoons must contain at least two (2) compartments to facilitate independent filling and dewatering operations. Mechanical concentration may be considered. If mechanical dewatering is used, it shall be preceded by sludge concentration and chemical pre-treatment. A pilot plant study is required before the design of a mechanical dewatering installation. See Subsection 501.19 for general information on conducting pilot studies. (4-4-13)

ii. Alum or ferric sludge may be discharged to a sanitary sewer if available and feasible. Acceptance of such waste must be approved by the sewer authority. (3-30-07)

iii. Dewatered alum or ferric sludge may be disposed of in a sanitary landfill in accordance with the requirements of IDAPA 58.01.06, "Solid Waste Management Rules." Acceptance of such waste is at the discretion of the landfill authority. (3-30-07)

iv. Alum or ferric sludge may be disposed of by land application if the permitting requirements of IDAPA 58.01.02, "Water Quality Standards," and IDAPA 58.01.17, "Recycled Water Rules," are met. (3-30-07)

v. Water removed from alum or ferric sludge may be disposed of in the same manner as liquid concentrates, as described in Subsection 540.02. (3-30-07)

c. Red Water. Red water is the waste filter wash water from iron and manganese removal plants. (3-30-07)

i. If sand filters are used they shall have the following features: (3-30-07)

(1) Total filter area shall be sufficient to adequately dewater applied solids. Unless the filter is small enough to be cleaned and returned to service in one (1) day, two (2) or more cells are required. (3-30-07)

(2) The "red water" filter shall have sufficient capacity to contain, above the level of the sand, the entire volume of wash water produced by washing all of the production filters in the plant, unless the production filters are washed on a rotating schedule and the flow through the production filters is regulated by true rate of flow controllers. Then sufficient volume shall be provided to properly dispose of the wash water involved. (3-30-07)

(3) Where freezing is a problem, provisions should be made for covering the filters during the winter months. (3-30-07)

(4) "Red water" filters shall not have common walls with finished water. (3-30-07)

ii. Subsurface infiltration lagoons may be permitted, but only if such discharge meets the requirements of IDAPA 58.01.03, "Individual/Subsurface Sewage Disposal Rules." (3-30-07)

iii. "Red water" may be discharged to a sanitary sewer if available and feasible. Acceptance of such waste must be approved by the sewer authority. Design shall prevent cross connections and there shall be no common walls between potable and non-potable fluid. (4-4-13)

d. Filter Backwash Water. (3-30-07)

i. Recycling is permitted if the backwash waters are returned to the head of the treatment plant or another entry point if supported by engineering studies. Backwash water shall be held for a sufficient time prior to recycling to allow solids to settle out. (3-30-07)

ii. Dewatered sludge from backwash water clarification processes may be disposed of in a sanitary landfill in accordance with the requirements of IDAPA 58.01.06, "Solid Waste Management Rules." Acceptance of such waste must be approved by the landfill authority. (3-30-07)

e. Radioactive Sludge. Waste residuals containing radioactive substances, including, but not limited to granular activated carbon used for radon removal or ion-exchange regeneration waste from uranium removal, must be disposed of in accordance with IDAPA 58.01.10, "Rules Regulating the Disposal of Radioactive Materials Not Regulated Under The Atomic Energy Act of 1954, As Amended." (3-30-07)

i. The buildup of radioactive materials such as uranium or radon and its decay products shall be considered and adequate shielding and safeguards shall be provided for operators and visitors. (3-30-07)

ii. Waste residuals containing naturally occurring radioactive materials that have been concentrated by human activities must be disposed of in an approved hazardous waste landfill (Class D), in accordance with the IDAPA 58.01.10, "Rules Regulating the Disposal of Radioactive Materials not Regulated Under the Atomic Energy Act of 1954, as Amended," and IDAPA 58.01.06, "Solid Waste Management Rules." (3-30-07)

iii. Waste residuals containing greater than point zero five (.05) percent by weight of uranium are subject to licensing and disposal under the regulations of the U.S. Nuclear Regulatory Commission, Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, TX 76011, Phone 817-860-8299. (3-30-07)

f. Arsenic Sludge. Solid waste residuals containing arsenic at a concentration less than five (5) mg/l may be disposed of at a sanitary landfill if permitted under IDAPA 58.01.06, "Solid Waste Management Rules." Solid waste containing arsenic at a concentration greater than five (5) mg/l must be disposed of at an approved hazardous waste landfill. Liquid wastes generated by arsenic treatment processes are subject to the handling and disposal requirements for liquid concentrates, as discussed under Subsection 540.02. (3-30-07)

04. Spent Media. Exhausted ion exchange media, adsorption media, disposable filters, and other components of treatment processes that contain concentrated contaminants shall be disposed of in accordance with IDAPA 58.01.06, "Solid Waste Management Rules," and/or IDAPA 58.01.10, "Rules Regulating the Disposal of Radioactive Materials not Regulated Under the Atomic Energy Act of 1954, as Amended." (3-30-07)

541. FACILITY AND DESIGN STANDARDS: PUMPING FACILITIES.
Pumping facilities shall be designed to maintain the sanitary quality of pumped water. (3-30-07)

01. Pump Houses. Unless otherwise approved by the Department based on documentation provided by the design engineer, pump house components shall be located above-grade. The following requirements apply to pump houses as defined in Section 003 unless it can be shown that some or all of these requirements are not needed to protect the combination of system components in a given structure: (4-4-13)

a. Pump houses shall be readily accessible for operation, maintenance, and repair at all times and

under all weather conditions unless permitted to be out of service for a period of inaccessibility. (3-30-07)

b. Pump houses shall be protected from flooding and shall be adequately drained. The ground surface shall be graded so as to lead surface drainage away from the pump house. Unless otherwise approved by the Department based on documentation provided by the design engineer, the floor surface shall be at least six (6) inches above the final ground surface and pump house components shall be located at least six (6) inches above the floor surface. (4-4-13)

c. Pump houses shall be of durable construction, fire and weather resistant, and with outward-opening doors. All underground structures shall be waterproofed. (3-30-07)

d. Provisions shall be made for adequate heating for the comfort of the operator and the safe and efficient operation of the equipment. In pump houses not occupied by personnel, only enough heat need be provided to prevent freezing of equipment or treatment processes. (3-30-07)

e. Ventilation shall conform to existing local and/or state codes. Adequate ventilation shall be provided for all pumping stations for operator comfort and dissipation of excess heat and moisture from the equipment. In all cases, measures must be taken to minimize corrosion of metallic and electrical components. (3-30-07)

f. Pump houses shall be provided with a locking door or access to prohibit unauthorized entrance and shall be protected to prevent vandalism and entrance by animals. Plans and specifications for pump houses must provide enough detail to enable the reviewing engineer to determine that the facility is secure, safe, accessible, and that it conforms to electrical and plumbing codes. (3-30-07)

g. Pump houses shall be kept clean and in good repair and shall not be used to store toxic or hazardous materials other than those materials required for treatment processes. (3-30-07)

h. A suitable outlet shall be provided for drainage from pump glands without discharging onto the floor. (3-30-07)

i. Floor drains shall not be connected to sewers, storm drains, chlorination room drains, or any other source of contamination unless otherwise approved by the Department based on documentation provided by the design engineer. Gas chlorination room drains shall not be connected to any other drainage system and should terminate in a properly located below ground sump. Sumps for pump house floor drains shall not be closer than thirty (30) feet from any well. (4-4-13)

j. Adequate space shall be provided for the installation of potential additional units and for the safe and efficient servicing of all equipment. (5-8-09)

k. Suction basins shall be watertight, have floors sloped to permit removal of water and settled solids, be covered or otherwise protected against contamination, and have two (2) pumping compartments or other means to allow the suction basin to be taken out of service for inspection maintenance or repair. (3-30-07)

l. Pump houses shall be designed to allow efficient equipment servicing. Crain-ways, hoist beams, eyebolts, or other adequate facilities for servicing or removal of pumps, motors or other heavy equipment shall be provided. Openings in floors, roofs or wherever else shall be provided as needed for removal of heavy or bulky equipment. (3-30-07)

m. All remote controlled stations shall be electrically operated and controlled and shall have signaling apparatus of proven performance. Signaling apparatus shall report automatically when the station is out of service. (3-30-07)

n. Any threaded hose bib installed in the pump house must be equipped with an appropriate backflow prevention device. (3-30-07)

02. **Pumping Units**. At least two (2) pumping units shall be provided for raw water and surface source

pumps. Pumps using seals containing mercury shall not be used in public drinking water system facilities. With any pump out of service, the remaining pump or pumps shall be capable of providing the peak hour demand of the system or a minimum of the maximum day demand plus equalization storage. See Subsection 501.18 for general design requirements concerning fire flow capacity and Subsection 501.07 regarding reliability and emergency operation. The pumping units shall meet the following requirements: (5-8-09)

a. The pumps shall have ample capacity to supply the maximum demand against the required pressure without dangerous overloading. (3-30-07)

b. The pumps shall be driven by prime movers able to meet the maximum horsepower condition of the pumps. (3-30-07)

c. The pumps shall be provided with readily available spare parts and tools. (3-30-07)

d. The pumps shall be served by control equipment that has proper heater and overload protection for air temperature encountered. (3-30-07)

e. Suction lift shall be avoided if possible. When suction lift is used, it shall be within the limits allowed by the manufacturer of the pumps, and provision shall be made for priming the pumps. (3-30-07)

f. Prime water must not be of lesser sanitary quality than that of the water being pumped. Means shall be provided to prevent either backpressure or backsiphonage backflow. When an air-operated ejector is used, the twenty-four (24) mesh or similar non-corrodible screened intake shall draw clean air from a point at least ten (10) feet above the ground or other source of possible contamination, unless the air is filtered by an apparatus approved by the reviewing authority. Vacuum priming may be used. (4-7-11)

03. **Appurtenances**. The following appurtenances shall be provided for all water pumps. Additional requirements specific to well pumps are provided in Section 511. (4-7-11)

a. Pumps shall be protected against freezing and valved to permit satisfactory operation, maintenance, and repair of the equipment. If foot valves are necessary, they shall have a net valve area of at least two and one-half (2.5) times the area of the suction pipe and they shall be screened. Each pump shall have an accessible check valve on the discharge side between the pump and the shut-off valve or a combination valve that performs both control valve and check valve functions. Surge relief measures shall be designed to minimize hydraulic transients. (4-7-11)

b. In general, piping shall be designed so that it will have watertight joints, be protected against surge or water hammer, be provided with suitable restraints where necessary, be designed so that friction losses will be minimized, and not be subject to contamination. Each pump shall have an individual suction line or the suction lines shall be manifolded such that they will ensure similar hydraulic and operating conditions. (3-30-07)

c. Each pump station shall have a standard pressure gauge on its discharge line and suction line. (3-30-07)

d. Water seals shall not be supplied with water of a lesser sanitary quality than that of the water being pumped. Where pumps are sealed with potable water and are pumping water of lesser sanitary quality, the seal shall: (3-30-07)

i. Be provided with either an approved reduced pressure principle backflow preventer or a break tank open to atmospheric pressure, (3-30-07)

ii. Where a break tank is provided, have an air gap of at least six (6) inches or two (2) pipe diameters, whichever is greater, between the feeder line and the flood rim of the tank. (3-30-07)

e. Pumps, their prime movers, and accessories shall be controlled in such a manner that they will operate at rated capacity without dangerous overload. Where two (2) or more pumps are installed, provision shall be made for alternation. Provision shall be made to prevent energizing the motor in the event of a backspin cycle. Equipment shall be provided or other arrangements made to prevent surge pressures from activating controls which

switch on pumps or activate other equipment outside the normal design cycle of operation. (3-30-07)

04. Booster Pumps. In addition to other applicable requirements in Section 541, booster pumps must comply with the following: (3-30-07)

a. In-line booster pumps shall maintain an operating pressure that is consistent with the requirements specified in Subsection 552.01, and shall be supplied with an automatic cutoff when intake pressure is less than or equal to five (5) psi. (3-30-07)

b. Booster pumps with a suction line directly connected to any storage reservoirs shall be protected by an automatic cutoff to prevent pump damage and avoid excessive reservoir drawdown. (3-30-07)

c. Each booster pumping station shall contain not less than two (2) pumps with capacities such that peak hour demand, or a minimum of the maximum day demand plus equalization storage, can be satisfied with any pump out of service. See Subsection 501.18 for general design requirements concerning fire flow capacity. (5-8-09)

542. FACILITY AND DESIGN STANDARDS - DISTRIBUTION SYSTEM.

01. Protection from Contamination. The distribution system shall be protected from contamination and be designed to prevent contamination by steam condensate or cooling water from engine jackets or other heat exchange devices. (3-30-07)

02. Installation of Water Mains. Division 400 of "Idaho Standards for Public Works Construction," referenced in Subsection 002.02, may be used as guidance for installation of water mains. In addition, the following provisions shall apply: (3-30-07)

a. Installed pipe shall be pressure tested and leakage tested in accordance with the applicable AWWA Standards, incorporated by reference into these rules at Subsection 002.01. (3-30-07)

b. New, cleaned, and repaired water mains shall be disinfected in accordance with AWWA Standard C651, incorporated by reference into these rules at Subsection 002.01. The specifications shall include detailed procedures for the adequate flushing, disinfection, and microbiological testing of all water mains. (3-30-07)

c. In areas where aggressive soil conditions are suspected or known to exist, analyses shall be performed to determine the actual aggressiveness of the soil. If soils are found to be aggressive, action shall be taken to protect metallic joint restraints and the water main, such as encasement in polyethylene, provision of cathodic protection, or use of corrosion resistant materials. (3-30-07)

d. The Department must approve any interconnection between potable water supplies, taking into account differences in water quality between the two systems. (3-30-07)

e. A continuous and uniform bedding shall be provided in the trench for all buried pipe. Backfill material shall be tamped in layers around the pipe and to a sufficient height above the pipe to adequately support and protect the pipe. Stones found in the trench shall be removed for a depth of at least six (6) inches below the bottom of the pipe. (3-30-07)

f. Water mains shall be covered with sufficient earth or other insulation to prevent freezing. (3-30-07)

g. All tees, bends, plugs and hydrants shall be provided with reaction blocking, tie rods or joints designed to prevent movement. (3-30-07)

03. Pressure Relief Valves. All pumps connected directly to the distribution system shall be designed in conjunction with a water pressure relief valve of type, size, and material approved by the Department unless the Department approves another method that will prevent excessive pressure development. (3-30-07)

04. Flow Meter Required. Unless otherwise approved by the Department based on documentation provided by the design engineer, all source pumps and booster pumps connected directly to the distribution system

shall have an instantaneous and totalizing flow meter, equipped with nonvolatile memory, installed in accordance with manufacture's specifications. (4-4-13)

05. Pipe and Jointing Materials. Pipe and jointing materials comply with the standards set forth in Subsection 501.01. Pipe shall be manufactured of materials resistant internally and externally to corrosion and not imparting tastes, odors, color, or any contaminant into the system. Where distribution systems are installed in areas of ground water contaminated by organic compounds: (3-30-07)

a. Pipe and joint materials which do not allow permeation of the organic compounds shall be used; and (4-11-06)

b. Non-permeable materials shall be used for all portions of the system including pipe, joint materials, hydrant leads, and service connections. (4-11-06)

06. Size of Water Mains. When fire hydrants are provided, they shall not be connected to water mains smaller than six (6) inches in diameter, and fire hydrants shall not be installed unless fireflow volumes are available. If fire flow is not provided, water mains shall be no less than three (3) inches in diameter. Any departure from this minimum standard shall be supported by hydraulic analysis and detailed projections of water use. (3-30-07)

07. Separation of Potable, Non-Potable, and Raw Water Pipelines. The requirements for the protection of potable mains from contamination by non-potable pipelines are described in Subsections 542.07.a. through 542.07.c. For the purposes of Subsection 542.07, the term "pipeline" applies to both mains and services. The Department will use the Memorandum of Understanding with the Plumbing Bureau as guidance in determining the relative responsibilities for reviewing service lines. The conditions of Subsections 542.07.a. and 542.07.b. shall apply to all potable services constructed or reconstructed after April 15, 2007 and where the Department or the QLPE is the reviewing authority. Raw water pipelines must be protected from contamination from non-potable pipelines, and must not contaminate potable pipelines. They shall therefore meet equivalent separation distances shown below from either potable or non-potable pipelines. (4-4-13)

a. Parallel installation requirements. (5-8-09)

i. Potable mains in relation to non-potable mains. (5-8-09)

(1) Greater than ten (10) feet separation: no additional requirements. (4-4-13)

(2) Ten (10) feet to six (6) feet separation: separate trenches, with the bottom of the potable main above the top of the non-potable main, and non-potable main constructed with potable water class pipe. (4-4-13)

(3) Less than six (6) feet separation: design engineer to submit data to the Department for review and approval showing that this installation will protect public health and the environment, non-potable main to be constructed of potable water class pipe, and with the bottom of the potable main above the top of the non-potable main. (4-4-13)

(4) Non-potable mains are prohibited from being located in the same trench as potable mains. (3-30-07)

(5) Pressure wastewater mains or other pressurized mains or lines containing non-potable fluids shall be no closer horizontally than ten (10) feet from potable mains. (4-7-11)

ii. New potable services in relation to non-potable services, new potable services in relation to non-potable mains, and new non-potable services in relation to potable mains. (5-8-09)

(1) Greater than six (6) feet separation: no additional requirements based on separation distance. (5-8-09)

(2) Less than six (6) feet separation: design engineer to submit data that this installation will protect public health and the environment and non-potable service constructed with potable water class pipe. (5-8-09)

(3) New potable services are prohibited from being located in the same trench as non-potable mains or non-potable services. (5-8-09)

b. Requirements for potable water mains or services crossing non-potable water mains or services. (4-4-13)

i. If there is eighteen (18) inches or more vertical separation with the potable water pipeline above the non-potable pipeline, then the potable pipeline joints must be as far as possible from the non-potable water pipeline. (4-7-11)

ii. If there is eighteen (18) inches or more vertical separation with the potable water pipeline below the non-potable pipeline, then the potable pipeline joints must be as far as possible from the non-potable pipeline, and the non-potable pipeline must be supported through the crossing to prevent settling. (4-7-11)

iii. Less than eighteen (18) inches vertical separation: (5-8-09)

(1) Potable pipeline joint to be as far as possible from the non-potable pipeline; and either: (5-8-09)

(a) Non-potable pipeline constructed with potable water class pipe for a minimum of ten (10) feet either side of potable pipeline with a single twenty (20) foot section of potable water class pipe centered on the crossing; or (5-8-09)

(b) Sleeve non-potable or potable pipeline with potable water class pipe for ten (10) feet either side of crossing. Use of hydraulic cementitious materials such as concrete, controlled density fill, and concrete slurry encasement is not allowed as a substitute for sleeving. (5-8-09)

(2) If potable pipeline is below non-potable pipeline, the non-potable pipeline must also be supported through the crossing to prevent settling. (5-8-09)

iv. Pressure wastewater mains or other pressurized mains or lines containing non-potable fluids shall be no closer vertically than eighteen (18) inches from potable mains. (4-7-11)

c. Existing potable services in relation to new non-potable mains, existing non-potable services in relation to new potable mains, and existing potable services in relation to new non-potable services shall meet the requirements of Subsection 542.07.b., where practical, based on cost, construction factors, and public health significance. If the Department determines that there are significant health concerns with these services, such as where a large existing service serves an apartment building or a shopping center, then the design shall conform with Subsection 542.07.b. (5-8-09)

08. Separation from Subsurface Wastewater Systems and Other Sources of Contamination. A minimum horizontal distance of twenty-five (25) feet shall be maintained between any potable water pipe and a septic tank or subsurface wastewater disposal system. Guidance on separation from other potential sources of contamination, such as stormwater facilities, may be found on the DEQ website http://www.deq.idaho.gov. (3-30-07)

09. Dead End Mains. All dead end water mains shall be equipped with a means of flushing and shall be flushed at least semiannually at a water velocity of two and one-half (2.5) feet per second. (3-30-07)

a. Dead ends shall be minimized by making appropriate tie-ins whenever practical in order to provide increased reliability of service and reduce head loss. (4-11-06)

b. Flushing shall be performed in such a way as to minimize any erosion of unprotected areas and, if applicable, shall be coordinated with the owner of the receiving system. No water main flushing device shall be directly connected to any sewer. (4-4-13)

c. Stub outs for future main connections shall meet all requirements for dead end mains listed in Subsection 542.09 as determined by the Department. Flushing devices may be temporary in nature. (4-7-11)

10. Repair of Leaks. Leaking water mains shall be repaired or replaced upon discovery and disinfected in accordance with American Water Works Association (AWWA) Standards, incorporated by reference into these rules at Subsection 002.01. (3-30-07)

11. Separation from Structures. Water mains shall be separated by at least five (5) feet from buildings, industrial facilities, and other permanent structures. (3-30-07)

12. Meter Vault Required. All new public water systems shall include a meter vault at each service connection. A lockable shut-off valve shall be installed in the meter vault. This requirement shall also apply to extensions of the distribution system of existing public water systems. (3-30-07)

13. Minimum Pressure at Building Sites. Any public water system constructed or undergoing material modification where topographical relief may affect water pressure at the customers' premises shall provide the Department with an analysis which demonstrates that the pressure at each designated building site will be at least forty (40) psi, based on dynamic pressure in the main, as set forth in Subsections 552.01.b.i. and 552.01.b.v., plus a static compensation from the elevation of the main to the elevation of each building site. (5-8-09)

a. If forty (40) psi cannot be provided at each designated building site, the Department may require that reasonable effort be made to provide notification to existing and potential customers of the expected pressure. (5-3-03)

b. The Department will not authorize a service connection at any designated building site where analysis indicates that pressure will be less than twenty (20) psi static pressure (or twenty-six point five (26.5) psi for two (2) story buildings). (5-3-03)

14. Isolation Valves. A sufficient number of valves shall be provided on water mains to minimize inconvenience and sanitary hazards during repairs. (3-30-07)

15. Air Valves. At high points in water mains where air can accumulate, provisions shall be made to remove the air by means of air release and vacuum relief valves or combination air release/vacuum relief valves. Air release valves, vacuum relief valves, or combination air release/vacuum relief valves may not be required if vacuum relief and air release functions in the pipeline can be adequately handled by approved appurtenances such as fire hydrants. (5-8-09)

a. The open end of an air valve shall be extended to at least one (1) foot above grade and provided with a twenty-four (24) mesh or similar non-corrodible screened, downward-facing elbow. When the air vent on an air relief valve cannot be practically installed above ground, the vent may be below grade provided that the valve is manually operated and the air vent is extended to the top of the valve vault and provided with a twenty-four (24) mesh or similar non-corrodible screened, downward-facing elbow. In addition, for below ground vents, the valve vault must be rated for appropriate traffic loading in traffic areas and the vault drained to daylight or provided with adequate drainage to prevent flooding of the vault. (4-7-11)

b. Discharge piping from air valves or combination air release/vacuum relief valves shall not connect directly to any storm drain, storm sewer, or sanitary sewer. (4-7-11)

16. Backflow Protection. Automatic air relief valves shall be equipped with a means of backflow protection. (3-30-07)

17. Surface Water Crossings. For the purposes of Subsection 542.17, surface water is defined as all surface accumulations of water, natural or artificial, public or private, or parts thereof which are wholly or partially within, which flow through or border upon the state. This includes, but is not limited to, rivers, streams, canals, ditches, lakes, and ponds. Surface water crossings, whether over or under water, shall be constructed as follows: (5-8-09)

a. Above water crossings: the pipe shall be adequately supported and anchored, protected from damage and freezing, and shall be accessible for repair or replacement. (4-11-06)

b. Under water crossings: A minimum cover of two (2) feet shall be provided over the pipe. When crossing a water course that is greater than fifteen (15) feet in width, the following shall be provided: (4-11-06)

i. The pipe shall be of special construction, having flexible, restrained, or welded water-tight joints; and (4-11-06)

ii. Valves shall be provided at both ends of water crossings so that the section can be isolated for testing or repair; the valves shall be easily accessible and not subject to flooding; and (4-11-06)

iii. Permanent taps or other provisions to allow insertion of a small meter to determine leakage and obtain water samples shall be made on each side of the valve closest to the supply source. (4-11-06)

543. FACILITY AND DESIGN STANDARDS: CROSS CONNECTION CONTROL.
There shall be no connection between the distribution system and any pipes, pumps, hydrants, water loading stations, or tanks whereby unsafe water or other contaminating materials may be discharged or drawn into a public water system. The water purveyor is responsible through its cross connection control program to take reasonable and prudent measures to protect the water system against contamination and pollution from cross connections through premises isolation or containment, internal or in-plant isolation, fixture protection, or some combination of premises isolation, internal isolation, and fixture protection. (4-7-11)

01. Testable Assemblies. All double check valve backflow prevention assemblies, reduced pressure principle backflow prevention assemblies, spill resistant vacuum breakers, and pressure vacuum breakers used must pass a performance test conducted by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research (USC Foundation) and be included on the USC Foundation "List of Approved Assemblies." (4-7-11)

02. Atmospheric Vacuum Breakers. All atmospheric vacuum breakers used shall be marked approved either by the International Association of Plumbing and Mechanical Officials (IAPMO) or by the American Society of Sanitation Engineers (ASSE). (5-8-09)

03. Replacement Parts and Components. All replacement parts and components, including resilient seated shutoff valves, shall meet original manufacturer's specifications or otherwise be approved by the USC Foundation as replacement parts or components for use on double check valve backflow prevention assemblies, reduced pressure principle backflow prevention assemblies, pressure vacuum breakers, and spill resistant pressure vacuum breakers. The design, material, or operational characteristics of any assembly must not be altered during maintenance or repair. (4-4-13)

04. Assembly Selection. Appropriate and adequate backflow prevention assembly types for various facilities, fixtures, equipment, and uses of water should be selected from the AWWA Pacific Northwest Section Cross Connection Control Manual, the Uniform Plumbing Code, the AWWA Recommended Practice for Backflow Prevention and Cross Connection Control (M14), the USC Foundation Manual of Cross Connection Control, or other sources deemed acceptable by the Department. The selected assembly manufacturer model number must be included on the USC Foundation "List of Approved Assemblies" and must comply with local ordinances. (4-4-13)

544. FACILITY AND DESIGN STANDARDS: GENERAL DESIGN OF FINISHED WATER STORAGE.
The materials and designs used for finished water storage structures shall provide stability and durability as well as protect the quality of the stored water. Finished water storage structures shall be designed to maintain water circulation and prevent water stagnation. Steel structures and facilities such as steel tanks, standpipes, reservoirs, and elevated tanks shall be designed and constructed in accordance with applicable AWWA Standards, incorporated by reference into these rules at Subsection 002.01. Other materials of construction are acceptable when properly designed to meet the requirements of Section 544. (5-8-09)

01. Sizing and Isolation Requirements. (4-4-13)

a. Storage facilities shall have sufficient capacity, as determined from engineering studies that consider peak flows, fire flow capacity, and analysis of the need for various components of finished storage as

defined under the term "Components of Finished Water Storage" in Section 003. The requirement for storage may be reduced when the source and treatment facilities have sufficient capacity with standby power to supply peak demands of the system. (3-30-07)

b. All storage structures which provide pressure directly to the distribution system, such as elevated storage structures or ground level storage structures with associated pumping systems, shall be designed so they can be isolated and drained for cleaning or maintenance without causing a loss of pressure in the distribution system. (4-4-13)

02. Location. Storage facilities shall be located in a manner that protects against contamination, ensures structural stability, protects against flooding, and provides year-round access by vehicles and equipment needed for repair and maintenance. (5-8-09)

a. If the bottom elevation of a storage reservoir must be below normal ground surface, it shall be placed above the seasonal high ground water table. (3-30-07)

b. Non-potable mains and services, standing water, and similar sources of possible contamination must be kept at least fifty (50) feet from any partially buried or below-ground storage structure or facility, except that non-potable mains and services constructed of potable water class pipe are allowed as close as twenty (20) feet from a partially buried or below-ground storage structure or facility. Partially buried or below-ground storage structures or facilities shall be located a minimum of fifty (50) feet from the nearest property line. (5-8-09)

c. No public water supply storage tank shall be located within five hundred (500) feet of any municipal or industrial wastewater treatment plant or any land which is spray irrigated with wastewater or used for sludge disposal. (3-30-07)

d. The top of a partially buried storage structure shall not be less than two (2) feet above normal ground surface. (3-30-07)

e. Ground-level or above-ground storage structures or facilities shall be located a minimum of twenty (20) feet from the nearest property line and a minimum of twenty (20) feet from any potential source of contamination. (5-8-09)

03. Protection from Contamination. All finished water storage structures shall have suitable watertight roofs which exclude birds, animals, insects, and excessive dust. The installation of appurtenances, such as antennas, shall be done in a manner that ensures no damage to the tank, coatings or water quality, or corrects any damage that occurred. (3-30-07)

04. Protection from Trespassers. Fencing, locks on access manholes, and other necessary precautions shall be provided to prevent trespassing, vandalism, and sabotage. (3-30-07)

05. Drains. No drain on a water storage structure may have a direct connection to a sewer or storm drain. The design shall allow draining the storage facility for cleaning or maintenance without causing loss of pressure in the distribution system. (3-30-07)

06. Overflow. Overflow pipes of any storage structure or facility shall discharge to daylight in a way that will preclude the possibility of backflow to the reservoir and, where practical, be provided with an expanded metal screen installed within the pipe that will exclude rodents and deter vandalism. The overflow pipe shall be of sufficient diameter to permit waste of water in excess of the filling rate. The overflow shall discharge over a drainage inlet structure or a splash plate and, when practical, discharge at an elevation between twelve (12) and twenty-four (24) inches above the receiving surface. (5-8-09)

a. When an internal overflow pipe is used on above-ground tanks, it shall be located in the access tube. (5-8-09)

b. The overflow for ground-level, partially buried, or below-ground storage structures or facilities shall have a vertical section of pipe at least two (2) pipe diameters in length and either: (5-8-09)

i. Be screened with a twenty-four (24) mesh non-corrodible screen installed within the pipe when practical or an expanded metal screen installed within the pipe plus a weighted flapper valve or check; or (5-8-09)

ii. Be an equivalent system acceptable to the Department. (5-8-09)

07. **Access**. Finished water storage structures shall be designed with reasonably convenient access to the interior for cleaning and maintenance. At least two (2) manholes shall be provided above the waterline at each water compartment where space permits, as determined by the Department. One (1) manhole may be allowed on smaller tanks on a case-by-case basis. (4-7-11)

a. The following access requirements apply to above-ground and ground-level storage structures. Each access manhole shall be framed a minimum of four (4) inches above the surface of the roof at the opening. The actual height above the surface of the roof must be sufficient to prevent incidental contamination from snow accumulation, storm water runoff or accumulation, irrigation water, or other potential sources of contamination. (5-8-09)

b. The following access requirements apply to, partially buried or below-ground storage structures. Each access manhole shall be elevated a minimum of twenty-four (24) inches above the surface of the roof or the ground level, whichever is higher. The actual height above the surface of the roof or the ground level must be sufficient to prevent incidental contamination from snow accumulation, storm water runoff or accumulation, irrigation water, or other potential sources of contamination. (5-8-09)

c. Each manhole shall be fitted with a solid water tight cover designed to prevent the entrance of contaminants. Each cover shall be hinged only on one (1) side and shall have a locking device. Unless otherwise approved by the Department based on documentation provided by the design engineer, each cover shall have a framed opening with the lid extending down around the frame at least two (2) inches, and the frame shall be at least four (4) inches high. (4-4-13)

08. **Vents**. Finished water storage structures shall be vented. The overflow pipe shall not be considered a vent. Open construction between the sidewall and roof is not permissible. Vents shall: (3-30-07)

a. Prevent the entrance of surface water and rainwater and extend twelve (12) inches above the roof. (3-30-07)

b. Exclude birds and animals. (3-30-07)

c. Exclude insects and dust, as much as this function can be made compatible with effective venting. (3-30-07)

d. On ground-level, partially buried, or below-ground structures, open downward with the opening at least twenty-four (24) inches above the roof or the ground level and covered with twenty-four (24) mesh non-corrodible screen. The screen shall be installed within the pipe at a location least susceptible to vandalism. (5-8-09)

e. On above-ground tanks and standpipes, open downward, and be fitted with twenty-four (24) mesh or similar non-corrodible screen. (4-7-11)

09. **Roof and Sidewall**. The roof and sidewalls of all water storage structures must be watertight with no openings except properly constructed vents, manholes, overflows, risers, drains, pump mountings, control ports, or piping for inflow and outflow. Particular attention shall be given to the sealing of roof structures which are not integral to the tank body. (3-30-07)

a. Any pipes running through the roof or sidewall of a metal storage structure must be welded, or properly gasketed. In concrete tanks, these pipes shall be connected to standard wall castings which were poured in place during the forming of the concrete. (3-30-07)

b. Openings in the roof of a storage structure designed to accommodate control apparatus or pump

columns shall be curbed and sleeved with proper additional shielding to prevent contamination from surface or floor drainage. (3-30-07)

c. The roof of the storage structure shall be sloped to facilitate drainage. Downspout pipes shall not enter or pass through the reservoir. Parapets, or similar construction which would tend to hold water and snow on the roof, will not be approved unless adequate waterproofing and drainage are provided. (3-30-07)

d. Reservoirs with pre-cast concrete roof structures must be made watertight with the use of a waterproof membrane or similar product. (3-30-07)

10. Construction Materials. Materials used in storage facility construction shall meet the requirements for water contact surfaces set forth in Subsection 501.01. Porous materials such as wood or concrete block are not acceptable for use in storage construction. (3-30-07)

11. Protection from Freezing. Finished water storage structures and their appurtenances, especially the riser pipes, overflows, and vents, shall be designed to prevent freezing which will interfere with proper functioning. (3-30-07)

12. Internal Catwalk. Every catwalk over finished water in a storage structure shall have a solid floor with sealed raised edges, designed to prevent contamination from shoe scrapings and dirt. (3-30-07)

13. Silt Stops. Removable silt stops shall be provided to prevent sediment from entering the reservoir discharge pipe. (3-30-07)

14. Grading. The area surrounding a ground-level, partially buried, or below-ground structures shall be graded in a manner that will prevent surface water from standing within fifty (50) feet of it. (5-8-09)

15. Coatings and Cathodic Protection. Proper protection shall be given to metal surfaces by paints or other protective coatings, by cathodic protective devices, or by both. (3-30-07)

16. Disinfection. Storage facilities shall be disinfected in accordance with AWWA Standard C652, incorporated by reference into these rules at Subsection 002.01. Two (2) or more successive sets of samples, taken at twenty-four (24) hour intervals, shall indicate microbiologically satisfactory water before the facility is placed into operation. (3-30-07)

17. Abandonment. All unused subsurface storage tanks shall be removed and backfilled, or abandoned by extracting residual fluids and filling the structure with sand or fine gravel. (3-30-07)

545. FACILITY AND DESIGN STANDARDS: TREATMENT PLANT STORAGE FACILITIES.
The design standards of Section 544 shall apply to treatment plant storage. (3-30-07)

01. Filter Wash Water. Filter wash water tanks shall be sized, in conjunction with available pump units and finished water storage, to provide the backwash water required by Section 521. Consideration must be given to the backwashing of several filters in rapid succession. (3-30-07)

02. Clearwell. When finished water storage is used to provide disinfectant contact time special attention must be given to tank size and baffling. An overflow and vent shall be provided. A minimum of two (2) clearwell compartments shall be provided to allow for cleaning or maintenance. Clearwells constructed under filters may be exempt from the requirements set out in Subsection 544.02.d. when the design provides adequate protection from contamination. (4-7-11)

03. Adjacent Storage. Finished or treated water must not be stored or conveyed in a compartment adjacent to untreated or partially treated water when the two (2) compartments are separated by a single wall, unless approved by the reviewing authority. (3-30-07)

04. Other Treatment Plant Storage Tanks. Unless otherwise allowed by the reviewing authority, other treatment plant storage tanks/basins such as detention basins, backwash reclaim tanks, receiving basins, and

pump wet-wells for finished water shall be designed as finished water storage structures. In addition, these tanks/basins shall be designed to allow for cleaning or maintenance through temporary tanks, standby pumping capabilities, or other means approved by the Department. (4-7-11)

546. FACILITY AND DESIGN STANDARDS: DISTRIBUTION SYSTEM STORAGE FACILITIES.

01. Design. The applicable design standards of Section 544 shall be followed for distribution system storage. (3-30-07)

02. Isolation. Finished water storage structures which provide pressure directly to the distribution system shall be designed so they can be isolated from the distribution system and drained for cleaning or maintenance without causing a loss of pressure in the distribution system. This requirement may be met through available temporary tanks, redundant pumping capabilities, or other temporary means approved by the Department. If the finished water storage structure provides fire flow for the water system, the water system owner shall provide the local fire authority advance notification of cleaning or maintenance events which isolate the structure from the distribution system and reduce available fire flow to less than the minimum required by the local fire authority. (4-7-11)

03. Drain. Drains shall discharge to daylight in a way that will preclude the possibility of backflow to the reservoir and, where practical, be provided with an expanded metal screen installed within the pipe that will exclude rodents and deter vandalism. The drain shall, when practical, discharge at an elevation between twelve (12) and twenty-four (24) inches above the receiving surface, and discharge over a drainage inlet structure or a splash plate. (5-8-09)

04. Level Controls. Adequate controls shall be provided to maintain levels in distribution system storage structures. Level indicating devices shall be provided at a central location. (3-30-07)

547. FACILITY AND DESIGN STANDARDS: HYDROPNEUMATIC TANK SYSTEMS.
Hydropneumatic tanks use compressed air to regulate pump cycling and to absorb pressure surges (water hammer). These tanks do not provide true storage. Systems serving more than one-hundred-fifty (150) homes are generally better served by providing reservoir storage, as set forth in Sections 544, 545 and 546. (3-30-07)

01. General Design of Hydropneumatic Systems. (3-30-07)

a. Tanks shall be located above normal ground surface and be completely housed. (3-30-07)

b. Tanks shall have bypass piping to permit operation of the system while the tank is being repaired or painted. Exterior surfaces and accessible interior surfaces shall be provided with protective coatings and shall be maintained in good condition. Supports beneath tanks shall be structurally sound. (3-30-07)

c. Tanks shall be sized to limit pump cycles to not more than six (6) per hour unless a pump manufacturer's warranty specifically supports more frequent cycling. The number of pump cycles may be increased in systems with multiple pumps if a means to automatically alternate pumps is provided. The Franklin Electric AIM manual, referenced in Subsection 002.02, Chapter 11 of the Washington State Department of Health Water System Design Manual, referenced in Subsection 002.02, or manufacturer's recommendations may be used as guidance in calculating the size of hydropneumatic tanks. (3-30-07)

d. Tanks of greater than one-hundred twenty (120) gallons volume shall conform with the American Society of Mechanical Engineers (ASME) specifications code for unfired pressure vessels. Tanks of less than one hundred twenty (120) gallons volume shall meet the ASME code or be certified by a nationally recognized testing agency to be capable of withstanding twice the maximum allowable working pressure. (3-30-07)

02. Requirements Specific to Conventional Hydropneumatic Tanks. Conventional tanks are those that have a direct air to water interface and require periodic air recharge to compensate for absorption of air into the water. (3-30-07)

a. Each tank shall have an access manhole, a drain, and control equipment consisting of a pressure

gauge, water sight glass, automatic or manual air blow-off, means for adding air that is filtered or otherwise protected from contamination, and pressure operated start-stop controls for the pumps. If tank size allows, the access manhole shall be at least twenty-four (24) inches in diameter. (3-30-07)

b. The gross volume of tanks in systems served by variable speed pumps may be less than that required for systems served by constant speed pumps. Design volumes shall be approved by the Department on a site-specific basis. (3-30-07)

03. Requirements Specific to Bladder Tanks. Bladder tanks have a membrane that separates air and water inside the tank. (3-30-07)

a. Bladder tanks must be pre-charged with air to a pressure of five (5) psi below the setting at which the pump turns on (the low operating pressure for the system). (3-30-07)

b. Each manifold assembly shall have a pressure gauge and pressure operated start-stop controls for the pumps. (3-30-07)

c. The procedure for sizing bladder tanks is to determine the number of a selected size of tanks that are needed to provide pump protection. Reduced tank volume in systems served by variable speed pumps shall be approved by the Department on a site specific basis. (3-30-07)

548. FACILITY AND DESIGN STANDARDS: DISINFECTION OF FACILITIES PRIOR TO USE.
Any supplier of water for a public water system shall ensure that new construction or modifications to an existing system shall be flushed and disinfected in accordance with American Water Works Association (AWWA) Standards, incorporated by reference into these rules at Subsection 002.01, prior to being placed into service. (4-4-13)

549. -- 551. (RESERVED)

552. OPERATING CRITERIA FOR PUBLIC WATER SYSTEMS.

01. Quantity and Pressure Requirements. Design requirements regarding pressure analysis are found in Section 542.13. (5-8-09)

a. Minimum Capacity. The capacity of a public drinking water system shall be at least eight hundred (800) gallons per day per residence. (5-8-09)

i. The minimum capacity of eight hundred (800) gallons per day shall be the design maximum day demand rate exclusive of irrigation and fire flow requirements. (5-8-09)

ii. The minimum capacity of eight hundred (800) gallons per day is only acceptable if the public drinking water system has equalization storage of finished water in sufficient quantity to compensate for the difference between a water system's maximum pumping capacity and peak hour demand. (5-8-09)

iii. The design capacity of a public drinking water system for material modifications may be less than eight hundred (800) gallons per day per residence if the water system owner provides information that demonstrates to the Department's satisfaction the maximum day demand for the system, exclusive of irrigation and fire flows, is less than eight hundred (800) gallons per day per residence. (5-8-09)

b. Pressure. All public water systems shall meet the following requirements: (4-7-11)

i. Any public water system shall be capable of providing sufficient water during maximum day demand conditions, including fire flow where provided, to maintain a minimum pressure of twenty (20) psi throughout the distribution system, at ground level, as measured at the service connection or along the property line adjacent to the consumer's premises. (4-7-11)

ii. Public Notification. (4-4-13)

(1) During unplanned or emergency situations, when water pressure within the system is known to have fallen below twenty (20) psi, the water supplier must notify the Department, provide public notice to the affected customers within twenty-four (24) hours, and disinfect or flush the system as appropriate. When sampling and corrective procedures have been conducted and after determination by the Department that the water is safe, the water supplier may re-notify the affected customers that the water is safe for consumption. The water supplier shall notify the affected customers if the water is not safe for consumption. (3-25-16)

(2) During planned maintenance or repair situations, when water pressure within the system is expected to fall below twenty (20) psi, the water supplier must provide public notice to the affected customers prior to the planned maintenance or repair activity and shall ensure that the water is safe for consumption. (4-4-13)

iii. If an initial investigation by the water supplier fails to discover the causes of inadequate or excessive pressure, the Department may require the water supplier to conduct a local pressure monitoring study to diagnose and correct pressure problems. Compliance with these requirements by water systems that do not have a meter vault or other point of access at the service connection or along the property line adjacent to the consumer's premises where pressure in the distribution system can be reliably measured shall be determined by measurements within the consumer's premises, or at another representative location acceptable to the Department. (4-4-13)

iv. Copies of pressure monitoring study reports required under Subsection 552.01.b.iii. detailing study results and any resulting corrective actions planned or performed by the public water system shall be submitted to the Department in accordance with these rules. (4-7-11)

v. The following public water systems or service areas of public water systems shall maintain a minimum pressure of forty (40) psi throughout the distribution system, during peak hour demand conditions, excluding fire flow, measured at the service connection or along the property line adjacent to the consumer's premises. (5-8-09)

(1) Any public water system constructed or substantially modified after July 1, 1985. (5-8-09)

(2) Any new service areas. (5-8-09)

(3) Any public water system that is undergoing material modification where it is feasible to meet the pressure requirements as part of the material modification. (5-8-09)

vi. Any public water system shall keep static pressure within the distribution system below one hundred (100) psi and should ordinarily keep static pressure below eighty (80) psi. Pressures above one hundred (100) psi shall be controlled by pressure reducing valve stations installed in the distribution main. In areas where failure of installed pressure reducing valve stations would result in extremely high pressure, pressure relief valves may be required. The Department may approve the use of pressure reducing devices at individual service connections on a case by case basis, if it can be demonstrated that higher pressures in portions of the distribution system are required for efficient system operation. If system modification will cause pressure to routinely exceed eighty (80) psi, or if a check valve or an individual pressure reducing device is added to the service line, the water system owner shall notify affected customers. Notification may include reasons for the elevated pressure, problems or damage that elevated pressure can inflict on appliances or plumbing systems, and suggested procedures or mitigation efforts affected property owners may initiate to minimize problems or damage. (4-4-13)

vii. The Department may allow the installation of booster pump systems at individual service connections on a case by case basis. However, such an installation may only occur with the full knowledge and agreement of the public water system, including assurance by the water system that the individual booster pump will cause no adverse effects on system operation. (4-11-06)

viii. For elevated storage tanks, pressure calculations during peak hour demand shall be based on the lowest water level after both operational storage and equalization storage have been exhausted. Pressure calculations during fire flow demands shall be based on the lowest water level after operational storage, equalization storage, and fire suppression storage have been exhausted. (4-4-13)

ix. For hydropneumatic tanks, pressure calculations shall be based on the lowest pressure of the

pressure cycle and this requirement shall be noted in the operation and maintenance manual. (4-4-13)

c. Fire Flows. Any public water system designed to provide fire flows shall ensure that such flows are compatible with the water demand of existing and planned fire-fighting equipment and fire fighting practices in the area served by the system. (5-3-03)

d. Irrigation Flows. (12-1-92)

i. Any public water system constructed after November 1, 1977, shall be capable of providing water for uncontrolled, simultaneous foreseeable irrigation demand, which shall include all acreage that the system is designed to irrigate. (5-3-03)

(1) The Department must concur with assumptions regarding the acreage to be irrigated. In general, an assumption that no outside watering will occur is considered unsound and is unlikely to be approved. (5-3-03)

(2) An assumption of minimal outside watering, as in recreational subdivisions, may be acceptable if design flows are adequate for maintenance of "green zones" for protection against wildland fire. (5-3-03)

ii. The requirement of Subsection 552.01.d.i. may be modified by the Department if: (5-3-03)

(1) A separate irrigation system is provided; or (12-10-92)

(2) The supplier of water can regulate the rate of irrigation through its police powers, and the water system is designed to accommodate a regulated rate of irrigation flow. The Department may require the water system to submit a legal opinion addressing the enforceability of such police powers. (5-3-03)

iii. If a separate non-potable irrigation system is provided for the consumers, all mains, hydrants and appurtenances shall be easily identified as non-potable. The Department must concur with a plan to ensure that each new potable water service is not cross-connected with the irrigation system. (5-3-03)

02. Ground Water. (12-10-92)

a. Public water systems constructed after July 1, 1985, and supplied by ground water, shall treat water within the system by disinfection if the ground water source is not protected from contamination. (12-10-92)

b. The Department may, in its discretion, require disinfection for any existing public water system supplied by ground water if the system has repeated coliform present samples or E.coli MCL exceedances, and if the system does not appear adequately protected from contamination. Adequate protection will be determined based upon at least the following factors: (3-25-16)

i. Location of possible sources of contamination; (12-10-92)

ii. Size of the well lot; (12-10-92)

iii. Depth of the source of water; (12-10-92)

iv. Bacteriological quality of the aquifer; (12-10-92)

v. Geological characteristics of the area; and (12-10-92)

vi. Adequacy of development of the source. (12-10-92)

03. Operating Criteria. The operating criteria for systems that provide filtration shall be as follows: (4-4-13)

a. A project specific operation and maintenance manual shall be provided as required in Subsection 501.12. See definition of Operation and Maintenance Manual in Section 003 for the typical contents of an operation

and maintenance manual and the included operations plan. For the operations plan in the operation and maintenance manual, additional guidance for several types of filtration systems can be found in the Department's SWTR Compliance Guidance referenced in Subsection 002.02. (4-4-13)

b. The system shall conduct monitoring specified by the Department before serving water to the public in order to protect the health of consumers served by the system. (4-4-13)

c. New treatment facilities shall be operated in accordance with Subsection 552.03.a., and the system shall conduct monitoring specified by the Department for a trial period specified by the Department before serving water to the public in order to protect the health of consumers served by the system. (3-30-07)

04. Chlorination. Systems that regularly add chlorine to their water are subject to the provisions of Section 320. Systems using surface water or ground water under the direct influence of surface water, are subject to the disinfection requirements of Sections 300 and 518. (3-30-07)

a. Systems using only ground water that add chlorine for the purpose of disinfection, as defined in Section 003, are subject to the following requirements: (4-6-05)

i. Chlorinator and chlorine contact tank capacity shall be such that the system is able to demonstrate that it is routinely achieving four (4) logs (ninety-nine point ninety-nine percent) (99.99%)) inactivation/removal of viruses. The required effective contact time will be specified by the Department. This condition must be attainable even when the plant design capacity coincides with anticipated maximum chlorine demands. (4-4-13)

ii. A detectable chlorine residual shall be maintained throughout the distribution system. (4-6-05)

iii. Automatic proportioning chlorinators are required where the rate of flow or chlorine demand is not reasonably constant. (4-4-13)

iv. Analysis for free chlorine residual shall be conducted at a location at or prior to the first service connection at least daily and records of these analyses shall be kept by the supplier of water for at least one (1) year. A report of all daily chlorine residual measurements for each calendar month shall be submitted to the Department no later than the tenth day of the following month. The frequency of measuring free chlorine residuals shall be sufficient to detect variations in chlorine demand or changes in water flow. (5-8-09)

v. If gas chlorination equipment is provided, a separate and ventilated room is required. (4-4-13)

vi. The Department may, in its discretion, require a treatment rate higher than that specified in Subsection 552.04.a.i. (3-30-07)

vii. When chlorine gas is used, chlorine leak detection devices and safety equipment shall be provided and equipped with both an audible alarm and a warning light. (5-8-09)

viii. The Department may require redundant chlorine pumping capabilities with automatic switchover for systems with documented source water contamination problems and that lack adequate storage to supply the system during a pump failure. (5-8-09)

b. Systems using only ground water that add chlorine for the purpose of maintaining a disinfectant residual in the distribution system, when the source(s) is not at risk of microbial contamination, are subject to the following requirements: (4-6-05)

i. Automatic proportioning chlorinators are required where the rate of flow or chlorine demand is not reasonably constant. (4-4-13)

ii. Analysis for free chlorine residual shall be made at a frequency that is sufficient to detect variations in chlorine demand or changes in water flow. (4-6-05)

c. Systems using only ground water that add chlorine for other purposes, such as oxidation of metals

or taste and odor control, when the source(s) is known to be free of microbial contamination, must ensure that chlorine residual entering the distribution system after treatment is less than four (4.0) mg/L. The requirements in Subsection 552.04.b.ii. also apply if the system maintains a chlorine residual in the distribution system. (3-30-07)

05. Fluoridation. (12-1-92)

a. Commercial sodium fluoride, sodium silico fluoride and hydrofluosilicic acid which conform to the applicable American Water Works Association (AWWA) Standards, incorporated by reference into these rules at Subsection 002.01, are acceptable. Use of other chemicals shall be specifically approved by the Department. (3-30-07)

b. Fluoride compounds shall be stored in covered or unopened shipping containers. (3-30-07)

c. Provisions shall be made to minimize the quantity of fluoride dust. Empty bags, drums, or barrels shall be disposed of in a manner that will minimize exposure to fluoride dusts. (3-30-07)

d. Daily records of flow and amounts of fluoride added shall be kept. An analysis for fluoride in finished water shall be made at least weekly. Records of these analyses shall be kept by the supplier of water for five (5) years. (12-10-92)

06. Cross Connection Control Program - Community Water Systems. The water purveyor is responsible through its cross connection control program to take reasonable and prudent measures to protect the water system against contamination and pollution from cross connections through premises isolation, internal or in-plant isolation, fixture protection, or some combination of premises isolation, internal isolation, and fixture protection. Pursuant to Section 543, all suppliers of water for community water systems shall implement a cross connection control program to prevent the entrance to the system of materials known to be toxic or hazardous. The water purveyor is responsible to enforce the system's cross connection control program. The program will at a minimum include: (4-7-11)

a. An inspection program to locate cross connections and determine required suitable protection. For new connections, suitable protection must be installed prior to providing water service. (5-8-09)

b. Required installation and operation of adequate backflow prevention assemblies. Appropriate and adequate backflow prevention assembly types for various facilities, fixtures, equipment, and uses of water should be selected from the AWWA Pacific Northwest Section Cross Connection Control Manual, the Uniform Plumbing Code, the AWWA Recommended Practice for Backflow Prevention and Cross Connection Control (M14), the USC Foundation Manual of Cross Connection Control, or other sources deemed acceptable by the Department. The assemblies must meet the requirements of Section 543 and comply with local ordinances. (4-4-13)

c. Annual inspections and testing of all installed backflow prevention assemblies by a tester licensed by a licensing authority recognized by the Department. Testing shall be done in accordance with the test procedures published by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research. See the USC Foundation Manual of Cross-Connection Control referenced in Subsection 002.02. (4-7-11)

d. Discontinuance of service to any structure, facility, or premises where suitable backflow protection has not been provided for a cross connection. (4-7-11)

e. Assemblies that cannot pass annual tests or those found to be defective shall be repaired, replaced, or isolated within ten (10) business days. If the failed assembly cannot be repaired, replaced, or isolated within ten (10) business days, water service to the failed assembly shall be discontinued. (4-4-13)

07. Cross Connection Control - Non-Community Water Systems. All suppliers of water for non-community water systems shall ensure that cross connections do not exist or are isolated from the potable water system by an approved backflow prevention assembly. Backflow prevention assemblies shall be inspected and tested annually for functionality by an Idaho licensed tester, as specified in Subsections 552.06.c. and 552.06.e. (4-4-13)

08. Start-up Procedures For Seasonal Systems Subject To Subsections 100.01.a., c., and d.

(3-25-16)

a. All seasonal system owners and operators must demonstrate completion of a Department approved start-up procedure, including start-up sampling, prior to serving water to the public. The system owner or operator must submit information on a Department provided or approved form that includes a statement certifying that the system owner or operator followed proper start-up procedures. The form shall be submitted to the Department within 30 (thirty) days following the system's start-up date. (3-25-16)

b. The Department may exempt any seasonal system from Subsection 552.08.a. if the entire distribution system remains pressurized during the entire period that the system is not operating, except that the systems that monitor less frequently than monthly must still monitor during the vulnerable period designated by the Department. The Department may exempt a seasonal system from Subsection 552.08.a. if the owner or operator of the system meets all of the following conditions: (3-25-16)

i. Requests an exemption in writing to the Department for approval; (3-25-16)

ii. Demonstrates a clean compliance history as defined in Section 003 for a minimum of five (5) years; (3-25-16)

iii. Has no uncorrected significant deficiencies from the most recent sanitary survey; and (3-25-16)

iv. Total coliform samples submitted to a certified laboratory within 30 (thirty) days prior to serving water to the public demonstrate the absence of total coliform. (3-25-16)

553. CLASSIFICATION OF WATER SYSTEMS.

01. System Classification Required. The Department shall classify community, nontransient noncommunity, and surface water systems based on indicators of potential health risks. (4-6-05)

a. The owner or designee of every community and nontransient noncommunity public water system shall submit proof of the current conditions related to the classification of the system every five (5) years or more frequently if required by the Department. (4-6-05)

b. The owner or designee of all surface water systems shall submit proof of the current conditions related to the classification of the system every five (5) years or more frequently if required by the Department. (4-6-05)

02. Classification Criteria. Systems shall be classified under a system that uses the following criteria: (4-6-05)

a. Complexity, size, and type of source water for treatment facilities. (3-16-04)

b. Complexity and size of distribution systems. (4-5-00)

c. Other criteria deemed necessary to completely classify systems. (4-5-00)

d. The Department shall develop guidelines for applying the criteria set forth in Section 553. (3-16-04)

554. LICENSE REQUIREMENTS.

01. Licensed Operator Required. (4-6-05)

a. Owners of all community and nontransient noncommunity public drinking water systems must place the direct supervision of their drinking water system, including each treatment facility and distribution system, under the responsible charge of a properly licensed operator. (5-8-09)

b. Owners of all surface water systems must place the direct supervision of their public drinking water system under the responsible charge of a properly licensed operator. (4-6-05)

02. Responsible Charge Operator License Requirement. An operator in responsible charge of a public drinking water system must hold a valid license equal to or greater than the classification of the public water system where the responsible charge operator is in responsible charge. Responsible charge means active, daily on-site or on-call responsibility for the performance of operations or active, on-going, on-site, or on-call direction of employees and assistants. (4-4-13)

03. Substitute Responsible Charge Operator License Requirement. At such times as the responsible charge operator is not available, a substitute responsible charge operator shall be designated to replace the responsible charge operator. A substitute responsible charge operator of a public water system must hold a valid license equal to or greater than the classification of the public water system where the substitute responsible charge operator is in responsible charge. (4-6-05)

04. Shift Operator Requirement. Any public drinking water system subject to these requirements with multiple operating shifts must have a designated properly licensed operator available for each operating shift. An on-duty designated shift operator does not replace the requirements in Subsections 554.01 and 554.03 for responsible charge operator coverage during all operating shifts. (4-6-05)

05. Water Operator License Requirement. All operating personnel at public drinking water systems subject to these requirements making process control/ system integrity decisions about water quality or quantity that affect public health must hold a valid and current license. (4-6-05)

555. -- 559. (RESERVED)

560. CONTRACTING FOR SERVICES.
Public water systems may contract with persons to provide responsible charge operators and substitute responsible charge operators. Proof of such contract shall be submitted to the Department prior to the contracted person performing any services at the public water system. (4-6-05)

561. -- 562. (RESERVED)

563. ADVISORY GROUP.
Stakeholder Involvement. Ongoing stakeholder involvement will be provided through the existing drinking water advisory committee at the Department. (4-5-00)

564. -- 899. (RESERVED)

900. TABLES.

01. Table 1 -- Minimum Distances From a Public Water System Well.

Minimum Distances from a Public Water System Well	
Gravity wastewater line	50 feet
Any potential source of contamination	50 feet
Pressure wastewater line	100 feet
Class A Municipal Reclaimed Wastewater Pressure distribution line	50 feet
Individual home septic tank	100 feet
Individual home disposal field	100 feet
Individual home seepage pit	100 feet

Minimum Distances from a Public Water System Well	
Privies	100 feet
Livestock	50 feet
Drainfield - standard subsurface disposal module	100 feet
Absorption module - large soil absorption system	150 - 300 feet, see IDAPA 58.01.03
Canals, streams, ditches, lakes, ponds and tanks used to store non-potable substances	50 feet
Storm water facilities disposing storm water originating off the well lot	50 feet
Municipal or industrial wastewater treatment plant	500 feet
Reclamation and reuse of municipal and industrial wastewater sites	See IDAPA 58.01.17
Biosolids application site	1,000 feet

(4-7-11)

02. Table 2 - Well Casing Standards for Public Water System Wells.

STEEL PIPE					
				WEIGHT PER FOOT (pounds)	
DIAMETER (inches)			THICKNESS (inches)	Plain Ends	With Threads and Couplings
SIZE	External	Internal		(calculated)	(nominal)
6 (id) *	6.625	6.065	0.280	18.97	19.18
8	8.625	7.981	0.322	28.55	29.35
10	10.750	10.020	0.365	40.48	41.85
12	12.750	12.000	0.375	49.56	51.15
14 (od) *	14.000	13.250	0.375	54.57	57.00
16	16.000	15.250	0.375	62.58	
18	18.000	17.250	0.375	70.59	
20	20.000	19.250	0.375	78.60	
22	22.000	21.000	0.500	114.81	
24	24.000	23.000	0.500	125.49	
26	26.000	25.000	0.500	136.17	
28	28.000	27.000	0.500	146.85	
30	30.000	29.000	0.500	157.53	

STEEL PIPE					
32	32.000	31.000	0.500	168.21	
34	34.000	33.000	0.500	178.89	
36	36.000	35.000	0.500	189.57	

* id = inside diameter
od = outside diameter (3-30-07)

901. -- 999. (RESERVED)

Subject Index

A

Administrative Provisions 26
Advisory Group 136

B

Backflow Protection, Distribution System 124

C

Classification Of Water Systems 135
- Classification Criteria 135
- System Classification Required 135

Coliform Treatment Technique Triggers & Assessment Requirements For Protection Against Potential Fecal Contamination 37
- Approved Parties for Level 2 Assessments 39
- Requirements For Assessments 38
- Treatment Technique Triggers 37

Community Water System 16
Composite Correction Program (CCP) 37
- Comprehensive Performance Evaluation (CPE) 37
- Comprehensive Technical Assistance (CTA) 37

Consumer Confidence Report 29
Continuity Of Service 25
- Maintenance of Standards 25
- Transfer of Ownership 25

Contracting For Services 136
Control Of Lead & Copper 42
- Analytical Methods 42
- Applicability of Corrosion Control Treatment Steps to Small, Medium-Size, & Large Water Systems 42
- Description of Corrosion Control Treatment Requirements 42
- General Requirements 42
- Lead Service Line Replacement Requirements 42
- Monitoring Requirements for Lead & Copper in Source Water 42
- Monitoring Requirements for Lead & Copper in Tap Water 42
- Monitoring Requirements for Water Quality Parameters 42
- Public Education & Supplemental Monitoring Requirements 42
- Recordkeeping Requirements 42
- Reporting Requirements 42
- Source Water Treatment Requirements 42

Coverage 21

D

Definitions, IDAPA 58.01.08 7
- Action Level 7
- Administrator 7
- Annual Samples 7
- Annular Opening 7
- Aquifer 7
- Average Day Demand 7
- Backflow 7
- Bag Filters 7
- Bank Filtration 7
- Board 7
- Capacity 7
- Cartridge Filters 8
- Clean Compliance History 8
- Combined Distribution System 8
- Community Water System 8
- Components of Finished Water Storage 8
- Composite Correction Program (CCP) 9
- Composting of Samples 9
- Confining Layer 9
- Confirmation Sample 9
- Connection 9
- Consecutive System 9
- Consumer 9
- Consumer Confidence Report (CCR) 9
- Contaminant 9
- Cross Connection 9
- Dead End Main 9
- Dead Storage 10
- Department 10
- Direct Integrity Test (DIT) 10
- Director 10
- Disinfection 10
- Disinfection Profile 10
- Distribution System 10
- Drinking Water 10
- Drinking Water System 10
- Dual Sample Set 10
- Effective Contact Time 10
- Effective Storage 10
- Enhanced Coagulation 10
- Enhanced Softening 10
- Equalization Storage 10
- Equivalent Dwelling Unit (EDU) 11
- Exemption 11
- Facility Plan 11
- Facility Standards & Design Standards 11
- Fee Assessment 11
- Filter Profile 11
- Filtrate 11
- Finished Water 11
- Finished Water Storage Structures or Facilities 11
- Fire Flow Capacity 12
- Fire Suppression Storage 12
- Fixture Protection 12
- Flowing Stream 12
- Flux 12
- Ground Water System 12
- Ground Water Under The Direct Influence of Surface Water (GWUDI) 12
- Haloacetic Acids (Five) (HAA5) 12
- Health Hazards 12
- Indirect Integrity Monitoring 12
- Inorganic 12
- Internal or In-Plant Isolation 12
- Lake/Reservoir 12
- Level 1 Assessment 12
- Level 2 Assessment 13
- License 13
- Locational Running Annual Average (LRAA) 13
- Log 13
- Log Removal Value (LRV) 13
- Material Deviation 13
- Material Modification 13
- Maximum Contaminant Level (MCL) 13
- Maximum Day Demand 13
- Maximum Pumping Capacity 13
- Maximum Residual Disinfectant Level (MRDL) 14
- Maximum Residual Disinfectant Level Goal (MRDLG) 14
- Membrane Filtration 14
- Membrane Unit 14
- Method Detection Limit (MDL) 14
- Microfiltration (MF) 14
- Module 14
- Nanofiltration (NF) 14
- New System 14
- Noncommunity Water System 14
- Non-Potable Fluids 14
- Non-Potable Mains 14
- Non-Potable Services or Lines 15
- Nontransient Noncommunity Water System 15
- Operating Shift 15
- Operation & Maintenance Manual 15
- Operational Storage 15
- Operations Plan 15

Owner/Purveyor of Water/Supplier of Water 15
Peak Hour Demand 15
Person 15
Pesticides 15
Plant 15
Plant Design Capacity 15
Point of Use (POU) Treatment Device 15
Point of Use (POU) Treatment System 16
Potable Mains 16
Potable Services 16
Potable Water 16
Preliminary Engineering Report 16
Premises Isolation or Containment 16
Presedimentation 16
Protected Water Source 16
Public Drinking Water System 16
Public Notice 16
Public Water System/Water System/System 17
Pump House 17
Qualified Licensed Professional Engineer (QLPE) 17
Quasi-Municipal Corporation 17
Raw Water 17
Redundancy 17
Regulated Public Utility 17
Repeat Compliance Period 17
Resolution 17
Responsible Charge (RC) 17
Responsible Charge Operator 17
Reverse Osmosis (RO) 17
Reviewing Authority 17
Sampling Point 17
Sanitary Defect 17
Sanitary Survey 18
SDWIS-State, Safe Drinking Water Information System-State Version 18
Seasonal System 18
Sensitivity 18
Sewage 18
Significant Deficiency 18
Simple Water Main Extension 18
Special Irrigation District 18
Spring 18
Standby Storage 19
Substantially Modified 19
Substitute Responsible Charge Operator 19
Surface Water System 19
Total Organic Carbon (TOC) 19
Total Trihalomethanes (TTHM) 19
Transient Noncommunity Water System 19
Treatment Facility 19
Turbidity 19
Ultrafiltration (UF) 19
Ultraviolet (UV) Light Technology 19
Unregulated Contaminant 19
Use Assessment 19
UV Transmittance (UVT) 19
Variance 20
Very Small Public Drinking Water System 20
Volatile Organic Chemicals (VOCS) 20
Vulnerability Assessment 20
Waiver 20
Wastewater 20
Water Demand 20
Water For Human Consumption 20
Water Main 20
Watershed 20
Wholesale System 21
Design Standards For Microscreening 74
Design Considerations 74
Design Requirements 74
Direct Filtration 85
Filtration Requirements 85
Redundancy 85
Siting Requirements 85
Disapproval Designation 22
Defects 22
Monitoring 23
Non-Payment of Annual Fee Assessment 23
Operating Procedures 23
Public Notification 23
Quality 23
Unapproved Source 23
Disinfectant Residuals, Disinfection Byproducts, & Disinfection Byproduct Precursors 41
Analytical Requirements 41
Compliance Requirements 41
General Requirements 41
Monitoring Requirements 41
Treatment Techniques for Control of Disinfection Byproduct (DBP) Precursors 41

E

Enhanced Filtration & Disinfection - Systems Serving Fewer Than Ten Thousand People 40
Enhanced Filtration & Disinfection - Systems Serving Ten Thousand Or More People 35
Criteria for Avoiding Filtration 35
Disinfection Profiling & Benchmarking 35
Filtration 35
Filtration Sampling Requirements 35
General Requirements 35
Enhanced Treatment For Cryptosporidium -- Long Term 2 Enhanced Surface Water Treatment Rule 40
Assessment of Significant Changes in the Watershed 40
Cryptosporidium Treatment Credit for Approved Watershed Control Program 40

F

Facility & Design Standards
Additional Design Criteria For Surface Water Treatment 72
Acceptable Technology 73
Continuous Monitoring of Disinfectant 72
Continuous Operation Required 73
Continuous Turbidity Monitoring 72
Disinfection 72
Engineering Design Requirements 72
Enhanced Disinfection 72
Filter to Waste 72
Pilot Studies 73
Redundant Disinfection 74
Removal of Pathogens 72
Aeration Processes 109
Disinfection 112
Forced or Induced Draft Aeration 109
Natural Draft Aeration 109
Other Methods of Aeration 112
Packed Tower Aeration 110
Pressure Aeration 110
Protection of Aerators 112
Spray Aeration 109
Cross Connection Control 125
Assembly Selection 125
Atmospheric Vacuum Breakers 125
Replacement Parts & Components 125
Testable Assemblies 125

Demonstration Of Technical, Financial, & Managerial Capacity Of Public Drinking Water Systems 45
Consolidation 46
Exclusion 46
Expanding Systems 46
Financial Capacity 45
Managerial Capacity 46
Submittal Form 46
Technical Capacity 45
Design Standards For Chemical Application 100
Chemicals 103
Design Requirements for Specific Applications 105
Facility Design 101
General Equipment Design 100
Operator Safety 105
Safety Requirements for Chemical Facilities 103
Design Standards For Fluoridation 114
Chemical Feed Equipment & Methods 114
Dust Control 115
Secondary Controls 115
Design Standards For Iron & Manganese Control Systems 112
Biological Removal 113
Removal by Ion Exchange 113
Removal by Manganese Coated Media Filtration 113
Removal by Oxidation, Detention & Filtration 112
Sampling Taps 114
Sequestration by Polyphosphates 113
Sequestration by Sodium Silicates 114
Design Standards For Softening 106
Cation Exchange Process 107
Lime or Lime-Soda Process 106
Design Standards For Stabilization 115
Carbon Dioxide Addition 115
Phosphates 116
Split Treatment 116
Water Unstable Due to Biochemical Action in Distribution System 116
Design Standards For Taste & Odor Control 108
Chlorination 108
Chlorine Dioxide 108
Copper Sulfate & Other Copper Compounds 108
Granular Activated Carbon 108
Other Methods 108
Ozone 108
Potassium Permanganate 108
Powdered Activated Carbon 108
Design Standards For Treatment & Disposal Of Treatment Plant Waste Residuals 116
Liquid Concentrates 116
Sanitary Waste 116
Sludge Waste 117
Spent Media 118
Disinfection Of Drinking Water, Disinfecting Agents 94
Chlorination 94
Disinfection with Chlorine Dioxide 100
Disinfection with Ozone 95
Other Disinfecting Agents 100
Disinfection Of Drinking Water, Ultraviolet Light 90
Alarms 93
Controls 92
General 90
Initial Startup 94
Monitoring 93
Operation & Maintenance Manual 94
Pilot Studies & Validation 90
Reactor Design 91
Reliability 92
UV Dose Table 91
Disinfection Of Facilities Prior To Use 130
Distribution System 121
Air Valves 124
Backflow Protection 124
Dead End Mains 123
Flow Meter Required 121
Installation of Water Mains 121
Isolation Valves 124
Meter Vault Required 124
Minimum Pressure at Building Sites 124
Pipe & Jointing Materials 122
Pressure Relief Valves 121
Protection from Contamination 121
Repair of Leaks 124
Separation from Structures 124
Separation from Subsurface Wastewater Systems & Other Sources of Contamination 123
Separation of Potable, Non-Potable, & Raw Water Pipelines 122
Size of Water Mains 122
Surface Water Crossings 124
Distribution System Storage Facilities 129
Design 129
Drain 129
Isolation 129
Level Controls 129
Facility Plans 51
Engineer's Seal Required 51
Existing Public Water System Facility Plan 52
Facility Plan Contents 51
Facility Plans Required 51
Public Water System Facility Plan funded by the State Revolving Fund 52
Submittal to the Department 51
General Design Of Finished Water Storage 125
Abandonment 128
Access 127
Coatings & Cathodic Protection 128
Construction Materials 128
Disinfection 128
Drains 126
Grading 128
Internal Catwalk 128
Location 126
Overflow 126
Protection from Contamination 126
Protection from Freezing 128
Protection from

Trespassers 126
Roof & Sidewall 127
Silt Stops 128
Sizing & Isolation Requirements 125
Vents 127
General Design Requirements For Public Drinking Water Systems 47
Additives Used in Operation 47
Design Basis 47
Design of Buildings 47
Design of Treatment Facilities 47
Electrical 48
Facility Potable Water Supply 49
Ground Water Source Redundancy 49
Materials Used in Construction 47
Meters 49
On-Site Analysis & Testing Capabilities 48
Operation & Maintenance Manual 49
Other Regulations 49
Pilot Studies 50
Redundant Fire Flow Capacity 49
Reliability & Emergency Operation 48
Safety 49
Sample Taps 49
Security 49
Start-Up Training 49
Hydropneumatic Tank Systems 129
General Design of Hydropneumatic Systems 129
Requirements Specific to Bladder Tanks 130
Requirements Specific to Conventional Hydropneumatic Tanks 129
Low Pressure Membrane Filtration 85
Membrane Selection & Design Considerations 85
Monitoring & Compliance Requirements for Membranes 86
Number Of Ground Water Sources Required – Existing Systems 69
Existing System with All Sources Constructed Prior to July 1, 1985 69
Existing System with Any Sources Constructed After July 1, 1985 70
Preliminary Engineering Reports 53
Preliminary Engineering Report Contents 53
Seal Required 53
Submittal to Reviewing Authority 53
Pumping Facilities 118
Appurtenances 120
Booster Pumps 121
Pump Houses 118
Pumping Units 119
Review Of Plans & Specifications 57
Connection to an Existing System 57
Construction 61
Contents of Plans & Specifications 59
Criteria for Review 59
Engineer's Seal Required 59
Exception 61
Notification of Material Deviations 61
Ownership 57
Plans & Specifications Required 57
Record Plans and Specifications Required 61
Requirement to Have Approved Plans & Specifications & Approval Letter On-Site During Construction 61
Schedule for Review 59
Siting & Construction Of Wells 61
Construction Standards 62
Conversion of Non-Public Water System Wells for Public Water System Use 65
Disinfection 64
Location 62
Observation Wells 65
Site Approval 61
Test Pumping 64
Well Abandonment 66
Well Completion Report Required 64
Spring Sources 70
Flow Measurement 70
Protected Area 70
Protection of the Spring 70
Sample Tap Required 70
Spring Box or Combined Spring Box/Finished Water Storage Design 70
Surface Sources And Ground Water Sources Under The Direct Influence Of Surface Water 70
Intake Structures 70
Offstream Raw Water Storage 71
Raw Water Pumps 71
Reservoirs 72
Surface Water Treatment 74, 85
Clarification Processes 74
Flocculation 75
High Rate Clarification 77
Independent Units 74
Manual Start-Up 75
Parallel or Serial Operation 74
Pre-Treatment 75
Rapid Mix 75
Sedimentation Units 75
Settler Units 77
Small Systems May Use Baffling 75
Solids Contact Clarifiers 76
Two Units Required 74
Filtration Using Diatomaceous Earth 81
Appurtenances 82
Backwash 82
Body Feed 82
Conditions of Use 82
Filtration Requirements 82
Monitoring 83
Number of Units 82
Precoat 82
Treated Water Storage 82
Filtration Using Rapid Rate Gravity Filters 77

Air Scouring 80
Backwash 81
Filter Appurtenances 81
Filter Bottoms & Strainer Systems 80
Filter Material 78
Number of Units 77
Pretreatment 77
Rate of Filtration 77
Roof Drainage 81
Structure & Hydraulics 77
Surface or Subsurface Wash 80
Washwater Troughs 78
Slow Sand Filtration 83
Control Appurtenances 84
Depth of Water Over Filter Beds 84
Filter Bed Control & Minimum Rate of Flow 85
Filter Material 83
Filter Sand Support 84
Number of Units 83
Quality of Raw Water 83
Ripening 84
Structural Details & Hydraulics 83
Supernatant Drain Required 85
Underdrains 83
Treatment Plant Storage Facilities 128
Adjacent Storage 128
Clearwell 128
Filter Wash Water 128
Other Treatment Plant Storage Tanks 128
Well Lot 69
Location of Hydrants 69
Parking Lots & Vehicle Storage 69
Storage of Hazardous Materials on the Well Lot 69
Use of Chemicals on the Well Lot 69
Well Pumps, Discharge Piping, & Appurtenances 66
Casings and Sanitary Well Caps 67
Discharge Piping 66
Discharge Pumps 68
Flow Meter & Check Valve 66
Pitless Adapters & Units 67
Pressure Gauge Required 66
Sample Tap Required 66
Well Houses 67
Well Vent 67
Wells Not Allowed in Pits 68
Fee Schedule For Public Drinking Water Systems 23
Billing 24
Delinquent Unpaid Fees 25
Effective Date 23
Enforcement Action 25
Fee Assessment 24
Fee Schedule 23
Payment 24
Reinstatement of Suspended Services & Approval Status 25
Responsibility to Comply 25
Suspension of Services & Disapproval Designation 25
Filtration & Disinfection 30
Analytical & Monitoring Requirements 32
Criteria for Avoiding Filtration 31
Disinfection 31
Filtration 30
General Requirements 30
Recycle Provisions 35
Reporting & Recordkeeping Requirements 34

G

General Provisions For Waivers, Variances, & Exemptions 21
Conditions 22
Exceptions 22
Exemptions 22
Public Hearing 22
Surface Water Exemptions 22
Surface Water Variances 22
Variances 21
Waivers 21
Ground Water Rule 41
Chlorine Purging Prior to Triggered Source Sampling 41
Discontinuation of Treatment 41

H

Health Hazards 23
Prohibited 23
Schedule 23
Standards 23

I

Incorporation By Reference & Availability Of Referenced Materials 4
Initial Distribution System Evaluations 41

L

License Requirements 135
Licensed Operator Required 135
Responsible Charge Operator License Requirement 136
Shift Operator Requirement 136
Substitute Responsible Charge Operator License Requirement 136
Water Operator License Requirement 136

M

Maximum Contaminant Level Goals & Maximum Residual Disinfection Level Goals 30
Maximum Contaminant Level Goals for Disinfection Byproducts 30
Maximum Contaminant Level Goals for Inorganic Contaminants 30
Maximum Contaminant Level Goals for Microbiological Contaminants 30
Maximum Contaminant Level Goals for Organic Contaminants 30
Maximum Contaminant Level Goals for Radionuclides 30
Maximum Residual Disinfectant Level Goals for Disinfectants 30
Maximum Contaminant Levels & Maximum Residual Disinfectant Levels 26
Effective Dates 27
Maximum Contaminant Levels for Disinfection Byproducts 27
Maximum Contaminant Levels for Inorganic Contaminants 26
Maximum Contaminant Levels for Microbiological Contaminants 26
Maximum Contaminant Levels for Organic Contaminants 26
Maximum Contaminant Levels for

Radionuclides 26
Maximum Contaminant Levels for Turbidity 26
Maximum Residual Disinfectant Levels 27
Monitoring 23
Monitoring & Analytical Requirements 27
Alternate Analytical Techniques 28
Analytical Methods for Radioactivity 27
Approved Laboratories 28
Disinfection Residuals, Disinfection Byproducts, & Disinfection Byproduct Precursors 29
Initial Monitoring Schedule 28
Inorganic Chemical Sampling & Analytical Requirements 27
Monitoring Frequency & Compliance Requirements for Radioactivity In Community Water Systems 27
Monitoring of Consecutive Water Systems 29
Monitoring Waivers 27
Organic Chemicals, Sampling & Analytical Requirements 27
Total Coliform Sampling & Analytical Requirements 27
Turbidity Sampling & Analytical Requirements 27

N

Noncommunity water system 16
Nontransient noncommunity water system 16

O

Operating Criteria For Public Water Systems 130
Chlorination 133
Cross Connection Control - Non-Community Water Systems 134
Cross Connection Control Program - Community Water Systems 134
Fluoridation 134
Ground Water 132
Operating Criteria 132
Quantity & Pressure Requirements 130
Start-up Procedures For Seasonal Systems Subject To Subsections 100.01.a., C., & D. 134

R

Reporting, Public Notification, Recordkeeping 29
Public Notification of Drinking Water Violations 29
Record Maintenance 29
Reporting & Record Keeping Requirements for the Disinfectants & Disinfectant Byproducts Rule 29
Reporting & Record Keeping Requirements for the Revised Total Coliform Rule 29
Reporting & Recordkeeping Requirements for the Interim Enhanced Surface Water Treatment Rule 29
Reporting for Unregulated Contaminant Monitoring Results 29
Reporting Requirements 29

S

Sanitary Surveys For Public Water Systems Using Ground Water 36
Consultation with the Department 37
Frequency 36
Report 36
Response Required 37
Significant Deficiencies 36
Violation 37
Sanitary Surveys For Systems Using Surface Water Or Ground Water Under The Direct Influence Of Surface Water 35
Consultation with the Department 36
Frequency 35
Report 35
Response Required 35
Violation 36
Secondary MCLS 42
Definitions 42
Monitoring 43
Purpose 42
Secondary Maximum Contaminant Levels 43
Siting Requirements 22
Special Regulations 29
Monitoring Requirements for Unregulated Contaminants 29
Prohibition on Use of Lead Pipes, Solder, and Flux 30
Special Monitoring for Corrosively Characteristics 30
Special Monitoring for Sodium 30
Stage 2 Disinfection Byproducts Requirements 41

T

Tables 136
Table 1 - Minimum Distances From a Public Water System Well 136
Table 2 - Well Casing Standards for Public Water System Wells 137
Transient noncommunity public water system 16
Treatment Techniques 45
General Requirements 45
Treatment Techniques for Acrylamide and Epichlorohydrin 45

U

Use Of Guidance 26
Use Of Non-Centralized Treatment Devices 43
Criteria & Procedures for Public Water Systems Using Point of Entry Devices 43
Point of Use (POU) Treatment Devices 43
Use of Bottled Water 45