

# **R309-505. Facility Design and Operation: Minimum Treatment Requirements.**

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### ***R309-505-1. Purpose.***

This rule specifies the type and degree of treatment which must be applied to the various types of water sources found in Utah. It is intended to be applied in conjunction with rules R309-500 through R309-550. Collectively, these rules govern the design, construction, operation and maintenance of public drinking water system facilities. These rules are intended to assure that such facilities are reliably capable of supplying adequate quantities of water consistently meeting applicable drinking water quality requirements and do not pose a threat to general public health.

### ***R309-505-2. Authority.***

This rule is promulgated by the Drinking Water Board as authorized by Title 19, Environmental Quality Code, Chapter 4, Safe Drinking Water Act, Subsection 104(1)(a)(ii) of the Utah Code and in accordance with Title 63G, Chapter 3 of the same, known as the Administrative Rulemaking Act.

### ***R309-505-3. Definitions.***

Definitions for certain terms used in this rule are given in R309-110 but may be further clarified herein.

### ***R309-505-4. Pre-design Consultation.***

The type and degree of treatment which shall be given a public drinking water source depends upon the nature of the source and the chemical and biological characteristics of the water it produces. Prior to the design of any water treatment facility, the Director shall be consulted and concur that the contemplated treatment method is appropriate for the source being treated.

### ***R309-505-5. Drinking Water Quality Standards.***

Drinking water provided for human consumption by public drinking water systems must meet all water quality standards as specified in R309-200. Sources of water which do not meet applicable standards, or may not meet such standards due to the proximity of contamination sources, shall be appropriately treated as specified herein or physically disconnected from the drinking water system.

### ***R309-505-6. Surface Water Sources.***

#### **(1) Determination of Surface Water Source.**

A surface water source is any water source which rests or travels above ground for any period of time. Such sources include rivers, streams, creeks, lakes, reservoirs, ponds or impoundments.

#### **(2) Treatment of a Surface Water Source.**

(a) As a minimum, surface water sources shall be given complete treatment as specified in R309-525 or R309-530.

(b) All surface waters shall be treated to assure:

- (i) at least 99.9 percent (3-log) removal and/or inactivation of *Giardia lamblia* cysts between a point where the raw water is not subject to re-contamination by surface water runoff and a point downstream before or at the first customer;
- (ii) at least 99.99 percent (4-log) removal and/or inactivation of viruses between a point where the raw water is not subject to re-contamination by surface water runoff and a point downstream before or at the first customer; and
- (iii) removal of substances, as needed, to comply with the quality requirements of R309-200.

(c) A public water system using a surface water source is considered to be in compliance with the requirements in subsection (b), above, if the treatment technique utilized produces water meeting the quality provisions of R309-200, provided that all monitoring required by R309-215 has been accomplished.

### **R309-505-7. Low Quality Ground Water Sources.**

#### **(1) Determination of a Low Quality Ground Water Source.**

(a) A low quality ground water source is any well or spring which, as determined by the Director, cannot reliably and consistently meet the drinking water quality standards described in R309-200. A water source shall be deemed to be a low quality ground water source if any of the following conditions exist:

- (i) It is determined by the Director that the source is Ground Water Under the Direct Influence of Surface Water.

(A) Classification of existing ground water sources, as to whether or not they are under direct influence of surface water, shall be made by the Director.

(B) Frequent monitoring of turbidity, temperature, pH and conductivity of source water, in conjunction with similar monitoring of nearby surface waters may, if properly documented, provide sufficient evidence that the source is not influenced.

(C) Classification of existing sources shall be based upon evaluation of part or all of the following:

(I) Records review; including review of plans and specifications used for construction of collection facilities as submitted for review and approval prior to construction; review of as-built plans as submitted after construction, especially where springs are concerned; review of previous sanitary surveys; and review of any system bacteriological violations which may be linked directly to a source.

(II) Results of written survey form.

(III) On-site inspection by Division personnel.

(IV) Special tests such as Microscopic Particulate Analysis (MPA), dye tracer studies, or time of travel studies done in conjunction with the source protection program. Because of critical timing for tests such as the MPA, accelerated monitoring and reporting of water characteristics as mentioned in R309-505-7 (1)(a)(i)(B) above, may be required prior to MPA sampling.

(b) Testing for microbiological, chemical or radiologic contaminants determines that the drinking water quality requirements of R309-200 cannot be reliably or consistently met.

(c) The location, design or construction of the well or spring makes it, in the judgement of the Director, susceptible to natural or man-caused contamination.

## **(2) Treatment of a Low Quality Ground Water Source.**

Low quality ground water sources shall be treated to assure that all chemical and biological contaminants are reduced to the levels which are reliably and consistently below MCL's prescribed in R309-200. If a source is determined to be ground water under the direct influence of surface water the following is required:

(a) Upon determination that a ground water source is under the direct influence of surface water, conventional surface water treatment, as specified in R309-525, or an approved equivalent, as specified in R309-530, shall be installed within 18 months or the source must be abandoned as a source of drinking water and physically disconnected from the drinking water system.

(b) Systems which must retain use of ground water sources classified as under direct influence of surface water shall start disinfection immediately on those sources and monitor in accordance with residual disinfectant monitoring under treatment plant monitoring and reporting found in R309-215- as well as maintain satisfactory "CT" values in accordance with R309-200-5(7) during the 18 month interim period before conventional surface water treatment, or an approved equivalent, is installed. Chlorine, chlorine dioxide, chloramine, and ozone are considered capable of attaining required levels of disinfection.

(c) Once a ground water source is classified as under the influence of surface water, it must be considered to be a surface water source. Thus, all requirements in these rules which pertain to surface water sources also pertain to ground water under the direct influence of surface water.

## ***R309-505-8. High Quality Ground Water Sources.***

### **(1) Determination of a High Quality Ground Water Source.**

A well or spring shall be deemed to be a high quality ground water source if the following conditions are met:

(a) The design and construction of the source are in conformance with these rules.

(b) Testing establishes that all applicable drinking water quality standards, as given in R309-200, are met, and can be expected to be met in the future

(c) The source is not susceptible to natural or man-caused contamination and, furthermore, adequate protection zones and management areas have been established in accordance with R309-600.

### **(2) Treatment of a High Quality Ground Water Source.**

A high quality ground water source requires no treatment.

### ***R309-505-9. Best Available Technologies (BATs).***

EPA has identified Best Available Technologies (BATs) in national regulations regarding drinking water. BATs include Activated Alumina, Coagulation/Filtration, Direct Filtration, Diatomite Filtration, Electrodialysis Reversal, Corrosion Control, Granulated Activated Carbon, Ion Exchange, Lime Softening, Reverse Osmosis, Polymer Addition and Packed Tower Aeration. Where a BAT is used to reduce the concentration of a contaminant:

- (a) The requirements of R309-500 through R309-550 shall govern if the BAT is included in these rules.
- (b) If the BAT is not included in R309-500 through R309-550, review of plans and specifications for a project will be governed by R309-530-9, New Treatment Processes or Equipment.

### ***R309-505-10. Temporary Use of Bottled Water.***

Initially the use of bottled water may be allowed on a temporary basis by the Director. The continued use of bottled water shall be reviewed at least annually and only allowed after the Director is satisfied that the PWS has made reasonable attempts since the last review to provide acceptable water on a more permanent basis without success.

**KEY: drinking water, surface water treatment, low quality ground water, high quality ground water**

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