

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF WATER RESOURCES

RULES AND REGULATIONS APPLYING TO WELL PERMITS TO WITHDRAW GROUNDWATER PURSUANT TO SECTION 37-90-137(4), C.R.S.

2 CCR 402-7

Rule 1. Title:

The title of these rules and regulations is “The Rules and Regulations Applying to Applications for Well Permits to Withdraw Groundwater Pursuant to Section 37-90-137(4), C.R.S.” The short title for these rules and regulations is the “Nontributary Groundwater Rules” and they may be referred to herein collectively as the “Rules” or referred to individually as a “Rule.”

Rule 2. Authority:

These Rules are promulgated pursuant to the authority granted the State Engineer in sections 37-90-137(9)(a) and 37-80-102(1)(g), C.R.S. (2019)¹.

Rule 3. Scope and Purpose:

- 3.1 These Rules apply to the evaluation and processing of all well permit applications for the withdrawal of groundwater from wells described in section 37-90-137(4), C.R.S., and to replacement permits for wells described in Rule 13, below, granted or denied on or after the effective date of these Rules.
- 3.2 The purpose of these Rules is to make the State Engineer's consideration of well permit applications for the withdrawal of groundwater from wells described in section 37-90-137(4), C.R.S., more certain and expeditious by prescribing reasonable criteria and procedures for the application for, and the evaluation, issuance, and administration of, such well permits.
- 3.3 These Rules apply to all applications and permits for the withdrawal of groundwater from wells described in section 37-90-137(4), C.R.S., regardless of the particular aquifer or portion thereof from which the well produces. In addition, other rules of the State Engineer may apply to applications for well permits in certain locations. Applicants for well permits pursuant to these Rules may also request to extract artificially recharged water pursuant to the Artificial Recharge Extraction Rules, 2 CCR 402-11. These Rules do not apply to a permit sought pursuant to the provisions of section 37-90-137(7),

¹ All statute references in this document are to C.R.S. (2020) unless otherwise noted.

C.R.S., to wells meeting the exemptions set forth in section 37-92-602, C.R.S., or to Designated Groundwater as defined under section 37-90-103(6), C.R.S.

- 3.4 As to any application for a well permit to withdraw nontributary or not-nontributary groundwater, which is the subject of an existing water court decree, in the event of a conflict between the terms and conditions specified in the decree and terms and conditions that would be required by these Rules, then the water court decree will control.

Rule 4. Definitions:

- 4.1 The following definitions are applicable to these Nontributary Groundwater Rules:

4.1.1 “Additional Well” means a well permitted pursuant to section 37-90-137(10), C.R.S., to be constructed on the Overlying Land. Additional Wells may pump in combination with previously permitted or decreed wells such that the amount pumped from the original well and any Additional Wells does not exceed the amount of groundwater permitted to be withdrawn by the original well.

4.1.2 “Allowed Annual Amount of Withdrawal” means the maximum amount of water in acre-feet that a Permittee may withdraw from a well in a particular calendar year pursuant to a permit issued under these Rules, as determined under Rule 8.2.

4.1.3 “Allowed Average Annual Amount of Withdrawal” means 1% of the Total Allowed Withdrawal determined under Rule 8.1., or a lesser amount if requested by the Applicant.

4.1.4 “Annual Appropriation,” is used in these Rules for the purpose of deriving a Cylinder of Appropriation (as defined in Rule 4.1.7 and applied in Rule 8.3). It means a decreed or permitted volume of water in acre-feet per year for a Pre-213 Well. If both the decree and permit for a Pre-213 Well specify only a pumping rate in gallons per minute or cubic feet per second, then the Annual Appropriation will be calculated assuming that the well is operated at that pumping rate continuously for a full year, unless the water court has determined some other annual volumetric limitation or entitlement for the well, or unless a valid statement of beneficial use specifies a lesser annual volumetric amount.

4.1.5 “Applicant” means that person or entity who applies to the State Engineer for a well permit pursuant to section 37-90-137(4), C.R.S.

4.1.6 “Contiguous Parcel” means that portion of the Overlying Land that is in contact with itself so that no part is totally separated. For the purpose of Rule 11, two or more parcels separated by a strip of land less than 150 feet wide owned by a party other than the owner(s) of the Overlying Land for public and private roadways, State and Federal highways, railroads, ditches, and utility structures such as power lines are considered a Contiguous Parcel.

- 4.1.7 “Cylinder of Appropriation” means a hypothetical cylinder in a specific aquifer centered around the location of a Pre-213 Well as applied in Rule 8.3, or centered around a proposed well as applied in Rule 11.2. The Cylinder of Appropriation contains a volume of water equal to one hundred times the Annual Appropriation of Pre-213 Well or the Allowed Average Annual Amount of Withdrawal of a proposed well. The radius of the Cylinder of Appropriation is computed from the following formula:

Radius of Cylinder (ft.) =

$$\sqrt{\frac{43,560 \left(\frac{ft^2}{acre} \right) \times withdrawal \left(\frac{acre - feet}{yr} \right) \times 100 (yr)}{specific\ yield \times saturated\ aquifer\ materials\ (ft) \times \pi}}$$

where: withdrawal means either the Annual Appropriation or Allowed Average Annual Amount of Withdrawal, whichever is appropriate.

- 4.1.8 “Nontributary Groundwater” means that groundwater, located outside the boundaries of any designated groundwater basins in existence on January 1, 1985, the withdrawal of which will not, within one hundred years of continuous withdrawal, deplete the flow of a natural stream at an annual rate greater than one-tenth of one percent of the annual rate of withdrawal. Full definition and further context contained in section 37-90-103(10.5), C.R.S.
- 4.1.9 “Not-nontributary Groundwater” means groundwater located within those portions of the Dawson, Denver, Arapahoe, and Laramie-Fox Hills aquifers defined by the Denver Basin Rules, 2 CCR 402-6, that are outside the boundaries of any designated groundwater basin in existence on January 1, 1985, the withdrawal of which will, within one hundred years, deplete the flow of a natural stream, including a natural stream as defined in sections 37-82-101(2) and 37-92-102 (1)(b), C.R.S., at an annual rate of greater than one-tenth of one percent of the annual rate of withdrawal (see section 37-90-103(10.7), C.R.S.).
- 4.1.10 “Overlying Land” means that land owned by the Applicant or by another who has consented to the Applicant’s withdrawal of groundwater, which land overlies groundwater as described in section 37-90-137(4), C.R.S., and which the Applicant requests be considered in determining the Allowed Average Annual Amount of Withdrawal sought in the application.
- 4.1.11 “Permittee” means the holder of an unexpired well permit issued pursuant to section 37-90-137(4), C.R.S.
- 4.1.12 “Pre-213 Well” means a well meeting the requirements of section 37-90-137(5), C.R.S.

- 4.1.13 “Saturated Aquifer Material(s)” means those geologic deposits where all void space is filled with water and can store and transmit water to wells for beneficial use.
- 4.1.14 “Saturated Aquifer Material Type” means the lithologic or geologic material with distinct hydrogeologic properties to be used in the determination of Specific Yield under Rule 8.6.
- 4.1.15 “Specific Yield” means the ratio of the volume of water which can be drained by gravity from a saturated volume of aquifer material divided by that volume of material.
- 4.1.16 “State Engineer” means the State Engineer of Colorado appointed pursuant to section 37-80-101, C.R.S., or any person deputized by the State Engineer in writing to perform a duty or exercise a right granted in Article 90 of Title 37 (see section 37-90-103(15), C.R.S.).
- 4.1.17 “Total Allowed Withdrawal” means the total amount of water, exclusive of artificial recharge, recoverable from a specific aquifer beneath the Overlying Land, as determined under Rule 8.1.
- 4.1.18 “Well Field” means two or more wells, all of which were permitted on or after July 6, 1973, producing groundwater from the same aquifer on a Contiguous Parcel or on non-contiguous parcels of land that are permitted together under Rule 11.2.
- 4.2 Any term used in these Nontributary Groundwater Rules that is defined in sections 37-90-103 or 37-92-103, C.R.S., is used with the meaning given therein.
- 4.3 If not defined herein, any term used in these Nontributary Groundwater Rules that is defined in other rules and regulations of the State Engineer is used with the meaning given therein.

Rule 5. Information to be Submitted on or with the Well Permit Application:

- 5.1 An Applicant for a well permit to be evaluated pursuant to section 37-90-137(4), C.R.S, must, at a minimum, provide the following information on a form prescribed by the State Engineer:
 - 5.1.1 The name, mailing address, telephone number, and email address of the Applicant;
 - 5.1.2 The name(s) of the owner(s) of the land on which the well will be located;
 - 5.1.3 The water court case number, if any, that adjudicated, or is seeking to adjudicate, the groundwater which is sought to be withdrawn from the well applied for;

- 5.1.4 The name of the aquifer from which water is to be withdrawn;
 - 5.1.5 The location of the proposed well by (a) legal description identifying the section, township, range, and prime meridian; and (b) the Global Positioning System (GPS) location or Universal Transverse Mercator (UTM) coordinates of the proposed well;
 - 5.1.6 The requested Average Annual Amount of Withdrawal in acre-feet per year;
 - 5.1.7 The requested Total Allowed Withdrawal in acre-feet;
 - 5.1.8 The proposed maximum pumping rate in gallons per minute;
 - 5.1.9 The proposed, non-speculative beneficial use of the water;
 - 5.1.10 If the proposed use is agricultural irrigation, a description of the location and number of acres of land to be irrigated;
 - 5.1.11 The proposed total depth of the well;
 - 5.1.12 The legal description and the number of acres of Overlying Land. For legal descriptions of irregularly shaped parcels (where the boundaries do not follow or parallel section lines) or where there are exclusions of land within the total parcel, the Applicant must submit a map having a scale of 1:24,000 or larger (e.g., 1:10,000) which accurately depicts the Overlying Land; and
 - 5.1.13 If the Applicant is seeking to withdraw groundwater from an aquifer that is not either a Denver Basin Aquifer as defined in the Denver Basin Rules (2 CCR 402-6) or another aquifer that is subject to rules promulgated by the State Engineer, the Applicant must demonstrate that the groundwater is Nontributary Groundwater as defined in Rule 4.1.8. This may be evidenced by either (a) a decree from the Water Court finding the groundwater is nontributary, or (b) hydrogeologic information supporting a nontributary determination and a request for such a determination.
- 5.2 If the Applicant has geologic or hydrologic data available that support the application, or if the Applicant's consultant(s) has/have generated or used such data on behalf of the Applicant, the Applicant must submit the data to the State Engineer with the application for a well permit, or as soon thereafter as data become available.

5.3 The Applicant must submit the following evidence of ownership or consent:

5.3.1 If the Applicant owns the Overlying Land, the Applicant must execute a statement, on a form supplied by the State Engineer, that the Overlying Land upon which the permit application is based is owned by the Applicant and that the groundwater in the particular aquifer that is sought to be withdrawn has not been conveyed or reserved to another, nor has consent been given to another for the right to its withdrawal.

5.3.2 If the Applicant claims consent of the owner(s) of the Overlying Land, they must submit, with their permit application, a statement, on a form supplied by the State Engineer, stating whether consent is claimed pursuant to paragraphs 5.3.2.1, 5.3.2.2, or 5.3.2.3 and providing the following additional information:

5.3.2.1 If the Applicant relies on section 37-90-137(4)(b)(II)(A), C.R.S., written consent from the owner of the Overlying Land for the Applicant's withdrawal must be in the form of a copy of a deed or other document, recorded in the county or counties in which the land is located, that includes a legal description of the land for which consent has been given and identifies the aquifers for which consent has been given.

5.3.2.2 If the Applicant relies on section 37-90-137(4)(b)(II)(B), C.R.S., a certified copy of the municipal ordinance or quasi-municipal district resolution and a copy of the water court application or resulting decree.

5.3.2.3 If the Applicant relies on section 37-90-137(4)(b)(II)(C), C.R.S., a copy of the ordinance or resolution of the municipal or quasi-municipal water supplier and the detailed map showing the land area as to which consent is deemed to have been given, as required by section 37-90-137(8), C.R.S. If such a map has been previously filed with the State Engineer, the Applicant need not file another map, but must reference that map and certify that the information thereon is still true and correct.

5.4 If the Applicant claims ownership of the Overlying Land, or claims consent of the owner(s) of the Overlying Land pursuant to section 37-90-137(4)(b)(II)(A), C.R.S., the Applicant must furnish evidence that the Applicant has given notice of the application by registered or certified mail, return receipt requested, no less than ten days prior to the filing of the application, to every record owner of the Overlying Land and to every person who has a lien or mortgage upon, or deed of trust to, the Overlying Land recorded in the county in which the Overlying Land is located. This requirement does not apply to Applicants whose right to withdraw the groundwater has been determined by a valid decree nor to political subdivisions of the state of Colorado, special districts, municipalities, or quasi-municipal districts that have obtained consent to withdraw the groundwater by deed, assignment, or other written evidence of consent where, at the time of application, the Overlying Land is within the water service area of such entity.

- 5.5 The Applicant must submit, with the application for a well permit, the fee required by statute.
- 5.6 The Applicant or the Applicant's authorized agent must affirm that the information set forth in the application is true to the best of their knowledge.

Rule 6. Issuance or Denial of a Well Permit:

- 6.1 The State Engineer will determine whether the well permit application meets the requirements of section 37-90-137(4), C.R.S., these Rules, and any other applicable rules and regulations. If so, the State Engineer will issue the well permit, subject to appropriate terms and conditions. The State Engineer may, in the permit, reserve the determination of, or provide for the subsequent adjustment of the Total Allowed Withdrawal and Allowed Average Annual Amount of Withdrawal until after the well, or other wells on the Overlying Land, are constructed to allow consideration of the geophysical logs and Specific Yield data. The State Engineer may consider additional data as appropriate in any determinations of aquifer properties.
- 6.2 If the application for a well permit is denied, the State Engineer will provide copies of the denied application and the findings of the State Engineer to the Applicant.
- 6.3 In the event an application for a well permit is submitted without the necessary information, fee, or signature as specified in Rules 5.1 through 5.6 above, the State Engineer will notify the Applicant by email, mail or phone of the deficiencies within the time period prescribed by statute. The State Engineer will not act on the application until such time as the deficiencies have been satisfactorily addressed by the Applicant.

Rule 7. Removed

Rule 8. Determination of the Total Allowed Withdrawal and Allowed Annual Amount of Withdrawal:

The Total Allowed Withdrawal and Allowed Annual Amount of Withdrawal will be determined based on the following criteria:

8.1 Total Allowed Withdrawal

The quantification of the Total Allowed Withdrawal from a specific aquifer underlying the Overlying land is determined by multiplying:

- the number of acres of Overlying Land (as adjusted by Rule 8.3, if necessary)
times
- the average feet of Saturated Aquifer Materials in the aquifer underlying those lands (as described in Rule 8.5).
times
- the weighted average Specific Yield of those Saturated Aquifer Materials (as described in Rule 8.6)

and then subtracting reduction amounts pursuant to Rule 8.1.1.

8.1.1 Total Allowed Withdrawal reduction amounts are calculated for any of the following that apply to the Overlying Land:

- Existing Exempt Wells
- Water Reserved for Approved Subdivisions
- Water Already Withdrawn by existing Non-Exempt Wells with Permits that will be canceled during the determination process:

The reduction amounts will be calculated as described in paragraphs 8.1.1.1, 8.1.1.2, and/or 8.1.1.3.

8.1.1.1 Existing Exempt Wells (indicated by a well permit meeting the exemptions specified in section 37-92-602(1), C.R.S., to withdraw water from the same aquifer beneath the Overlying Land):

- a. For wells not located within a subdivision for which the State Engineer issued to a county an opinion of adequacy on the subdivision's water supply pursuant to section 30-28-136(1)(h)(I), C.R.S., but the permit includes an annual acre-foot limitation, the reduction amount will be one-hundred (100) times the Allowed Annual Amount of Withdrawal of the well.;

or

For wells located within a subdivision for which the State Engineer issued to a county an opinion of adequacy on the subdivision's water supply pursuant to section 30-28-136(1)(h)(I), C.R.S., the reduction amount will be computed as the Allowed Annual Amount of Withdrawal specified by the subdivision water supply plan times one hundred (100) years or the maximum of the number of years for which the wells were approved for withdrawal under the subdivision water supply plan, whichever is greater

or

- b. If an exempt well permit or subdivision water supply plan does not specify an Allowed Annual Amount of Withdrawal, the reduction amount will be based on the annual withdrawal amount the State Engineer determines is required to satisfy the allowed uses of the well. The following presumptive amounts will be used:

| Type of Use | Annual Withdrawal |
|--|--|
| Ordinary household use inside one single family dwelling | 0.3 acre-feet/year |
| Domestic | 3.0 acre-feet/year |
| Domestic and livestock | 4.0 acre-feet/year |
| Watering of 1 domestic animal | 0.0125 acre-feet/year |
| Watering of home lawn and garden | 0.05 acre-feet/year per 1,000 square feet |
| Livestock watering | 1.0 acre-feet/year |
| Watering of poultry (per 200 animals) | 0.0125 acre-feet/year |
| Commercial Drinking and Sanitary | 0.33 acre-feet/year |
| Monitoring and Observation | 0.0 acre-feet/year |
| Fire protection and fire fighting | 0.0 acre-feet/year |

If the exempt well owner requests in writing to cancel the well permit concurrent with the application, the amount of reduction will be computed as the Allowed Annual Amount of Withdrawal of the well times the number of years since the initial pump was installed.

8.1.1.2 For Approved Subdivisions where well permit(s) are not issued, but the State Engineer issued an opinion of adequacy on the subdivision's water supply pursuant to section 30-28-136(1)(h)(I), C.R.S., the reduction amount will be computed as the amount of water that is approved for withdrawal from the aquifer beneath the Overlying Land by proposed wells in the subdivision. Such amount will be determined in the same manner as described in 8.1.1.1 above for existing wells located within a subdivision for which the State Engineer issued to a county an opinion of adequacy on the subdivision's water supply pursuant to section 30-28-136(1)(h)(I), C.R.S.

8.1.1.3 Water Already Withdrawn by Non-Exempt Well with Permits that will be canceled during the determination process:

The reduction amount will be computed as the amount of groundwater already withdrawn from the aquifer beneath the Overlying Land by wells that were permitted pursuant to section 37-90-137(4), C.R.S., for which the well owner states in writing that the existing well(s) will no longer operate under the existing non-exempt well permit(s), and a new 100 year allocation is being sought for the aquifer beneath the Overlying Land.

The amount of water already withdrawn will be computed as the total metered amount pumped since initial pump installation, or if a meter has not always been installed on the well, the amount of water already withdrawn will be computed as the Allowed Annual Amount of Withdrawal times the number of years since the initial pump was installed.

8.2 Allowed Average Annual Amount of Withdrawal and Allowed Annual Amount of Withdrawal

8.2.1 The Allowed Average Annual Amount of Withdrawal will be based on an aquifer life of 100 years in accordance with section 37-90-137(4)(b)(I), C.R.S.

The Allowed Average Annual Amount of Withdrawal for all of the wells on the Overlying Land is one percent (1%) of the Total Allowed Withdrawal, or a lesser amount if requested by the Applicant. An applicant may request a lesser annual withdrawal that complies with county regulations as described in an approved subdivision water supply opinion issued by the State Engineer pursuant to Section 30-28-136(1)(h)(I), C.R.S. for the Overlying Land Area.

The Allowed Annual Amount of Withdrawal may exceed the Allowed Average Annual Amount of Withdrawal provided the total volume of water withdrawn from the well(s) does not exceed the product of the number of years since

- the date(s) of issuance of the well permit(s)
- **or**
- the date(s) of determination(s) of right to groundwater by the water court (whichever comes first)
- **times**
- the Allowed Average Annual Amount of Withdrawal.

8.3 Pre-213 Wells and Previous Allocations Not Otherwise Accounted For

The Overlying Land claimed in the application to be used for determining the Total Allowed Withdrawal cannot include land for which the groundwater in the requested aquifer has been previously appropriated as part of a water court decree or non-exempt well permit (that will not be vacated or canceled during the determination process).

In addition, if the Cylinder(s) of Appropriation of a Pre-213 Well(s) overlap the Overlying Land claimed in the application, the number of acres of Overlying Land claimed in the application to be used for determining the Total Allowed Withdrawal will be reduced by the number of acres of the Cylinder(s) of Appropriation which overlap the Overlying Land, unless the water court has determined some other acreage to represent the Cylinder or Cylinders of Appropriation which overlap the land. The area of the Cylinder of Appropriation of a Pre-213 Well will be computed as defined in Rule 4.1.7, making the following assumptions, if necessary:

- 8.3.1 In the event that the Pre-213 Well does not fully penetrate the aquifer, the radius of the Cylinder of Appropriation for that well will be calculated assuming that it does fully penetrate that aquifer.
- 8.3.2 In the event that a Pre-213 Well is constructed so as to produce water from more than one aquifer, Cylinders of Appropriation must be calculated for each aquifer. The production of the well from each aquifer will be allocated in proportion to the estimated historical production of the well from each aquifer. If no data are available to show what the estimated historical production from each aquifer was, the production will be divided equally between the aquifers.
- 8.3.3 If the Specific Yield for a Pre-213 Well has not been specified by decree, it will be assumed to be the same as determined for the well for which a permit application is being evaluated, absent site-specific data for the existing well.
- 8.3.4 In the event that the thickness of Saturated Aquifer Materials for a Pre-213 Well has not been specified by decree, the thickness of Saturated Aquifer Materials will be assumed to be that thickness existing at the time of the issuance of the permit, registration of the well with the State Engineer, or decree, whichever was earlier.
- 8.3.5 In the event that a well meets the exemptions specified in section 37-92-602(1), C.R.S., the area of the Cylinder of Appropriation will be considered to be zero (0).

8.4 Site-Specific Data

- 8.4.1 If presumptive Specific Yield or feet of Saturated Aquifer Materials have not been established by Rule, the State Engineer may require an Applicant or Permittee to furnish site-specific data from multiple sites across the Overlying Land.

8.4.2 Presumptive Specific Yield and feet of Saturated Aquifer Material values may be rebutted by data or studies provided by Applicants or Permittees. In determining whether an Applicant or Permittee has rebutted a presumptive value set forth in Rule 8 or other Rules, the State Engineer may also consider other site-specific data and any other scientific evidence available to them.

8.4.3 Site-specific data acquisition methods and procedures to determine specific yield and/or feet of Saturated Aquifer Materials must be presented to, reviewed, and approved by the State Engineer prior to an Applicant or Permittee commencing a process to determine Specific Yield or Saturated Aquifer Materials. Such approaches may require submission of additional geophysical logs as described in Rule 9.3.

8.4.4 All data collected in support of Specific Yield and Saturated Aquifer Material determinations must be submitted to the State Engineer.

8.5 Saturated Aquifer Material(s)

The number of feet of Saturated Aquifer Materials will be determined by application of valid rules applying to a particular aquifer, such as the Denver Basin Rules, or calculated from geophysical logs in conjunction with lithologic logs and well construction reports.

8.5.1 An average value representative of all Saturated Aquifer Materials under the Overlying Land will be used in the determination of Total Allowed Withdrawal.

8.5.2 On a case-by-case basis, the State Engineer may accept feet of Saturated Aquifer Material estimates determined by appropriate geophysical technologies that calculate the feet of Saturated Aquifer Materials for the full claimed aquifer interval(s) consistent with Rule 8.4.3.

8.6 Specific Yield

8.6.1 Denver Basin Aquifers Specific Yield Values

The following Specific Yield values for Denver Basin Aquifers are presumptive according to the Denver Basin Rules (2 CCR-402-6, effective January 1, 1986):

| Aquifer | Specific Yield² |
|----------------------|-----------------------------------|
| Upper/Lower Dawson | 0.20 |
| Denver | 0.17 |
| Upper/Lower Arapahoe | 0.17 |
| Laramie-Fox Hills | 0.15 |

² 2 CCR-402-6 Denver Basin Rules and Appendices, 1986.

8.6.2 Statewide Aquifers' Specific Yield Values

The following presumptive Specific Yield values are established by these Rules.

| Aquifer | Specific Yield |
|---|-----------------------|
| Laramie-Fox Hills (outside Denver Basin) | 0.15 |
| Dakota Group Aquifer ³ | 0.10 |

8.6.3 Saturated Aquifer Material Type, Specific Retention, and Specific Yield Values

In order to minimize the need for individuals to obtain site-specific data, the following Specific Retention and Specific Yield values will be considered presumptive values for the listed saturated aquifer materials.

- 8.6.3.1 The Applicant or Permittee may calculate (per Rule 8.4.3) average weighted Specific Yield by subtracting the presumptive specific retention value from porosity (calculated from geophysical log) for each Saturated Aquifer Material Type.

| Saturated Aquifer Material Type | Specific Retention |
|--|---------------------------|
| Siltstone | 0.30 |
| Sandstone | 0.13 |

- 8.6.3.2 Alternately, the Applicant or Permittee may calculate average weighted Specific Yield using the following presumptive Specific Yield values and the method provided in Rule 8.6.4

| Saturated Aquifer Material Type | Specific Yield |
|--|-----------------------|
| Siltstone | 0.07 |
| Sandstone | 0.14 |

³ Robson and Banta, 1987, Geology and Hydrology of Deep Bedrock Aquifers of Eastern Colorado.

8.6.4 Calculating Weighted Average Specific Yield

If Specific Yield has not been presumed by Rule, or if an Applicant requests a Specific Yield other than presumed by Rule, the Specific Yield value used in calculating the Total Allowed Withdrawal must be a weighted average for the Saturated Aquifer Material Types within the specific aquifer under the Overlying Land.

For Example

If an aquifer has two Saturated Aquifer Material Types (e.g., sandstone and siltstone) then the weighted average Specific Yield (Avg. S_y) will be calculated as follows:

$$\text{Avg. } S_y = [S_{y1} * (\text{type feet}_1/\text{total feet})] + [S_{y2} * (\text{type feet}_2/\text{total feet})]$$

| <u>Aquifer Material Type</u> ⁴ | <u>Specific Yield</u> ⁵ |
|---|------------------------------------|
| 150 feet of siltstone | 0.07 |
| 110 feet of sandstone | 0.14 |

$$\text{Avg. } S_y = [0.07 * (150 \text{ ft} / 260 \text{ ft})] + [0.14 * (110 \text{ ft} / 260 \text{ ft})]$$

$$\text{Avg. } S_y = 0.10$$

8.6.5 Site Specific Data Collection for Specific Yield

Specific Yield Tests must be done in accordance with the following criteria and Rule 8.4.3:

8.6.5.1 If cores are collected, the depths for collecting either sidewall or down hole vertical cores will be selected by the Applicant or the Applicant's consultant, but they must be obtained from within the representative Saturated Aquifer Materials. If using sidewall cores for laboratory analysis, the sidewall cores must be from a rotary coring tool of the large-format type. The cores must be a minimum of one-inch (1") diameter and one and one-half inches (1.5") in length. Cores from percussion coring tools are not allowed for determination of aquifer properties, including specific yield.

⁴ Calculated from geophysical log in conjunction with the geologic log

⁵ Either set by Rule or determined pursuant to Rule 8 (numbers shown are for example only)

8.6.5.2 Laboratory tests must be conducted on a minimum of six (6) samples from each well. The samples must be representative of Saturated Aquifer Materials. A minimum of three (3) samples must be tested for each claimed Saturated Aquifer Material Type.

For example, an Applicant might claim the aquifer has two (2) Saturated Aquifer Material Types: siltstone and sandstone. Laboratory tests must be conducted (and reported) on:

- At least three (3) samples from representative siltstone intervals, **and**
- At least three (3) samples from representative sandstone intervals.

8.6.5.3 Laboratory tests for Specific Yield must be made on undisturbed samples which can be cut from either sidewall or vertical cores. The proposed procedure(s) for sample preparation and testing of aquifer material must be submitted to the State Engineer for approval prior to testing. The State Engineer will consider if the procedure complies with applicable standards of current common practice accepted by the materials testing community and will accept the procedure or request modification.

8.6.5.4 Applicants must submit Specific Yield test results to the State Engineer within 63 days of receipt of such results. The State Engineer will consider the Specific Yield test results as well as any other geologic or geophysical data in their determination.

8.6.6 Other Methods to Determine Specific Yield

8.6.6.1 The State Engineer may accept Specific Yield estimates determined by appropriate geophysical technologies. Acceptable geophysical technologies must be able to characterize the claimed Saturated Aquifer Materials and Types for the full claimed aquifer interval(s).

8.6.6.2 In unconfined aquifers, the State Engineer may accept an aquifer test ascertaining the Specific Yield of the aquifer at the location of the well.

8.6.6.3 The Applicant, prior to well construction, may request the State Engineer to consider the use of other methods to determine Specific Yield. The State Engineer will evaluate the request and either approve or disapprove the alternate method and inform the Applicant accordingly.

8.6.6.4 If a Permittee is unable to obtain site-specific data, the State Engineer will assign a Specific Yield value based on presumptive values or another value based on existing data or literature.

Rule 9. Geophysical Logs:

- 9.1 The required geophysical logs listed in Rule 9.3 must be submitted to the State Engineer for all wells permitted and constructed pursuant to section 37-90-137(4), C.R.S.

Continuous (non-paginated) paper and electronic (.pdf, .tif, and .las) copies of the logs must be submitted to the State Engineer's Office within 63 days following collection of the data.

- 9.1.1 Geophysical Logs must be obtained prior to the installation of well casing (unless being obtained for a previously-permitted and constructed well pursuant to Rule 9.6) and must record the entire length of the borehole. To be acceptable, the log must record the permitted aquifer and all overlying confining layers, and saturated aquifers. Geophysical logs that do not record the entire length of the borehole may only be acceptable with a variance pursuant to Rule 16.
- 9.1.2 Portions of the permitted aquifer not geophysically logged may not be included in a site-specific calculation of feet of Saturated Aquifer Material or Saturated Aquifer Material type.
- 9.1.3 Well Construction Contractors⁶ licensed by the Board of Examiners of Water Well Construction and Pump Installation Contractors, or Private Drillers⁶, who construct wells are responsible for obtaining and submitting the required geophysical logs on behalf of the well owner. If the geophysical log is not obtained before casing is installed, the State Engineer may require a log from an uncased borehole (test hole) or through the casing (See Rule 9.6.1).
- 9.2 The geophysical logging requirement may be waived at the discretion of the State Engineer if either:
- 9.2.1 There is an existing geophysical log within 1,320 feet of the permitted location of the proposed well which:
- portrays data from the permitted aquifer and all overlying confining layers and saturated aquifers,
 - is representative of aquifer conditions at the location of the permitted well, and
 - is of acceptable quality to the State Engineer
- or**
- 9.2.2 The well will only partially penetrate an aquifer that is present at ground surface at the well location and the well will not penetrate any underlying confining layers.

⁶ Defined in 2 CCR 402-2 (2016)

9.3 The required and additional recommended geophysical log types are identified in the table below:

| Required Geophysical Logs |
|----------------------------------|
| Resistivity (shallow and deep) |
| Gamma |
| Spontaneous Potential (SP) |
| Caliper |

| Additional Recommended Geophysical Logs |
|--|
| Density (Porosity) ⁷ |
| Neutron ⁷ |
| Single Point Resistance (SPR) |
| Sonic |
| Magnetic Resonance ⁷ |

9.4 Geophysical logs must conform with the following requirements:

9.4.1 Required Header Information

- a. Permit number
- b. Ground surface elevation and elevation data source
- c. Log datum (ground surface or kelly bushing)
- d. Log datum elevation (if not ground surface)
- e. Drilled location coordinates (UTM or Lat/Long decimal degrees)
- f. Logging date
- g. Log depth
- h. Hole depth
- i. Tool configuration
- j. Assumed matrix density (if density log is run)

⁷ Density, Neutron, Magnetic Resonance, or another acceptable porosity log is required if the Applicant intends to use geophysical methods (either independently or in conjunction with other tests) to calculate porosity, specific retention, and/or specific yield.

9.4.2 Required Scaling

- a. Horizontal must be a linear scale (not logarithmic) for required logs
 - i. Logarithmic scale accepted for additional recommended logs
- b. Vertical scales of both 1 inch = 20 feet and 1 inch = 50 feet

9.5 If a Permittee or an Applicant desires to use other geophysical logs to meet the minimum requirement, they must apply in writing to the State Engineer and get the approval of the State Engineer prior to well construction.

9.6 For permits for the use of an existing well issued pursuant to 37-90-137(4) after the amended effective date of these Rules in 2021 with no record of a geophysical log submitted to the State Engineer, Permittees or Applicants must submit a geophysical log that is representative of aquifer conditions at the location of the permitted well within 63 days of receiving a new well permit when:

- The existing well was drilled pursuant to a well permit that required geophysical logging.
- or**
- The existing well was drilled after the effective date of these Rules pursuant to a well permit that notified the owner that future re-permitting of the well would require geophysical logging.

Otherwise, a geophysical log is not required when an existing well is re-permitted or if the well is issued a geophysical log waiver.

9.6.1 The geophysical log must be obtained from:

- an uncased borehole (test hole) pursuant to Rule 9.1.
- or**
- a cased well using geophysical methods accepted in writing by the State Engineer.

9.7 The following timelines will be followed if an Applicant or well contractor requests the State Engineer confirm or amend the permitted production interval, well screen interval, sump/rathole interval, gravel pack interval, and/or grout interval during well construction.

9.7.1 Expedited Review:

The Contractor notifies the State Engineer by submitting a request through AskDWR (or a future replacement tool), available on DWR's website, at the following times:

- Approximately 2 business days before the total depth of the well is anticipated to be reached,
- Approximately 12 hours before actual anticipated logging, and
- When logging commences with notice of the anticipated end time or time to expect the geophysical logs.

The Contractor must include their requested aquifer interval(s) or other request(s) concurrently with the transmittal of the geophysical logs.

The State Engineer will respond as soon as possible, but no more than twelve (12) hours after receiving the geophysical logs.

9.7.2 Standard Review:

If the Applicant or Permittee does not inform the State Engineer pursuant to Rule 9.7.1, the State Engineer will respond as soon as possible, usually within one business day, after receiving the geophysical logs.

Rule 10. Removed

Rule 11. Well Location:

11.1 All wells, including Additional Wells applied for pursuant to section 37-90-137(10), C.R.S., must be located on the Overlying Land as defined at Rule 4.1.10.

11.2 If the Applicant has identified non-contiguous parcels of Overlying Land, they may withdraw permitted amounts from one or more wells in accordance with Rule 12, provided that the well or wells are located so that the Cylinder(s) of Appropriation for at least one of the well or wells overlaps, at least in part, each of the non-contiguous parcels. In determining the Cylinder of Appropriation, the water from all non-contiguous parcels will be included in the calculation.

11.3 Any well will be considered to have been constructed at the permitted location if it is constructed within 200 feet of the permitted location, provided that it is still located on the Overlying Land. If, for any reason, the location of the well is to be more than 200 feet from the permitted location, the Applicant must request a Well Location Amendment prior to construction.

Rule 12. Permits for Additional Wells:

- 12.1 An Applicant for a permit for an Additional Well pursuant to section 37-90-137(10), C.R.S., must provide the following information:
- The well permit numbers of all previously issued permits; and
 - All of the information required by Rule 5.1.
- 12.2 The permit for an Additional Well will reiterate the Allowed Average Annual Amount of Withdrawal and Total Allowed Withdrawal for the previously permitted or decreed well(s) and will state that the amount pumped from the Additional Well in combination with the amount pumped from the previously permitted or decreed well(s) may not exceed those amounts.
- 12.3 An Additional Well may be located anywhere on the Overlying Land, limited only by the provisions of Rule 11 above.

Rule 13. Replacement Permits For Existing Wells Completed in Two or More Aquifers:

In the event a replacement permit is sought for an existing well completed in two or more aquifers, then, unless the Rules for a specific aquifer or aquifers provide otherwise, the State Engineer will issue replacement permits requiring that the existing well be replaced by wells each of which are completed in only one aquifer. Upon proper application, replacement permits will be issued for wells in each of the aquifers from which the existing well produced water. The Allowed Average Annual Amount of Withdrawal for the existing well will be divided equally among the replacement wells unless data are available which support an estimate that the existing well produced water from the aquifers in a different ratio.

Rule 14. Well Fields:

A Permittee having a Well Field may withdraw the Total Allowed Withdrawal and Allowed Annual Amount of Withdrawal for the wells in the Well Field (determined pursuant to Rules 8 and 12) from any combination of the wells in the Well Field, unless such withdrawal would conflict with the terms and conditions of an existing water court decree or well permit.

Rule 15. Metering and Reporting of Withdrawals from Wells Permitted Pursuant to Section 37-90-137(4):

- 15.1 The well owner must install and maintain a totalizing flow meter to measure all withdrawals from the well. At a minimum, the meters must be installed according to manufacturer's recommendations and contain sufficient recording digits to assure that "roll over" to zero does not occur within three years. The meters must be maintained by the well owner so as to provide a continuous, accurate record of withdrawals. If the meter is not operational, the well must cease pumping. The State Engineer may approve an alternate method of measurement if it is capable of recording or can be used to calculate the total volume pumped.

- 15.2 The well owner must collect and permanently maintain annual diversion records from the well. The owner will report the amount of withdrawal from the permitted well when required by the State Engineer.

Rule 16. Variances

- 16.1 Written Requests - Variances to these Rules may be granted by the State Engineer upon written request and a showing by the Applicant or person requesting the variance that (1) the Rules will result in undue hardship, and (2) the requested variance will comply with the intent of these Rules to protect the public safety, health and environment and prevent injury to existing users of, and rights to withdraw water from aquifers subject to these Rules.
- 16.2 Written Response - The State Engineer will respond in writing to a variance request stating the reasons for the decision and imposing conditions necessary to implement the intent of these Rules.

Rule 17. Enforcement

- 17.1 No person may divert groundwater if the diversion violates any of the Rules herein.
- 17.2 Any person who diverts groundwater in violation of these Rules may be subject to enforcement proceedings under section 37-90-110, C.R.S., to enjoin further illegal withdrawal or use of groundwater from the well and to enforce compliance with the requirements of these Rules.

Rule 18. Severability:

If any portion of these Nontributary Groundwater Rules is found to be invalid, the remaining portion of the Rules will remain in force and unaffected.

Rule 19. Revision:

The State Engineer may revise these Nontributary Groundwater Rules in accordance with section 24-4-103, C.R.S.

Rule 20. Statement of Basis and Purpose Incorporated by Reference:

The Statement of Basis and Purpose for the Adoption of Nontributary Groundwater Rules is incorporated by reference as part of these Rules.

Rule 21. Effective Date:

These Rules originally became effective on March 2, 1986 and the amended Rules are effective [*placeholder, at least 20 days after SOS publication*].