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State of Colorado

Oil and Gas Conservation Commission

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Via Website: <https://cogcc.state.co.us/RuleMaking/make/?&cat=Mission>

RE: Comments on COGCC Mission Change Rulemaking from local governments and public water suppliers

Dear Colorado Oil and Gas Conservation Commission:

The undersigned local governments and organizations that supply public drinking water (“public water suppliers”) would like to thank the COGCC for taking action to protect drinking water supplies in proposed Rule 411. While we appreciate the COGCC’s efforts to protect water quality in the March 15th draft rules, we believe there are unintended gaps in the protections given to some public drinking water systems.

The undersigned local governments and public water suppliers’ greatest concern with the draft rules is the apparent lack of protection for many shallow public water supply groundwater wells.

The COGCC has proposed 1,000-foot setbacks from “Groundwater Wells Under the Direct Influence” (“GUDI wells”). The COGCC has proposed to use the definition of GUDI wells from the Colorado Water Quality Control Commission (5 CCR 1002-11).

Groundwater Wells Under the Direct Influence of Surface Water (“GUDI”) means any water beneath the surface of the ground with:

- Significant occurrence of insects or other macro-organisms, 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.

The definition of GUDI has almost nothing to do with a water well’s susceptibility to contamination from surface spills or releases. Rather, the GUDI definition is used by the Water Quality Control Division and State Engineer’s Office to identify water wells that require additional treatment before the water can be used for public consumption.

Reliance on the GUDI definition leaves many public water supply wells that are vulnerable to spills or releases completely unprotected. For example, the Town of Lochbuie operates three existing alluvial water supply wells, which comprise its entire potable water supply. The wells produce from the Beebe Draw alluvial aquifer, which consists of shallow sand and gravel deposits deposited by the South Platte River that once flowed at this location. The Beebe Draw Aquifer is a unique, highly permeable, very shallow, alluvial aquifer with water levels often lying 10 feet or less from ground surface. This, combined with the very permeable nature of the aquifer gravels, makes the Beebe Draw Aquifer highly susceptible to contamination from surface and near surface releases. Although the Beebe Draw Aquifer is very shallow and susceptible to contamination from a spill, the wells are not classified as GUDI wells.

The Town of Lochbuie is not alone in its concern for shallow water supply wells near oil and gas activities. According to the CDPHE, there are roughly 500 public water systems serving 670,000 Coloradans daily with groundwater from wells not classified as GUDI wells. Several of those public water suppliers are listed below. We are authorized to state that they endorse this letter and the attached redlined version of Rule 411. We add that our proposed term “Shallow Public Water System Well” as a substitute for GUDI wells would still include GUDI wells (all GUDI wells draw from a Type III aquifer but not all Type III aquifers are GUDI).

The other remaining issue is to ensure that public water suppliers receive timely notice of oil and gas development proposals near their wells or designated recharge areas. The relevant sections include: Rule 302.d.(2) (Notice for Consultation); Rule 302.e.(1) (Notice); Rule 305.c. (Notice of Recommended Decision); Rule 309 (Consultation); Rule 314.e.(1) (CAP Notice); Rule 314.e.(3) (CAP Consultation); and Rule 314.f.(3) (CAP Notice of Director’s Recommendation). The state’s Source Water Assessment and Protection (SWAP) Program could be utilized to provide the maps necessary for notifying public water suppliers. Additionally, water suppliers could provide GIS layers of their operations, including well fields such as those overlying the Beebe Draw Aquifer, for the COGCC to incorporate into its mapping and notification system.

Please feel free to call anytime if we can be of assistance.

Thank-you for your efforts to protect public drinking water.

Sincerely,

On behalf of the following local governments and public water systems:

- City of Brighton,
- Town of Castle Rock,
- Town of Lochbuie,
- East Cherry Creek Valley Water & Sanitation District (ECCV),
- United Water and Sanitation District,
- South Beebe Draw Metro District,
- South Adams Water and Sanitation District,
- Arapahoe County Water and Wastewater Authority,
- South Metro Water Supply Authority

Recommendations

100 SERIES DEFINITIONS

PUBLIC WATER SYSTEM (PWS) means a system to provide to the public water for human consumption through pipes or other constructed conveyances, if such systems have at least 15 service connections or regularly serve an average of at least 25 individuals daily at least 60 days out of the year. The definition of PWS includes:

- a. Any collection, treatment, storage, and distribution facilities under control of the PWS operator of such system and used primarily in connection with such system.
- b. Any collection or pretreatment storage facilities not under such control, which are used primarily in connection with such system.

The definition of PWS does not include any “special irrigation district,” as defined in Colorado Primary Drinking Water Regulations (5 C.C.R. 1003.1).

SURFACE WATER SUPPLY AREA means the classified water supply segments and buffers described in Table 411-1 that are within 5 stream miles upstream of a public water system surface water intake on a classified water supply segment or within one-half mile of a Shallow Public Water System Groundwater Under Direct Influence of Surface Water Public Water System supply well.

OPERATIONS AND REPORTING (400 Series)

411. PUBLIC WATER SYSTEM PROTECTION

- a. **Definitions.** For purposes of this Rule 411:
 - (1) **Drilling, Completion, Production and Storage (“DCPS”) Operations.** DCPS means Oil and Gas Operations at:
 - A. Oil and Gas Locations for the drilling, completion, recompletion, workover, or stimulation of Wells; or
 - B. Any other Oil and Gas Location at which Production Facilities are operated.
 - (2) **Existing Oil and Gas Location** means an Oil and Gas Location, excluding roads, and gathering lines:
 - A. Permitted or constructed prior to the later of May 1, 2009 for federal land or April 1, 2009 for all other land, or
 - B. The date that the Oil and Gas Location becomes subject to this Rule 411 by virtue of its proximity to a Classified Water Supply Segment or Shallow Public Water System Well.
 - (3) **New Oil and Gas Location** means an Oil and Gas Location, excluding roads and gathering lines, that is not an existing Oil and Gas Location.
 - (4) **New Surface Disturbance** means a surface disturbance that expands the area of surface covered by an Oil and Gas Location beyond that initially disturbed in the construction of the Oil and Gas Location and any disturbance or modification to an existing Oil and Gas Location that requires the approval of a Form 2A, Oil and Gas Location Assessment.
 - (5) **Non-Exempt Linear Feature** means a road or a pipeline regulated by the Commission that is not necessary to cross a stream or connect or access a well or a pipeline.
 - (6) **Shallow Public Water System Well** means a water well connected to a public water system that is drawing water from a Type III aquifer, as defined by the Colorado Department of Natural Resources’ Division of Water Resources.

~~**Groundwater Under the Direct Influence of Surface Water Well (“GUDI”)** means any water beneath the surface of the ground with:~~

- ~~A. Significant occurrence of insects or other macro-organisms, algae, or large-diameter pathogens such as Giardia lamblia or Cryptosporidium; or~~
~~B. Significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH, which closely correlate to climatological or surface water conditions.~~

b. Statewide Spill Emergency Notification Procedures. All Operators will evaluate their DCPS operations at Existing Oil and Gas Locations and New Oil and Gas Locations with respect to the downstream surface water hydrology for waterways that may be impacted from spills or releases from their operations, regardless of whether the DCPS operation is within a Surface Water Supply Area.

- (1) For all DCPS operations within 2,640 feet of surface water that is 15 stream miles or less upstream from a Public Water System(s) intake(s) or a ~~Groundwater Under Direct Influence (GUDI)~~ Shallow Public Water System supply well:
 - A. The Operator will maintain an emergency response program that includes current contact information for downstream Public Water System(s) and provisions to immediately notify downstream Public Water System(s) within 15 stream miles of the DCPS operations;
 - B. The Operator will maintain an emergency spill response program that includes employee training, safety, and maintenance and response provisions; and
 - C. The Operator will maintain the ability to immediately notify any downstream Public Water System(s) with intake(s) within 15 stream miles of the DCPS operations in the event of a Spill or Release.
- (2) In the event of a Spill or Release that is reportable under Rule 912, the Operator will immediately implement the emergency response procedures in the above-described emergency spill response program.
- (3) In the event of a Spill or Release that is reportable under Rule 912 or has the potential to impact a Public Water System(s), the Operator will notify the affected or potentially affected Public Water System(s) immediately following discovery of the Spill or Release.

c. Applicability Determination.

- (1) Rule 411 is applicable to DCPS Operations within and upstream from Surface Water Supply Areas. The applicability of Rule 411 will be determined by field survey verification of proposed DCPS operation locations, the PWS intake or Shallow Public Water System supply ~~GUDI~~ well, the ordinary-high water mark of the Classified Water Supply Segment, the buffer zones defined in Table 411-1, and the hydrology map submitted with the Form 2A, Oil and Gas Location Assessment. Final applicability of this Rule 411 will be determined by the Director.
- (2) With a Form 2A, Oil and Gas Location Assessment, Operators will submit a copy of the Colorado Department of Public Health and Environment's Public Water System Surface Water Supply Area Map for the proposed location as described in Rule 304.b.(14).
- (3) DCPS Operations at New Oil and Gas Locations within a Surface Water Supply Area will be subject to the requirements in Rules 411.d, 411.e, or 411.f based on the buffer zones defined in Table 411-1, below. DCPS Operations at Existing Oil and Gas Locations within a Surface Water Supply Area at which no new surface disturbance has occurred after the date Rule 411 became applicable to that Oil and Gas Location will be subject to the requirements in Rule 411.g based on the buffer zones defined in Table 411-1. DCPS Operations at Existing Oil and Gas Locations within a Surface Water Supply Area at which new surface disturbance has occurred after the date Rule 411 became applicable to that Oil and Gas Location will be subject to the requirements in Rule 411.f.(2) based on the buffer zones defined in Table 411-1.
- (4) For Classified Water Supply Segments that are perennial and intermittent streams, buffer zones will be determined by measuring from the ordinary high-water mark of each bank to the near edge of the disturbed area at the Oil and Gas Location at which the DCPS Operations will occur. For Shallow Public Water System supply ~~GUDI~~ wells, measurements will be coordinated with Public Water System(s) so they may identify accurate locations of their water sources.

- (5) The buffer zones will apply only to DCPS Operations located on the surface of the Oil and Gas Location. The buffer zones will not apply to subsurface boreholes and equipment or materials contained therein.

TABLE 411-1. Buffer Zones Associated with DCPS Operations.

Zone	Classified Water Supply Segments (ft)	<u>Shallow Public Water System supply well</u> <u>Groundwater wells under the direct influence (GUDI) of surface water</u> (ft)
Internal Buffer	0 - 1,000	0 - 1,000
Intermediate Buffer	1,001 - 1,500	1,001 - 1,500
External Buffer	1,501 - 2,640	1,501 - 2,640

d. Requirements for DCPS Operations Conducted at New Oil and Gas Locations in the Internal Buffer Zone.

DCPS Operations conducted and Non-Exempt Linear Features located at New Oil and Gas Locations and New Surface Disturbance may not occur in whole or in part within the Internal Buffer Zone of a Surface Water Supply Area identified in Table 411-1 unless a variance is granted by the Commission pursuant to Rule 502.b and consultation with the Public Water System(s) and the Colorado Department of Public Health and Environment occurs pursuant to Rule 309.f and a Form 2A, Oil and Gas Location Assessment, or Comprehensive Area Plan has been approved with appropriate conditions of approval. In determining appropriate conditions of approval for such operations, the Director will consider the extent to which the conditions of approval are required to prevent impacts to the Public Water System.

- (1) The Commission will not grant a variance unless the Operator demonstrates that:
 - A. The proposed DCPS Operations and applicable Best Management Practices and operating procedures will result in substantially equivalent protection of drinking water quality within the Internal Buffer Zone in the Surface Water Supply area; and
 - B. Conducting the DCPS Operation outside the Internal Buffer Zone would pose a greater risk to public health, safety, welfare, the environment or wildlife resources, such as may be the case where conducting the DCPS Operations outside the Internal Buffer Zone would require construction in steep or erosion-prone terrain or result in greater surface disturbance due to an inability to use infrastructure already constructed such as roads, well sites, or pipelines.
- (2) At a minimum, for any DCPS Operation or New Surface Disturbance at a New Oil and Gas Location within the Internal Buffer Zone, the Director will include as conditions of approval in the Form 2A, Oil and Gas Location Assessment, or Comprehensive Area Plan, the requirements of Rule 411.d and e.

e. Requirements for DCPS Operations at New Oil and Gas Locations in the Intermediate Buffer Zone.

- (1) The following will be required for all DCPS Operations at New Oil and Gas Locations within a Surface Water Supply Area and in the Intermediate Buffer Zone as defined in Table 411-1.
 - A. Flowback and stimulation fluids contained within tanks that are placed on a working pad surface in an area with downgradient perimeter berming;
 - B. Lined berms or other lined containment devices will be constructed in compliance with Rule 603.s. around crude oil, condensate, and produced water storage tanks;

- C. Daily inspection of the Oil and Gas Location for compliance with Rule 411; and
- D. During drilling and completion operations, the Operator will maintain spill response equipment at the Oil and Gas Location.
- (2) Pits are prohibited within the Intermediate Buffer Zone.
- (3) The following chemicals listed in Table 411-2 are prohibited as additives in Hydraulic Fracturing Fluid within the intermediate buffer zone. This prohibition does not prevent Operators from recycling or reusing produced water that may have trace amounts of chemicals listed in Table 411-2 as Hydraulic Fracturing Fluid. For any chemical constituent for which Table 915 provides a standard, the concentration will be below the Table 915 standard.

TABLE 411-2. Chemical Additives Prohibited in Hydraulic Fracturing Fluid

Ingredient Name	CAS #
Benzene	71- 43- 2
Lead	7439- 92- 1
Mercury	7439- 97- 6
Arsenic	740- 38- 2
Cadmium	744043- 9
Chromium	7440- 47- 3
Ethylbenzene	100- 41- 4
Xylene	1330- 20- 7
1,3,5,-trimethylbenzene	108- 67- 8
1,4,-dioxane	123- 91- 1
1-butanol	71- 36- 3
2-butoxyethanol	111- 76- 2
N,N-dimethylformamide	68- 12- 2
2-ethylhexanol	104- 76- 7
2-mercaptoethanol	60- 24- 2
benzene, 1,1'-oxybis-,tetrapropylene derivatives sulfonated, sodium salts (BOTS)	119345- 04- 9
butyl glycidyl ether	8- 6- 2426
polysorbate 80	9005- 65- 6
Quaternary ammonium compounds, dicoco alkyl dimethyl, chlorides (QAC)	61789- 77- 3
Bis hexamethylene triamine penta methylene phosphonic acid (BMPA)	35657- 77- 3
Diethylenetriamine penta (methylene- phosphonic acid) (DMPA)	15827- 60- 8
FD& C blue no. 1	3844- 45- 9
Tetrakis(triethanolaminate) zirconium(IV) (TTZ)	101033- 44- 7

- (4) DCPS Operations at New Oil and Gas Locations and New Surface Disturbances within the Intermediate Buffer Zone will comply with the requirements of Rule 411.f.

f. Requirements for DCPS Operations at New Oil and Gas Locations within the External Buffer Zone.

The following will be required when DCPS Operations are conducted at New Oil and Gas Locations within ~~a Surface Water Supply Area and in~~ the External Buffer Zone as defined in Table 411-1.

- (1) Pitless drilling systems; and
- (2) When sufficient water exists in the Classified Water Supply Segment, collection of baseline surface water data consisting of a pre-drilling surface water sample collected immediately downgradient of the Oil and Gas Location and follow-up surface water data consisting of a sample collected at the same location 3 months after the conclusion of any drilling activities and operations or completion. In addition to the

requirements of Rule 615, the Director may require the Operator to install and sample site-specific Groundwater monitoring wells. The Operator will sample the Shallow Public Water System supply GUDI well(s) within 2,640 feet of the Oil and Gas Location unless the PWS Well Operator does not consent to the sampling. The sample parameters for both Groundwater and surface water samples will include:

- A. pH;
 - B. Alkalinity (total bicarbonate and carbonate as CaCO_3);
 - C. Specific conductance;
 - D. Major cations (calcium, iron, magnesium, manganese, potassium, sodium);
 - E. Major anions (bromide, chloride, fluoride, sulfate, nitrate and nitrate as N, and phosphorus);
 - F. Total dissolved solids;
 - G. BTEX compounds (benzene, toluene, ethylbenzene, and total xylenes);
 - H. Diesel Range Organics (DRO – C10 to C28) and Gasoline Range Organics (GRO – C6 to C10);
 - I. Polycyclic Aromatic Hydrocarbons (including those listed as Organic Compounds in Soils in Table 915-1); and
 - J. Metals (including those listed as Metals in Soils in Table 915-1 including those listed as Metals in Soils in Table 915-1).
 - K. Perfluorinated Compounds (PFCs).
- (3) Current applicable EPA-approved analytical methods for drinking water will be used and analyses will be performed by laboratories that maintain state or nationally accredited programs.
- (4) Copies of all test results described above will be provided to the Director and the potentially impacted Public Water System(s) within ~~60~~7 days of collecting the samples. In addition, the analytical results and surveyed sample locations will be submitted to the Director in an electronic data deliverable format via Form 43. Any result measuring a constituent of concern above the laboratory reporting limit shall be immediately reported to the Director and the potentially impacted Public Water System(s).

g. Requirements for Ongoing DCPS Operations at Existing Oil and Gas Locations.

- (1) Except for New Surface Disturbance, existing Oil and Gas Locations and ongoing DCPS Operations at Existing Oil and Gas Locations within a Surface Water Supply Area and within zones specified in Table 411-1 will be subject to the following requirements instead of the requirements of Rules 411.d, 411.e, or 411.f provided that no new surface disturbance at the Existing Oil and Gas Location occurs after the date Rule 411. became applicable to the Oil and Gas Location:
- A. Collection of surface water data from a Classified Water Supply Segment consisting of a sample collected immediately downgradient of the oil and gas operation will occur by the latest of June 1, 20~~21~~19, within 6 months after the date Rule 411. became applicable to the Oil and Gas Location, or when sufficient water exists in the stream.

In addition, the Operator will sample the Shallow Public Water System supply GUDI well(s) within 2,640 feet of the Oil and Gas Location. The sample parameters for both groundwater and surface water samples will include:

- i. pH;
 - ii. Alkalinity (total bicarbonate and carbonate as CaCO_3);
 - iii. Specific conductance;
 - iv. Major cations (calcium, iron, magnesium, manganese, potassium, sodium);
 - v. Major anions (bromide, chloride, fluoride, sulfate, nitrate and nitrate as N, and phosphorus);
 - vi. Total dissolved solids;
 - vii. BTEX compounds (benzene, toluene, ethylbenzene, and total xylenes);
 - viii. Diesel Range Organics (DRO – C10 to C28) and Gasoline Range Organics (GRO – C6 to C10);
 - ix. Polycyclic Aromatic Hydrocarbons (including those listed as Organic Compounds in Soils in Table 915-1); and
 - x. Metals (including those listed as Metals in Soils in Table 915-1 including those listed as Metals in Soils in Table 915-1); and.
 - xi. Perfluorinated Compounds (PFCs).
- B. Current applicable EPA-approved analytical methods for drinking water will be used and analyses will be performed by laboratories that maintain state or nationally accredited programs.
- C. Copies of all test results described above will be provided to the Director and the potentially impacted Public Water System(s) within ~~60~~7 days of collecting the samples. In addition, the analytical results and surveyed sample locations will be submitted to the Director in an electronic data deliverable format via Form 43. Any result measuring a constituent of concern above the laboratory reporting limit shall be immediately reported to the Director and the potentially impacted Public Water System(s).
- D. Operators will employ and maintain Best Management Practices, as necessary, to protect the Surface Water Supply Area.
- E. If an existing Well is restimulated within the Intermediate or Internal Buffer Zone, the chemicals listed in Rule 411.e.(4) will be prohibited.