
COLORADO STATE UNIVERSITY EXTENSION
BOULDER COUNTY

**B O U L D E R
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G U I D E**

Water, Sewer and Utilities



COLORADO STATE UNIVERSITY
EXTENSION

INTRODUCTION WATER, SEPTIC, UTILITIES AND MINERAL RIGHTS

This section covers issues concerning water both domestic and irrigation, septic systems, utilities and mineral rights.

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WATER, SEPTIC, UTILITIES AND MINERAL RIGHTS

Water Rights

“Whiskey is for drinking and water is for fighting” is an old saying in Colorado. Colorado water law can be very confusing to new rural Colorado residents. According to Colorado water doctrine, all surface and ground waters are a public resource to be used for beneficial use by Colorado citizens. The right to divert water from a surface water source or groundwater system can only be secured by applying for a decree, also known as a water right, from the Colorado Division of Natural Resources.

Colorado water law is complex with its own law-enforcement and court system. Water laws follow the prior appropriation doctrine, “first in time, first in right” (the first person to divert the water, file for the right in water court and put the water to a useful purpose has the first right to the water from this source). These property rights are in place on every river, pond, reservoir and stream in Colorado and can be inherited, bought and sold. A person’s right to use water “in priority” are strictly enforced by the Colorado Division of Water Resources.

Ditches and Easements

When purchasing land with existing ditches, the ditch owner has the right and duty to use and maintain their ditch across your property. Adequate head gates on diversion structures and measuring devices are required to allow flows from the stream system to be controlled efficiently. Ditch owners are required to keep their ditches in good repair to prevent unnecessary flooding and water waste. Owners also have a duty to divert only the amount of water allowed for the decreed uses. If you do not own shares in the ditch on your property, you do not have the right to use, withdraw or impede the water flow in the ditch.

Be aware that the land you own or are purchasing may not have water rights included. Here are some important issues to consider:

- Water rights that are sold with a property may not give you the right to use the water from any ditches crossing your land (only if the ditch crossing your property is the one in which you own rights, verify which ditch the water rights are part of and if the ditch actually crosses your property and if you can get water to the areas you want to irrigate). Other users may have senior rights to the water that can limit your use or require you to pay for the over sizing or other improvements to the ditch.
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- It is important to make sure that any water rights you purchase with the land provide enough water to maintain trees, pastures, gardens or livestock or you should be prepared to find an additional water source or plant vegetation that requires less water. A share in ABC ditch company is not the same amount of water in acre-feet as a share in XYZ ditch company. Contact the ditch company to see exactly how much water your share is, how do you get the water and any maintenance needed to get the water. Getting to know the ditch rider and the ditch board is important to you getting your water.
- Existing irrigation ditches have legal rights-of-way through properties, even if they serve other properties. If you have a ditch running through your property, there is a good possibility that the ditch owners have the right to come onto your property with heavy equipment to maintain the ditch by removing trees or sediment from the ditch.
- An empty ditch is not to be used for recreational purposes or grazing. There is a 50-foot setback from the centerline of the ditch for all structures. In addition, planting landscaping materials near or next to a ditch is not recommended as they may be removed when the ditch is cleaned or repaired.
- Flowing water can be a hazard, especially to your children. Before you decide to locate your home near an active ditch, consider the possible dangers for your family and liability.

Water rights can be sold with land or they can be separated from the land. A property's water rights can be considered abandoned if they are not used in many years. You cannot change the use of the water, either well or irrigation, on your property without going to Water Court.

A water right decree establishes the location of diversion point/s; the source of the water (stream system); the amount of water that can be diverted or stored; and the type and place of use and the priority date. A priority date is the date of the first diversion and use or the date the intent to divert and use was formed and the date the water right was decreed. The first water right decreed on a stream system has the first right of use of available water, up to the decreed amount. All subsequent water rights are given later priority dates to establish the order in which water can be diverted; hence the expression, "first in time, first in right". During periods of high flow, there is generally enough water available for all users. As stream flows drop at the end of the run-off season or in drought times, junior water rights are often curtailed to provide water for the senior rights. There may be times when there is not enough water available even for senior water rights to have their full decree.

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Types of Water Decrees

There are three basic types of water decrees:

1. Surface water (springs and streams);
2. Storage rights (ponds and reservoirs);
3. Underground rights (wells).

Each of these water rights requires an application with a filing fee payable to the Water Court. A change in water right application also has a filing fee. The Office of the Division Engineer provides assistance in completing water right applications, as do local water attorneys. Following the application date, for approximately two months, there is an established process for verifying the application accuracy, during which time other persons may file opposition to the claim. The Division must make a recommendation to the Court. At that time, a decree may or may not be issued. Common reasons for denial of water decrees are: inaccurate applications; the water source is already fully decreed; and over-appropriation of ground water (in the case of wells); or injury to other vested water rights holders.



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Water Wells

If you do not have access to treated water, the most common source for domestic water is a well. Wells are permitted for a specific use i.e. irrigation, domestic, livestock, etc. Water quantity from a well may vary from season to season depending on the water depth, source and proximity to pollution sources. Water quality in all wells should be monitored regularly as there are any number of factors that can affect that quality, including natural mineralization, bacteria, radium and proximity to septic systems and livestock operations. Radon gas in well water can potentially increase the indoor air level of radon in a building. For well permitting information contact the Colorado State Engineer's Office. For water quality testing, contact Boulder County Public Health.

A permit is required prior to the construction of a well, or for the replacement of a well pump. Application forms and assistance can be obtained from the Division Engineer's Office. An under-ground water right is required for all wells that produce more than 15 gallons per minute; or which are for the irrigation of more than one acre. Wells used for ordinary household use, watering domestic livestock, and irrigation of less than one acre of land also require a permit, but are exempt by statute from administration or the necessity of obtaining a water right.

- 1) Check your well permit. If issued after 1972 it should be designated as "household use only" permit.
 - a. Allows for single family use only.
 - b. You cannot water outside including gardens, domestic animals, livestock or greenhouses (attached to the house or detached).
 - c. There is an option to "augment" your well permit but it generally costs between \$1-5 thousand and a significant time period, 6 months to a year, and is not guaranteed.
 - d. You might wish to put in a cistern or holding tank and have water delivered for a more reasonable cost. Most mountain communities have water delivery systems available.
 - 2) If the well was there prior to 1972, then it may be an "Unregistered Existing Well."
 - a. It allows for serving up to three homes.
 - b. Allows for irrigating home gardens and lawns and watering user's own domestic animals and livestock.
 - c. Cannot be used for commercial use.
 - d. It can be registered for historic uses if those uses are no greater than those allowed for a domestic and livestock permit (see below).
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If you have 35 or more acres of land, then:

- 1) The well should be permitted for “Domestic and Livestock.”
 - a. It may be able to serve up to three single-family dwellings.
 - b. Irrigate one acre, or less, of lawn and garden, and
 - c. Provide water for the individual’s domestic animals and livestock.
 - d. This permit cannot be used for commercial use.

Other Water Considerations

Because of Colorado’s very stringent water laws, the following items must also be considered:

- 1) Passed in 2016, Colorado House Bill 16-1005 allows municipal citizens to collect and use 110 gallons (two 55-gallon drums) of rain water to water outdoor lawns, plants and or gardens. Rural residents under Senate Bill 09-080 who qualify for an “exempt well” may collect rain water to be used for the same use as the exempt well, i.e. indoor grey water use, outdoor garden or livestock watering. The rainwater is non-potable water and not for drinking use. A permit from the Colorado Department of Natural Resources is required.
- 2) You cannot use untreated grey water for exterior watering purposes.

Drinking Water Quality

For many people in Colorado, residential drinking water is supplied by a municipal water treatment plant. More information on this type of water treatment can be obtained from your local provider or the EPA’s Safe Drinking Water Hotline, (800) 426-4791. However, there is no regulation for the water quality from a private water system. If your drinking water comes from a private well, you are responsible for monitoring the safety of your own drinking water. Protecting your drinking water supply from contamination is important for health, to protect property values, and to minimize potential liability.

Natural well water quality varies from location to location because of the local geology and soils influence through which the water is filtered and stored. Groundwater contamination can result from point sources, such as leaking underground fuel storage tanks, animal feedlots and septic systems. Landfills, abandoned mines and industrial discharges can also impact rural groundwater quality. Older, shallower wells are generally more easily contaminated than deeper wells dug with a properly-installed casing and well cap. Due to high natural soil radon levels, drinking water may bring additional radon into a home.

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The water's appearance, taste or odor from a well or other source offers some information on obvious contamination, but chemical analysis is needed to detect most contamination in water. Obvious contaminants include silt and hydrogen sulfide, which can be detected by smell, but other contaminants such as bacteria and nitrate are colorless and do not have an odor. Two types of tests, bacteriological and chemical should be used to assess drinking water quality.

Bacteriological tests are used to determine whether water contains bacteria that are harmful for human health. Anyone wanting a bacteriological test performed on drinking water should contact the Boulder County Health Department to obtain the specially-prepared bottles and instructions for taking a water sample. Chemical tests are used to identify impurities and other dissolved substances that can affect water used for domestic purposes. Common analyses include metals, nitrate, acidity or alkalinity (pH) and relative hardness of water. The CSU Soil, Water and Plant Testing Laboratory can perform these analyses for you. Your local Extension Office has the contact information, price lists and sampling instructions, as well as information on other private laboratories that can provide these services.

Ponds and Reservoirs

There are two basic classifications of ponds and reservoirs you can build:

1. Livestock tanks and erosion control dams. These are limited to drainages that are dry 80% of the time, they are not decreed by the Water Court. The Natural Resource Conversation Service (NRCS) can provide cost-share assistance in the design and construction of these dams.
2. Reservoirs on live streams.

There are two basic pond and reservoir types:

1. Non-jurisdictional ponds/reservoirs include: when a dam measures less than ten feet deep; impounds less than 100-acre feet; or a surface area at high water line of less than 20 acres. If you are building a non-jurisdictional dam, you must file a Notice of Intent to Construct.
 2. Jurisdictional ponds or reservoirs, which exceed any of the limits set for non-jurisdictional dams, above. These require plans and specifications prepared by an engineer and need approval by the State Engineer. The primary responsibility for maintaining a safe dam rests with the owner. State statute places liability for damages on the owner if the dam fails.
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Questions to Ask About Water When Buying a Property

1. Is the household water source a public water supply or well? If a well, how is it permitted (irrigation, domestic, etc.) and is the latest water test available? If water is provided other than a public water supply or a well, who is the water supplier?
2. When was the septic system installed and what has been maintenance (pumped routinely?) on it? Are there records?
3. Are there surface water rights (i.e. ditch/irrigation) associated with the property? If so, what is their priority and how often can I expect water and how much?
4. What is the ditch system or company associated with the water rights and what are the annual fees or assessments? How much water (acre feet) does a share in the ditch company equate to (each ditch company is different)? Can I purchase more?
5. What kind of irrigation infrastructure exists and what is its condition? How well does it cover the acreage? Are there high areas where the water does not reach?
6. If the irrigation is flood or furrow, where does runoff from irrigation events leave the property? What are my responsibilities associated with this runoff?

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Colorado Division of Water Resources

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<https://extension.colostate.edu/topic-areas/agriculture/subsurface-drip-irrigation-sdi-4-716/>

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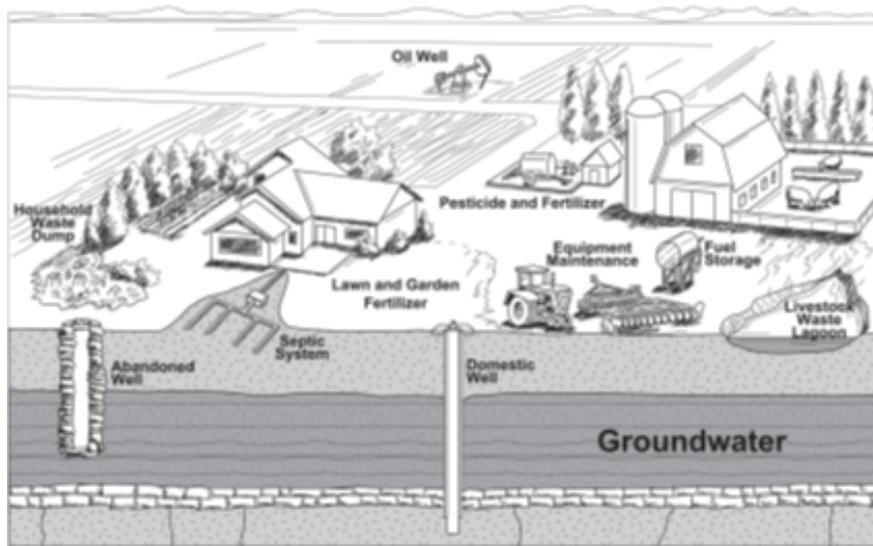
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Protecting Your Water Supply

If you are on a well system, then you are your own water treatment agency and it is imperative that you protect your water source for you, your family and your neighbors' health. The picture below shows some typical ways that groundwater can become contaminated. For mountain residents, groundwater is usually in fractured rock aquifers and looks different than this illustration.



Below are considerations to keep in mind regarding your well and water sources:

1. Keep livestock away from the well head, water sources (such as streams and riparian areas) and off the septic leach field, which could cause leach field failure from compaction.
 - a. Create or maintain a Riparian Buffer at least 50 to 250 feet from the water's edge
 - b. Allow very limited or no grazing within the buffer to maintain healthy vegetation
 - c. Plant native trees, shrubs, and grasses in the buffer area
 - d. Avoid storing manure or corralling animals within the buffer area
 - e. Use only water-safe herbicides within the buffer area
2. Keep manure piles, corrals, and livestock buildings away from the well head.
3. Periodically inspect exposed parts of the well for problems such as:
 - a. Cracked, corroded, or damaged well casing.
 - b. Broken or missing well cap.
 - c. Settling and cracking of surface seals.

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4. Slope the area around the well to drain surface runoff away from the well.
5. Keep accurate well maintenance and water quality analysis records.
6. Hire a licensed water well contractor for new well construction, modification, or abandonment and closure.
7. Avoid mixing or using pesticides, fertilizers, weed killers, fuels degreasers, and other pollutants within 50' of the well.
8. Do not dispose of wastes in dry wells, abandoned wells or sinkholes.
9. Do not cut off the well casing below 12 inches above the ground's surface.
10. Pump and inspect septic systems as often as recommended by your local health department.
11. Never dispose of hazardous materials in a septic system.
12. Have the well tested once a year for coliform bacteria, nitrate and other particles of concern and every 5-10 years for heavy metals or other contaminants.

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Private Wells for Home Use, CSU Extension Fact Sheet #6.700

<https://extension.colostate.edu/topic-areas/natural-resources/private-wells-for-home-use-6-700/>

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<https://extension.colostate.edu/topic-areas/nutrition-food-safety-health/drinking-water-quality-and-health-9-307/>

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<https://csuextstore.com/protecting-water-quality-and-the-environment>

Household Water Conservation, CSU Bulletin XCM219

<https://csuextstore.com/household-water-conservation>

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Water Disposal Systems (Septic)

If a public sewer service is not available, you need to get a permit for an approved septic system or another approved sewage treatment process from the Boulder County Public Health Department. The soil type, as well as the proximity to ground water and other physical features, influence the design, function and cost of the septic system. For existing systems, an inspection most likely be required prior to or after a sale. For assistance, contact Boulder County Public Health Department Septic Smart program.

Living with Your on-Site Sewage Disposal System

Managing and maintaining your septic system is a very important aspect of rural living and your responsibility. A septic system is an individual wastewater treatment system using soil to treat the small wastewater flows from a residence. A conventional system consists of a septic tank and a drain or “leach” field. Neglecting the septic tank is the most common cause of damage to the leach field. When the tank is not pumped routinely, sludge builds up to the point where it is carried into the leach field and blocks the liquid flow into the soil. When this occurs, the leach field must be replaced, which is more expensive than routine maintenance.

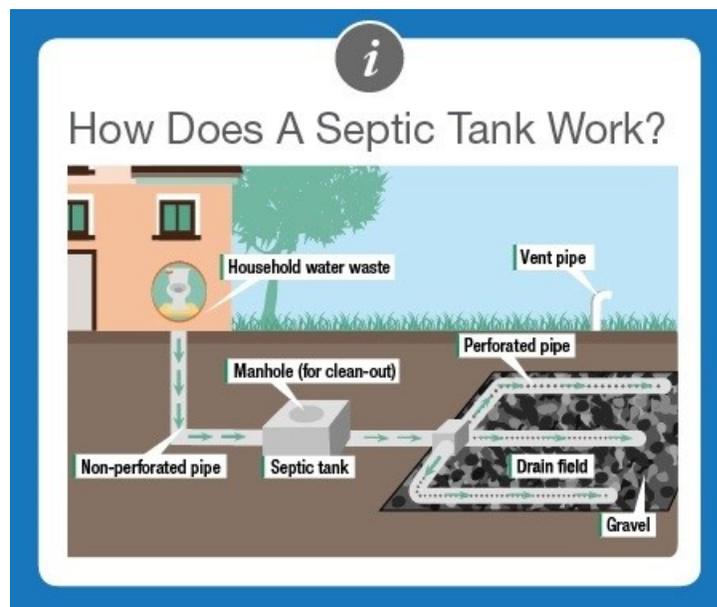
Many homeowners inquire about the best septic additive for their system. The answer to this is very simple: There isn’t one! Proper use ensures a healthy and stable bacterial population. Bacteria are vital to solids breakdown. The best way to prevent septic failure is to maintain a routine tank pumping schedule.

About the Septic System

The first stage in a system is the septic tank. All the water and sewage waste produced in your home is diverted to this underground tank. It is a watertight container, usually made of concrete that temporarily holds materials while heavy solids settle out. These solids are primarily decomposed by bacteria; however, the solids do accumulate requiring periodic removal to ensure proper long-term system function.

The drain field (or leach field) allows effluent (the liquid left after the solids have settled out) to flow from the septic tank through underground pipes to seep into gravel and then into the soil. Nutrients, organic materials and pollutants in the effluent are degraded by soil microbes as they pass through the soil.

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Engineered Systems

A conventional septic system is not always the best approach. Some sites require special engineering because of inappropriate soils (high clay or sand content), shallow bedrock or a high groundwater table. Engineered systems require professional design, installation, and routine maintenance. Contact Boulder County Public Health Department Septic Smart Program for additional information.

Maintenance

Have your tank inspected annually for sludge level, structural integrity and pump your tank according to the recommended intervals or the recommendation of the inspector. The costs for regular inspection and pumping are far less than repairing and/or replacing your system.

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Septic Tank Pumping Chart

Tank Size (Gallons)	Household Size - Number of Occupants									
	1	2	3	4	5	6	7	8	9	10
	Septic Tank Pumping Frequency in Years									
500*	5.8	2.6	1.5	1.0	0.7	0.4	0.3	0.2	0.1	--
750*	9.1	4.2	2.6	1.8	1.3	1.0	0.7	0.6	0.4	0.3
900	11.0	5.2	3.3	2.3	1.7	1.3	1.0	0.8	0.7	0.5
1000	12.4	5.9	3.7	2.6	2.0	1.5	1.2	1.0	0.8	0.7
1250	15.6	7.5	4.8	3.4	2.6	2.0	1.7	1.4	1.2	1.0
1500	18.9	9.1	5.9	4.2	3.3	2.6	2.1	1.8	1.5	1.3
1750	22.1	10.7	6.9	5.0	3.9	3.1	2.6	2.2	1.9	1.6
2000	25.4	12.4	8.0	5.9	4.5	3.7	3.1	2.6	2.2	2.0
2250	28.6	14.0	9.1	6.7	5.2	4.2	3.5	3.0	2.6	2.3
2500	30.9	15.6	10.2	7.5	5.9	4.8	4.0	3.5	3.0	2.6

Septic Do's:

1. Know where your system is located: keep a diagram showing the location of your system
2. Inspect your system every year
3. Pump your tank regularly
4. Keep records of pumping, inspection and other maintenance
5. Repair leaking faucets and toilets
6. Install washing machine lint and effluent filters
7. Conserve water to reduce wastewater
8. Divert roof drains and surface water away from drain/leach field
9. Limit the use of drain solvents, household chemicals, strong disinfectants and chlorine
10. Call a professional when you have questions

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Septic Dont's:

1. Park, drive vehicles over, or allow large animals on any part of your septic system
2. Place sprinkler systems close to the leach field
3. Dig or build on top of your septic system
4. Plant deep-rooted plants (i.e. alfalfa) over the drain field
5. Dispose of sanitary napkins, diapers, cooking oil, solvents, paint, etc. use garbage disposals sparingly, do not put coffee grounds, fats, or meats into a septic system
6. Breathe emitted tank gasses – these are toxic
7. Ignore odors, wet or sunken spots, or lush growth above the drain field

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Protecting Water Quality and the Environment, CSU Bulletin XCM223
<https://csuextstore.com/protecting-water-quality-and-the-environment>

Source: www.thenaturalhome.com

Boulder County Public Health Septic Smart Program

<http://www.bouldercounty.org/env/water/pages/septicmartcheckrecords.aspx>

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Power and Heat

In most sections of the county, landowners should have access to a public energy source.

For those in remote locations, they may be limited either by location or expense to accessing the public source. Power may be provided by electricity either brought to the property or generated by solar panels. Heating may be provided by propane, natural gas, electric (either solar or local provider), wood or geothermal.

Check with your local power company to find what's available if you are building a new house or remodeling. Wind energy is not a reliable energy source for Boulder County.

Communications

Cell phone and internet service may be limited in remote parts of the county. Check with neighbors who have lived in the area to find out which providers are the most reliable and are available in your area. Some areas may require satellite access.

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<https://extension.colostate.edu/topic-areas/family-home-consumer/introduction-to-domestic-solar-hot-water-systems-10-627/>

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<https://extension.colostate.edu/topic-areas/family-home-consumer/the-sun-tempered-superinsulated-house-9-936/>

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<https://extension.colostate.edu/topic-areas/family-home-consumer/using-a-power-monitor-to-control-your-electricity-costs-10-628/>

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<https://extension.colostate.edu/topic-areas/family-home-consumer/water-heating-in-colorado-homes-10-637/>

Wind Energy for Colorado Homeowners, Farmers and Small Businesses, CSU Extension Fact Sheet #10.623

<https://extension.colostate.edu/topic-areas/family-home-consumer/wind-energy-for-colorado-home-owners-farmers-and-small-businesses-10-623/>

MINERAL RIGHTS

If you own or are purchasing land, you should be aware that the property's mineral rights may not be included. Mineral rights include, but are not limited to oil, gas and hard rock products. Most property owners do not own the mineral rights on their property. Therefore, mineral rights owners could change the surface characteristics to extract their coal, minerals, gas or oil. It is very important to know what mineral rights may be located under your property and who owns them.

- Rural Boulder County is best known for its hard rock metal mines and mills (western part of the county in the foothills and mountains), while more than 80 documented coal mines were worked in the eastern portion of the county starting in the 1860's. The mining took place in the Louisville, Lafayette, Erie and Superior areas, the western portion of the Boulder-Weld Coal Field.
- Inactive mine sites are included under the Colorado Storm Water Discharge Permit Regulations. If there is an inactive mine on a property, the property owner may be required to apply for a Colorado Storm Water Discharge Permit. If he or she believes that a Storm Water Discharge Permit is not applicable to his or her site, he or she needs to send a letter to CDPHE Water Quality Control Division/Storm Water Unit detailing his or her reasons for this.
- Be advised that any mining site may have additional environmental hazards/impacts associated with them such as heavy metal accumulation, subsidence, underground fires and mine dumps, etc. There can also be physical hazards such as open mine shafts and adits (a nearly horizontal passage to a mine). The Colorado Inactive Mine Program works toward safe closure of open mine hazards. The Colorado Mine Subsidence Program provides insurance for buildings located on old coal mines that may subside. Be sure to do your due diligence prior to purchasing a mine site property.

References:

Colorado Mine Subsidence Program

<https://mining.state.co.us/Programs/Abandoned/MineSubsidence/Pages/Mine%20Subsidence%20Information%20for%20Homeowners.aspx>

Inactive Mine Reclamation Program

<https://mining.state.co.us/Programs/Abandoned/Pages/impwelcomepage.aspx>

Colorado Alliance of Mineral and Royalty Owners website

<https://www.camro.us/>
