COGA Fast Facts

Produced Water

Produced water is naturally-occurring ("connate") water that exists in the formation and is "produced" along with hydrocarbons. This water is generally saline (due to formation deposition in marine environments), containing minerals such as barium, calcium, iron, and magnesium. Produced water can require treatment before surface disposal. When drilling and hydraulic fracturing (HF) occur, produced water flows are high due to "flowback" of water injected during the operations. Approximately 50% of all produced water that is released from drilling and stimulation comes out of the well in the first few days to a week, and is stored in holding and treatment tanks. After the well is serviced, water can keep flowing from the well for long periods of time depending on the quantity of water in the target formation. The remainder of this water is stored in holding tanks, for eventual disposal.

Flowback water is recovered water from HF use that returns to the surface. As it travels up the well bore, it mixes with produced water, and often times when it reaches the surface, it is referred to as produced water. This water contains clay, dirt, metals, and chemicals, and generally requires treatment before reuse.

Regulation

In Colorado, produced water is regulated by the Colorado Oil and Gas Conservation Commission (COGCC). Rules 907, 908 and 325 govern the disposal methods for produced water and requirements for those disposal methods.

Rule 907, Management of Exploration and Production (E&P) Waste: Covers the treatment, disposal, reuse/recycling, and mitigation of E&P waste, including produced water

Rule 908 - E&P Waste Management Facilities Regulation: describes the requirements for waste management facilities, including those treating produced water

Rule 325 - Underground Injection of Water: identifies construction requirements for wells that dispose of produced water and describes that eligibility of zones to receive waste water

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Produced Water Management Practices in Colorado

In Colorado, most of the flowback water is recycled. The rest of the water is disposed according to COGCC guidelines. Of the water disposed, approximately 60 percent is disposed of in underground injection wells, 20 percent is managed in evaporation ponds, and 20 percent is discharged to surface waters under permits by the Colorado Department of Public Health and Environment (CDPHE).

Recycling/Reuse

Produced water recovered in the first few days of servicing a well is generally reused for future operations. Often times, this water comes back brackish, withhigh total dissolved solids (TDS). Dilution of this water can prepare it for reuse in another well. Reuse and recycling rates vary due to field conditions. For example, if there is high demand for water for other operations, then nearly all of the water recovered is reused for servicing new wells. Conversely, if production is slow, then more produced water is disposed.

Disposal Practices

Underground Injection

Produced water that is not recovered in the first few days after servicing a well is often disposed of. In Colorado, the most common method of disposal is through an underground injection control (UIC) well. These wells are permitting by COGCC under the Environmental Protection Agency's UIC program. This includes requirements for casing and cementing, monthly reporting on materials and volumes injected, and periodic pressure tests to ensure the waste stays in the designated formation.

Evaporative Pits

In Colorado, the majority of evaporative pits are used in in the Raton Basin in the southern part of the state. Operations there are dominated by coalbed methane production, which produces water with low TDS.

Surface Discharge

In Colorado, produced water may be permitted for discharge to streams or surfaces. Guidelines for surface disposal are established by the Colorado Water Control Division, and such discharge requires a permit. If the stream or river is a drinking source, then the water must meet stringent parameters. Water can also be spread on roads for dust suppression if it meets TDS requirements.

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