

UT22197-00000: Decision to Public Notice Aquifer Exemption for Requested Injection Well

EPA Well ID: UT22197-10701

Well Name: Federal 15-30-8-18

API#: 43-047-36231 **Staff Reviewer:** E. Schmitz **Review Date:** 11/03/2014

Background: Newfield Production Company submitted an application on October 21, 2014, to construct the subject oil well as an injection well according to the terms and conditions of Area UIC Permit UT22197-00000 issued final on December 13, 2012, and subsequently modified on November 5, 2013. Analysis of formation fluids included in the application indicates that injection zone waters have a total dissolved solids content less than 10,000 mg/l. Based on the absence of historic injection into wells proximate to the subject well, and based on the EPA's knowledge that this part of the Monument Butte Field is known to exhibit natural formation waters less than 10,000 mg/l, the EPA determined that this occurrence of TDS less than 10,000 mg/l is not attributable to aquifer freshening due to the injection of relatively fresh water for the enhanced recovery waterflood. The Statement of Basis for Final Area UIC Permit UT22197-00000 includes additional information on the EPA's determination that aquifer freshening is occurring in some parts of the oil field, and in direct proportion to the extent of historic injection activity. The EPA has determined that aquifer exemption is necessary prior to authorizing injection into the subject well.

Injectate Characteristics: The injectate for Area UIC Permit UT22197-00000 is a combination of Green River surface water, produced water from the Green River Formation associated with oil and gas production, and municipal water from the Johnson Water Supply District.

Aquifer Water Quality: Produced water from the Federal 15-30-8-18 well was determined to have total dissolved solids (TDS) content of 5,838 mg/l on October 2, 2014. No injection activity is known to have occurred proximate to this oil well and this water sample is therefore representative of originally in place formation waters.

Aquifers to be exempted: Any water bearing formations within the Green River Formation, from the top of the Garden Gulch #2 sand in the Garden Gulch Member to the top of the Wasatch Formation, and including the Douglas Creek and Castle Peak (Basal carbonate) Members of the Green River Formation, would be exempted.

Aquifer Depth: At the well bore, the proposed interval for exemption occurs between the depths of 4,322' and a Wasatch Formation estimated depth of 6,522' (depth from kelly bushing). The bottommost depth must be estimated because the subject well does not penetrate the base of designated injection zone and as a result, there is no logged depth to the top of the Wasatch Formation at the location of the subject well. The depth to the top of the Wasatch was estimated using a gamma ray log for the subject well and the type-well log established by EPA for the Monument Butte Field, a 1991 gamma ray log for the Federal 1-26-8-17 well. While the depth interval of approximately 2,200' is expected to remain constant within the exempted area, the actual depth from ground surface of the exempted interval is expected to deviate from the depths observed at the wellbore in any direction other than perpendicular to a 3-5 degree dip to the Northeast of geologic formations in this part of the Uinta Basin. The exact depth of the exempted formations at points beyond the well bore may be obtained using logs from oil production wells proximate to from the injection well or using geophysical imaging methods.

Aquifer Exemption Area: 1,980 feet radially from the Federal 15-30-8-18 well bore. This distance was selected because it is most likely that fluids from the injection well will reach production wells located at this maximum distance.

Injection Volume: The volume of fluids to be injected into the subject well is not limited because the purpose of injection is enhanced recovery of oil. Water injected into the subject well is expected to flow preferentially to the nearest oil production wells, the farthest located at 3/8-mile (1,980 feet) from the subject well. Based on the proximity of production wells, the EPA does not expect injected water to flow beyond 1,980' from the subject well.

Confining Zone(s): The confining zone for Area UIC Permit UT22197-00000 extends from approximately 200 feet above the Garden Gulch Marker to the top of the Garden Gulch #2 Sand. At the well bore of the Federal 15-30-8-18 well, this interval extends from approximately 3,836' to 4,322.' The EPA has determined that injected fluid will not migrate above the Confining Zone.

Public Notice of Proposed Aquifer Exemption: The EPA proposes to aquifer exempt a portion of the Green River Formation, from the top of the Garden Gulch #2 Sand within the Garden Gulch member of the Green River Formation to the top of the Wasatch Formation, and including the Douglas Creek and Castle Peak (basal carbonate) members of the Green River Formation. This interval is located from a kelly bushing depth of 4,322' to an approximate depth of 6,522' within a 1,980' radius of the subject well. The regulatory criteria for which this aquifer exemption is proposed are that the aquifer does not currently serve as a source of drinking water (40 CFR 146.4(a)) and is mineral, hydrocarbon or geothermal energy producing, or can be demonstrated by a permit applicant as part of a permit application for a Class II or III operation to contain minerals or hydrocarbons that considering their quantity and location are expected to be commercially producible (40 CFR 146.4(b)(1)). The attached public notice announcement should be published in the following newspapers as soon as possible:

The Vernal Express
The Uinta Basin Standard

UIC Technical Reviewer #1 Date

UIC Technical Reviewer #2 Date

Douglas K. Minter Date
Acting Chief, UIC Unit
Office of Partnerships and Regulatory Assistance (OPRA)