



March 2019

Fact Sheet and Statement of Basis

*Major Modification of Class III Solution Mining
Underground Injection Control (UIC)
Permit – UTU-27AP-718D759
Magnum Solution Mining, LLC (Magnum)*

I. Purpose of the Fact Sheet

Pursuant to section §124.8 of the Underground Injection Control (UIC) regulations in Title 40 of the Code of Federal Regulations (CFR) which is incorporated by reference in the Utah UIC Administrative Rules (R317-7), the purpose of this fact sheet is to briefly describe the principal facts and considerations that went into preparing the modifications of this permit by the Division of Water Quality (DWQ), the UIC permitting authority. To meet these objectives, this fact sheet contains a description of the permitted facility, a description of the injectate, information on the permitting process, a statement of basis for setting permit conditions, and the reasons for specific permit modifications.

II. Brief Description of the Facility

Magnum plans to construct underground storage caverns in a tectonically thickened salt body located approximately 9 miles north of Delta, Utah in Millard County and at depths greater than 3,000 feet below the surface.

III. Description of Injectate

The storage caverns are created by solution mining with fresh water in a tectonically thickened salt. Brine created by the solution mining process is stored in nearby surface solar evaporation ponds and later used in the operation of brine-compensated caverns to bring liquefied product to the surface.

Location:

Northeastern Millard County
(see map below)

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*Location of the Magnum Storage
Project in Millard County, Utah*

IV. Information on the Permitting Process

The original permit became effective on September 26, 2014 when Magnum requested that the creation of natural gas liquid (NGL) caverns and natural gas (NG) caverns be covered under separate UIC Class III permits. The 2014 permit was for four NG storage caverns.

The 2017 modification addressed Magnum's intent to create caverns for natural gas, refined or crude petroleum products, compressed air energy and other liquids or gases and the substantial expansion of the permit area. In preparing the 2017 modification of the permit, DWQ imposed several additional requirements including more stringent injection zone monitoring during the drilling of the pilot borehole for each cavern.

This 2019 modification of the permit removes references to specific products to be stored after the caverns are created; aligns permit conditions with those of Sawtooth Caverns, LLC's (Sawtooth) UIC Class III permit to facilitate the newly created partnership between Magnum and Sawtooth; and further clarifies coordination and jurisdiction between DWQ and the Utah Division of Oil, Gas and Mining (DOG M) during the construction, development and operation of the well/cavern systems.

Referring to 40 CFR 144.39 which is incorporated by reference in R317-7 and included in the permit at Part II (D) (6) (a), DWQ has determined that these modifications represent material and substantial alterations and additions to the last modification of the permit and are therefore subject to the procedures for decision-making under 40 CFR 124. Furthermore, 40 CFR 124.5 (c) (2), also incorporated by reference in R317-7, states that for permit modifications only those conditions being modified shall be reopened when preparing a new draft permit.

V. Statement of Basis for Establishing Permit Conditions

The original basis for issuing the UIC Class III Solution Mining area permit was, and still is, to ensure compliance with the Utah UIC administrative rules for Class III injection well activities, R317-7. Additionally, the underground hydrocarbon storage industry has standards for the construction, development and monitoring of wells and caverns which were used to inform the development of the permit conditions where they apply to the storage of hydrocarbons in brine-compensated caverns and pressurized gas caverns particularly in regards to cavern integrity and stability.

The following references were used:

- Common Practices – Gas Cavern Site Characterization, Design, Construction, Maintenance, and Operation, SMRI Research Report RR2012-03
- Recommended Practice for the Design of Solution-Mined Underground Storage Facilities – API Recommended Practice 1114, API, July 2013
- Recommended Practice on the Operation of Solution-Mined Underground Storage Facilities – API Recommended Practice 1115 (R2012), API, October 2012
- Design and Operation of Solution-mined Salt Caverns Used for Natural Gas Storage - API Recommended Practice 1170, API, July 2015
- Canadian Standard Association, CWA Z341 Series 14 – Storage of hydrocarbons in underground formations, April 2014

Because Utah does not have specific statutes and regulations for the construction and operation of underground storage caverns, in general, and for hydrocarbon storage caverns, specifically, we have combined the authorities under the Utah UIC Program in DWQ and those available in DOGM to cover the oversight of these facilities.

In cases where a cavern will be used to store products for which DOGM has authority, DWQ and DOGM will share regulatory oversight of the construction of the cavern well. DWQ will assume primary oversight during the drilling of the pilot hole in the salt body and solution mining of the caverns. At the end of a solution mining phase for each individual cavern, the individual well/cavern system will be released from this UIC permit according to the procedure detailed in the permit and DOGM will assume primary authority under a special order of the Utah Board of Oil, Gas and Mining during storage of product.

In cases where a cavern will be used to store products for which DOGM does not have authority, DWQ will assume sole regulatory responsibility for the construction of the cavern well, drilling of the pilot hole, and solution mining of the cavern under this permit. At the end of a solution mining phase for each individual cavern, the individual well/cavern system will be released from this UIC permit according to detailed procedure in the permit and DWQ will then assume regulatory oversight responsibility during product storage under a UIC Class V permit.

VI. Reasons for Specific Modifications of the Permit

The permit is being modified to make it more general in nature thus allowing the creation of caverns of different size for the eventual storage of different products. These permit revisions coincide with similar revisions being made to Sawtooth's UIC Class III permit thereby facilitating the newly formed partnership between Sawtooth and Magnum. Further clarification of the coordination between DOGM and DWQ has also been added.

1. Part I
 - added references to the Utah Board of Oil, Gas and Mining (BOGM) to clarify its role in addition to the Division of Oil, Gas and Mining (DOGM) and throughout permit,
 - removed text that specifies a particular type of product to be stored after the caverns are constructed,
 - removed text specifying a maximum capacity for the caverns,
 - added text clarifying the coordination of DWQ and DOGM regulatory authority,
 - updated legal description of project area, and
 - added text clarifying that permit does not convey mineral or contractual rights.
2. Part III (A) – clarification of circumstances under which the permit will remain in effect and transferred to the agency responsible for regulatory oversight during product storage,
3. Part III (D) (1) – removed references to specific products to be stored after caverns are constructed,
4. Part III (D) (8) – expanded to explain that monitoring wells may be required under a Class V UIC permit to cover operation of caverns for which DOGM does not assume regulatory authority,
5. Part III (D) (13) (b) – revised to allow increase in maximum allowable operating pressure gradient provided request is accompanied by a geomechanical analysis supporting increase,
6. Part III (E) (1) – removed references to specific products to be stored after caverns are constructed,

7. Part III (G) - revised by adding procedures for releasing individual well/cavern systems from the permit during periods of active product storage and for readmitting individual well/cavern systems back into the permit during periods of active solution mining.
8. Part III (I) – added reference to document entitled "Cavern Well Abandonment Techniques Guidelines Manual" issued by the Solution Mining Research Institute (SMRI) which provides guidance in the preparation of an appropriate Well and Cavern Closure Plan.
9. Part III (J) – added requirement for providing adequate financial assurance to cover the pressure and cavern capacity monitoring during the waiting period required for the cavern and brine to reach static equilibrium before the well is plugged and abandoned and to cover the post-closure subsidence monitoring.
10. Part III (K) (2) – added new paragraph stating that changes in permit area boundaries may be made through minor modification of the permit.

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