

Optimization of Underground Storage Brine Operations At Mont
Belvieu, Texas

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ABSTRACT

Optimization of Petroleum Salt Dome storage and the related brine operations requires a thorough understanding of the operations as well as specific goals of achieving effective management through new innovations. The implementation of computer programs to determine the brine injection pressures, and to aid in the economic justification for brine generation and its management, has become a critical part of the overall operations.

The economic analysis of seasonal demands for storing, disposing and generating brine is discussed in terms of cost, effective methods of a fresh water blending and a viable alternative to resolve the seasonal cycle.

Determination of the maximum brine injection pressure can be a complex problem when operating multi-storage wells for different petroleum products. The most critical brine pressure requirements occur when the well is near empty. Reference to hydraulic calculations and to product injection pump curves is required to effect the most efficient choice in a multi-well operation.

Injection of unsaturated brine and resultant leaching which occurs is detrimental to the life of the salt cavern and affects the gross measurement of product inventory. Cavern size and longevity can be determined through the use of a customized Lotus 123 program designed to perform daily leaching calculations.

Texas Eastern along with other operators of underground storage facilities has obtained knowledge through working experience over the past 30 years. One version of the described system in this article is used as an example. The intent of this paper is not to provide a comprehensive design guide, but rather a basic guideline for operating principles as they pertain to brine and underground storage.