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by Larry Sevenker

PB-KBB Inc.
800 Commerce Rd. West
Harahan, La. 70123
(504) 733-9822

Two sonar surveys are scheduled as a part of roof development. The first provides early control of roof shape as well as detects coalescence with the other wells of this final cavern. The second sonar is conducted at the end of roof development.

Reverse Leach/Fill

After completion of the fourth sonar survey, the leaching strings will be repositioned. Simultaneously with indirect leaching, oil will be injected to fill the upper part of the cavern. Oil/brine interface levels will be regularly monitored after oil injections. When the cavern has a net volume of about 9.4 MMB, the fifth sonar survey will be conducted.

The final leach/fill stage will be conducted with the leaching strings set near each other. Leach/fill will continue until a net cavern volume of 11 MMB is reached.

Both leaching casings will be removed and the sixth sonar survey is then conducted to verify that the full cavern volume has been reached. The final oil fill is then made to bring the total storage to 10 MMB.

For every 10 MMB oil storage cavern, an additional volume of 1 MMB is required to compensate for cavern creep and to provide a margin, or cushion. Thus, in a 10 MMB oil storage facility, the total open cavern space will be 11 MMB.

Work-Over Procedure

During well adjustment and cavern surveys special work-over procedures will apply. Safety procedure will be implemented for each work-over. Blow out preventers or wireline lubricators will be installed on the wellhead for required well maintenance and surveys. The equipment will vary according to the service or adjustment required. The wellhead will be disassembled and safety equipment installed. The requirements of work-over operation are classified accordingly.

Operation Within	Safety Equipment
7" Tubing	Lubricator on Wellhead
10 3/4" Casing	Blowout Preventor and Shear Rams on 13 3/8" Assembly
13 3/8" Casing	Blowout Preventor and Shear Rams on 20" Assembly

5. Summary

Throughout the design and construction, numerous precautions are taken to assure safe and well controlled cavern development. The locations of both existing and expansion caverns are carefully considered to assure cavern stability. Cavern design takes into account stability for the individual cavern by providing for sufficient salt roof,

and also considers in detail well hydraulics and the effects of product cycling.

The cavern leaching program utilizes a sophisticated computer model to simulate and predict the leaching process. These predictions will be used as a sound basis for evaluation of actual leach configurations of the caverns.

The initial well completion has several pressure tests to verify integrity. In particular, the pressure tightness of the initial well to the bottom of the cavern and the final cemented casing will be verified by a pressure test.

At each stage of the leach/fill of a cavern, work-overs will be preceded by a depressurization. Careful review of the sonars and actual configuration of the cavern will be used to adjust the subsequent stages of leach/fill if required. In addition, frequent monitoring of flowrates, wellhead pressures, brine composition, and oil/brine interface will verify that the process follows the design.

Verification of cavern development is conducted at several stages of leach/fill. These numerous steps of verification of cavern integrity and cavern development are conducted before beginning additional oil injection.