Cavern Surveyor™ III

Underground Storage Survey Tool

SONASEARCH
The Cavern Surveyor™ III is the latest in high-quality sonar tools for surveying fluid-filled storage caverns. Designed by Sonasearch, this state-of-the-art device creates an accurate picture of the cavern shape and measures volume capacity through horizontal and vertical cross sectional images as well as 3-D renderings and data tables. Reports include a complete wall table that provides distance on radii to 128 points at each depth station, an abbreviated short wall table and a maximum radii table.

New advanced features only available in the Cavern Surveyor III have been designed to solve some of the industries most common problems and make this tool rise above similar technology. For example:

- The ability to accurately ensonify a storage cavern roof through brine/product interface which provides accurate, timely, unambiguous data on which to base decisions. (See case study for more detail.)
- The ability to survey a storage cavern through a pipe string. In fact, our tool has been tested through two layers of pipe with excellent results.
- The advanced EHRS (Electronic Heading Reference System) allows accurate thru-pipe surveys in a single pass. The updated system takes only one minute for reference calibration.
- State-of-the-art software runs on modern, Windows-based computers.
Background: Typically, the casing stops short of the storage well roof. However, it is not uncommon for various circumstances (roof collapse, erosion, etc.) to result in the casing extending into the cavern. Historically, this has resulted in an unknowable amount of petroleum product being trapped between the bottom of the casing and the roof. Without an accurate measurement of the volume of trapped product, it is difficult to determine whether efforts to recover the trapped product will be cost effective.

Our customer’s story: A large cavern owner was faced with just such a dilemma—trying to determine whether it was cost-effective to perforate the casing based on the amount of product trapped. Prior survey tools were unable to accurately survey the cavern roof through the brine/product interface. Sonasearch was called in and the Cavern Surveyor III survey team successfully measured the storage well, accurately ensonifying the cavern roof through the brine/product interface, as well as the 8 5/8” pipe string at 616’ and 13 3/8” casing/product interface at 604’. The Cavern Surveyor III Volume Capacity Report shows a product volume of 15,140.976 barrels of product trapped between the roof of the cavern at 591’ and the 604’ product interface. Given accurate, timely and unambiguous data, the cavern owner was able to make the decision to perforate the casing with confidence, recovering sufficient trapped product for a positive return on investment.
The Cavern Surveyor III consists of a downhole probe, a Console Interface Electronics Cabinet, cavern survey and reporting software and custom shipping cases. The user must supply a PC with a serial port running Microsoft® Windows® XP operating system.

The Cavern Surveyor III is primarily designed for sonar surveys of fluid-filled storage caverns. A Sonar Engineer commands the Cavern Surveyor III Probe electronics to sweep the walls of the storage cavern.

The sonar crystal transmits an ultrasonic frequency and the echo return is received, digitized and transmitted to the surface where it is displayed on a monitor. The transducer rotation speed and pulse rate are software controlled as a function of the selected range and speed of sound. The data displayed & stored includes date, depth, distance in feet of the radii, angle of tilt in degrees and angle of rotation in degrees.

For more information contact your Sonasearch representative:
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