Carlsbad I&W Brine Well Remediation

Fact Sheet – Initial, November 2018

What is the Carlsbad Brine Well Remediation project?

The former I&W Brine Well property, located at 3005 South Canal Street in Carlsbad, New Mexico, produced brine water for oil and gas drilling for thirty years before ceasing operation in July of 2008 due to concern of a potential collapse. In 2008, two other brine water production operations in remote areas of southeastern New Mexico experienced cave-ins leaving large sinkholes at the surface. Brine production operations pumped fresh water into salt layers underground, dissolving the salt to make brine, resulting in subsurface cavities. Although I&W has not collapsed, the situation is more serious because the property is located near Carlsbad's "South Y" interchange where two major highways and an irrigation canal come together (see map). The surface area potentially impacted by a collapse may exceed the footprint of the cavity and could cause damage to infrastructure and property, disrupt interstate travel, commerce, and local agriculture, and pose a threat to public safety. The Carlsbad Brine Well Remediation project aims to design and implement a plan to minimize these impacts by filling the subsurface cavity with grout to stabilize the existing underground void created by operation of the I&W facility.

Who runs the remediation project?

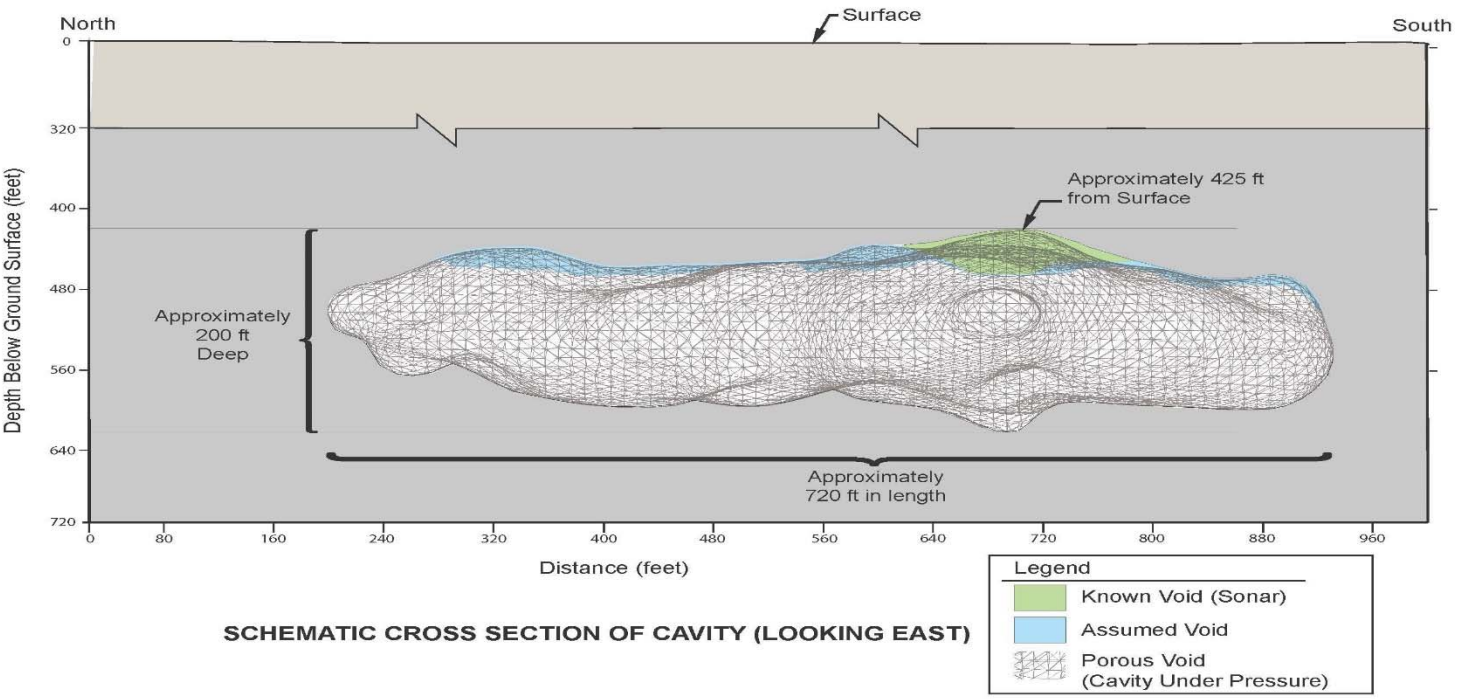
The New Mexico Energy, Minerals and Natural Resources Department's (EMNRD) Oil Conservation Division (OCD) regulates the oil and gas industry within the state and oversees this project. Wood Environment & Infrastructure Solutions, Inc. (Wood), formerly Amec Foster Wheeler, was selected by EMNRD to design, manage, and implement the remedy at the project site. Since 2012, Wood has participated in monitoring the underground cavity, creating a conceptual site model, and developing a feasible remedy. Wood has assembled a highly knowledgeable team to safely complete the remediation project.

Work done to date.

- 2009 - Installed initial cavity monitoring system, including sensitive near-surface tilt meters and groundwater level transducers. Later, more instrumentation was added, including wellhead fluid pressure and canal water level transducers, equipment to monitor cracks in buildings surrounding the property, and a weather station. The electronic monitoring systems run 24-hours a day and will trigger alarms to warn state and local authorities of any important changes.
- 2012 to 2014 - Conducted a feasibility study to determine possible remedies to stabilize the cavity.
- 2012 to 2014 - Used computer modeling to estimate the contents, size, and shape of the cavity based on monitoring and investigation information and created a conceptual site model, which continues to be revised with new data.
- 2012 to present day – Continuous site monitoring performed.
- 2013 to 2014 - Installed a deep underground seismic monitoring system to identify and locate movement of rock around the cavity, as well as onsite video cameras. These systems run 24-hours a day.
- Summer 2018 –Installed security fencing around the site and project related signs, conducted brine well sampling, and made other site improvements in preparation for cavity filling.
- September 13, 2018 - Wood hosted the first public meeting held in Carlsbad to present the remediation plan.

Nature of the cavity.

The underground cavity, as defined by geologic remote sensing equipment, extends beyond the site boundary. It is under pressure, brine-filled, and partially filled with rubble and sediments. It is estimated to be a maximum of 720 feet long, 450 feet wide and 200 feet deep, and lies approximately 425 feet below ground (see figure).



SCHEMATIC CROSS SECTION OF CAVITY (LOOKING EAST)

Remedy.

The remedy selected by EMNRD is to structurally support the roof of the cavity and prevent collapse with cement grout mixtures called high mobility and low mobility grout.

- Additional instruments will be installed into new boreholes to monitor the site during the remedy implementation.
- A series of wells will be installed to progressively extract brine water and inject grout into the cavity.
- Pressure will be maintained in the cavity to support the cavity roof.
- Installation of a grout cap to support the cavity roof and grout columns to support the cap.

What is coming up?

- More activity at the property begins in October 2018 to upgrade the monitoring systems before the remediation effort starts next year. As part of that work, five deep boreholes with pressure control and 10 shallow boreholes without pressure control will be drilled 12-hours per day, every day through the end of the year.
- Demolition of some onsite buildings and structures.
- Expanding the site boundary to include key adjacent properties.
- Changes to traffic patterns in early 2019 in coordination with New Mexico Department of Transportation (NMDOT).
- Finalizing the remedy design.
- Mobilization for remedy implementation.

This fact sheet is the first in a series designed to keep the public and local stakeholders informed of developments at the Carlsbad I&W Brine Well Remediation site. Further information related to brine wells in New Mexico can be obtained from EMNRD's Brine Well website (http://www.emnrd.state.nm.us/OCD/brinewellinfo.html). Information regarding the Carlsbad Brine Well Remediation can be found at the Carlsbad Brine Well Remediation Authority website (http://www.emnrd.state.nm.us/cbwraa/index.html).