

NATURAL GAS EXPLOSIONS IN HUTCHINSON, KANSAS: UNRAVELING A GEOLOGIC MYSTERY

M. LEE ALLISON (lallison@kgs.ukans.edu), Kansas Geological Survey, Lawrence, KS 66047.

Explosions and fires on January 17-18, 2001, burned businesses and killed two people in Hutchinson, a town of 40,000 in central Kansas. This coincided with a leak of 143 million cubic feet of natural gas through casing in a solution cavern in the Permian Hutchinson Salt at the Yaggy gas storage field 7 miles northwest of the town. Only about 20% of the initial relief wells drilled to vent the gas from under the city encountered any gas, and only within a thin geologic interval at the base of the Permian Ninnescah Shale, about 200 feet above the salt layer. Gas reached the surface through unplugged brine wells that had been drilled through the horizon and into the salt as long ago as the late 1800s. In order to return evacuees to their homes and the city to normalcy, a dozen scientists of the Kansas Geological Survey undertook a wide-ranging geologic exploration program to identify gas pathways and accumulations under the city for venting. An experimental search for buried brine wells was successfully undertaken using electromagnetic methods.

No simple geologic model allowed easy prediction of pathways to locate additional vent wells. Seismic reflection lines indicated two amplitude anomalies, each 150-200 feet wide that were drilled and found to produce gas. Geophysical well logs and cores from newly drilled vent wells in Hutchinson were correlated with similar data and archived samples from oil, gas, and water wells in the region. After six months of investigation, questions remained about the nature of the geologic path for the gas, compartmentalization of the leaked gas, near-wellbore formation damage, the amount of gas remaining under the city, and whether the gas storage field could be re-opened.

Reference: Allison, M. Lee, 2001, *Natural Gas Explosions in Hutchinson, Kansas: Unraveling a Geologic Mystery (abs)*, Geological Society of America Abstracts with Programs, v33, #6, p132.