

RAILROAD COMMISSION OF TEXAS

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**INTERNAL**  
OIL AND GAS DIVISION  
Tommie Seitz  
Director, Oil and Gas Division  
John James Tintera P.G.  
Deputy Director, Technical Permitting

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MEMORANDUM

TO: Tommie Seitz  
Director, Oil and Gas Division

FROM: John J. Tintera  
Deputy Director, Technical Permitting

SUBJECT: Daisetta Sinkhole Logging Evaluation

DATE: December 12, 2008

INTRODUCTION:

After delays due to hurricane season and ground instability, the two DeLoach wells have been logged. The information obtained by logging efforts in the DeLoach #1D and #3D wells is inconclusive regarding a connection between the DeLoach operations and sinkhole development.

RRC inspections indicate the sinkhole has been stable since the collapse with some sloughing of the loose soil on the sides. All RRC state managed plugging activities have been completed. In addition, the RRC review of DeLoach injection records is near conclusion. Staff has continued to provide daily e-mails on the sinkhole to interested parties.

THE FOLLOWING IS A BRIEF SUMMARY INTERPRETATION OF THE DATA OBTAINED FROM LOGS OF THE DeLOACH WELLS:

RECENT LOG ANALYSIS OF DeLOACH WELLS 1D and 3D:

Two separate caliper logs were run to determine if there were cavities in the two wells. The mechanical caliper log is used to measure small cavities (up to 6" diameter). The sonar caliper will not register a cavity of less than 8 inches in diameter.

WELL NO. 1D:

3-arm mechanical caliper, casing collar locator, and gamma ray logs were run on October 20, 2008 (when the caliper malfunctioned, and on October 30, 2008 (when the caliper was successful).

The logs showed no significant anomalies in the casing. The logs indicated the 4-1/2" casing shoe to be at a depth of 1032 feet, and the 7" casing shoe to be at a depth of 1094 feet, and measured total depth to be at 1130 feet. The caliper log showed no significant void in the 36 feet of open hole logged below the casing shoe. The mechanical caliper log has been reported to have a maximum depth of investigation of 6 inches.

A sonar caliper log was run on October 20, 2008, and was able to log open hole from the casing shoe (1105 feet) to a depth of 1135 feet. No voids or cavities were detected.

NOTE: According to the logging records, there may be between 46 and 56 feet of unsurveyed bore hole in Well No. 1D. The unsurveyed intervals are based on the difference between the base of the sonar log interval, the original reported TD (1181 feet), and rock bit TD (1191 feet).

WELL NO. 3D:

3-arm mechanical caliper, casing collar locator, and gamma ray logs were run on October 20, 2008 (caliper malfunctioned), and October 30, 2008 (caliper was successful). The logs showed no significant anomalies in the casing. The logs indicated the 5-1/2" casing shoe to be at a depth of 1076 feet, and measured total depth to be at 1090 feet. The caliper log showed no significant void below the casing shoe.

A sonar caliper log was run on October 20, 2008, and was only able to log 3 feet below the logged casing show depth (1089 feet to 1092 feet) before the end of the tool hit TD at 1092 feet. The log measured a maximum radius void of 1.7 feet at a depth of 1090 feet.

CONCLUSIONS:

The logs run by DeLoach in each of its two disposal wells, Nos. 1D and 3D, have been reviewed by Commission staff. The information obtained from the logs is inconclusive as to the origin of the sinkhole and whether the operation of the DeLoach disposal wells were or were not responsible for causing the sinkhole.

The logged open-hole intervals of each well do not reveal any large washouts or voids indicative of a connection of cavernous porosity. However, RRC total depth records indicate that the logs may not have surveyed the entire wellbore below the casing shoes and that only a portion of the originally open borehole below casing was logged.

The tools were unable to get deeper in the wellbores due to obstructions. These unexpected shallow TD's may be due to the wellbores collapse simultaneous with the sinkhole's collapse, or it may be naturally occurring fill, or some other phenomenon.

Therefore, in staff's opinion, the logs run on these two wells neither demonstrate nor exclude a connection between the DeLoach disposal activity and sinkhole formation.

**RECOMMENDATION:**

Staff has not identified other environmentally safe or prudent diagnostic activities that could conclusively determine a connection, if any, between the operation of the DeLoach disposal wells and the development of the sinkhole.

However, the apparent condition of the open hole and the disposal well locations near the area of concern lead staff to conclude the wells should not be reactivated. The risk of injected fluids not being confined to a permitted interval is likely high. Staff recommends that the injection permit for Well No. 1D be canceled. Well No. 3D's injection permit is already canceled.