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SPECIALIZING IN ACTIVE GEOLOGIC  
FAULTS ON THE GULF COASTAL PLAIN

May 4, 2017

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Attention: Mark Smith, GRP Division Director  
Copy to: Lance McLeod, PE, PMP

SUBJECT: REPORT ON THE FOURTH RE-MEASURE OF WATERLINE W1A AND W2A  
BENCHMARK ELEVATIONS IN THE WOODLANDS, TEXAS IN MARCH 2017.

The fourth re-measure of 47 benchmarks on 4 lines that cross two known faults and one possible fault in the Woodlands shows no evidence of fault movement since the last measurements in September 2016. During that 6 month period, 5 BMs increased in elevation 0.01 feet (0.12 inches), 4 lost 0.01 feet of elevation, and the remaining 38 showed no change. The 2 known faults, the Egypt and Big Barn, remain inactive at the benchmark locations, and the possible fault at Research Forest Drive and Cat's Cradle Drive shows no sign of its existence in the field or in the benchmark elevation data.

Over the 2 years since their installation, 26 of the benchmarks have decreased 0.01 feet in elevation, one decreased 0.02 feet, and one decreased 0.05 feet (0.6 inches). The remaining 19 show no elevation change. The 0.05 feet loss in elevation occurred at benchmark MBM-11 near the middle of the north-south line of 20 benchmarks across the Egypt Fault at the east side of FM 2978. Because it shows 2.5 to 5 times more elevation change (and that change being progressive) than any other benchmark in that line, its loss in elevation is likely due to its location within weak, highly sheared soil in the fault's deformation zone. A fault movement event will be revealed when most, or all, benchmarks on one side of a fault show a consistent up or down sense of movement compared to those on the opposite side of the fault. The magnitude of elevation change will exceed the range of measurement error by a factor of 2 or more.

The fifth re-measure of the benchmarks is scheduled for September 2017.

Respectfully submitted,

  
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