

Is It Safe to Frack Beneath Lake Lewisville ?

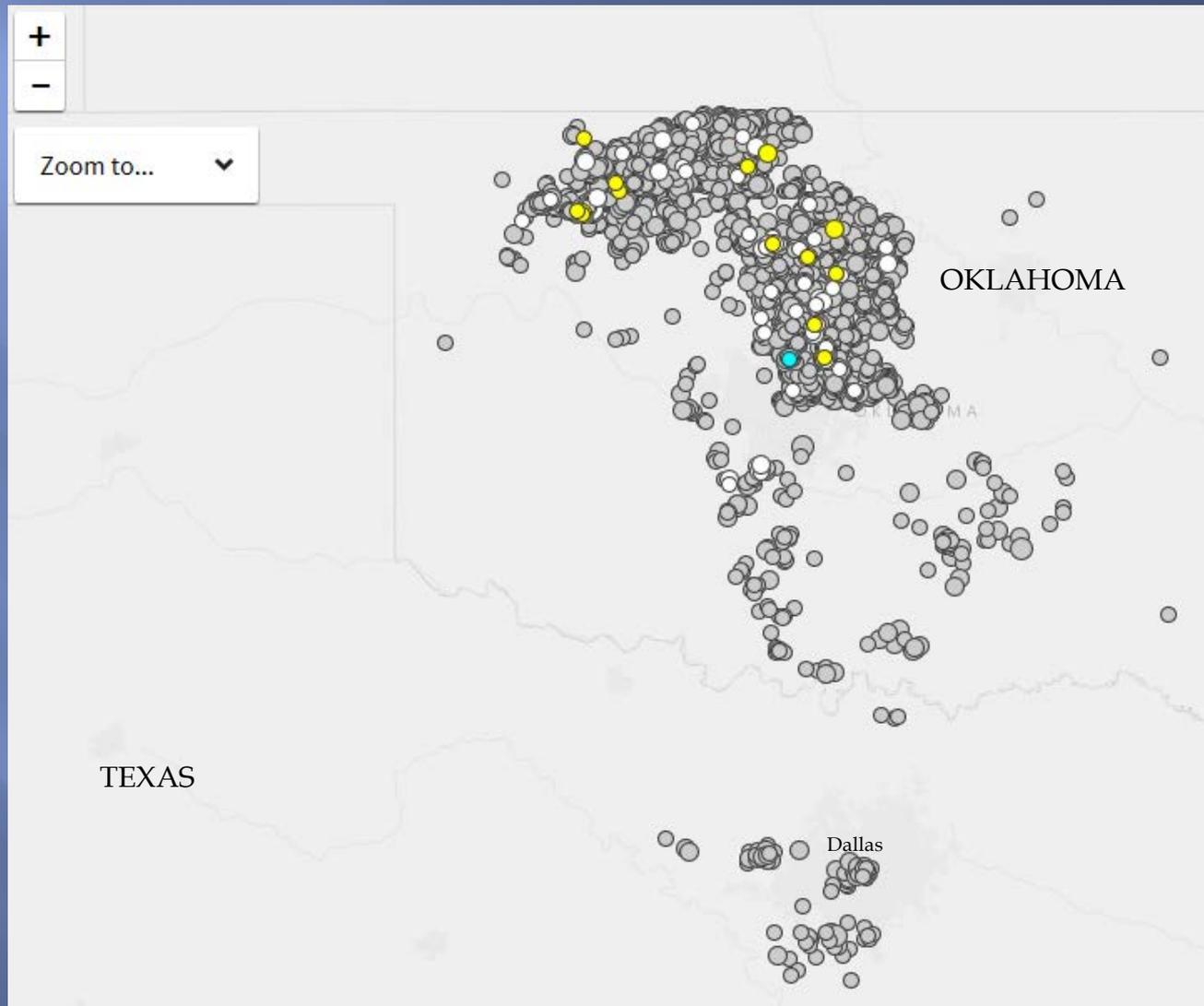


Jerry Bartz, 2016

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- **Partial Vitae: Jerry Bartz**
- 5 years experience in locating fractured geothermal reservoirs
 - 4 patents, one involving fault detection and delineation.
- 9 years in Oil and Gas exploration
 - Trained to use remote sensing to optimize geophysical surveys to detect the probable existence of underground features, including faults at depths to 13,000 feet.
- 6 years experience in environmental assessments,
 - Assessment at weapons grade US Nuclear sites.
- 2 years as Adjunct Professor of Geology.
- 6 years as tutor in Geospatial Technology
 - AAPG lecturer – The Many Faces of GIS: Oil and Gas Applications.
 - Contributing editor to 2 textbooks.

Since the first Man-induced Earthquake occurred in the DFW area, there have been 6682 Earthquakes =>1.5 10/2008 to 8/2016 in the Texas Oklahoma area.



When the next gas boom comes, will our regulations result in an Oklahoma type Earthquake distribution and what will be the taxpayer cost to restore the earthquake damage? For the Lake Lewisville-Lake Grapevine area the TAXPAYER COST IS >> 9M\$.

Is It Safe to Frack Beneath Lake Lewisville?

Nominated Acreage



General Location

- On 1/20/16, the Bureau of Land Management, New Mexico, issued a nomination notice for leasing 258.9 acres beneath Lake Lewisville, TX. Texas municipalities were not officially notified.
- On 2/4/16, I was asked, by an HV City official to assess the risk of fracking beneath the nominated acreage.



- From 2/9 to 2/18, I presented my assessment to cable televised city council meetings, a home owners association and local news organizations.
- By 2/19/16, I filed a scientific opinion in support of letters of protest from 500 individuals, 6 municipalities and 2 water districts.
- On 3/4/16, the BLM announced it had withdrawn the lease sales for Lake Lewisville and 3 other lake reservoirs.

These are the data used to protest the lease sale.

First, let's examine the
Integrity of the Lake Lewisville Dam



Some of the Lewisville Dam Major Repairs (1955-2013)

- ***Repair of Riprap (Nov 1966 – May 1967)***
- ***Embankment Modifications***
 - ▶ ***Upstream Berm (Jul 1979 – May 1980)***
 - ▶ ***Downstream Berm (May 1981 – Nov 1983)***
 - ▶ ***Upper Slope Rehabilitation (Jun 1983 - Apr 1984)***
- ***Spillway Repair (Sep 1984 - Sep 1985)***
- ***Spillway Wall & Slab Repair (Oct 1987 - May 1988)***
- ***Upstream Embankment & Erosion Repair (Oct 1995 - Jul 1996)***

Uncontrolled seepage through the foundation has been observed in several areas



West End of Dam



Both on East End of Dam

Upstream and Downstream Embankment Problems

Center of Dam

East Side of Dam



*Unreported Downstream Repair
Activity Circa 2005*

*2 Upstream Slides
1995 and 2015*



The Corps of Engineers has classified it as the
8th Most Hazardous Dam in the Country

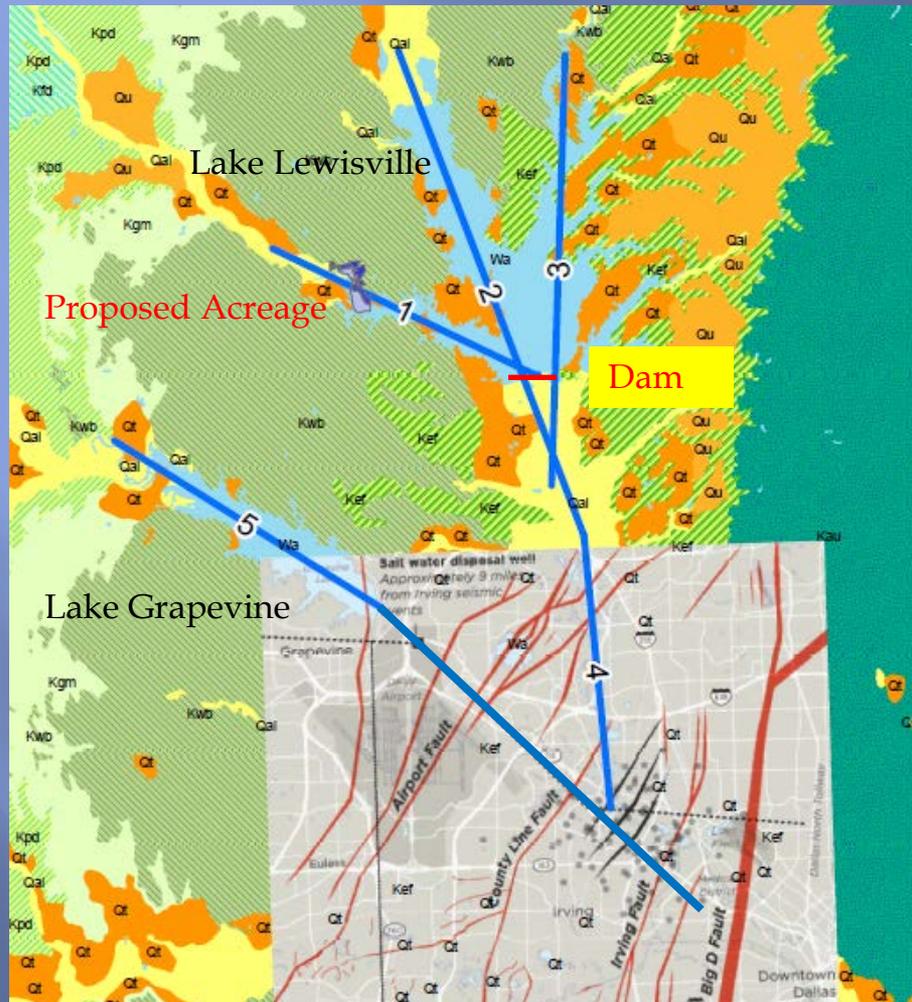
AND

is considering asking Corps headquarters to
upgrade its risk classification to the highest:
"critically near failure" — that is, "almost certain
to fail under normal operations ... within a few
years without intervention," according to a Corps
document.

These are the data used to protest the lease sale.

Second, let's examine the
Geological Data and Some Nearby Fracking Data

Man-Induced Earthquakes with Interpreted Lineaments and Industry provided Seismic Faults



Dots represent USGS defined Man-Induced Earthquakes associated movement of dormant faults activated by Fracking activities near Airport.

Earthquakes could be interpreted as occurring near intersection of lineament pair 5 and 4.

Lineament pair 1 and 2 have a similar intersecting relationship.

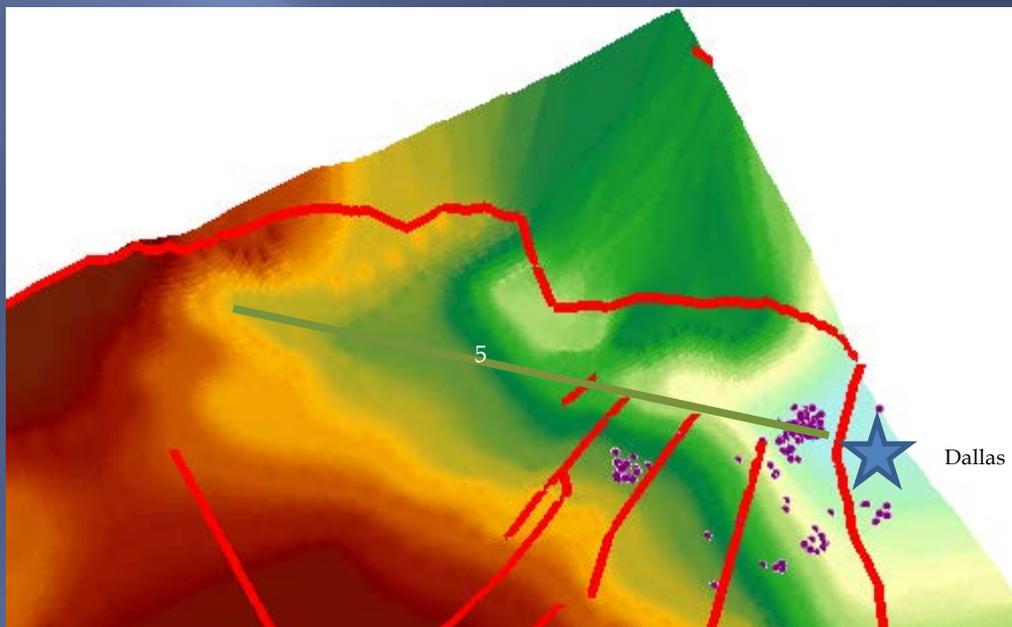
Do Lineaments 1, 2, and 3 have any association to dam integrity problems?

Why do the Industry released seismic not see lineament 5?

Lineament 5 was later found to be strongly associated with a deep Ellenburger canyon. Dots are earthquakes.



January 2015 – 15 tremblors Irving, Texas
More than 130 quakes in 6 years.

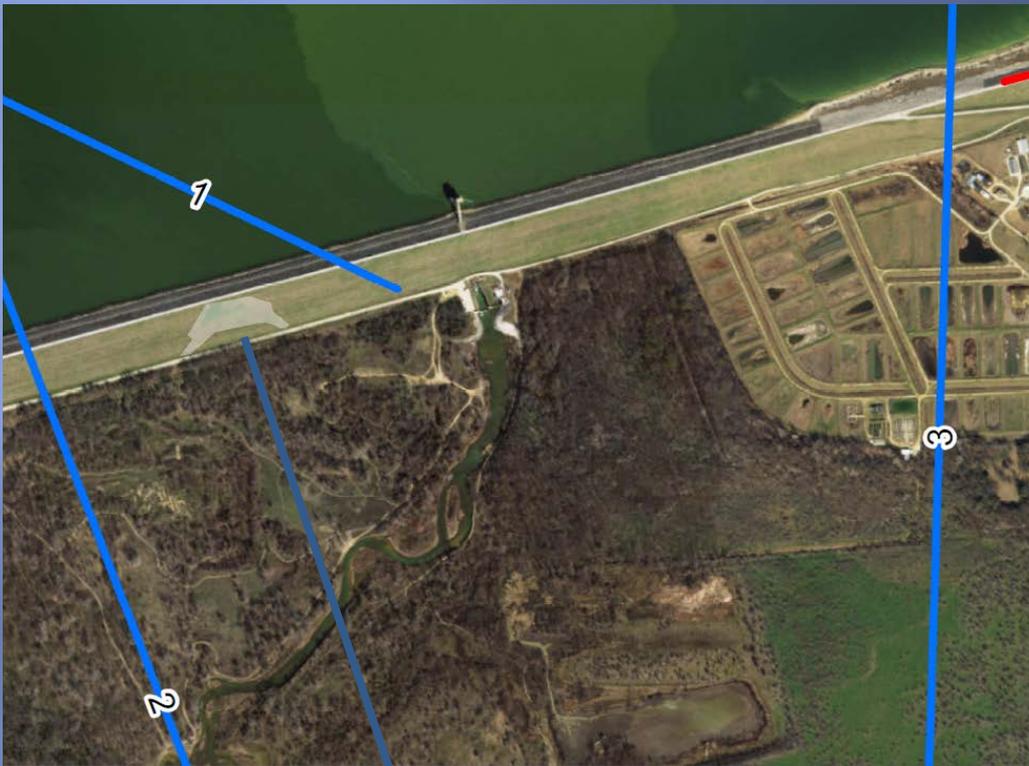


ArcScene Surface of the Barnett Ellenburger Canyon – Deepens from west to east – 5,000 feet of relief.

Association of Lineaments and Dam Integrity Problems

Center of Dam

East Side of Dam



Lineament 3 is spatially associated with 1995 and 2015 upstream slides.

Taxpayer Cost for this area
6M\$ 8M\$.

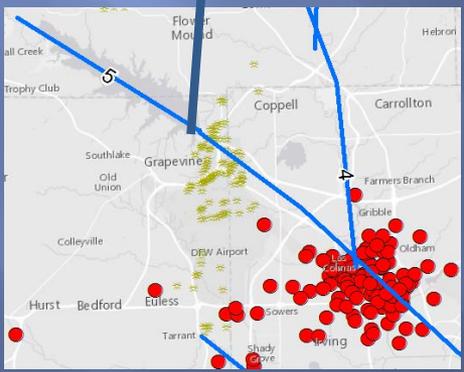
Lineaments 1 and 2 intersect the dam on either side of the unreported repair (approx 83,648 sq. ft. or 2 acres).
Cost unknown.



Lineament 5 Lake Grapevine
November 2015
95 foot slide
(600 feet from Lineament 5
3,500 feet from Barnett wells)

Damage Classification raised from
low urgency to high urgency

Taxpayer cost 1 M\$



This dam has experienced integrity problems since 1967

The problems may reflect a geologic setting with dormant or slowly moving faults.

Fracking beneath the Nominated Acreage may cause movement of Lineament 1 and endanger the dam integrity.

Dams are an environmental
necessity for flood control
and potable water supply

BUT

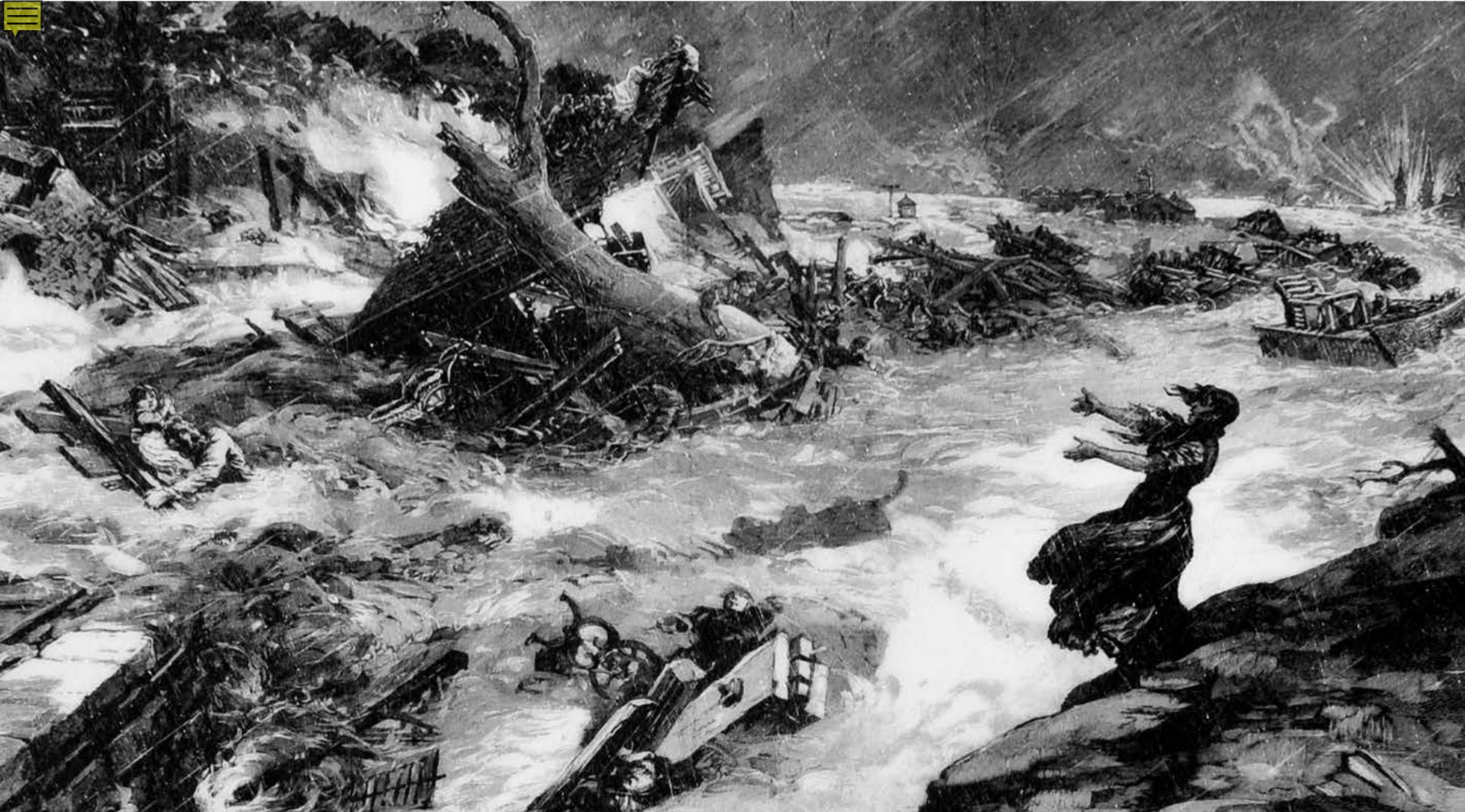
They can fail with disastrous
consequences

Baldwin Hills Dam, Los Angeles CA - Catastrophic Failure 1963



277 Homes Destroyed; 5 Fatalities

Fault Movement possibly associated with pressurized injection of Shallow Inglewood Field which is approximately 20 Miles from the dam.



Johnstown, Pennsylvania Dam Failure - 1889
Catastrophic damage to downstream communities

2,209 documented fatalities





The Lake Lewisville dam holds back 125 times more water than the Johnstown dam.

The seepage problems can be an indicator of "piping," a tunnel underneath the dam that could lead to failure. The results would be an estimated 431,000 people displaced by floodwater, countless deaths, \$21 billion in property damage and a downtown Dallas under 50 feet of water.

In Canada, small earthquakes have been detected with micro-seismic surveys for both well fracking as well as disposal injection.

The Lewisville dam AND ALL RESERVOIR DAMS should be monitored with micro-seismic surveys to assess the effect of fracking operations on the dam, prior to the leasing of acreage beneath a water reservoir.