



Updated October 6, 2009
Revision #1

Seismic Testing and Produced Wastewater Gathering System Fact Sheet

1. What is the proposal the Town has received?

There are currently two issues being proposed. First, staff has received a proposal for a produced water gathering and storage system that would transport produced water from other pad sites/locations to a central storage location for removal by wastewater hauling trucks. Truck traffic would be diverted from multiple pad sites to a centralized storage location or "tank farm." Second, staff has been approached to allow seismic testing via the vibroseis method on the Town's roads.

2. When will the Town Council discuss these issues?

On October 5, the Town Council publicly discussed the Council's direction to staff on these topics, the next steps in considering a seismic testing policy, and the need for review and revision of the ordinances that apply to the centralized collection of produced wastewater. The next discussion will take place at the Town Council Work Session scheduled for October 15 where the Council will hear from Town staff and continue to publicly discuss their views and the future steps on these topics.

3. Why can't these proposals be conducted under the Town's ordinances?

The Town's regulations allow for produced water pipelines on permitted gas well pad sites for storage and removal from the same permitted pad site. Current regulations do not address the gathering system and will not allow the centralized collection facility as proposed. The Town's Zoning Ordinance describes in detail the uses that are permitted in agriculturally zoned land and those uses that require a specific use permit. Agriculturally zoned property does not support the contention that the "tank farm" is permitted in such zoning classification. It is an industrial use; however, none of the uses for Industrial-1 or Industrial-2 districts is applicable. Therefore, produced water from a central collection facility is neither a permitted use nor a specific use under any zoning classification in the Town. A central collection facility on an agricultural tract in Flower Mound could require a Master Plan amendment and would require an amendment to the Zoning Ordinance and an amendment to the zoning on the tract. The tract would also have to be platted in conformance with the Town's subdivision standards before any permits for this use could be issued.

The Town's regulations require seismic operators to provide notification seven business days prior to commencing work, the location, date and time of the survey, survey method, and date and time of survey completion. The requirements apply to the regulation of these activities on any property in Town, but do not imply

permission to conduct the activities. The Town has the same property rights as any landowner relative to allowing seismic operations in the right-of-way. In other words, any seismic testing requires the permission of the landowner. The Town is taking a long-term approach to the seismic testing issue. The Town must consider the viability of its infrastructure now and in the future.

4. What are the potential risks and benefits of each activity?

In regards to a centralized wastewater collection system, potential benefits include one pick up station for trucks. This would reduce the number of trucks on certain streets. This could also increase truck traffic on other streets. There is a tradeoff between having one large tank or several small tanks.

For seismic testing, the tests could help produce detailed mapping of natural gas locations for drilling. This may produce more efficient and profitable operations. The Town has historically denied requests to conduct seismic testing on roads because of concern for potential damage to the roads and adjacent infrastructure. Although not immediately seen, the damage could appear many years in the future. The Town has approximately \$450 million in roadway infrastructure assets to replace in the next 20 plus years from normal wear and tear.

5. What is produced water and what is in it?

Produced water or production fluid is the fluid or wastewater resulting from the drilling, completion, and production processes. Although oil and gas companies typically don't release their specific drilling and fracturing fluid additives, the attached documents provide information on elements that are generally known to be associated with the drilling and production process. One document is an article from the Dallas Morning News, and the other is a section of a white paper describing produced water from production of crude oil, natural gas, and coal bed methane prepared for the U.S. Department of Energy in 2004.

6. Why is a bond for the infrastructure not acceptable for the Town?

Bonds are written by bonding companies generally for short periods of time and for certain amounts, subject to certain defined risks. If a bond were issued to provide protection for damage to streets, when the Town asserted a claim against the bond, there is the potential for litigation, with the Town being required to prove how much the seismic testing damaged the roadway as opposed to poor construction or ordinary wear and tear. This analysis would require experts and would be the subject of significant debate.

7. Why is the Town requesting replacement costs to allow seismic testing?

Replacement costs for the Town's infrastructure would provide the Town the security it needs should damage result from seismic testing to any Town infrastructure including roads and water and sewer lines.

8. What about the light bulb and egg demonstration?

Town staff did not witness the demonstration where the light bulb and egg were buried prior to seismic testing and did not break. There are many factors that could have contributed to this including how the items were packed. We do not, however,

believe it would be prudent to base a decision where \$450 million of roadway infrastructure is at stake on a test such as this.

9. Is this a private property issue?

The Town has the same property rights as any landowner relative to allowing seismic operations in the right-of-way, and staff has repeatedly made the decision to not allow seismic activity in these areas. Any seismic testing requires the permission of the landowner.

10. Do the Town's survey cities and other transportation agencies allow seismic testing?

Out of the Town's 15 survey cities, Southlake and Denton currently allow seismic testing on city streets. Twelve other cities (Allen, Carrollton, Colleyville, Coppell, Frisco, Grapevine, Lewisville, McKinney, North Richland Hills, Plano, Richardson, and Rowlett) do not currently allow seismic testing on city streets. A response from Irving has not been received. The Texas Department of Transportation (TxDOT) does not have a policy prohibiting seismic testing; however, the Denton Area Engineer has indicated that he would not allow seismic testing if permission was requested from him. The Town is awaiting a response from the North Texas Tollway Authority.

11. What is the replacement cost of all Town of Flower Mound infrastructure over the next 20 years?

The Town has approximately \$450 million in roadway infrastructure assets to replace in the next 20 plus years as well as more than \$150 million from the utility distribution system.

12. Has Town staff experienced a seismic demonstration?

Yes, the Town sent a staff member on Sunday, August 16 to observe seismic vibrator units in operation in Bartonville. The Town's preference was to observe the units actually conducting seismic reading instead of a demonstration, which is why this date was selected. The staff person is an engineer, and his title with the Town is Public Works Director. His duties include responsibility for the maintenance and reconstruction of our streets. He also happens to be the person on our staff with the most experience with vibration units as he worked in an area of Oklahoma where the units were built. Observations from the testing included the units operating at full power and 50 percent power. During the running of each test, the staff member stood approximately 25 feet from the units, and under both test conditions, the vibrations generated by the unit caused the ground to shake beneath his feet. This observation reinforced our concern that the testing could negatively affect either asphalt or concrete pavement.

13. Have any studies been performed that proves seismic testing would not harm the streets?

Town staff is not aware of specific studies relative to the impact on streets. Staff has contacted various industry representatives to determine if such studies have been conducted, and they indicated that they were not aware of a study.

14. Will seismic testing on streets be requested more frequently during urban drilling activity as less open fields become available for such testing? If so, by permitting such an approach, will the Town be increasing the likelihood of gas drilling in the eastern portion of Town?

Town staff anticipates that requests to conduct seismic operations on streets may increase if operations move east. Many factors are involved with permitting the gas well locations; therefore, it is difficult to determine if allowing seismic operations on streets will increase gas drilling activity in the eastern portion of the Town.

15. Will any ordinances have to be changed to allow seismic testing on the Town-owned and maintained streets?

An amendment to the Town's ordinances would not be necessary to allow seismic testing on Town streets.

16. What is the weight of the vehicles used to conduct seismic tests? Are smaller trucks available to perform testing and do the trucks provide similar results?

The weight of the vehicle typically used in this area is approximately 60,000 pounds. While there are smaller trucks available, there is the potential that the operation time necessary for the smaller trucks to obtain similar data would be longer which may require a longer duration of low frequency vibration that could result in road damage.

17. At what level of power of a seismic testing machine will damage the Town's streets? At what level is the machinery normally run to conduct the testing?

Numerous factors beyond the level of power generated during the seismic testing could lead to road damage. The frequency and duration of the vibration, the condition of the road, and the level of power could all be contributing factors. The vibroseis trucks typically operate at 70% power on an open tract of land. The trucks operate at approximately 50% power on roads.

18. How can the Town measure the extent of any long-term damage from seismic testing on streets as they age and attribute that damage and assess a fee to any particular party or event?

Unless damage was observed at the time of testing, measuring the extent of long-term damage to the street resulting from the seismic operations would be challenging.

19. Are there environmental risks associated with seismic operations?

Staff is not aware of any environmental risks associated with seismic operations.

20. Is the burden on the Town to prove that seismic testing would damage the Town's streets, or is it on companies seeking to conduct the test to prove that it will not damage streets?

The Town's streets are the property of the Town and any company needs the Town's permission to do testing on the Town's property. Companies do not have a "right," either contractual or legal, to perform seismic testing on the Town's streets.

21. If homes in neighborhoods are damaged, such as foundations or swimming pools, what liability does the Town share?

If this testing were permitted, the Town would suggest that companies provide neighbors with some access to insurance coverage or an indemnification agreement for the Town's benefit in the event a claim were to be asserted against the Town relative to seismic testing.