

## 0-6886: Engineering Guidelines for Installing Temporary Lines within the Right of Way

### Background

The Texas Department of Transportation (TxDOT) uses two types of lease agreements for installing saltwater pipelines on the right of way. Short-term leases (up to 180 days) are used for aboveground temporary saltwater pipelines, mainly to carry non-produced water. Longer-term leases are used for underground saltwater pipelines, mainly to carry produced water. This research reviewed temporary pipeline installation practices, developed a guidebook to install and operate temporary pipelines, and recommended potential changes to policies and regulations based on field data collection and stakeholder feedback.

### What the Researchers Did

The researchers completed the following activities:

- Review of current practices related to the use of temporary pipelines, including a review of relevant laws and regulations in Texas and other states, definitions related to the use of water for energy developments, and current practices by pipeline operators.
- Field data collection to extract information about typical trends related to the installation and operation of temporary pipelines within the right of way.
- High-level hydraulic analysis to estimate the impact of temporary pipelines in the hydraulic capacity of culverts.
- Review of the characteristics and impact of saltwater on the roadside.
- Stakeholder meetings with TxDOT officials, county officials, and temporary pipeline operators to review existing practices and identify issues, as well as stakeholder meetings to discuss the guidebook and recommendations for

temporary pipeline installation, operation, and maintenance practices.

- Development of a guidebook that contains recommended guidelines for installing, operating, and maintaining temporary pipelines within the state right of way.
- Development of recommendations for potential changes to policies for the accommodation of temporary pipelines within the right of way.

### What They Found

Temporary pipelines installed in Texas vary from 2 to 12 inches in diameter. Because of the difficulty in installing and repairing temporary aluminum pipelines, operators began to use other materials such as polyethylene and lay-flat temporary pipelines. Polyethylene temporary pipelines are 3 or 4 inches in diameter and are used during the drilling phase of well development. Lay-flat temporary pipelines are 8 or 10 inches in diameter and are used during hydraulic fracturing or well completion activities.

Although the use of temporary pipelines has brought considerable benefits because fewer trucks are needed to transport water for energy development, there are many issues related to the installation and

#### Research Performed by:

Texas A&M Transportation Institute

#### Research Supervisor:

Cesar Quiroga, TTI

#### Researchers:

William Holik, TTI

Jing Li, TTI

Ioannis Tsapakis, TTI

David Bierling, TTI

#### Project Completed:

8-31-2017

operation of temporary pipelines, which warrant the implementation of guidelines to clarify roles and responsibilities, improve pipeline installation and operation practices, and minimize the risk and exposure to TxDOT and the public. Examples of issues include:

- Temporary pipelines that occupy the right of way without authorization.
- Temporary pipelines that use highway culverts incorrectly or driveway culverts illegally.
- Water that contains a much higher salt content than what TxDOT envisioned when first permitting temporary pipelines.
- Temporary pipelines that are placed all over the roadside, including in ditches and near the edge of pavement, which affects the clear zone.
- Perception by temporary pipeline operators that they follow effective practices, not realizing that their pipelines interfere with TxDOT roadside maintenance activities.

### What This Means

The researchers developed a guidebook that contains recommended guidelines for installing, operating, and maintaining temporary pipelines within the state right of way. The guidebook addresses practices concerning temporary pipeline accommodation, installation, operation, and maintenance for three main user groups:

- TxDOT personnel responsible for leasing the right of way.
- Oil and gas operators and their subcontractors.
- TxDOT personnel responsible for inspecting and managing temporary pipelines in the field.

The topics covered in the guidebook follow the lifecycle of a temporary pipeline and range from

application for a lease, water characteristics, construction of pipelines, pipeline crossings, maintenance of the right of way, maintenance of temporary pipelines, and removal of temporary pipelines. The guidelines focus on critical information for TxDOT and operators, but not on prescriptive mandates about how things are to be done.

Recommendations for potential changes to policies included potential changes to the Texas Administrative Code and recommendations to improve the management of the temporary pipeline life cycle and lease program. Potential changes to the Texas Administrative Code include defining clearly the type of water that temporary pipelines can transport and clarifying the maximum operating pressure for temporary pipelines. Recommendations to improve the overall management of the temporary pipeline lease program include:

- Add references to temporary pipelines in relevant TxDOT manuals.
- Clarify the type of water that can be transported in temporary pipelines.
- Require pipeline operators to disclose the total dissolved solids (TDS) of the water they propose to transport.
- Request operators submit a spatial data file with the lease application, showing the entire location of the proposed temporary pipeline.
- In Exhibit A of the lease, change the wording for water production source and end disposal source to origin and destination, and add a box for coordinates and permit numbers for the origin and destination.
- Implement a response protocol for leaks and spills that takes into account different thresholds based on the TDS concentration of the water being transported.

### For More Information

**Project Manager:**

Kevin Pete, TxDOT, (512) 416-4738

**Research Supervisor:**

Cesar Quiroga, TTI, (210) 321-1229

Technical reports when published are available at <http://library.ctr.utexas.edu>.

Research and Technology Implementation Office

Texas Department of Transportation

125 E. 11th Street

Austin, TX 78701-2483

[www.txdot.gov](http://www.txdot.gov)

Keyword: Research