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Underground Construction Technology

International Conference & Exhibition

Executive Summary

- The pipeline industry is under increased scrutiny from various environmental and political groups
- The HDD industry is now making national news after happily operating in relative obscurity for many years
- The pressure on pipeline operators and service firms is intense and continuous…business models are at risk
- The HDD industry needs to define a better approach to overall project execution and risk mitigation

The pipeline and HDD industries are making national headlines…

Feds Halt New Drilling on Rover Pipeline After Spill Into Ohio Wetland
-NBC News, 2017

Drilling Operations Halted on 350-Mile Sunoco Mariner East 2 Pipeline After Local Challenges
-NBC News, 2017

The company building an oil pipeline that has fueled sustained public protests said on Thursday it has started drilling under a North Dakota lake despite a last-ditch legal challenge from a Native American tribe leading the opposition.
-Reuters, 2016

Source: Ohio EPA

Risk allocation in HDD projects

- Risk allocation theory
  - *Theoretical*: Risk should be priced and owned by the party best positioned to manage the risk
  - *Actual*: Risk should be allocated based on what can be negotiated in a competitive contracting environment
- In today's competitive HDD environment, contractors are often required to assume risks that they not well positioned to manage
- Project owners ultimately wear the risk for delivering projects on schedule and on budget
- The industry needs to work together to define a new model for executing HDD projects

Inadvertent returns (IRs) costs and causes

- IR risk is significant
  - Project cost
  - Project schedule
  - Public perception
  - Loss of opportunity
- The causes of IRs are straightforward
  - Academic
  - In practice

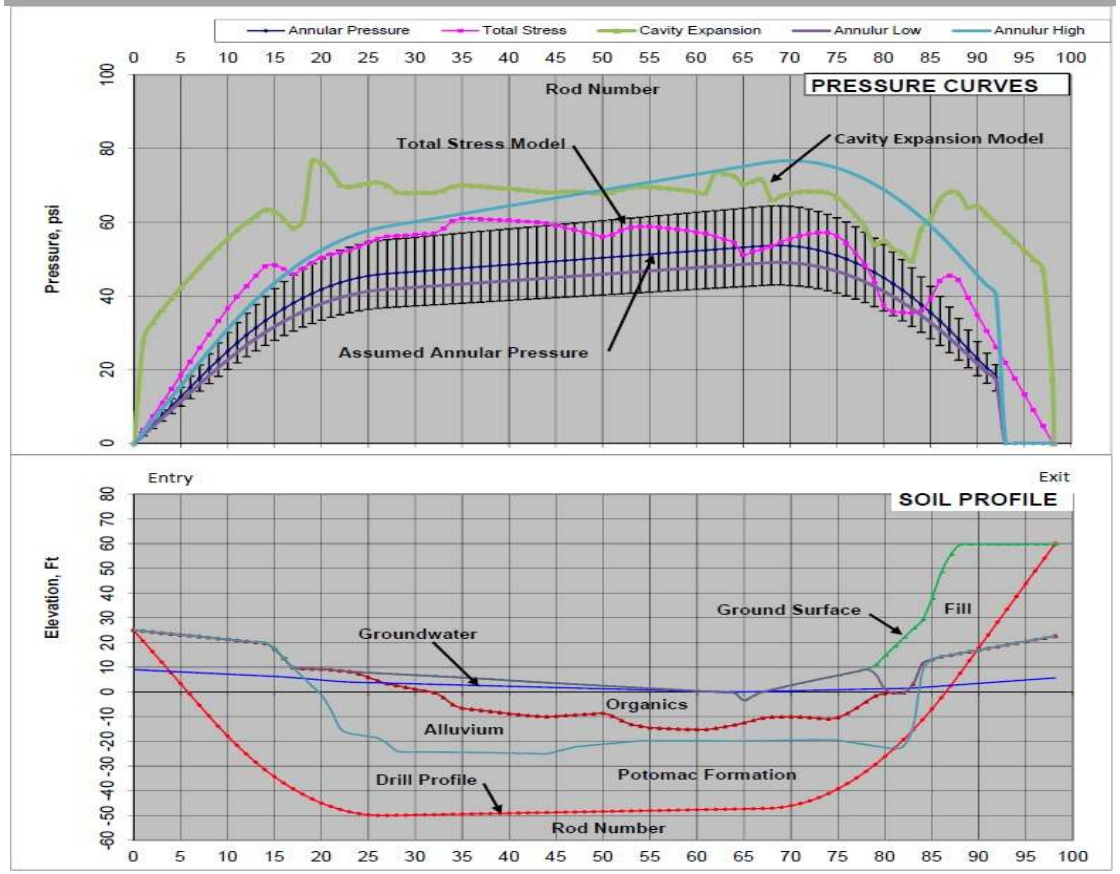
The added cost of IR prevention is a fraction of the cost of environmental clean up and non existent in the context of public perception

How can IR risk be mitigated during design

Best practices

- Select engineering firm that specializes in HDD design
- Perform adequate geotechnical analysis
- Integrate geotechnical information into bore design
- Develop annular pressure profile for bore (APC)

Pressure profile



How can IR risk be mitigated through contractor selection and planning

- Lowest cost per foot is not always the best decision
- Define procedures to address IR risks *with* contractors
  - Develop plans to monitor pressure levels and returns
  - Define metrics that trigger action
  - Define risk response strategies
- Ensure contractors and other participants are not penalized financially for taking actions to prevent IRs

How can IR risk be mitigated during construction

Best practices

- Monitor AP levels in real time
  - Pressure tools
  - EDR
- Monitor other related operating parameters
- Manage and monitor fluid program
  - Fluid characteristics
  - Pumping rates
  - Fluid flow/returns
- Review alternatives with project stakeholders and take remedial actions

Monitoring tools

Summary

- The HDD industry needs to define a better approach to overall project execution and risk mitigation
- Owners and service firms need to implement best practices at each step of the project process
- The knowledge, tools, and technology exist today to materially reduce IR risk
- They way we respond today will impact the future of the HDD industry