

# High Pressure Self Monitoring Composite Pipeline System

January 14, 2021



# Smartpipe<sup>®</sup> Overview



Protective  
Outer Cover

Retention  
Windings

High Strength  
Pulling Tapes

Fiber Optic Monitoring  
and Communication Cable

High Strength  
Fiber Wrap



# What is Smartpipe®?

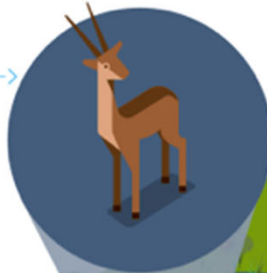
## High Pressure Composite Pipeline System

-  Fully Structural
-  Long Lengths
-  Embedded Fiber Optic Monitoring and  
Communication System & Valve Control
-  Embedded Material Health Sensors *(NEW)*
-  Non-Corroding
  
-  Inserted into Existing Steel Pipeline (HPIR), or...
-  Laid in Ditch

# The Environmental Solution

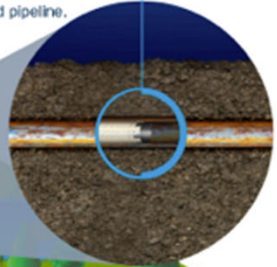
## Protect Native Species

Smartpipe® can be installed as a HPIR class installation inside a corroded pipeline without the need to disrupt the habitats of native species, avoiding lengthy Environmental Impact Studies.



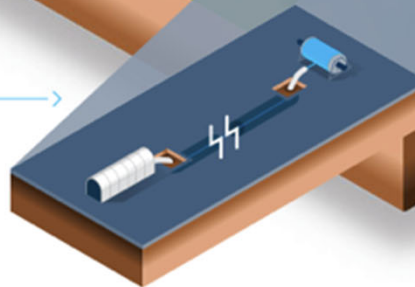
## High Strength Design

With a maximum operating pressure of up to 1,000 psi, Smartpipe® design exceeds current industry standards requirements, is fully structural and can be laid as a direct burial or inside an existing corroded pipeline.



## Continuous Pull

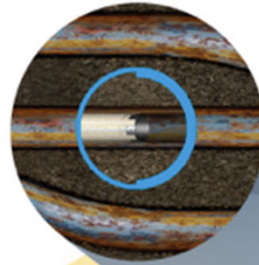
The Smartpipe® design includes high strength longitudinal pulling tapes, which allow the Smartpipe® system to be installed in very long continuous lengths, of up to several miles, without the need for intermediate couplings.



# The Industrial Solution

## Optimal for Congestion

Smartpipe® is especially suited to right-of-ways with multiple pipelines, that are considered highly congested. Minimal access is required to the existing pipeline so excessive excavations are not required.



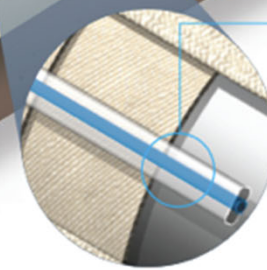
## Replace Corroded Pipelines

Smartpipe® is a composite pipeline system that is non-metallic and, once installed, eliminates the requirement for corrosion control and excessive pigging.



## Fiber Optic Monitoring & Communication

The Smartpipe® embedded fiber optic monitoring system instantly identifies and locates a leak or movement in the pipeline to within one meter, with notification sent to a SCADA system, pipeline control room and with data sent directly to a Smart Phone.



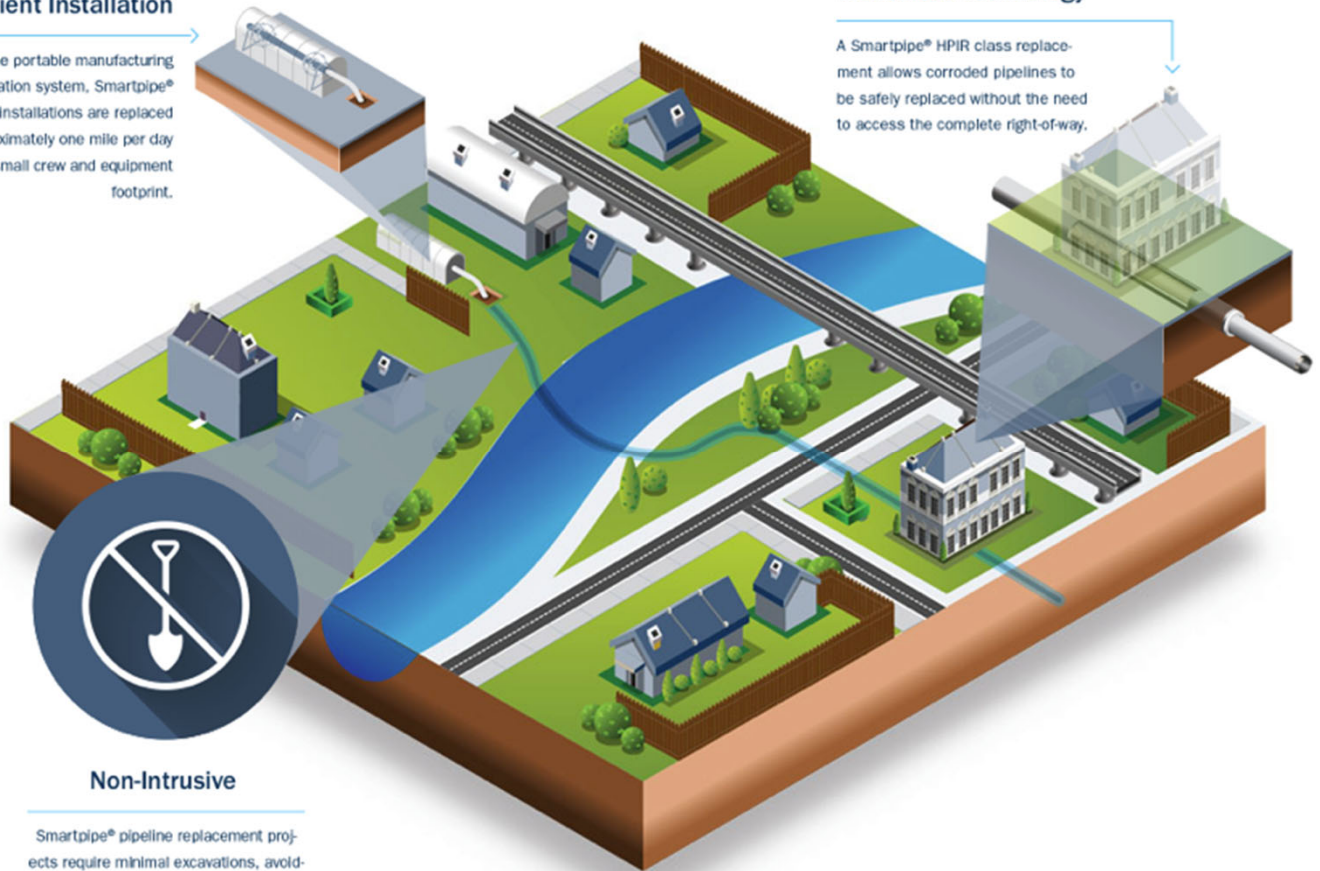
# The Urban Solution

## Efficient Installation

Using the portable manufacturing and installation system, Smartpipe® HPIR class installations are replaced at approximately one mile per day with a small crew and equipment footprint.

## Trenchless Technology

A Smartpipe® HPIR class replacement allows corroded pipelines to be safely replaced without the need to access the complete right-of-way.

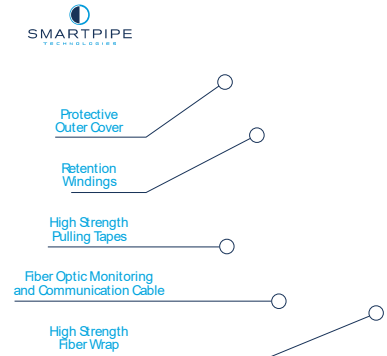


## Non-Intrusive

Smartpipe® pipeline replacement projects require minimal excavations, avoiding the need for long trenches with public and environmental disruption.



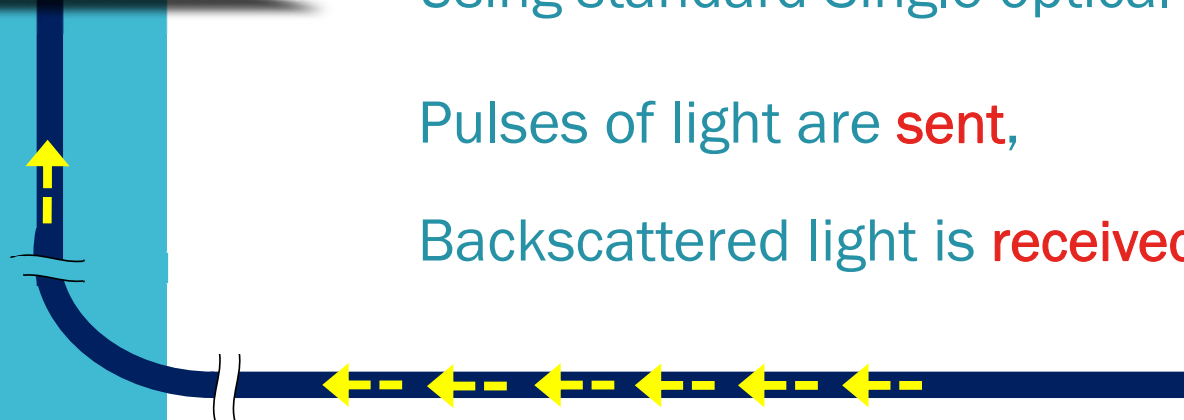
## Distributed Acoustic Sensor (DAS)



Using standard Single optical fibre:

Pulses of light are **sent**,

Backscattered light is **received**.



# The Fibre is the Sensor

# Pipeline Integrity Management

## LivePIPE Interface & Control

### 1. Installer Interface (HWI)

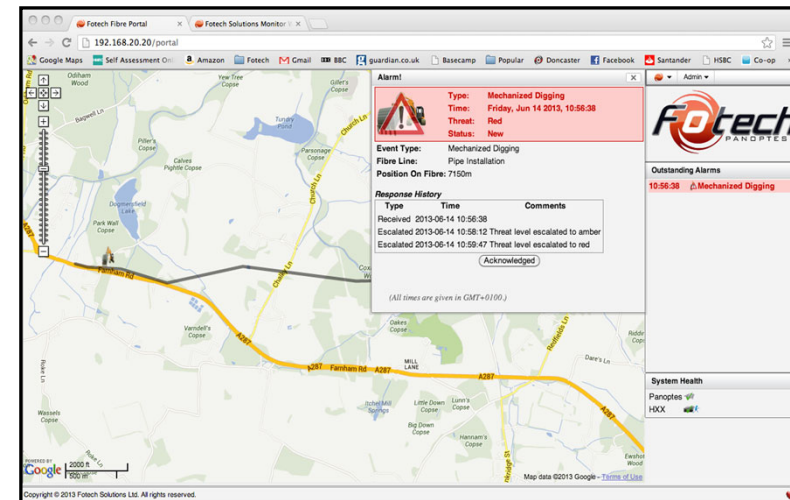
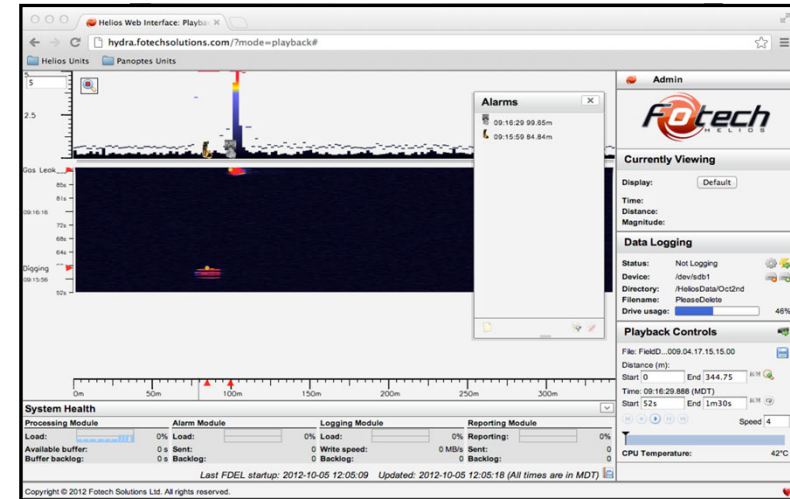
Real-time monitoring & control software installed on Helios.

### 2. Operator Interface

Fotech's proprietary server Panoptes & alarm handing GUI.

### 3. Interface, client integration

Integration with multiple platforms including SCADA.





# Smartpipe® Value Proposition

- Large Diameter Pipelines
  - 6” to 16” in long continuous segments
  - 24” coming soon
- High Pressures
  - Up to 2,000 psi MAOP
    - (Fully structural, pressure/temperature & diameter dependent)
- Long Replacement Lengths
  - up to several miles in one continuous segment
  - (Smartpipe® is “C”-Formed prior to installation)
  - If laid as a new pipeline in a ditch – “C”-forming not required
- Integrated Fiber Optics for Real Time Leak Detection, Impact, Ground Movement and Communications
- Portable Assembly Plant set up at the project site

## Product Development & Testing

### Product Family 4" to 9" ID

- 2,200 psi to 1,800 psi @ 73°F
- 2,000 psi to 1,400 psi @ 140°F

### Product Family 8" to 14" ID

- 2,000 psi to 1,200 psi @ 73°F
- 1,500 psi to 850 psi @ 140°F

### Proposed SDTC Project

- $\leq 20"$  Diameter  $\leq 720$  psi @ 180°F

## Portable Assembly Plant



Set up at Job Site  
Continuously Produces Smartpipe® in Long Continuous Lengths  
Approximately 1 Mile per Day

Portable Assembly  
Plant





**Smartpipe Technologies**  
Mobile Factory

## Re-Rounding Process





# Connectors



Preparation



Swaging



Final Coupling



Robust R&D Program  
Extensive Testing and  
In-service systems



Elevated Temperature Test Bay  
With Samples at 60°C

# ADV Integrity



Cyclical Dent Testing



Cyclical Bend Testing

# Testing Operations

## Testing Bays and Prototyping Machine



## 80°C, 60°C and 20°C Test Bays

## Control Room with Computer Monitoring



#1 Priority  
SAFETY

## #1 Priority - Safety



Smart Pipe Technology



Thank You

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