

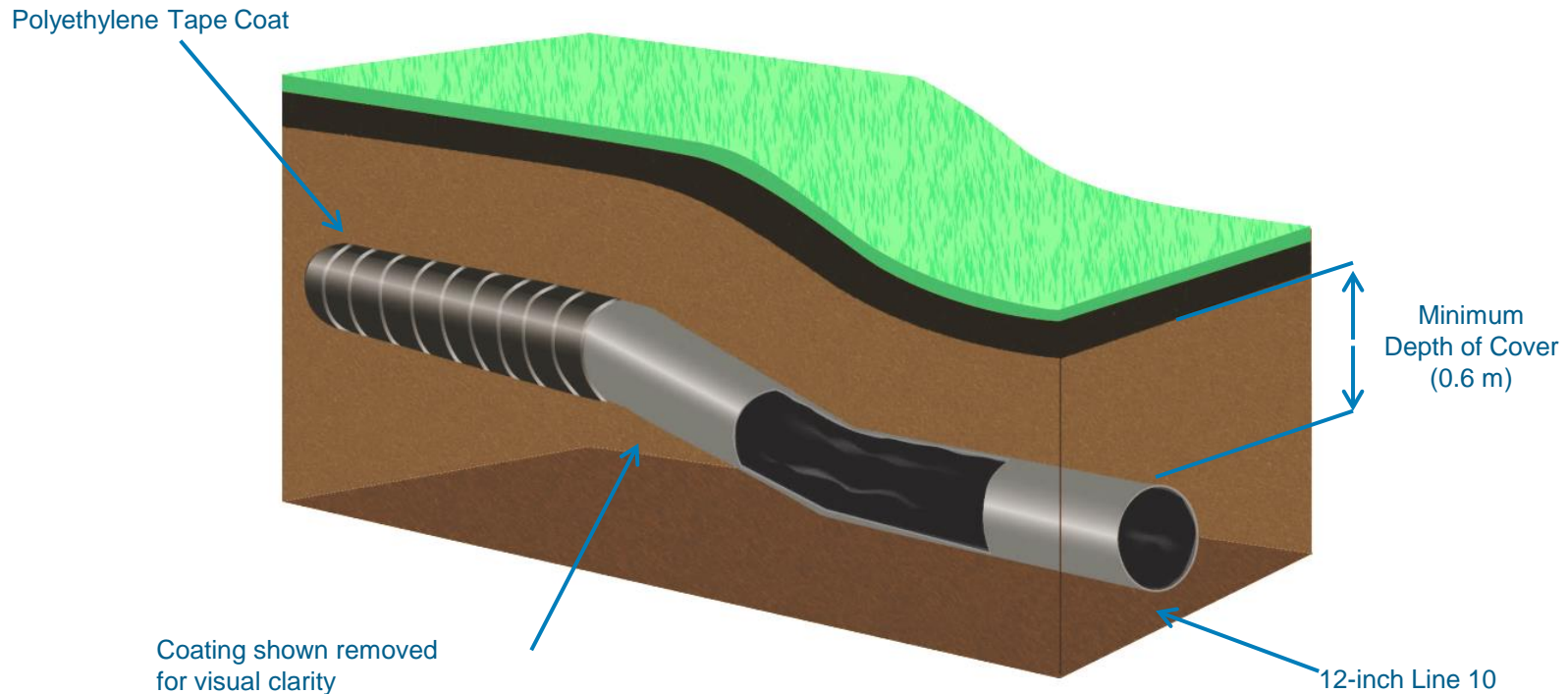
Line 10 Westover Segment Replacement Project

Ministry of the Environment and Climate Change Pipeline
Construction 101

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New Construction (1962)

Pipeline Age = 0 Years



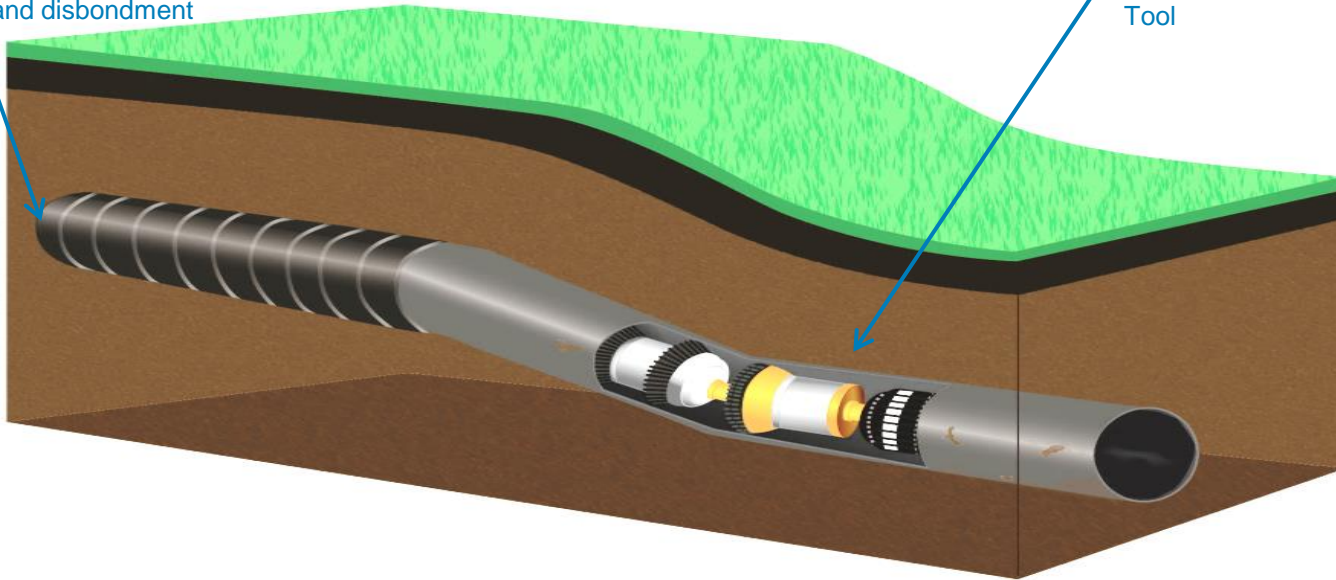
- Pipeline designed to have a safety factor of 1.25 based on original design pressure
- Typical pipe is NPS 12x 6.35 mm wall thickness
- Coating is predominately a polyethylene tape wrap

Current Operation (2015)

Pipeline Age = 53 Years

Coating degradation – local regions of wrinkling and disbondment

In-line Inspection (ILI) Tool



- Typically in-line inspection (ILI) tools are run on a three year cycle
- Pipeline capacity de-rated
- Dig programs conducted to repair corrosion features that exceed acceptable thresholds
- Protect pipeline with right-of-way monitoring and cathodic protection

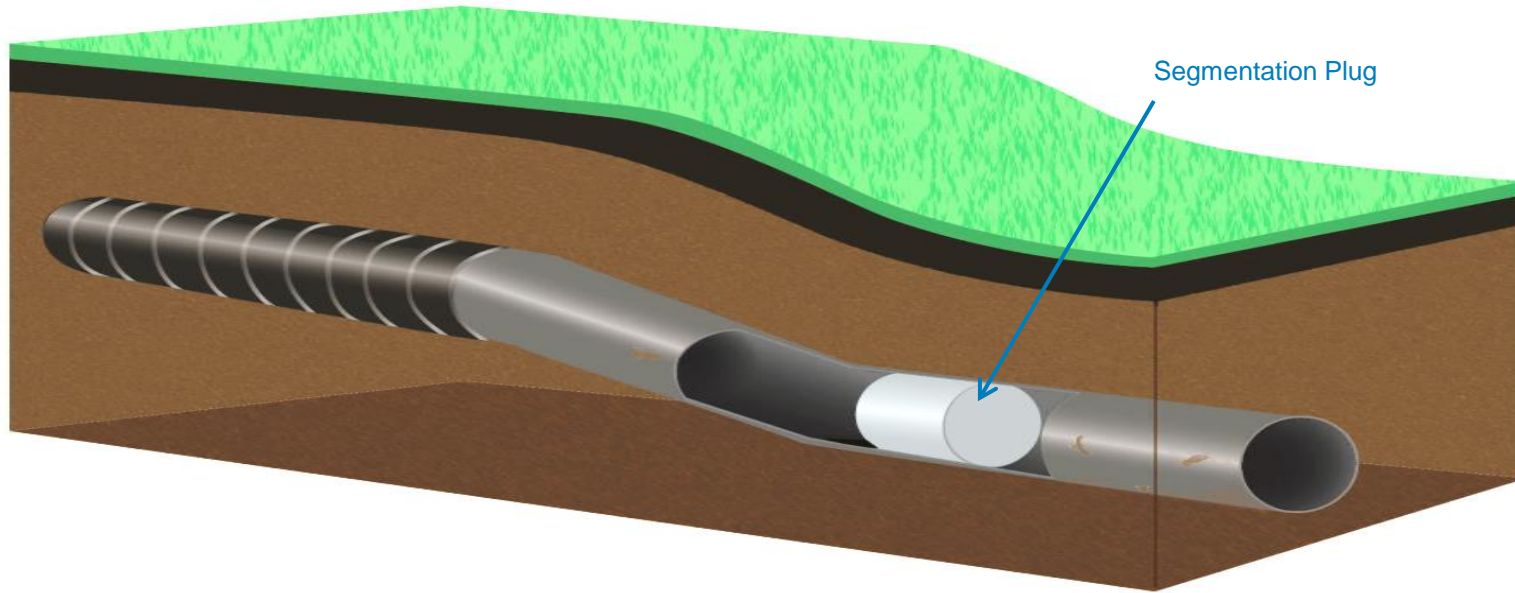
Current Operation (2015)

Pipeline Age = 53 Years

- Monitoring and maintenance programs keep the pipeline operating safely:
 - In-line inspection and pipeline integrity assessments
 - Dig maintenance program
 - Pipeline right-of-way patrols
 - Potential geotechnical threats assessments
 - Pipeline signage
 - Depth of cover surveys
 - Cathodic protection system monitoring
 - Public awareness programs
 - Ground disturbance best practices

Pipeline Decommissioned (2018)

Pipeline Age = 56 Years

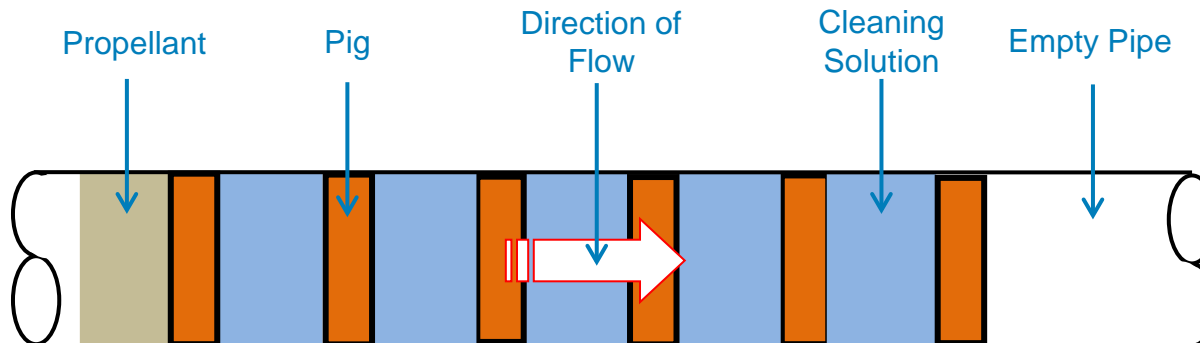


- All oil removed during displacement
- Pipeline is cleaned to level that won't cause harm to the environment
 - Nitrogen atmosphere depicted is a remnant of the cleaning program and will not be maintained under pressure
- Pipeline is isolated from active facilities to prevent injection of oil into the decommissioned pipeline
- Pipeline segmented at select locations based on an environmental risk assessment, method to be determined by field trials that Line 3 Replacement is conducting.

Pipeline Decommissioned (2018)


Pipeline Age = 56 Years

- Product is displaced from the pipeline
- Pipeline is cleaned to reduce concentration of product in the film left behind after cleaning
 - Research and development program to validate theoretical model
 - Illustration representative of cleaning operation separate from pipeline displacement
 - Number, size, and composition of cleaning batches based on specific cleaning application
 - Cleaning reduces the concentration of residual product left in the film left behind after pipeline displacement



Pipeline Decommissioned (2018)

Pipeline Age = 56 Years

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- Pipeline is physically separated from active pump stations and terminals
 - Prevents re-injection of product into the decommissioned pipeline
 - Valves are closed, permanently disabled, and de-energized
 - Stand alone facilities are partially demolished and the right-of-way restored
 - Pipeline is segmented to mitigate the effects of water conduit formation
 - Physical separation of pipeline at pump stations and closing valves provides segmentation points along the pipeline

Pipeline Decommissioned (2018)

Pipeline Age = 56 Years

- Cathodic protection will continue to be applied to reduce the corrosion rate of the decommissioned pipeline
 - Aligns with options for abandonment in Alberta Clipper easement agreement and Land Matters Consultation Initiative
- Monitoring and maintenance programs keep the pipeline right-of-way safe:
 - In-line inspection and pipeline integrity assessments - **discontinued as there is no rupture/leak threat**
 - Dig maintenance program - **discontinued as there is no rupture/leak threat**
 - Pipeline right-of-way patrols - **continued**
 - Potential geotechnical threats assessments - **continued**
 - Pipeline signage - **continued**
 - Depth of cover surveys - **continued**
 - Cathodic protection system monitoring - **continued**
 - Public awareness programs - **continued**
 - Ground disturbance best practices - **continued**
 - Void detection monitoring at primary highways and active railways - **new program Line 3 Replacement testing**
 - Additional level of protection at critical locations
 - Research and development program to validate technology

Questions

