

# Water Crossings from a Pipeline Surveillance Perspective

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# Overview

- What is Surveillance?
- Why do Surveillance?
- Types of Water Crossing Surveillance
- Examples



# What is Pipeline Surveillance?

- Regular inspection of Pipelines
- Looking for:
  - Erosion
  - Slumping of earth
  - Signs of leaks
  - Missing Pipe Warning Signage
  - Unauthorized construction or disturbance along the ROW
  - Overgrown Vegetation in the ROW
  - Exposed Pipeline



# Why do Surveillance?

- Regulatory Requirements
  - Alberta Energy Regulator (AER)
  - National Energy Board (NEB)
- Production Incentive to reduce loss of product
- Moral Obligation and Social License
- Multi-Use Data
  - Prevent leaks and loss of product
  - For repair and new development planning





# Types of Water Crossing Surveillance

## Mode of Inspection

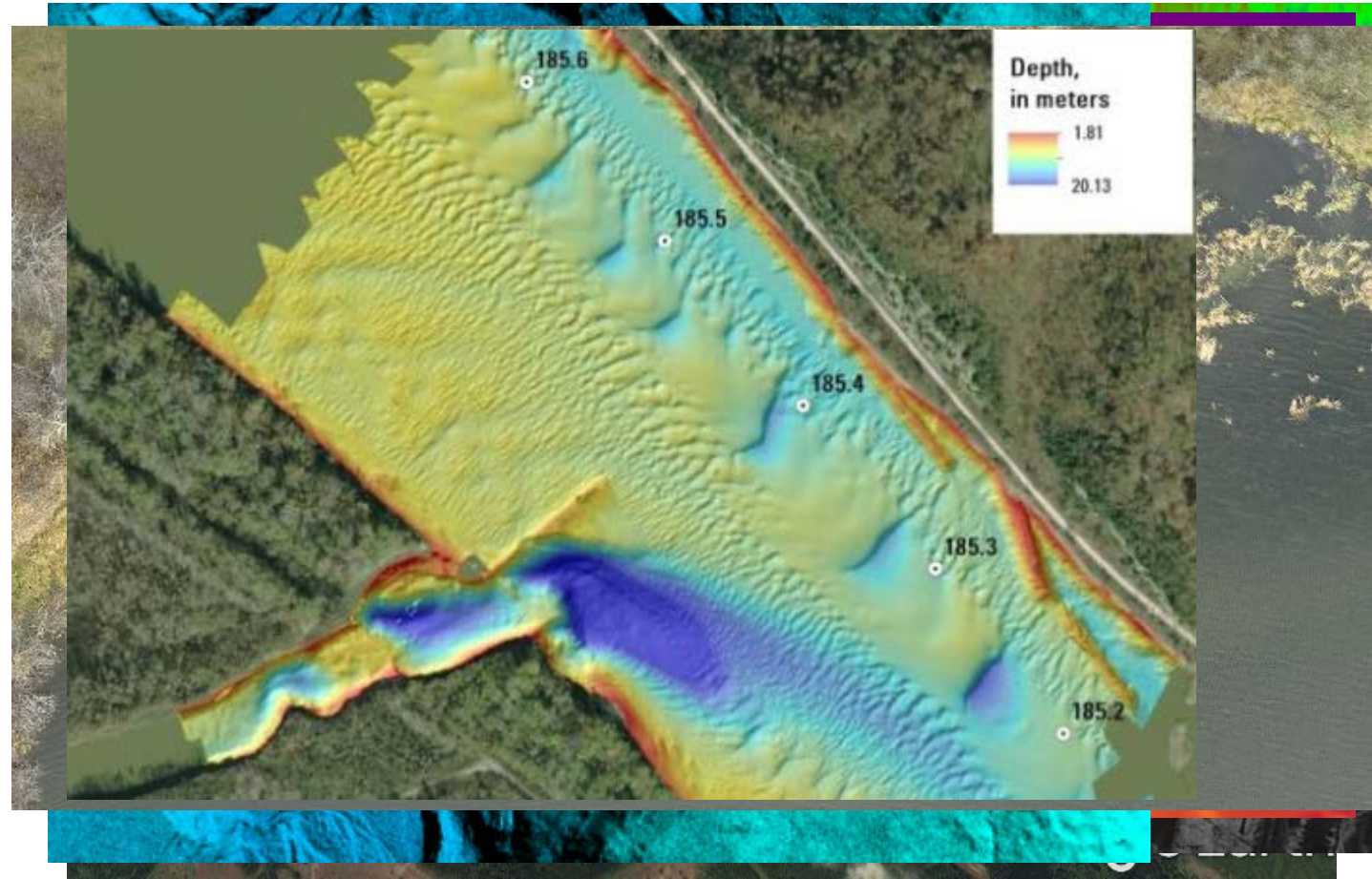
- Ground Assessments
- Drone
- Aerial
  - Helicopter
  - Airplane
- Underwater / Boat



# Types of Water Crossing Surveillance

## Technology

- Visual Inspection/GPS points
- Video and Image Collection
- Thermal
- Hyperspectral Sensor
- Lidar Scanning
- Photogrammetry
- Underwater Sonar or scanning technology





# Example Water Crossing Imagery

- Some energy companies ID their crossings and track them from year to year
- Watercrossings include any type of waterbody within close proximity to the pipeline right of way



# **..Watercourses of All Sizes**

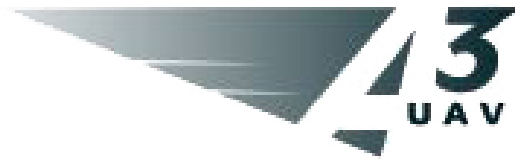




# Example of an Exposed Pipe



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# Sample Hyperlink to an Image

