

# IPG 2023

INTERNATIONAL PIPELINE GEOTECHNICAL CONFERENCE

November 23<sup>rd</sup> - 24<sup>th</sup>

Bogotá Plaza Hotel. Bogotá D.C. - Colombia

Under the auspices of:



Organize:

C-IPG



## 6<sup>TH</sup> INTERNATIONAL PIPELINE GEOTECHNICAL CONFERENCE IPG 2023

### IPG2023-0041

#### INTEGRATING LIDAR AND AERIAL IMAGING TECHNOLOGIES INTO MIDSTREAM GEOTECHNICAL INTEGRITY PROGRAMS

**Kris Covey**

Barr Geospatial  
Director Midstream  
Monitoring Solutions  
and Regulatory  
Compliance  
Calgary, AB, Canada

**Jocelyn Parent**

Airborne Imaging Inc.  
Director of Operations  
Calgary, AB, Canada

#### ABSTRACT

As one of North America's largest air patrol and LiDAR acquisition companies, Barr Geospatial will draw upon our experience using advanced imaging technologies, such as high-resolution aerial photography and Light Detection and Ranging (LiDAR) surveys to capture imagery along the pipeline right of way. LiDAR processing creates a digital elevation model (DEM) of the topography below, allowing for identification of potential hazards, such as landslides, erosion, and sinkholes. Successive passes over the same pipeline corridor (LiDAR change detection) can be used to find emerging potential hazards including newly developing and re-activating historic landslides. This paper will explore how LiDAR data processing techniques, accuracy and proper classification are critical when implementing the data into operator's integrity programs. It will highlight best practices for LiDAR data acquisition, including seasonality, swath widths, ground truth surveys and point density. The paper will discuss added applications of combining advanced imaging solutions over pipeline networks to enhance risk and threat management programs related to natural force, depth of cover and 3rd party damage.

The paper will explain how integration of advanced imaging technologies can lessen limitations of each data set by pinpointing hotspots over entire pipeline networks. Barr Geospatial will show how this data can be incorporated in a GIS platform to provide a comprehensive understanding of the pipeline's physical environment and potential risks. Targeted data can be collected over regional areas where multiple operators have assets to maximize efficiencies. Overall, this paper will show the value of geospatial technology in enhancing geotechnical management programs and protecting critical infrastructure.