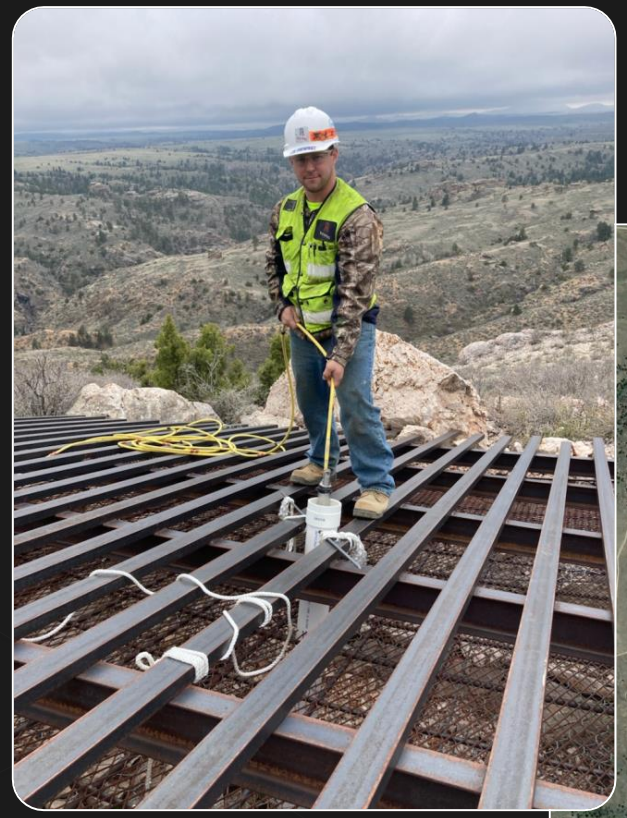
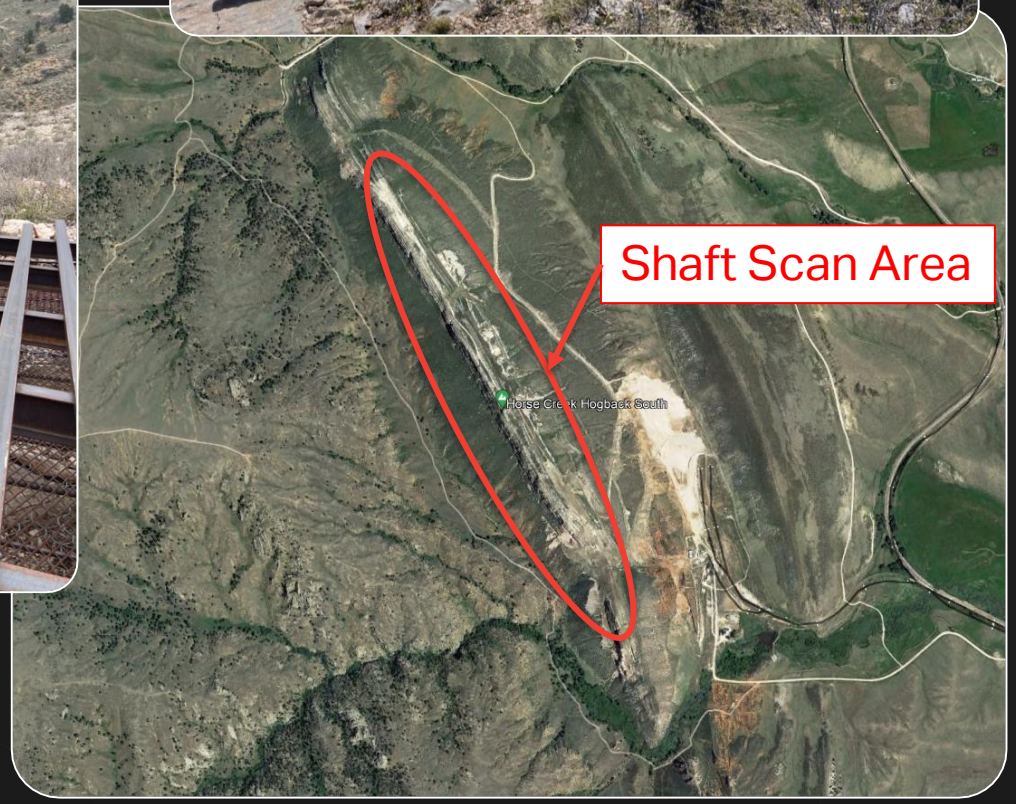
UNDERGROUND INVESTIGATION NEAR HORSE CREEK, WY

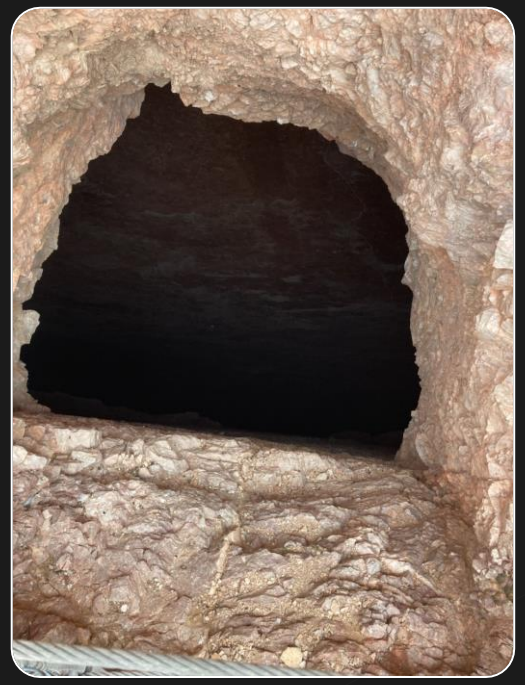
- Worked closely with WY AML
- Underground limestone stope operation
- Remote scan and map underground workings
  - Historical maps
  - Void scans
  - 3-D modeling
- Geotechnical analysis
  - Roof pillar thickness
  - Ground stability
- Identify and remediate concerned areas

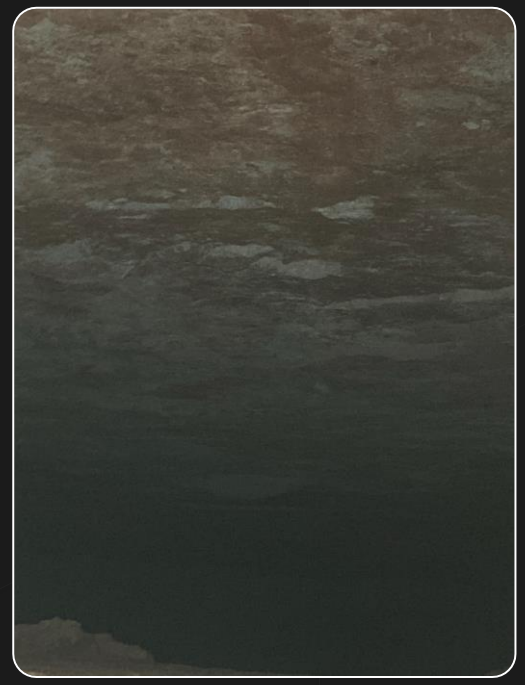




BACKGROUND INFORMATION

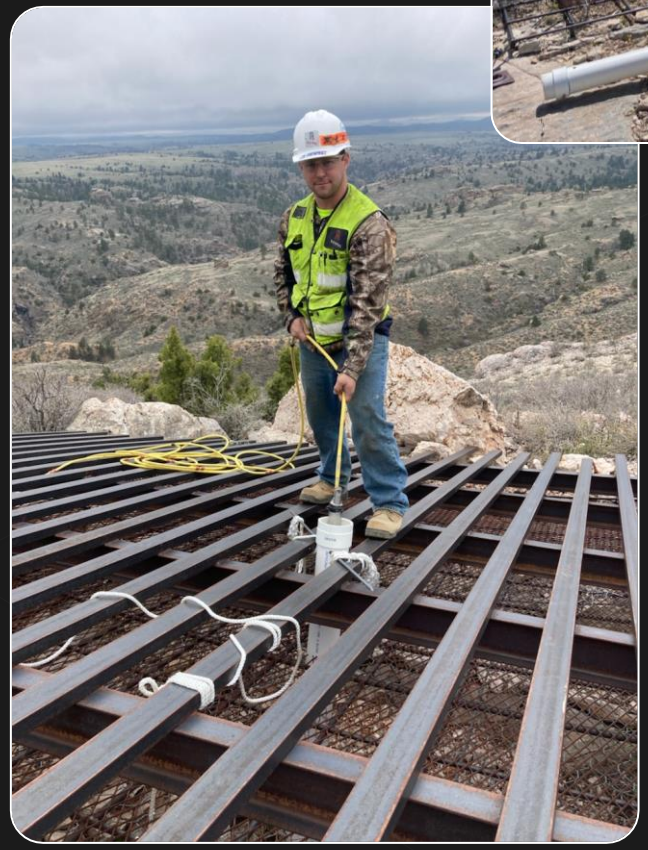
- Mining 1900's through 1970's
- Stope mining
  - Two stope sections
    - West & East
  - Multiple elevations
    - 300' and 600'
  - Void areas run full length of hogbacks
    - Workings approximately 5,600ft in length
- Concerns with surface stability above void areas
  - Minimum of 20ft to 50ft roof pillar in areas

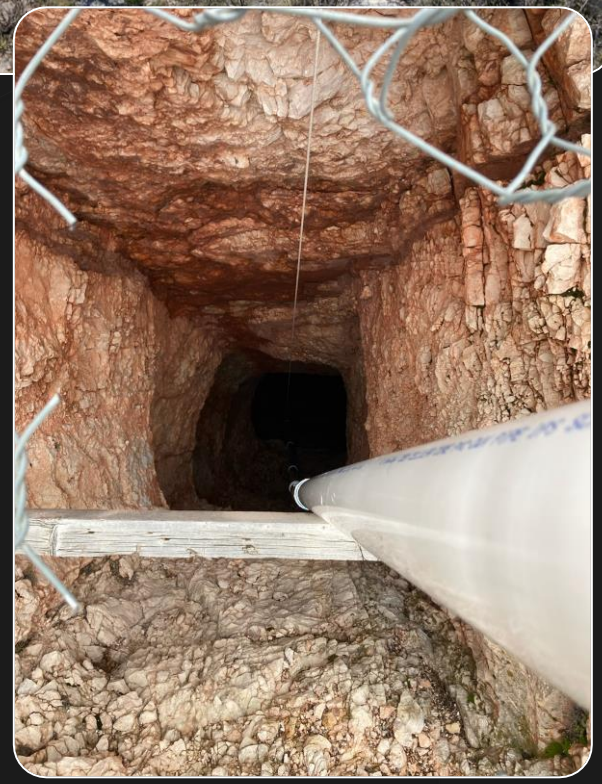




EAST STOPE INVESTIGATION

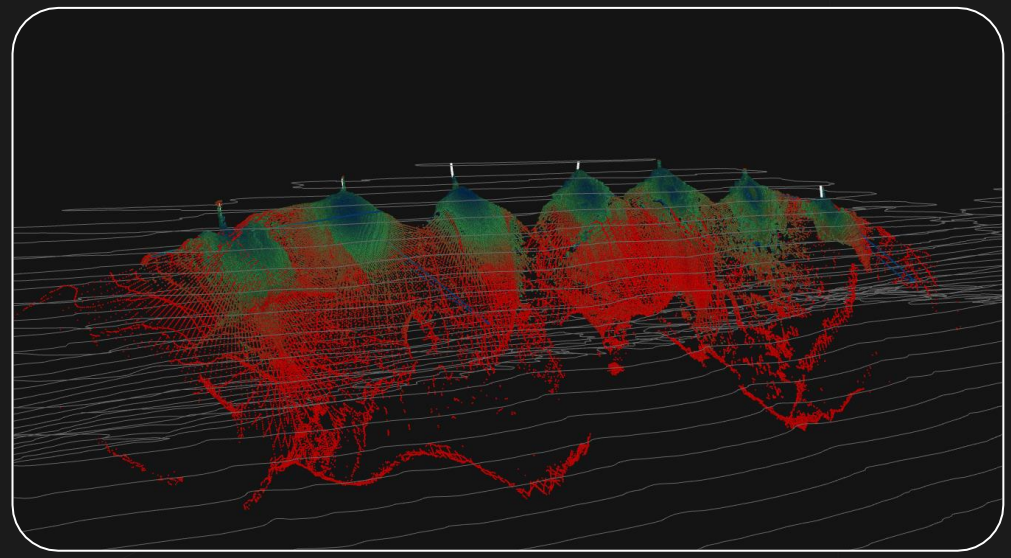
- Deployed down 7 shafts
  - Reviewed historic maps and data
  - Focused on less than 50 ft depth
  - Accessible open shafts
- Deployed C-ALS Void Scanner
  - Temporary access to shaft (resealed when finished)
  - Deployed PVC pipe
    - Mocked drill hole for safe. Effective, and accurate deployment
  - Collected 3-D point cloud data

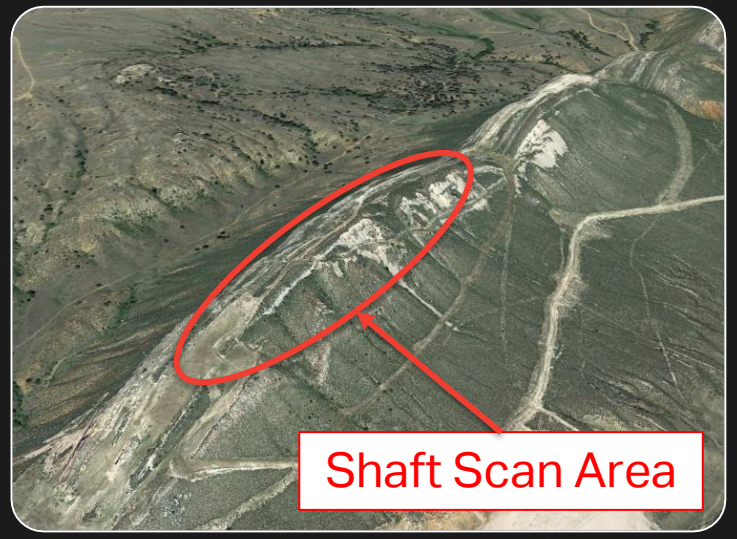


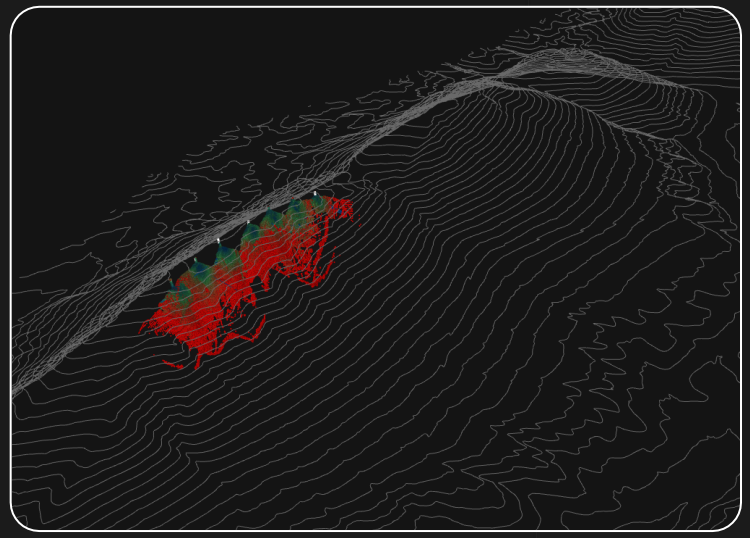


VERIFY 3-D VOID SCAN DATA FOR THE EAST STOPE

- Combined scans from all 7 shafts
- Georeferenced point cloud data with updated surveys
- Verified against site topo and historic maps
- Depth to void areas
  - Minimum of 12ft
  - Average 20ft

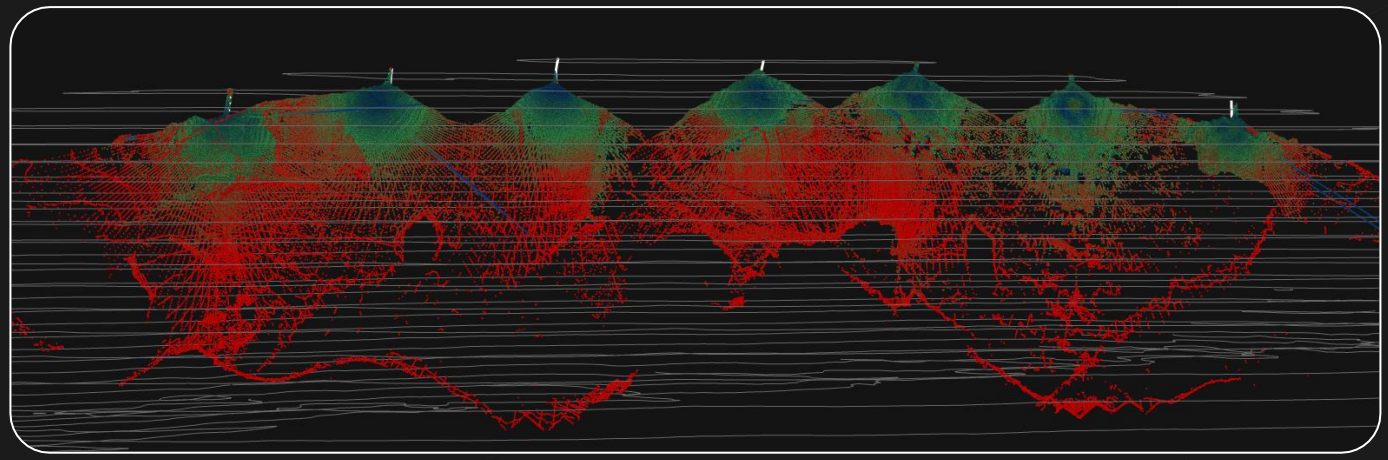


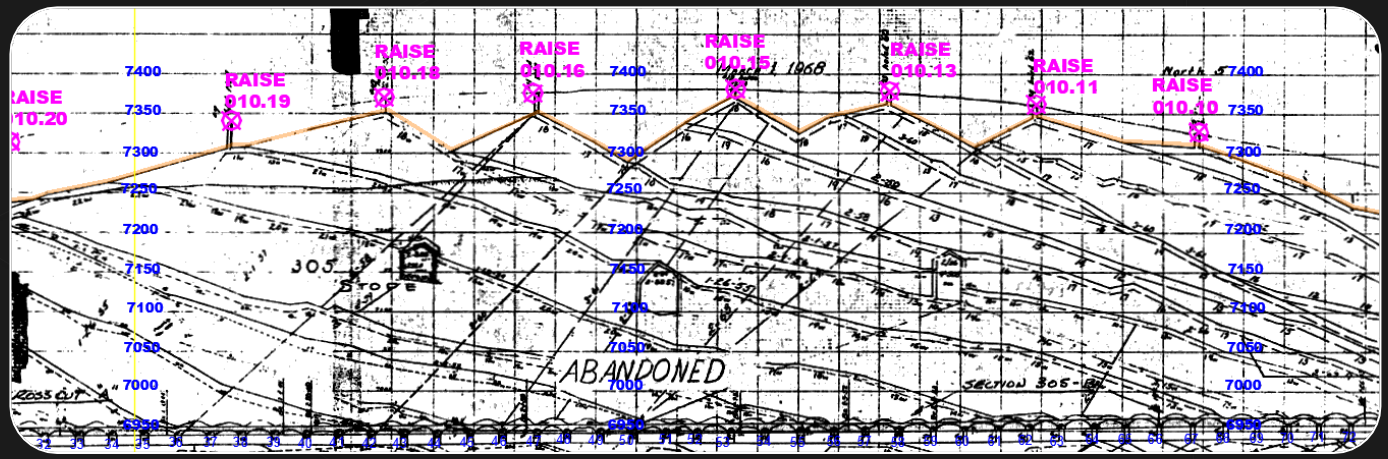




EAST STOPE VOID SCANS VS. HISTORIC DATA

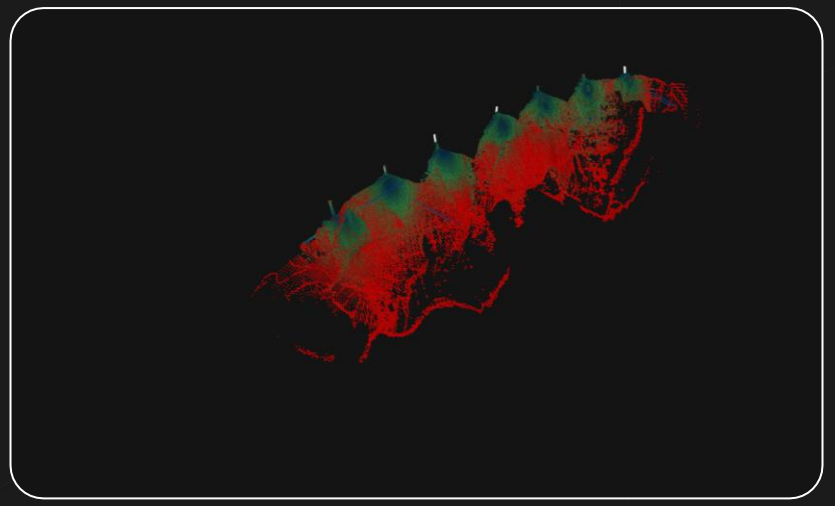
- Compared 3-D void scan data against historical maps from previous phases of work
  - Shaft depth
  - Depth to void area
  - Width of voids
- Determined measurements mapped historical data was relatively comparable to the 3-D void scan data
- Strong correlation between historical maps and scan data

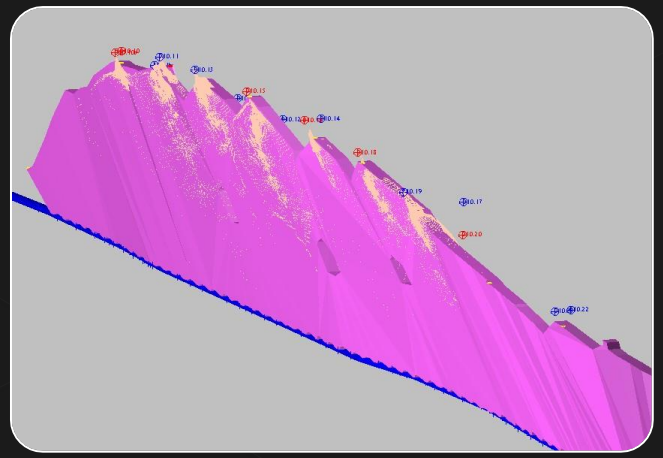




GENERATE 3-D MODEL OF EAST STOPE AREAS

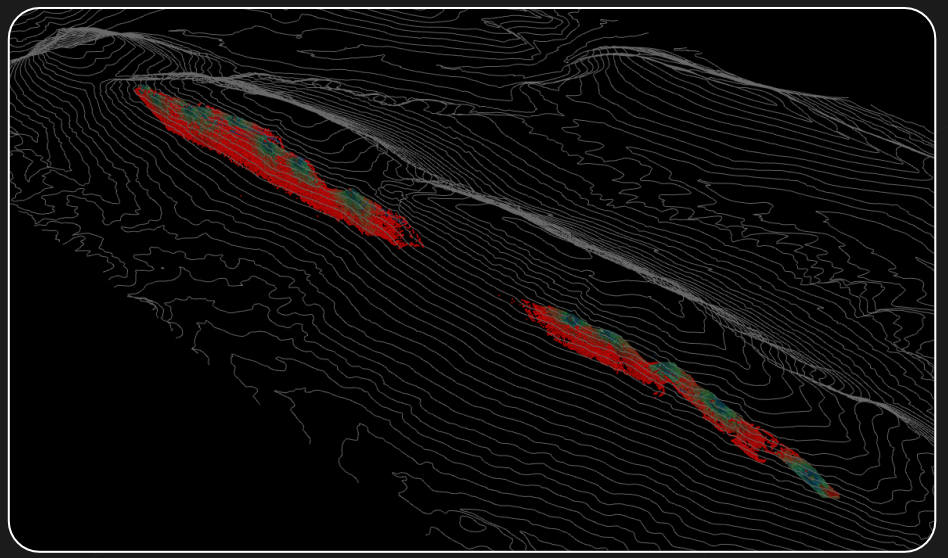
- Generating 3-D models of open stope areas
  - Focusing on currently scanned area
  - Utilizing historical 2-D maps and known stope thickness to generate a 3-D model based off of collected 3-D scan data
- Determined methodology for generating 3-D models was accurate compared to field data
- Generated 3-D models of the remaining open stope areas

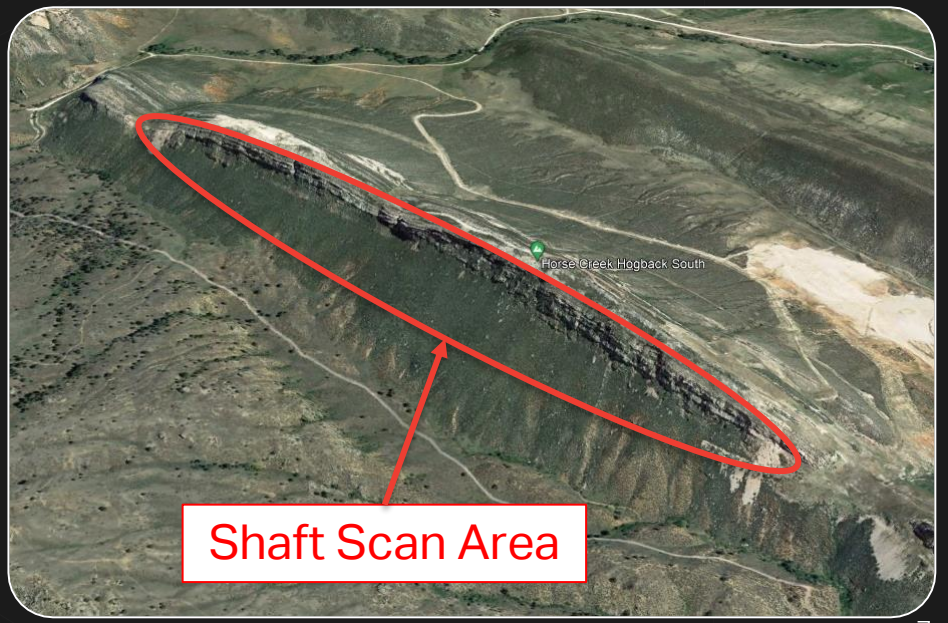




PHASE 2: WEST STOPE INVESTIGATION

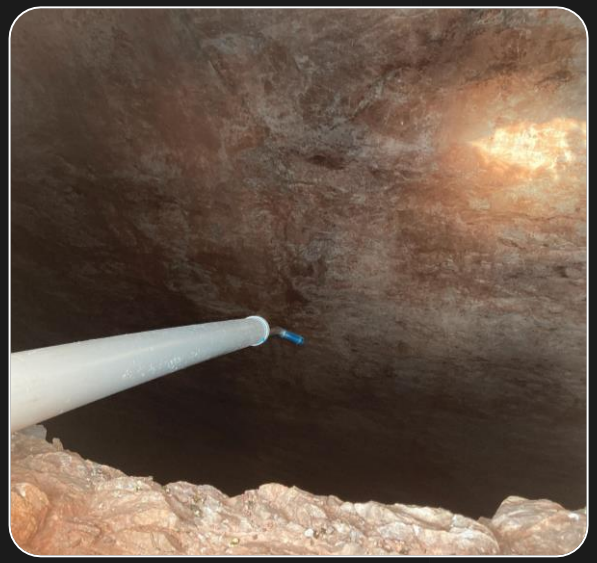
- Deployed down 13 shafts
  - Reviewed historic maps and data
  - Focused on less than 50 ft depth
  - Accessible open shafts
- Verify actual data against modeling methods, results, and historic data
- Deployed C-ALS Void Scanner using similar methodology for East Stope





WEST STOPE VOID SCANS VS. HISTORIC DATA

- Identifying conditions of open stope areas
- In process of verifying west stope scan data with the 3-D model
- Ensuring data used in geotechnical analysis is accurate based on:
  - Existing conditions
  - Scans vs historic maps
  - Accuracy of modeling methods



IDENTIFYING ADDITIONAL SCAN AREAS

- Primary focus on East and West stopes at the 300 level
- Compare 3-D models vs. historical maps vs. current topography
- Compare historical reclamation work with existing maps and models
- Identify additional scan areas needed
  - Verify historic reclamation and identify any potential concerns
  - Verify stability of area
  - Verify historical mapping
  - Additional drill holes to access stopes
- Recommendations for remediating site