

# Long Baseline Neutrino Facility (LBNF) Update

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Community Informational Meeting

03 March 2022



U.S. DEPARTMENT OF  
**ENERGY**

Office of  
Science

## Who am I

- I joined the LBNF FSCF Team in October 2020 as the Project Manager and based in Lead, South Dakota
- Prior experience includes thirty (30) years of both domestic and international project management, engineering, construction and maintenance expertise in the following heavy construction industries:
  - Oil & Gas (Upstream & Downstream)
  - Petrochemical
  - Power (Nuclear and Fossil Fuel)
  - Steel Mills
  - Agriculture
  - Highway, Rail and Bridges
- B.S. Aerospace Engineering and Graduate Certificate in Construction Management

# Outline

1. Dust Status:
  - Dust Mitigation, Activities and Monitoring
2. Construction Progress Update
3. Questions & Answers



# Dust Status

# Dust Mitigation Activities & Monitoring

- Dust at the Open Cut continues to be an issue when wind speeds are greater than 15 mph (hourly average)
- Continued placement of rock treated with the tackifier continues to reduce the level of dust
- Recent agricultural drone sprayer deployed to the Open Cut was unsuccessful with spraying capping agent onto untreated stockpile. Future attempts will commence in late March depending on snow cover.
- The next drone operation will be conducted with a larger drone with upgraded software to operate effectively in the Open Cut
- Short term solution is to control dust by wetting untreated stockpile with water at the top bench using water sprinklers



Stockpile treated with tackifier is shown as the dark color; untreated stockpile is shown as the light grey color which is causing the dust issues.

# Air Quality (AQ) Monitors and Future Ambient Air Sampling Plans

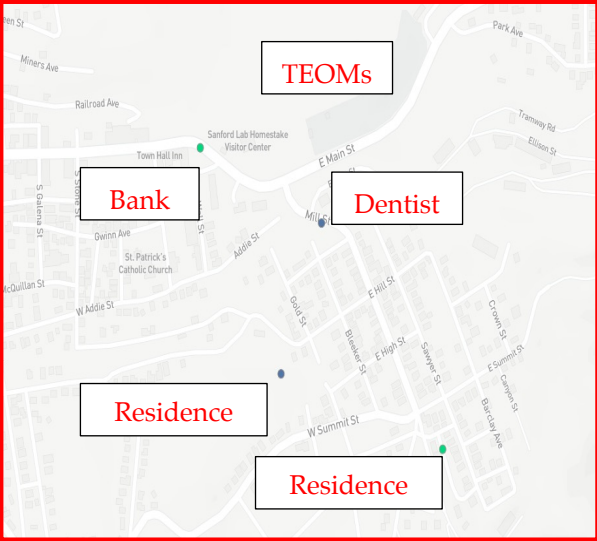
- The four (4) AQ monitors have all been installed and are collecting data at the four strategic locations downwind of the prevailing wind (Northwest to Southeast). The monitors sample Particulate Matter (PM) much smaller than what the TEOMs can measure at the Open Cut.
- The AQ monitors are sampling PM 2.5 and PM 1-microns (extremely small particles). The initial data recorded over the last ~2 weeks shows *respirable dust* readings **well under the health hazard criteria set forth by EPA** on dust pollution.
- The other important aspect of small particulate is that smoke pollution is read in the PM 2.5-micron size and the monitors showed spike readings from 2/23/2022 to 2/25/2022 when the US Forest Service was burning slash piles. The smoke readings were still well under EPA health hazard criteria and are currently well below EPA's criteria as well.
- In Mid-March, Fermilab will be mounting three EPA certified samplers at the following locations (Open Cut, Manuel Brothers City Park and near Lotus Up). The monitoring equipment will adhere to an EPA three-day compliance schedule and this sampling will last 30 days which will produce a final report of the results (See Picture).



EPA Certified Sampling Monitors

# Dust Mitigation Activities & Monitoring

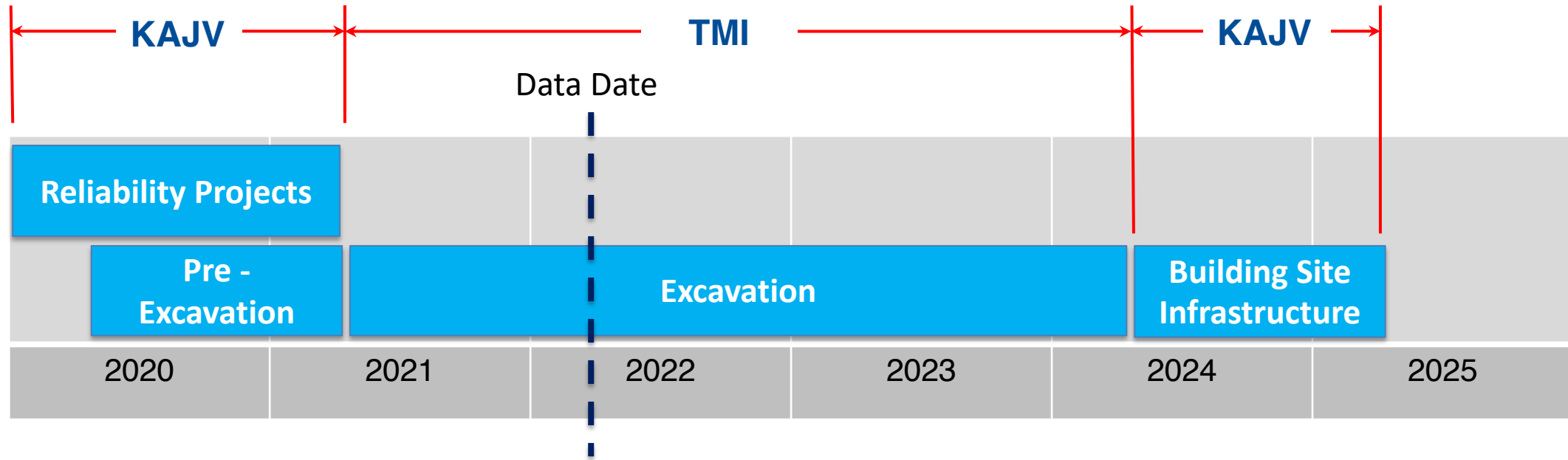
## Map of Installed Locations for AQ Monitors



# Construction Progress Update



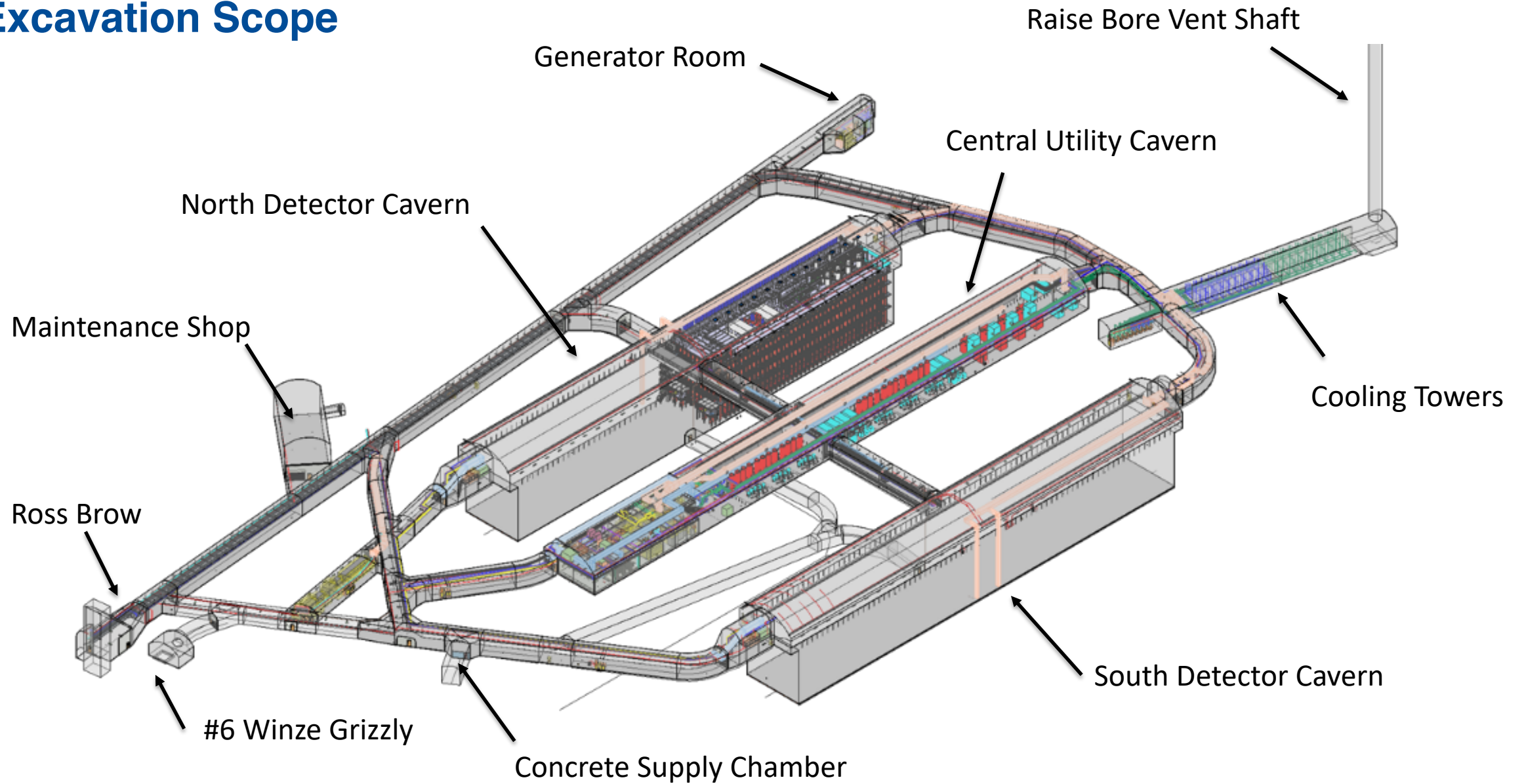
# Construction Execution Phases & Timeline



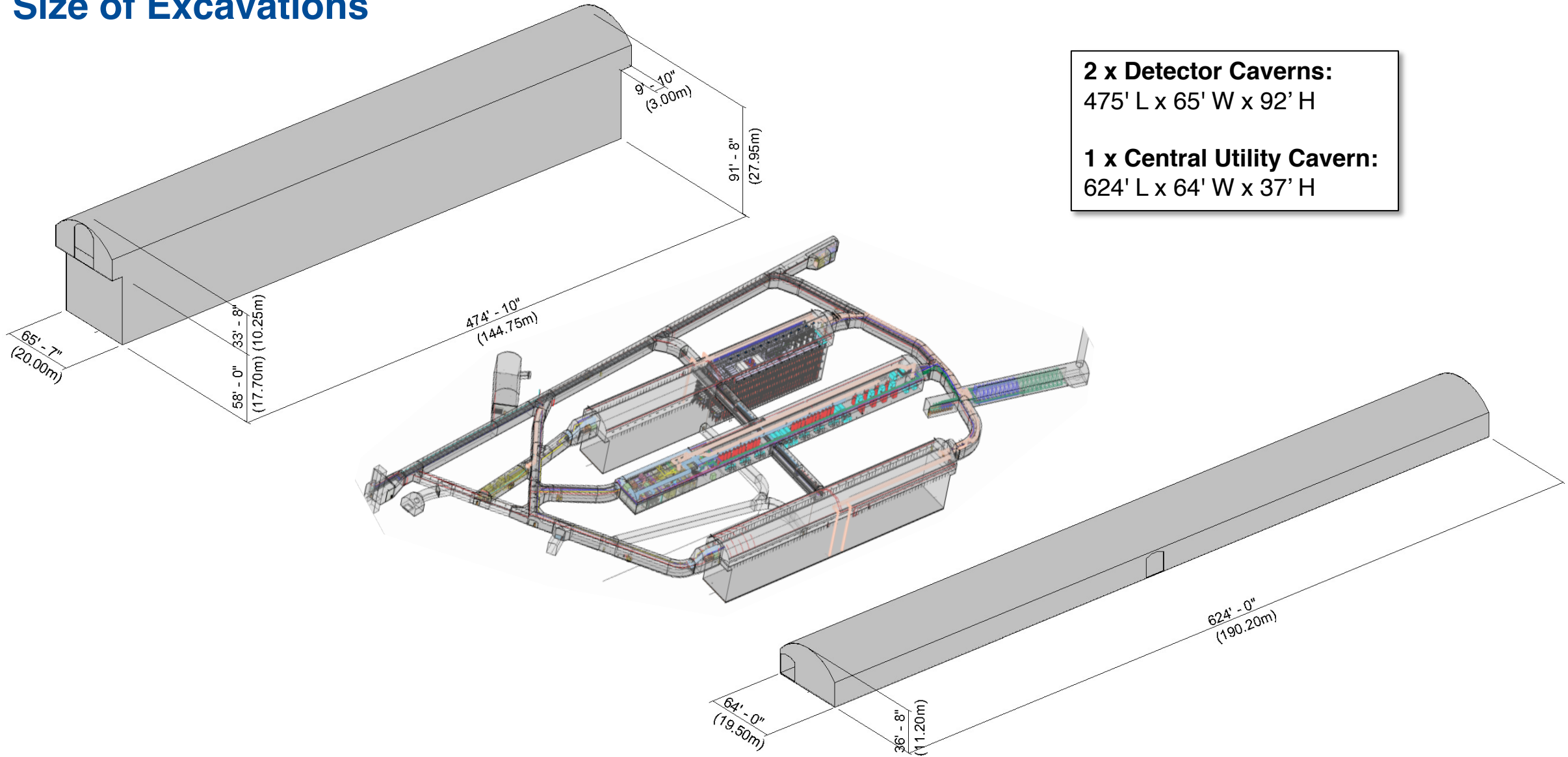
## Scope of Work:

- **Reliability Projects** – Mine shaft and hoist system infrastructure refurbishments to ensure safe and reliable operations.
- **Pre-EXC Projects** - Installation of equipment and systems required to move excavated rock from one mile underground to the surface and deposit the muck in the Open Cut.
- **EXC Project** – The excavation of three (3) caverns, interconnecting drifts and raise bore ventilation.
- **BSI Project** - The construction of the underground and surface utility systems (Mechanical, Electrical, HVAC Systems, Fire Protection, etc.)

# Excavation Scope



# Size of Excavations



**2 x Detector Caverns:**  
475' L x 65' W x 92' H

**1 x Central Utility Cavern:**  
624' L x 64' W x 37' H

# TMI Progress & Activities

Total Excavation to Date 20.0% (Volume of Rock Removed In-Situ)

## 4850-31 Ore Pass:

- Rock Breaker Operational

## Recently Completed:

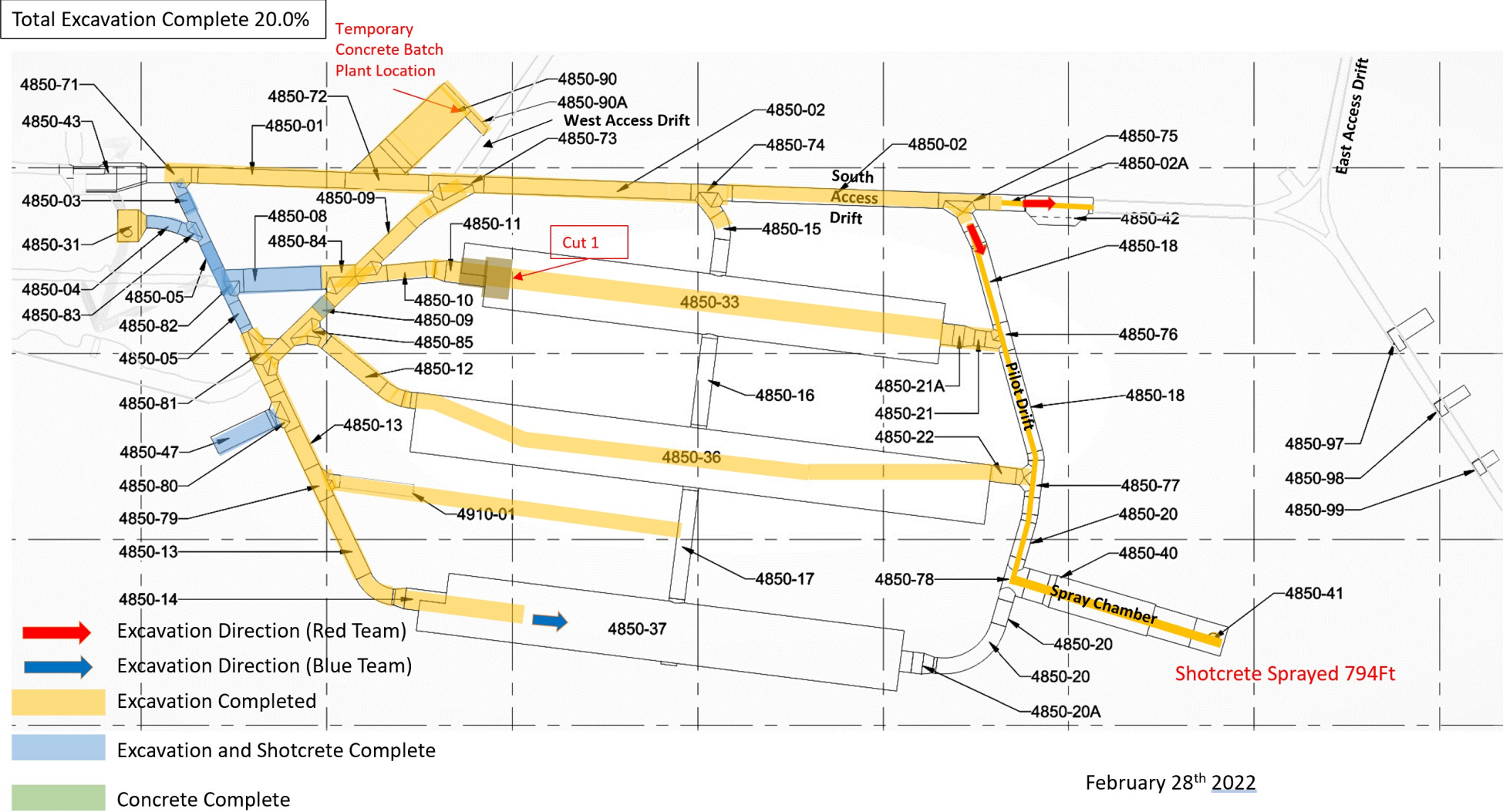
- 4850-02(S)
- 4850-14
- 4850-75
- 4850-22
- 4850-36 (Pilot)

## Active Headings:

- 4850-02A
- 4850-18
- 4850-33 Cut 1
- 4850-37 Pilot

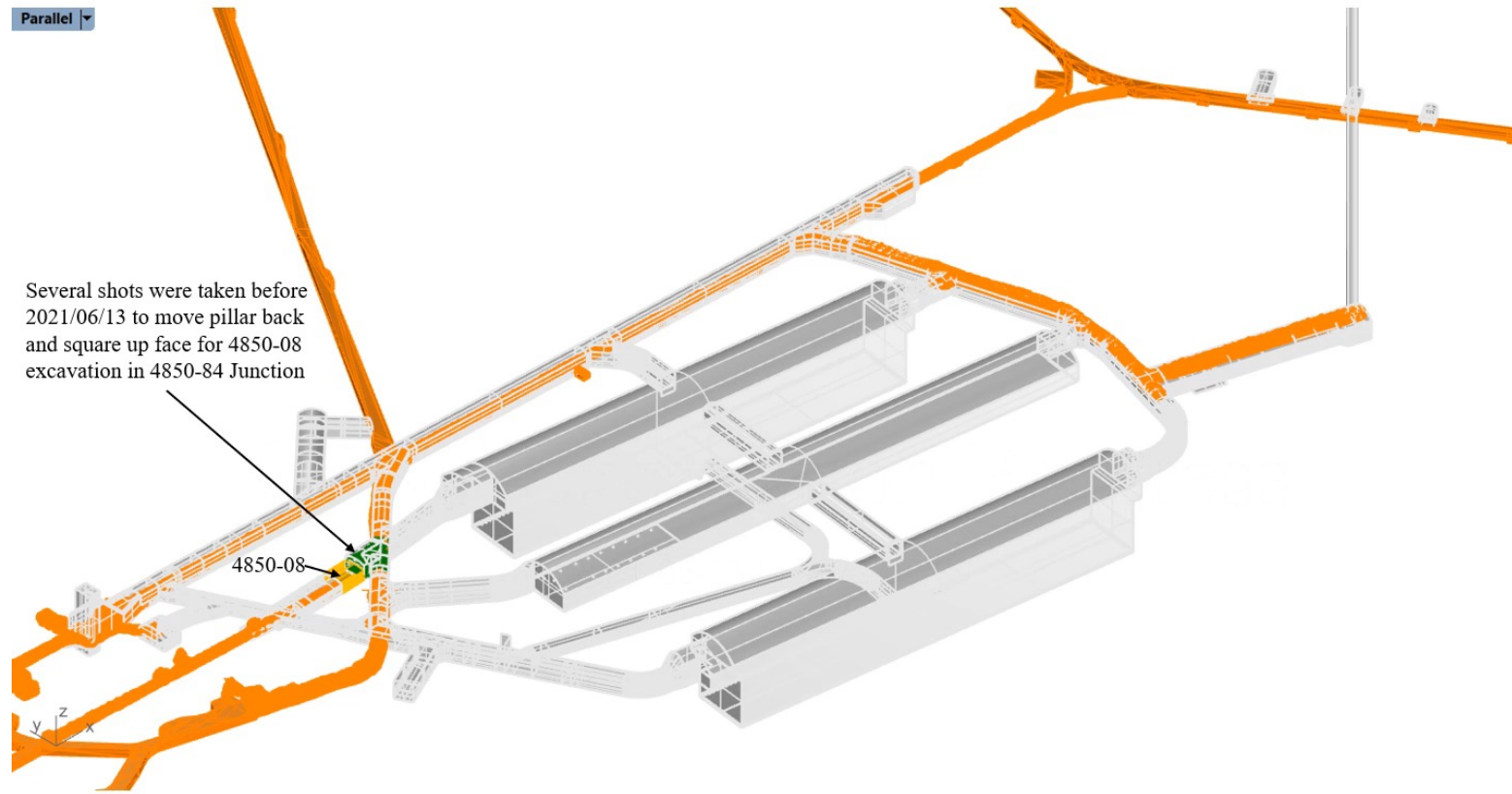
## Raise Bore Shotcrete:

- 794 Feet Completed
- 406 Feet To-Go

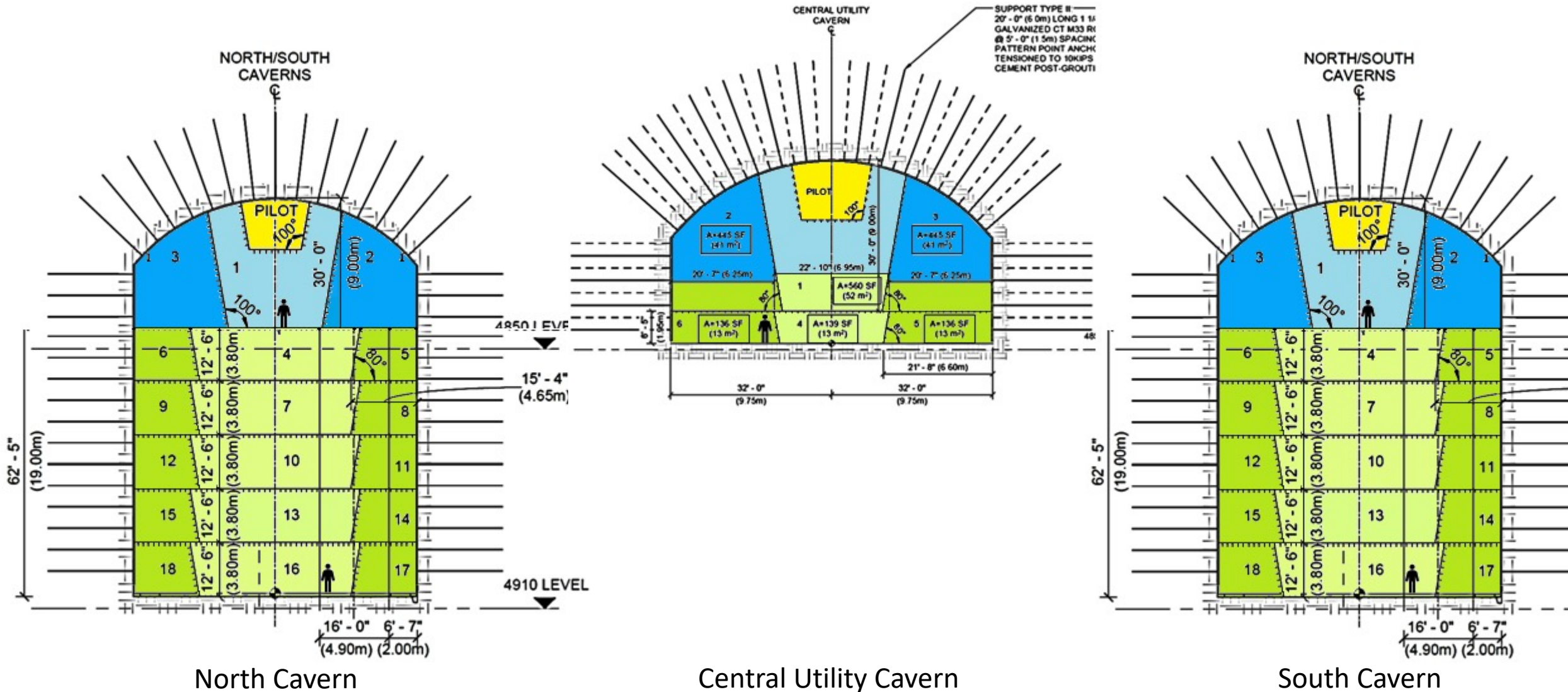


# Progress through 1/9/22

Week 2021-06-13 to 2021-06-19



# Cavern Design - Excavation Sequence Cross Sections



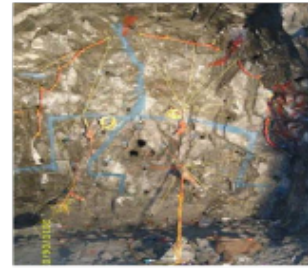
# Drill & Blast Cycle



1. Drill Blast Holes



2. Remove Explosive from magazine



3. Charge Face



4. Evacuation



5. Close Blast Doors



6. Initiate Blast



7. Ventilate



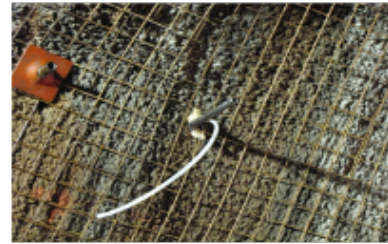
8. Scaling



9. Mucking



10. Geological Mapping



11. Ground Support



## Drill and Blast Cycle

## Ventilation / Blast Doors





# Excavation - Blasting



TMI Miners Sheltering Behind Blast Door No. 5



TMI Personnel Installing Ground Support  
(Split Sets and Welded Wire Fabric)

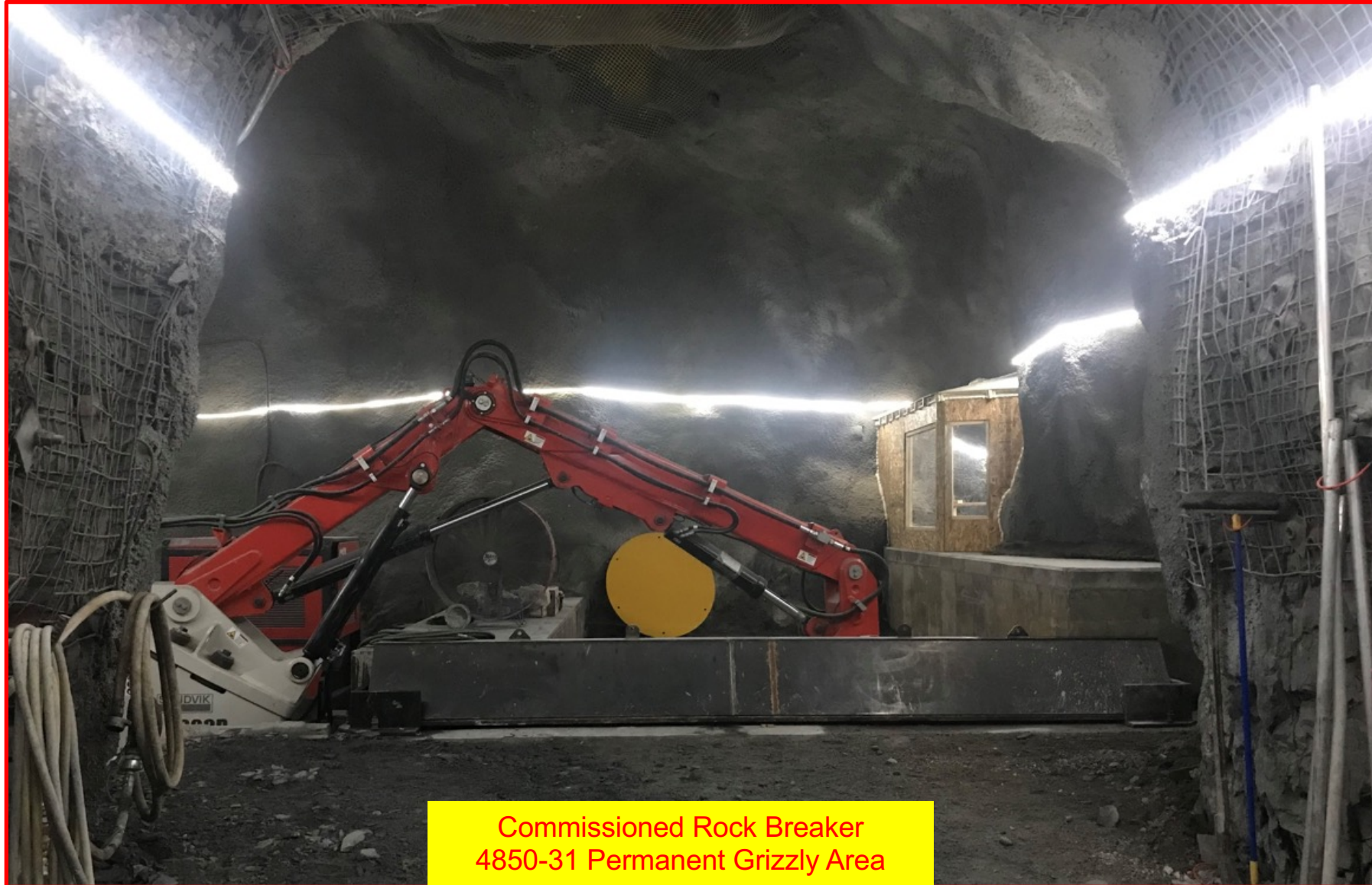
4850-02 Drift Profile Looking Towards Ross Station



## LBNF FSCF Project Highlights (Excavation)



## LBNF FSCF Project Highlights (Excavation)



Commissioned Rock Breaker  
4850-31 Permanent Grizzly Area

# Thank You

