

West Virginia Division of Highways I-70 Mining Project

WV PA

E.L. ROBINSON E N G I N E E R I N G

Presentation Outline

- Purpose and Background
- Current Mining Schedule Under I-70
- Lessons Learned from Longwall Panel No. 15
- Geology / Geotechnical Aspects
- Subsidence
- Pre-Mining Asset Inventory
- Environmental Permitting
- Action Items
- General Discussion



Purpose and Background

- Tunnel Ridge Mine Plan
- Longwall Mining Section
- Mining Began in January 2019
- 8 Longwall Panels (15 to 22)
- Predicted ~4 Feet subsidence
- Maintain traffic and safety during mining operations
- AADT 2016 43,390
- Restore I-70 (Vertical Alignment) to 70 mph





Purpose and Background

- Pittsburgh Seam (~7' thick / ~800' below drainage)
- High-volatile Bituminous Coal
- 15,000 BTU's per Pound
- Strike & Dip of Coal Seams
- Coal Seam Mine Operations Deep Mine -vs- Surface
- Coal Face 1,200' on Longwall Section



Tunnel Ridge, LLC operates the Tunnel Ridge Mine, located near Wheeling, West Virginia. Tunnel Ridge utilizes the longwall mining technique to produce medium/high-sulfur coal. The Tunnel Ridge preparation plant has a throughput capacity of 2,000 tons of raw coal per hour.



Purpose and Background Longwall Mining Operations







Current Mining Schedule* Under I-70



ALLIANCE RESOURCE PARTNERS, LP TUNNEL RIDGE MINE

> *Schedule will be dependent on market demand for coal.



Lessons Learned from Panel No. 15

- Communication & Coordination Key to a successful project
- PennDOT Actions After Results (AAR) Meeting
- Work Zone Speed 45 mph
- State Owned Secondary Roads in Mining Footprint
- Early and Often Coordination with the Coal Company
- How to Handle Public Interaction
 - Social Media w/ Communications Office
- False Sense of Security





Lessons Learned from Panel No. 15 Actions Moving Forward

- Location of Pavement Relief Joints
- Actual -vs- Anticipated Subsidence
- Planned Lane Closures
- Message Boards, Detour Route, Light Plants
- Median Crossovers and Dead Lane for Storage
- WVDOH /PennDOT/ELR Single Point of Coordination
- Marshall County US 250 Longwall Panels





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Lessons Learned From Panel No. 15 Contract Modifications

- Use of WVDOH Maintenance Forces
- Review Agreement for Repairs
- Monitors 2 per a 12-hour Day Shift
- State Police Used for Night Shifts
- Ground Penetrating Radar
- Outreach to both Waze and Google Maps





Subsidence - Prediction





Subsidence - Actual



Subsidence - Expected





Pre-Mining Asset Inventory Condition Assessment and Documentation

- Structures
 - bridges
 - guardrails
 - culverts
- Signs
- Lighting
- Pavement
- Secondary Roads
- Utilities Verification







Pre-Mining Asset Inventory Data Collection

- Mobile LiDAR
- Conventional Surveys
- Contour mapping
- Instrumentation installation
 - Tilt meters, Inclinometers, Piezometers (PennDOT)
- Profiles
- Videos
- Survey Control Points
- Pavement Mapping with Stationing





Pre-Mining Asset Inventory Data Collection - Culverts Example



- Review original I-70 plans with respect to location of drainage materials of construction
- Survey location to assure as built location as well as condition of structure
- Examine interior condition of culverts prior to mining
 - Cleaning of debris/flushing/pressure wash
 - Run camera through culvert documenting condition
 - Analyze data obtained
- Evaluate existing hydraulic capacity and existing storm water volume requirements
- Evaluate condition of pipe and determine methods to stabilize if required
- Slip-Line Culverts (Method Evaluated)
 - Where culverts are failing or may suffer damage during mining activity evaluate methods to stabilize or replace
 - Consider slip-lining with HDPE liner prior to mining
 - Consider grouting of annular space between lining after slip lining and after site experiences subsidence
 - Consider bore and jack operations to replace piping that has failed and cannot be re-lined
 - Consider routing of stormwater to other existing conduit locations if possible



Environmental Permitting

- Categorical Exclusion approved November 16, 2018 (Valid for 5-years)
- Nationwide Permit 3
- Notice of Intent Construction Stormwater NPDES Permit





Action Items Longwall Panel No. 16

- Plan Revisions Based upon Panel No. 15
- Additional Relief Joints
- Two Culverts (36" and 48")
- Bridge Inspections on Secondary Roads
- Utilities Verification
- Median Crossover Designs
- Cold Patch Provisions
- Placement of Monitoring Devices (if any)
- 24/7 Monitoring Activities





Action Items Longwall Panels Nos. 17 & 18

- Design / Plan Development
- Schedule
- Panel 17 Welcome Center Rest Area
- Panel 17 One 60" Culvert
- Identification of Houses Purchased by Coal Company





Action Items Welcome Center Rest Area Panels 17 & 18

- Pre-Mining Inspection
- Impacts to Site Features
- Maintaining Operations
- Building Preservation
- Continuous Communication between Mining Operations, DOH, Contractor, and EOR





Welcome Center Rest Area

Operations and Functionality Prep Work for the Building

- Tunnel Ridge's specialty contractor
- Perimeter trenching
- Capping off utilities (water, sewer, gas, etc.)
- Steel Cables Affixed and Monitoring
- Building to be cut into 3 sections
- Temporary facilities





Welcome Center & Longwall Panels 17 & 18





Pavement Relief Joints - Installation





Temporary Welcome Center





Tunnel Ridge Daily Production Reports Panel 16 -- 4 October 2019





Water Tank in Panel 16 Preparation of the Structure

- The Hughes Corporation
- Drain Water Tank
- Perimeter Trenching
- Tension Cable with Gauges
- Monitoring 3X Day





Points of Interest

- Subsidence wave impacts to surface features occurs when mining is under the roadway
- Road buckling occurs within 1.0 to 1.5 days
- Full subsidence 30 to 35 days
- 98% subsidence 10 days
- Approximately 7 8 months between panels





Mining Schedule for Subsequent Panels

- Panel 17 -- May 2020
- Panel 18 -- January 2021
- Panel 19 -- September 2021
- Panel 20 -- June 2022 Underground shields adjusted with the structures in the subsidence trough
- Panel 21 -- February 2023
- Panel 22 -- November 2023
- Panel 23 -- To be determined with PennDOT's involvement



Longwall Mine Layout & Reserves



WV Coal Bed Mapping Project

www.wvgs.wvnet.edu/www/coal/cbmp/coalimsframe.html



Partners and Stakeholders I-70 Design Build Mining Project

- Engineering Division
- District 6
- Tunnel Ridge Mining
- PennDOT District 12
- Shelly & Sands Paving

- WVSP and Ohio County Sherriff Department
- Department of Tourism
- The Hughes Corporation
- E. L. Robinson Engineering



General Discussion Longwall Panels Nos. 19+

- Stakeholder Involvement
- Communication and Coordination
- Bridge in Longwall Panel No. 20
- I-70 Bridges Rehab Project WZTC
- Social Media
- Driven by Market Demand for Coal
- Panel 23 Scheduled 2024 PennDOT



General Discussion Questions?



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