AZURITE MINE
REMOVAL ACTION OVERVIEW

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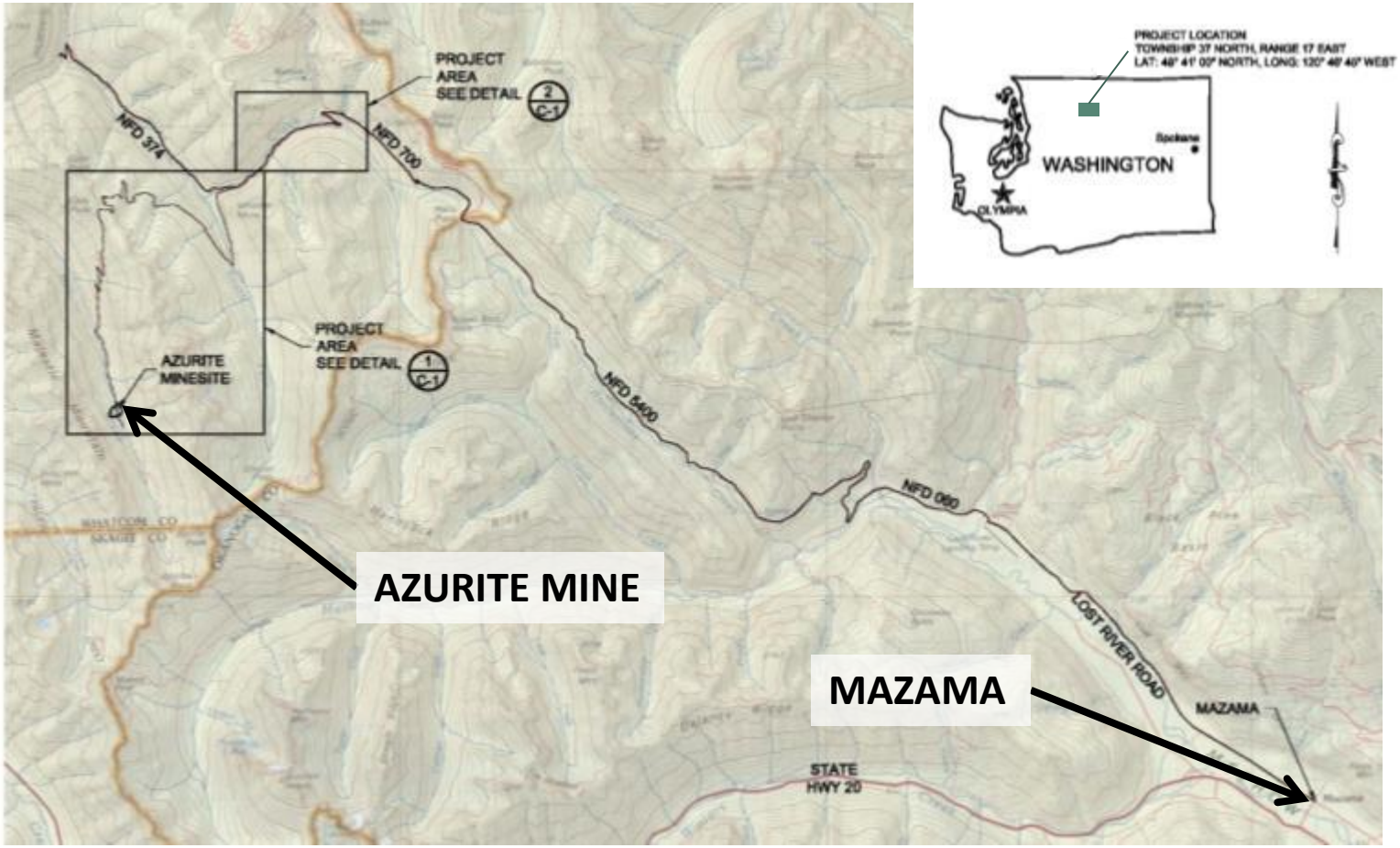
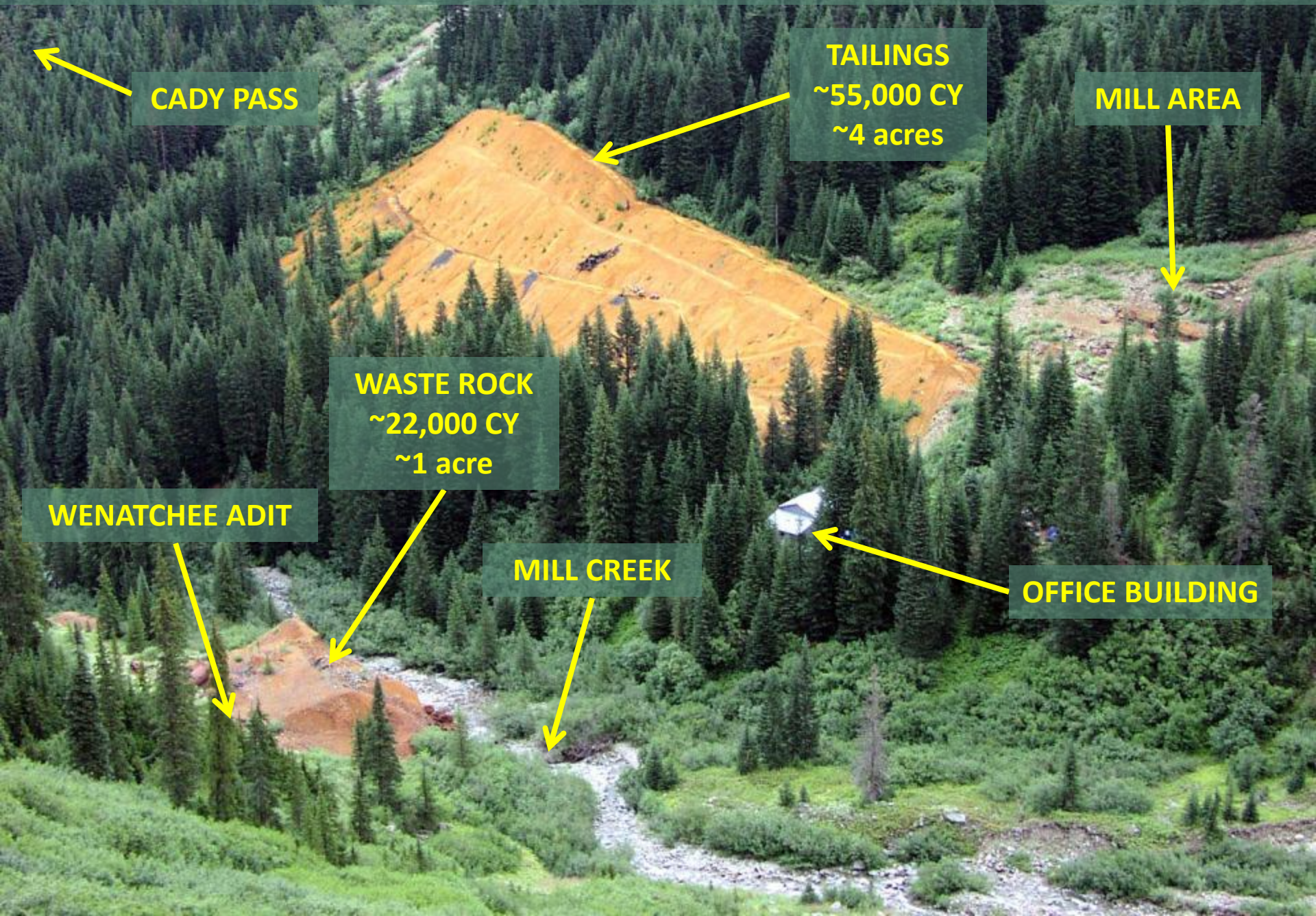
Azurite Mine Overview

- Abandoned Underground Gold Mine, Located in North-Central WA on USFS-Administered Land
- Northwest of Mazama, Near Harts Pass Recreation Area & Pacific Crest Trail
- Remote with Poor Access, Steep Terrain
- Several RTE Species – Aquatic and Terrestrial
- Inventoried Roadless/Non-Motorized Management Area
- High Value for Potential Wilderness Area in Future

Azurite Mine Location



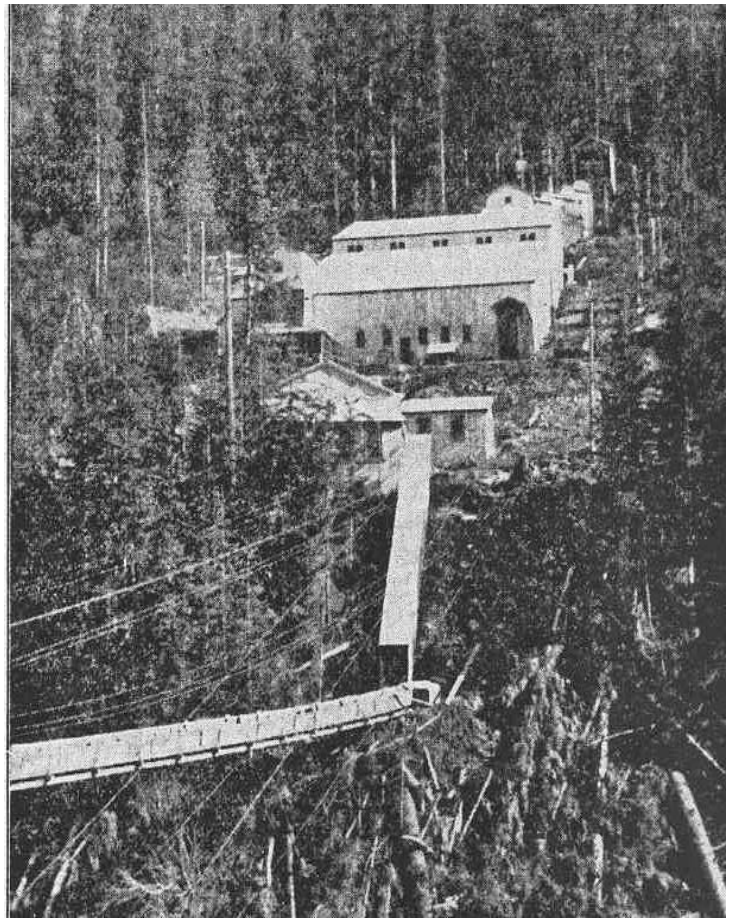
OVERVIEW OF AZURITE MINE FROM TINSON ADIT

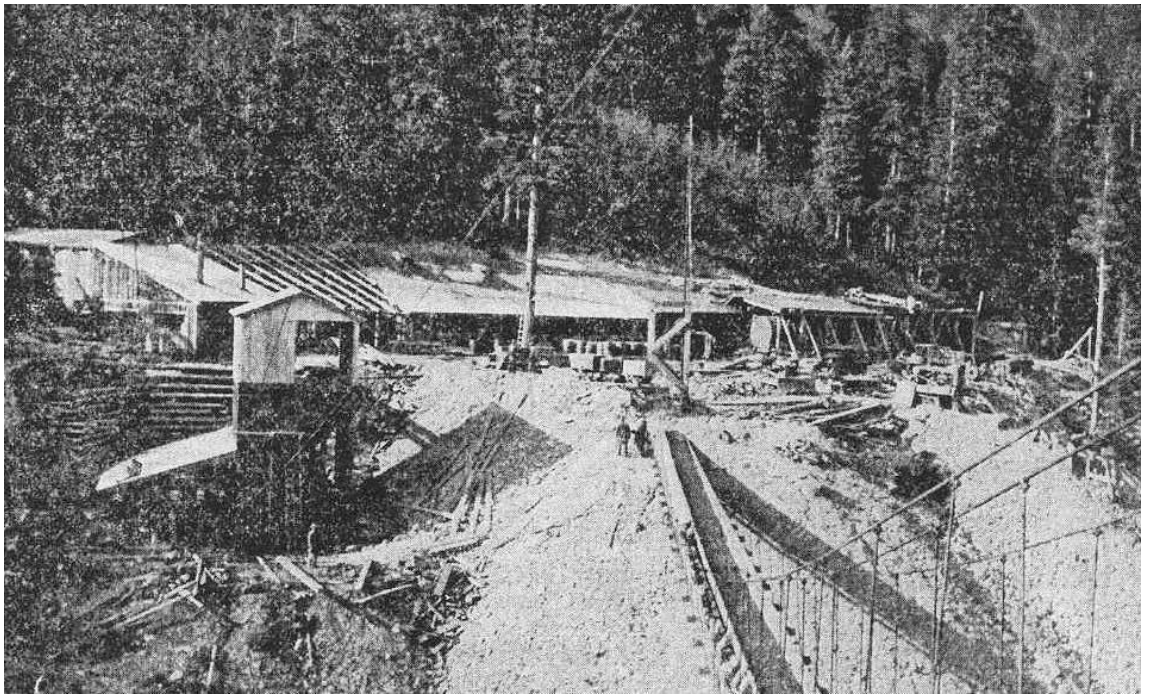


Azurite Mine – Early History

- 1915 – 31 Claims Staked
- 1916 – Azurite Copper Company (renamed Azurite Gold)
- 1918 to 1931 – Underground Development
- 1934 – ASARCO Leased Mine
- 1934 to 1936 – 100 TPD Mill and Infrastructure
- 1936 to 1942 –Development, Production
  - ~73,000 tons @ 0.38 opt gold
- 1942 – ASARCO Removes Equipment

Historic Photos - 1936





Azurite Mine – Recent History

- 1995 – Discovery Assessment (USFS)
- 2002 – IAM Open File Report (WA DNR)
- 2004/2005 – CERCLA Site Inspection (USFS/CES)
- 2005 – Reprocessing Study (USFS/CES);
  – PRP Report (USFS)
- 2006 to 2008 – EE/CA & Risk Assessment (ASARCO/MFG)
- 2008 – ASARCO Settlement with USFS ~$5.5M
- 2007 to 2010 – Data Gaps/Removal Design (USFS/CES)
- 2011 – Removal Action Activities

Final Removal Action Alternative

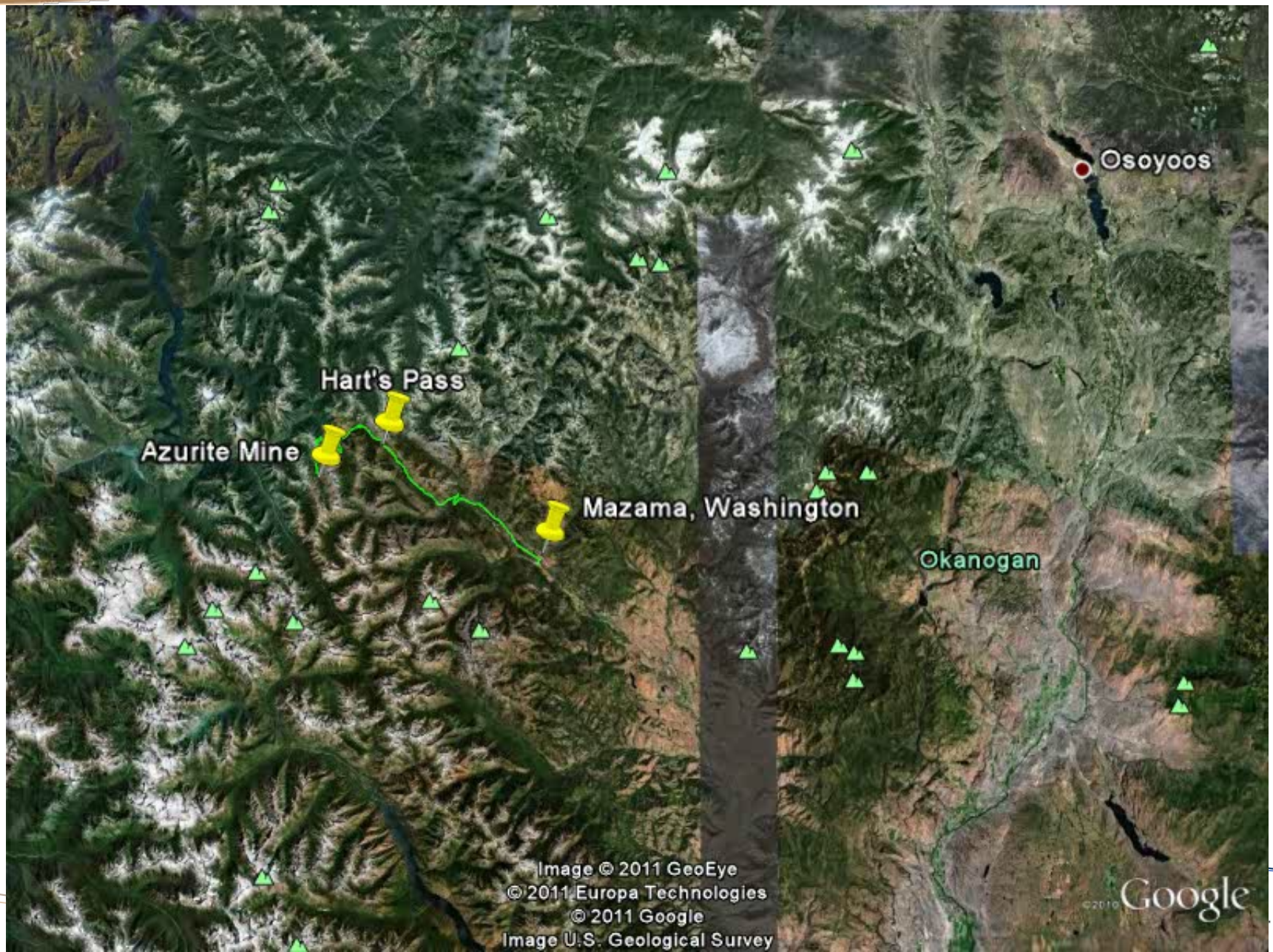
- Access Road Improvements / Bridge Replacement (2010)
- Temporary Access Road Across Mill Creek (2011)
- Mill Creek Diversion Away from Waste Rock Pile (2011)
- Onsite Covered Repository (2011)
  - Reinforced Stabilized Slope/Repository Toe Berm
  - Waste Rock and Mill Area Soil Blended with Tailings
  - Multi-Layer Cover, HDPE Membrane, and Talus/Rock Cover
- Physical Hazard Closures (2011)
- Revegetation (2011) – USFS Lead

Construction Challenges

- Weather Conditions (rain, snow, heat)

Construction Challenges

- Weather Conditions (rain, snow, heat)
- Typical Construction Window (late June – early October)
- Steep Slopes / Difficult Terrain
- Limited Onsite Staging Areas
- All Borrow Material from Onsite
- Remote Access/Logistics/Communication


Osoyoos
Hart's Pass
Azurite Mine
Mazama, Washington
Okanogan
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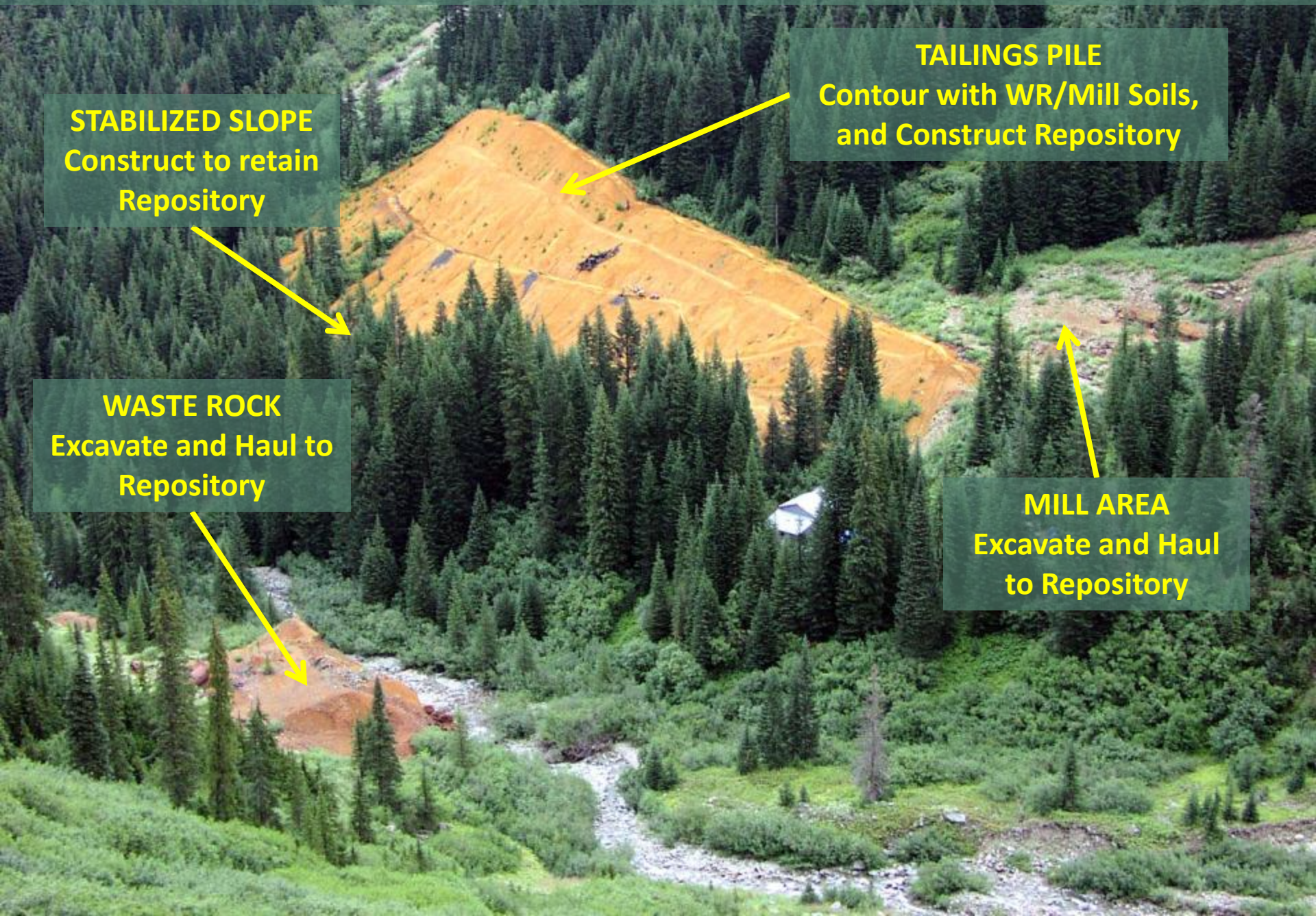
2011 Removal Action Summary

- Turnkey “Design/Build” Contract Structure
  - CES – Prime Contractor
  - Palm Construction – Main Subcontractor (Local)
- Mobilization – July 11, 2011 – 3 weeks late (weather)
- Continuous Work Schedule, CES and Subs
- Demobilization – September 26, 2011 – 1 week early

OVERVIEW OF AZURITE MINE REMOVAL ACTION



Camp, Equipment and Manpower

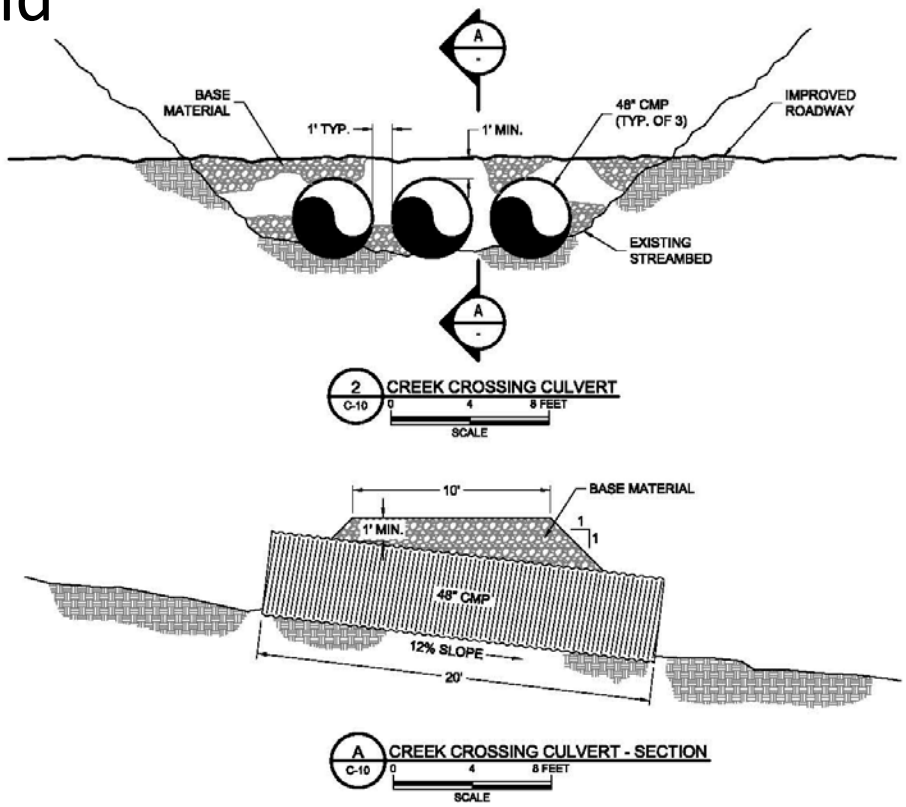
- Remote Camp (internet, phones, running water, flushing toilets, showers, washer/dryer, cook, tents/campers)
- 3 Excavators
- 2 Loaders
- 3 Dozers
- 2 Off-Road, Articulated Haul Trucks
- Roller Compactor, Water Truck, Misc. Work Trucks
- Bear Proof Storage Containers
- Manpower – 10 to 20 (Palm/Subs) / 1 to 3 (CES)

Erosion and Sediment Control

- Run-On Ditches
  - Waste Rock / Tailings
- Silt Fence
  - Borrow Area / Waste Rock
- Filter Berms
  - Borrow Area / Waste Rock
- Sedimentation Pond
  - Tailings / Repository

Mill Creek Crossing and Diversion

- Access Waste Rock Pile, and Transport to Repository
- Three, 48-inch CMPs
- Temporarily Divert Mill Creek Away From Waste Rock Pile



Mill Creek Crossing

Borrow Area Development

- Onsite Source for Screening / 3 Products
- 2-inch minus
  - Stabilized Slope Fill, Road Bed/Base, Fill Material
  - 40,000+ cubic yards used, more remains onsite
- 2-inch to 36-inch
  - Repository cover, rocked diversion ditches
  - ~20,000 cubic yards
- 36-inch plus
  - Misc. Placement, armoring

Borrow Area Development

Borrow Area Development

Underground Working Closures

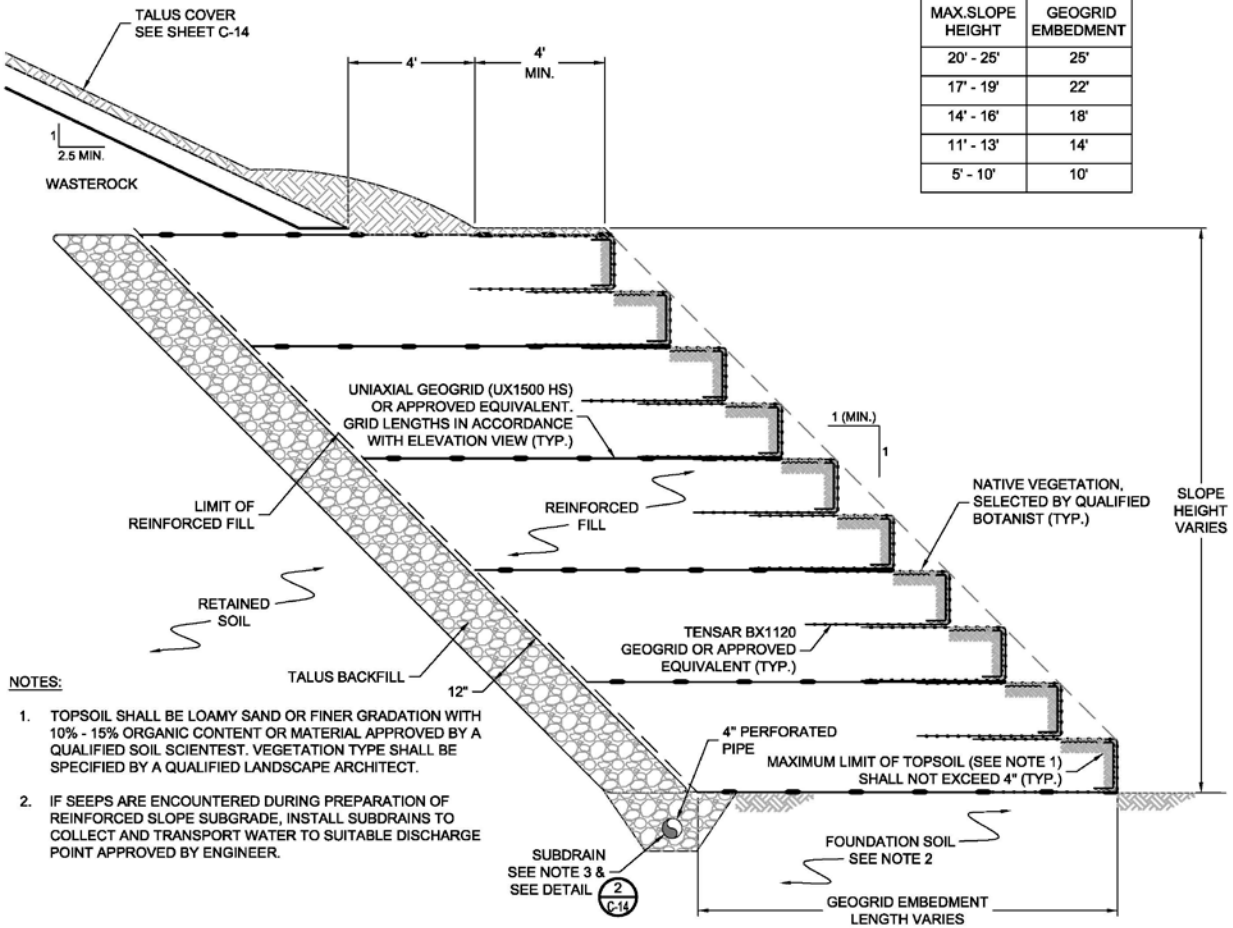
- Planned for 5 Closures (4 Adits / 1 Vent)
- Pre-Cut Steel and Culverts Delivered to Site
- Final Onsite Fabrication
- Installation with Helicopter and Onsite Welder
- 4 Closures
  - Burnham, Tinson, and Discovery Adits
  - Discovery Vent
- Wenatchee Adit
  - Collapsed - No Bat Gate Installed

Reinforced Stabilized Slope

- Designed to Stabilize/Retain the Repository
- Original Design was 15-feet (H) x 15-feet (W) – 12 lifts
- Final Layout was 22-feet (H) x 25-feet (W) – 17 lifts
  - Competent Soil Deeper Than Planned
  - Increased Quantities For Borrow Material/Geogrid
- Onsite QA/QC Testing – All Final Tests Met Compaction Requirements (95% of Proctor)
- 23 days to build
  - Bottom lifts ~ 1.5 days to complete
  - Upper lifts ~ 1 day to complete

Reinforced Stabilized Slope Typical

GEOGRID SPECIFICATIONS	
MAX.SLOPE HEIGHT	GEOGRID EMBEDMENT
20' - 25'	25'
17' - 19'	22'
14' - 16'	18'
11' - 13'	14'
5' - 10'	10'



NOTES:

1. TOPSOIL SHALL BE LOAMY SAND OR FINER GRADATION WITH 10% - 15% ORGANIC CONTENT OR MATERIAL APPROVED BY A QUALIFIED SOIL SCIENTEST. VEGETATION TYPE SHALL BE SPECIFIED BY A QUALIFIED LANDSCAPE ARCHITECT.
2. IF SEEPS ARE ENCOUNTERED DURING PREPARATION OF REINFORCED SLOPE SUBGRADE, INSTALL SUBDRAINS TO COLLECT AND TRANSPORT WATER TO SUITABLE DISCHARGE POINT APPROVED BY ENGINEER.

Reinforced Stabilized Slope – Lift 1

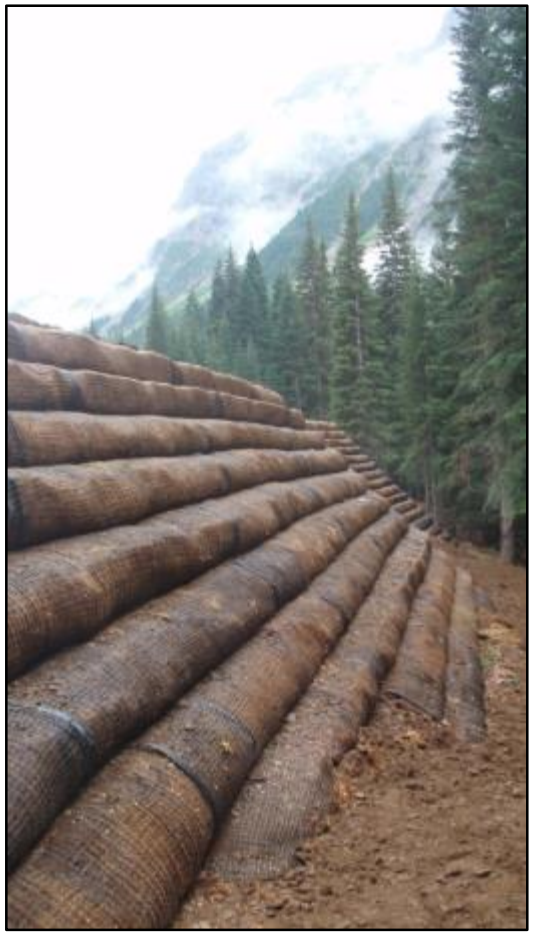
Reinforced Stabilized Slope – Lift 4

Reinforced Stabilized Slope – Lift 8

Reinforced Stabilized Slope – Lift 12

Reinforced Stabilized Slope – Lifts 14/15

Reinforced Stabilized Slope – Complete



Waste Rock Excavation and Placement

- Design Estimate was 22,000 bcy of Waste Rock
- Risk Assessment Cleanup Goal – 104 mg/kg Total Arsenic
- Revised Cleanup Goal – 204 mg/kg Total Arsenic
  - Additional Background Soil Sampling
  - Used MTCA Stat 3.0 to Calculate Natural Background
- In-Field Screening with Niton XRF (RPDs ≤ 33%)
- Final Quantities ~ 16,500 bcy

Waste Rock Pile – Before

Waste Rock Pile – Removal

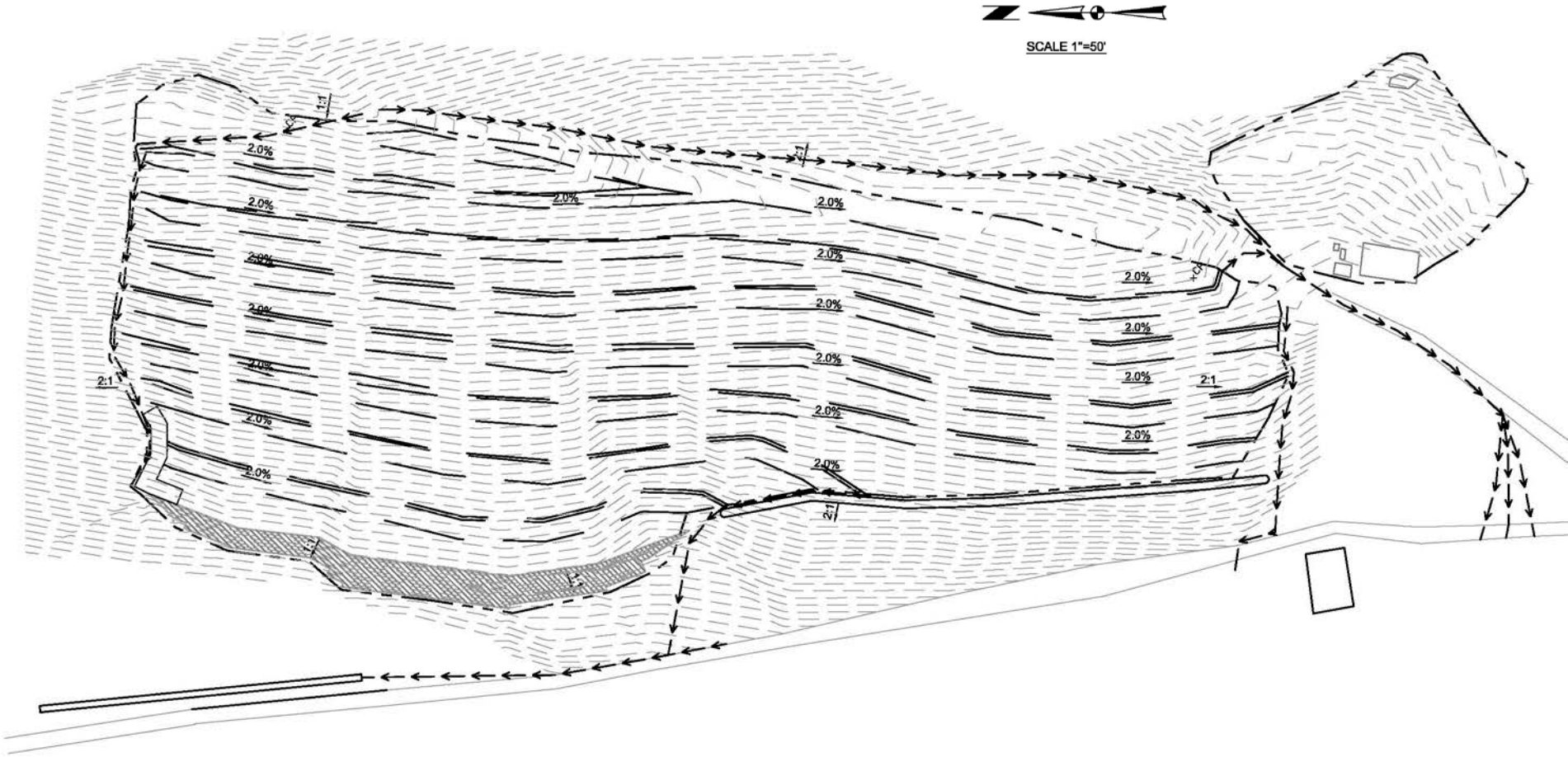
Waste Rock Pile – Removal

Waste Rock Pile – Final

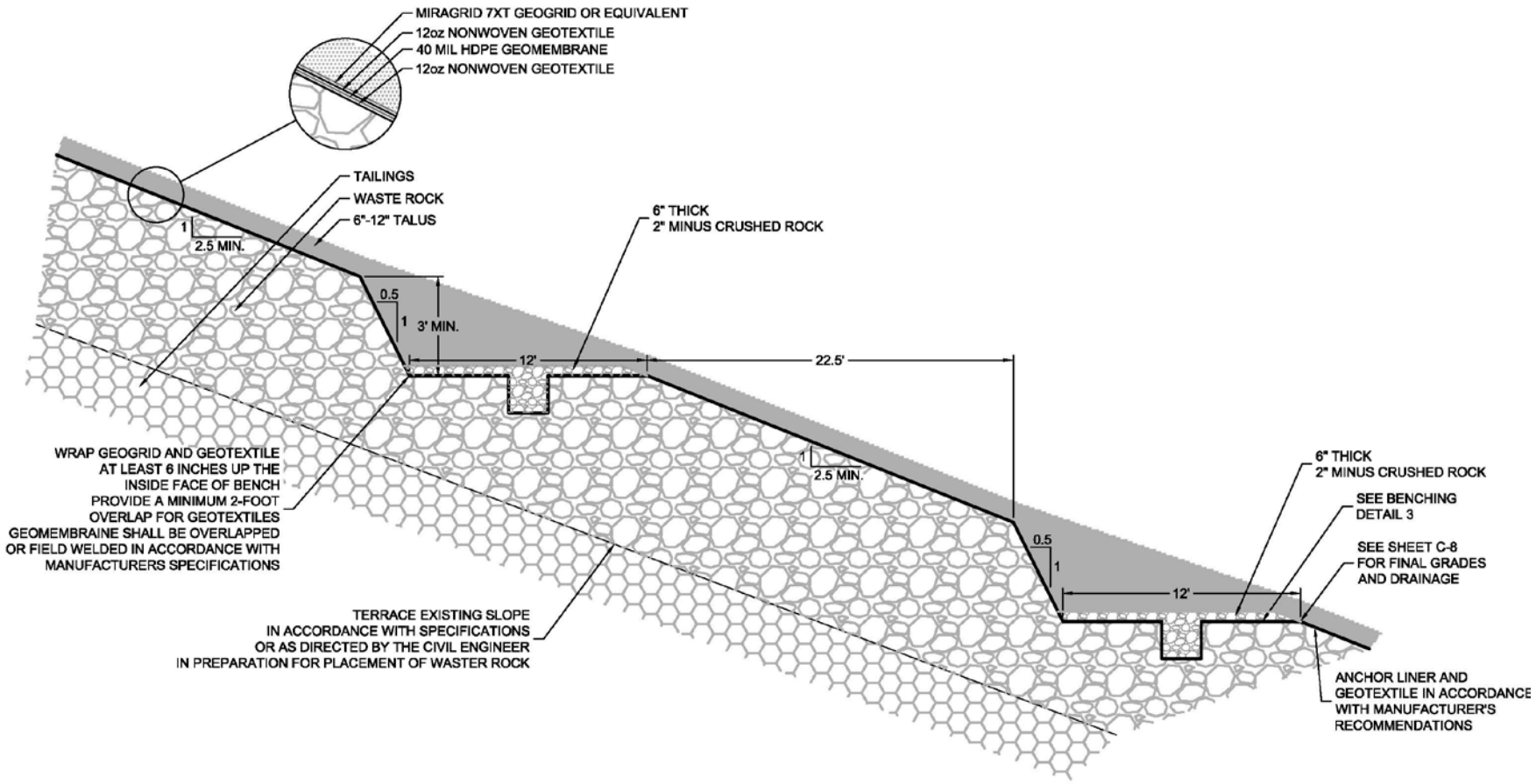
Onsite Repository

- Overall Slope = 2.5:1
- Reinforced Slope and Berm to Stabilize Repository
- Waste Rock Blended with Tailings to Achieve Slope
- In-sloped Benches Every 9 Vertical Feet
- Repository Cover (Multi-Layer)
  1. Talus/Rock Cover – Top
  2. Geogrid
  3. 12-oz Nonwoven Geotextile
  4. 40-mil HDPE Membrane
  5. 12-oz Nonwoven Geotextile
  6. Waste Rock/Tailings – Bottom

Repository Grading Plan



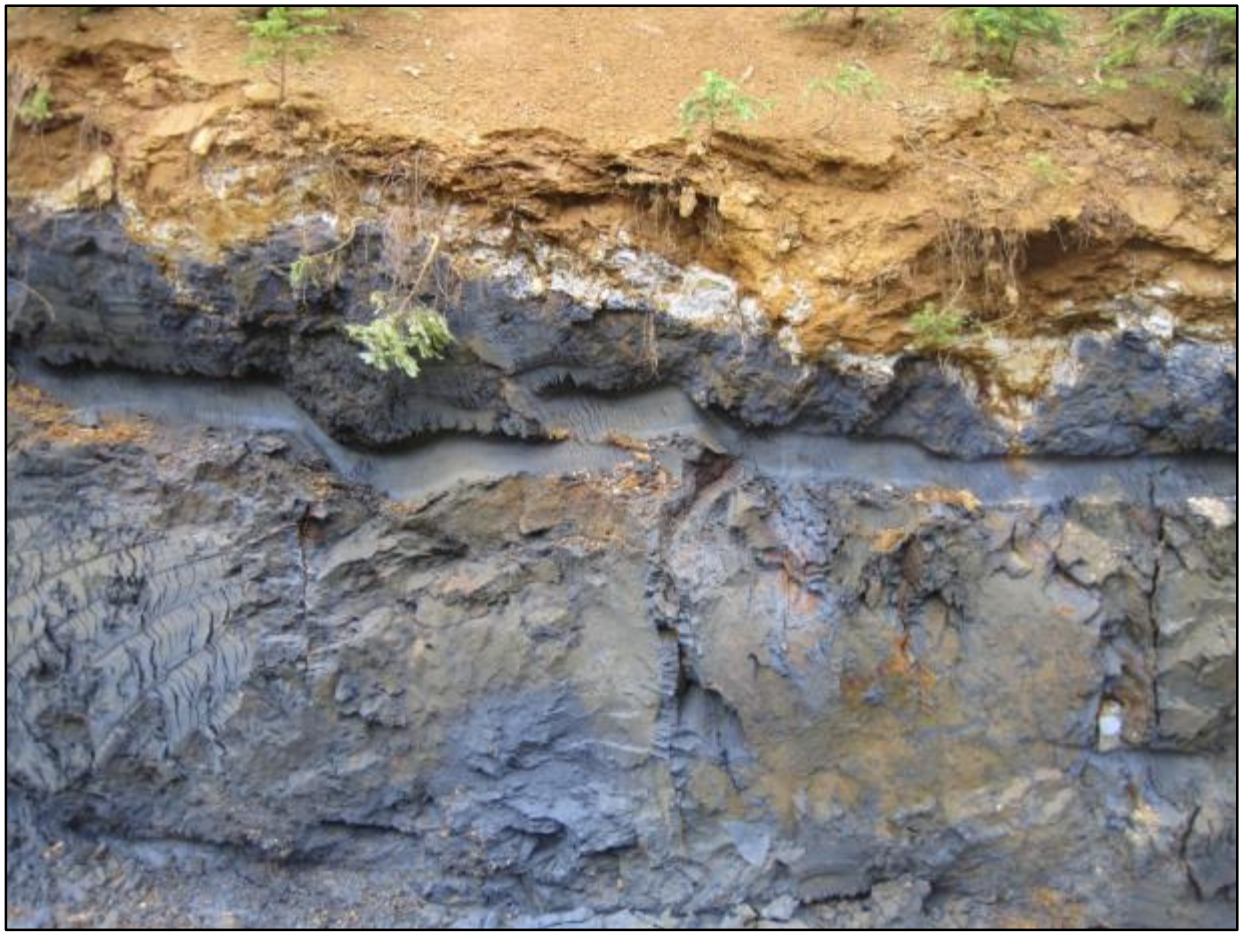
Repository Cross Section Detail



Tailings Pile - Before

Tailings Pile - Before

Tailings Pile – Oxidation Profile



Repository Benching / Grading

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Repository Benching / Grading

Liner Installation

Liner Layers

Liner Installation

Liner Installation

Liner / Cover Installation

Repository – Final

Repository – Final

Repository / Tailings Pile – Before

Repository – Final

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Summary

- Completed 4 Weeks Ahead of Schedule
- Field Changes Easily Made with Continuous Oversight & Communication
- No Health/Safety Concerns
- 3-Years of Long-term O&M Inspections, & Monitoring
- RA Cost - $2.5M Capital

QUESTIONS