

# **BLACK PINE MINE ENGINEERING EVALUATION AND CONCEPTUAL REPOSITORY DESIGN**

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# BLACK PINE MINE SUMMARY

- Located near Philipsburg, Montana
- Several abandoned mills, tailings impoundment, waste rock
- Modern mining operation (90s) – ASARCO
- 400,000 CY of tailings, waste rock and impacted soil
- Project being funded as part of the ASARCO settlement
- Montana DEQ, Federal Superfund Section, is lead agency
- Trihydro & Herrera Environmental Consultants –  
Consultants

# BLACK PINE MINE BACKGROUND

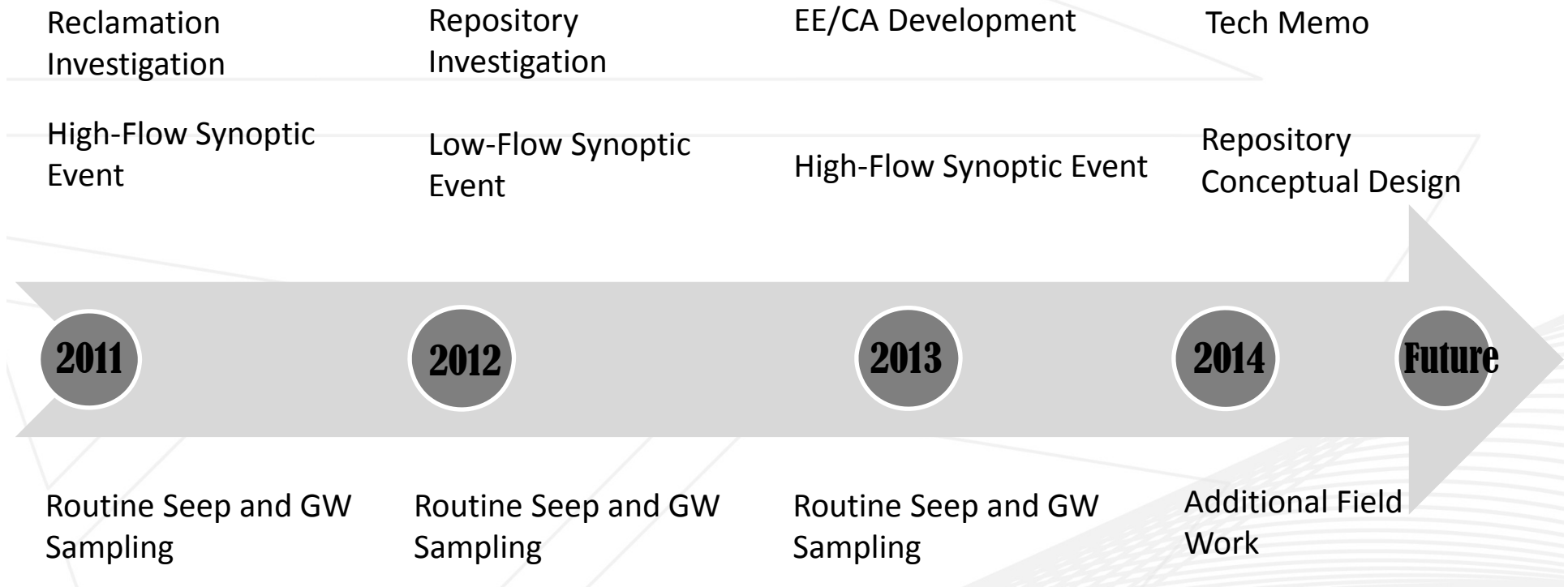
- 1882 – Combination lode located
- 1887 to 1897 – 10 Stamp mill construction and operation
- 1920s to 1940s – Intermittent mining
- 1970 – Inspiration Development Company
- 1974 – Inspiration formed Black Pine Mining Company
- 1980s – ASARCO purchased the mine for a source of flux for their East Helena smelter
- 2001 – East Helena Smelter shutdown
- 2005 – ASARCO filed bankruptcy
- 2009 – Bankruptcy settlements reached

# BLACK PINE MINE BACKGROUND

## SUMMARY OF ASARCO SETTLEMENT:

- ~\$195 million for cleanup of MT sites
  - Black Pine Mine Designated Properties = \$17.3 M
- Created the Montana Environmental Custodial Trust to own and manage the four properties
- The Montana Environmental Trust Group, LLC was formed to oversee the affairs of the Custodial Trust

# BLACK PINE MINE BACKGROUND



# FOUR AREAS OF CONCERN

- ◆ Combination Mill
- ◆ Historic Mine
- ◆ Combination Mine
- ◆ Tim Smith Mine

# COMBINATION MILL

- Combination Mill And Historic Mill Debris
- Combination Mill Tailings Impoundments (Consolidated 1994)
- Former Reprocessing Area (USFS)
- South Fork Lower Willow Creek Sediments (USFS)
- Metals of Concern – Antimony, Arsenic, Lead, Mercury
- Impacted Material Volumes
  - Tailings Impoundment And Adjacent Soils/Sediments – 128,300 CY
  - Downstream Sediments And Tailings –19,700 CY

# HISTORIC MINE

- ◆ Historic Shafts and Adits
- ◆ Lewis Shaft and Buildings
- ◆ Harper Shaft and Waste Rock
- ◆ Harrison Shaft and Waste Rock
- ◆ Metals of Concern – Antimony, Arsenic, Lead, and Asbestos
- ◆ Impacted Material Volumes
  - Waste Rock And Impacted Soil – 13,350 CY



# COMBINATION MINE

- Modern Mining Operations
- Combination Mine Main and Auxiliary Adits
- Combination Mine Waste Rock Pile
- Soils Removal Areas
- Seeps
- Seepage Collection and Pumpback System
- Metals Of Concern – Antimony, Arsenic, Lead
- Impacted Material Volumes
  - Waste Rock and Impacted Soil – 208,200 CY
  - Impacted Groundwater

# TIM SMITH MINE

- ◆ Modern Mining Operations
- ◆ Tim Smith Adit #1 and Waste Rock Pile
- ◆ Tim Smith Adit #2 and Waste Rock Pile
- ◆ Metals Of Concern – Antimony, Arsenic, Lead
- ◆ Impacted Material Volumes
  - Waste Rock – 22,650 cy

# RISK ASSESSMENT SUMMARY

- Screening level human health and ecological risk assessment
- Recreational use scenario
- Human Health (solid) – As, Sb, and Pb are drivers
- Human Health (water) – As, Sb, Hg, and Pb are drivers
- Ecological Health (plants, terrestrial wildlife, and aquatic life) – As, Sb, Cd, Cu, Fe, Hg, Ni, Ag, and Zn are the primary drivers
- Risk Based Clean-up Guidelines (Solids): As – 40.4 mg/kg, Sb – 293 mg/kg, and Pb – 1,100 mg/kg

# RECLAMATION ALTERNATIVE ANALYSIS

- Engineering Evaluation / Cost Analysis (EE/CA) is used to:
  - Identify and screen reclamation technologies
  - Eliminate technologies that are infeasible or ineffective
  - Retain potentially effective options for detailed analysis
- No action
- Institutional controls
- Engineering controls
- Treatment

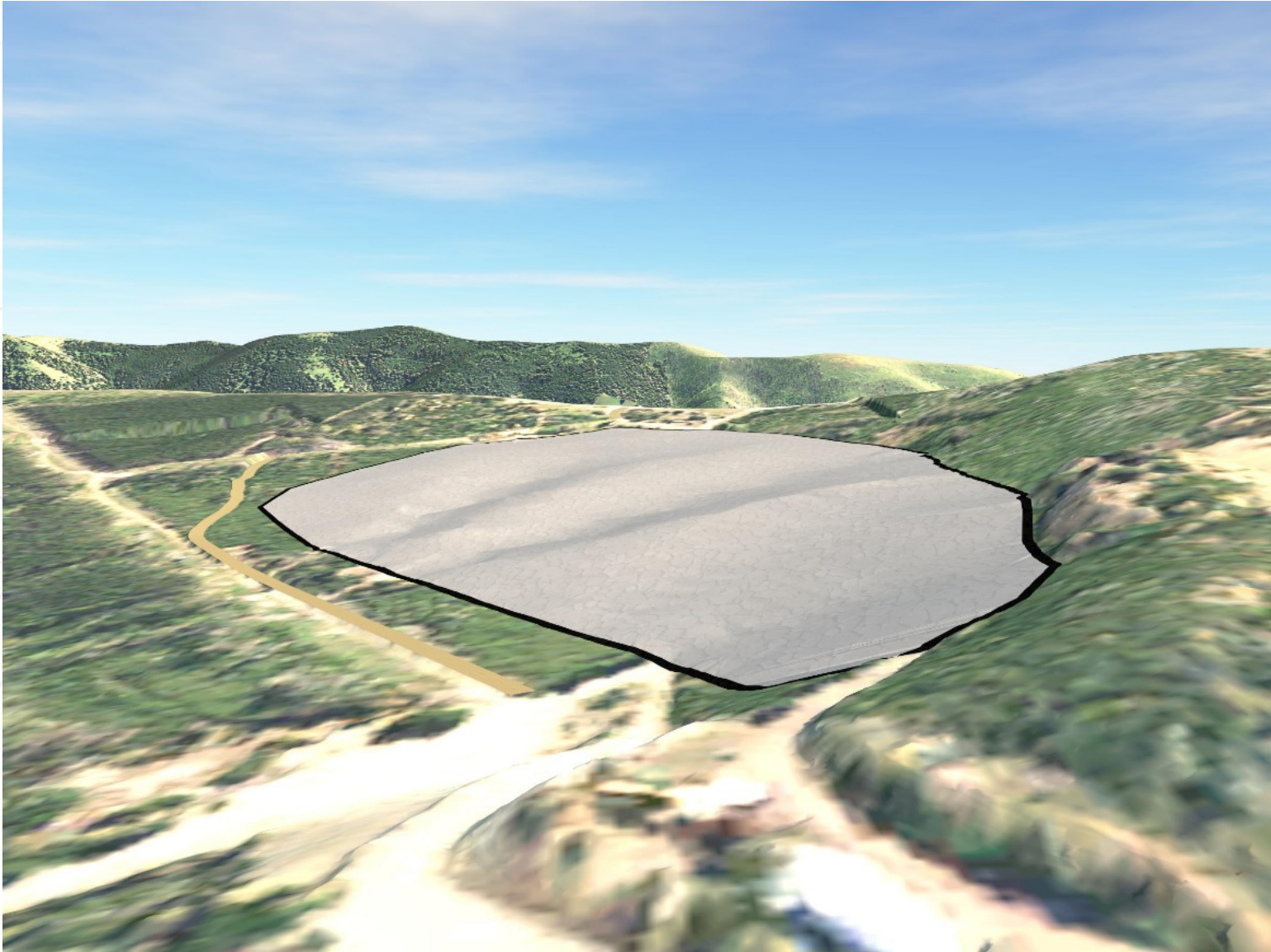
# RECLAMATION ALTERNATIVE SUMMARY

SOLID MEDIA				
Alternative	Risk Reduction	Effective	Implementable	Estimated Cost (\$)
Alternative 1: No Action	No	No	N/A	\$140,000
Alternative 2: Select in-place capping and select removal of waste and placement in an onsite repository	Yes	Yes	Yes	\$13,600,000
Alternative 3: Select in-place capping and select removal of waste and placement in an offsite facility	Yes	Yes	Yes	\$23,200,000
<b>Alternative 4: Site-wide removal and placement in an onsite repository</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>\$13,900,000</b>
Alternative 5: Site-wide removal and disposal in an offsite facility	Yes	Yes	Yes	\$25,000,000

# CONCEPTUAL REPOSITORY DESIGN

- Located over Historic Mine Area Near Top of Ridge
- 16 acres, with Carlson Natural Regrade
- 12 acre Subgrade, ~ 10 feet deep
- ~400,000 CY of consolidated tailing, waste rock, and soil
- Cover Constructed from Subgrade Material and Geomembranes, with rock and vegetative cover
- Multi-year Construction, with Separate Contracts





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## Bid Results

- Fall 2014 Bidding
- 9 Bids
- Engineers Estimate - \$775K
- \$597K - \$1.3M
- Montana Civil Contractors – Low Bid



## Next Steps

- Overall Reclamation Design – Winter 2015
- Repository Subgrade Construction – Summer 2015
- Bid Repository Construction – Fall 2015
- Repository Construction – 2016 to 2018 (summers)
- Post Monitoring and Maintenance – Ongoing
- Water Treatment - ??

# QUESTIONS / COMMENT

## ◆ Contact Information

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