Financial Assurance for Hardrock Mine Cleanup

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What is Financial Assurance?

Financial Assurance is the basic concept of a company or corporation impacting public lands or resources (such as water) having to provide insurance that the funds are available for the necessary activities to mitigate or remediate any adverse impacts from those activities.

Who Requires Financial Assurance?

- Federal Agencies
  - Forest Service
  - Bureau of Land Management
  - Environmental Protection Agency
- State Agencies
  - Every state with significant hardrock mining activity has promulgated mine cleanup statutes that include provisions for financial assurance

To What Mine Cleanup Activities Does Financial Assurance Apply?

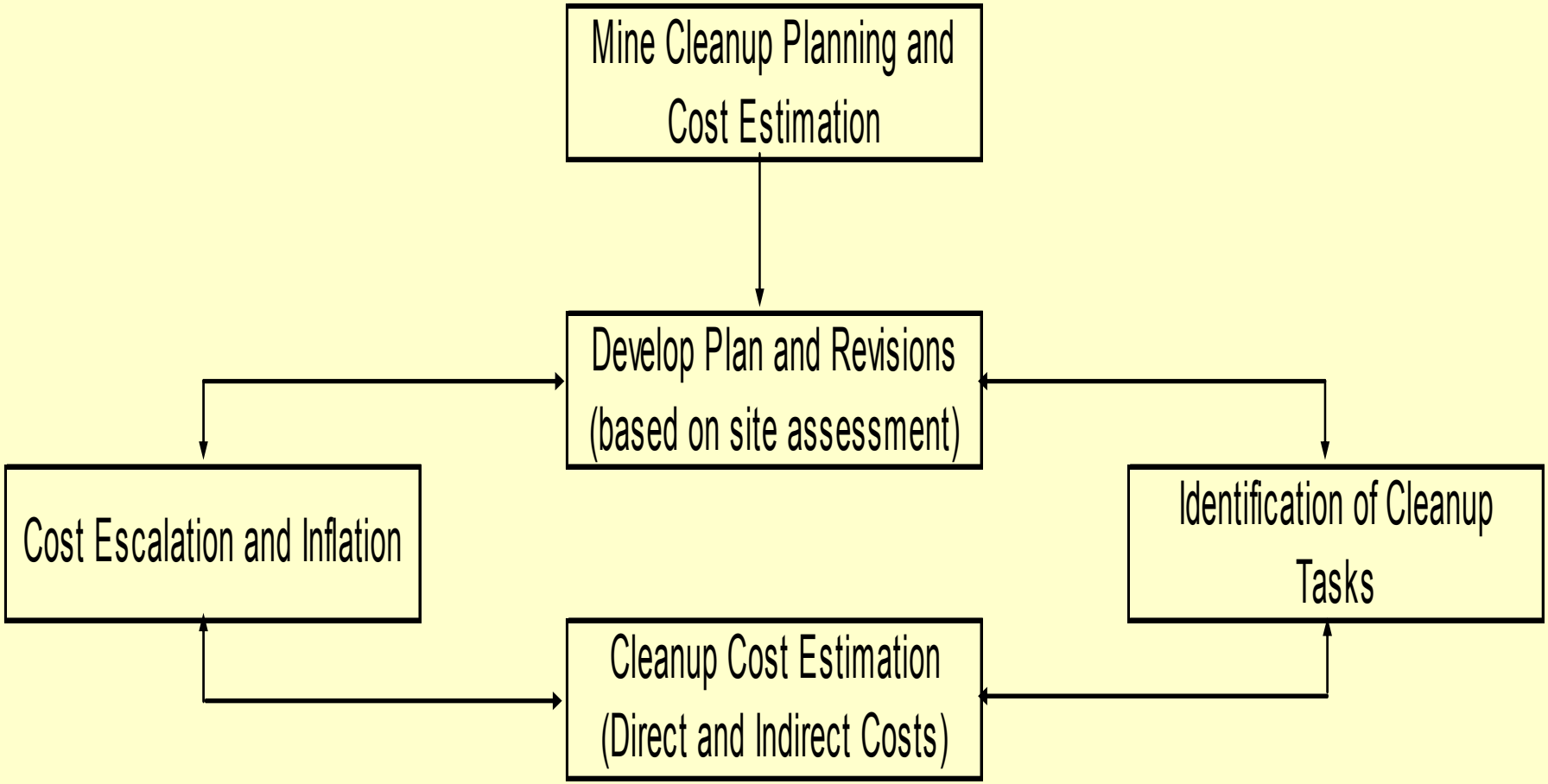
- New and Operating Mines – NEPA and Operating Permits
  - Federal financial assurance laws apply to federally administered lands (including tribal lands) and State laws apply to state and private lands.
- Abandoned Mines – CERCLA and other state and federal cleanup activities
  - CERCLA financial assurance provisions are borrowed from RCRA

How is Financial Assurance Determined?

Two Primary Processes:

1. Mine Cleanup Planning / Cost Estimation

2. Financial Assurance Administration


Mine Cleanup Planning and Cost Estimation
Develop Plan and Revisions (based on site assessment)
Cost Escalation and Inflation
Identification of Cleanup Tasks
Cleanup Cost Estimation (Direct and Indirect Costs)

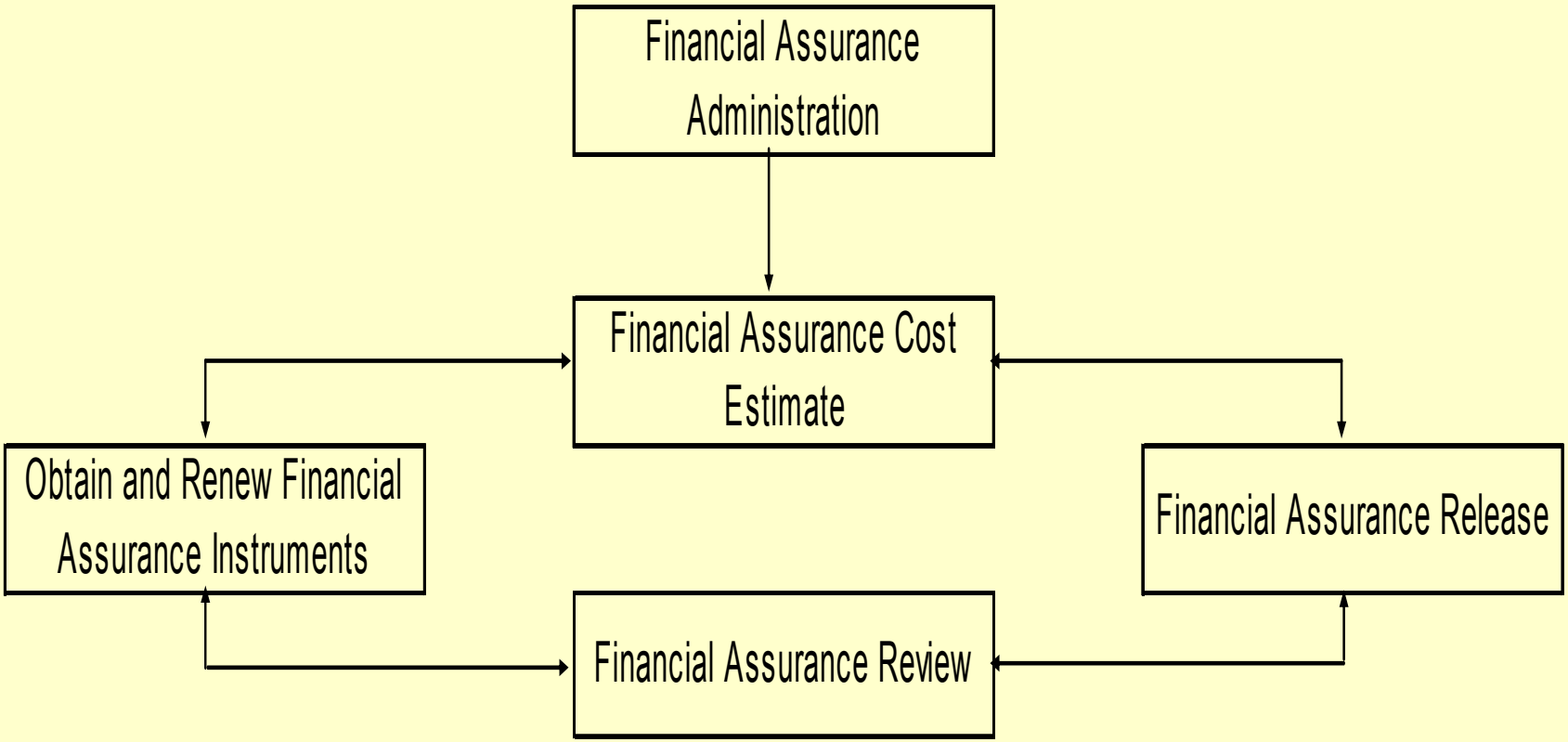
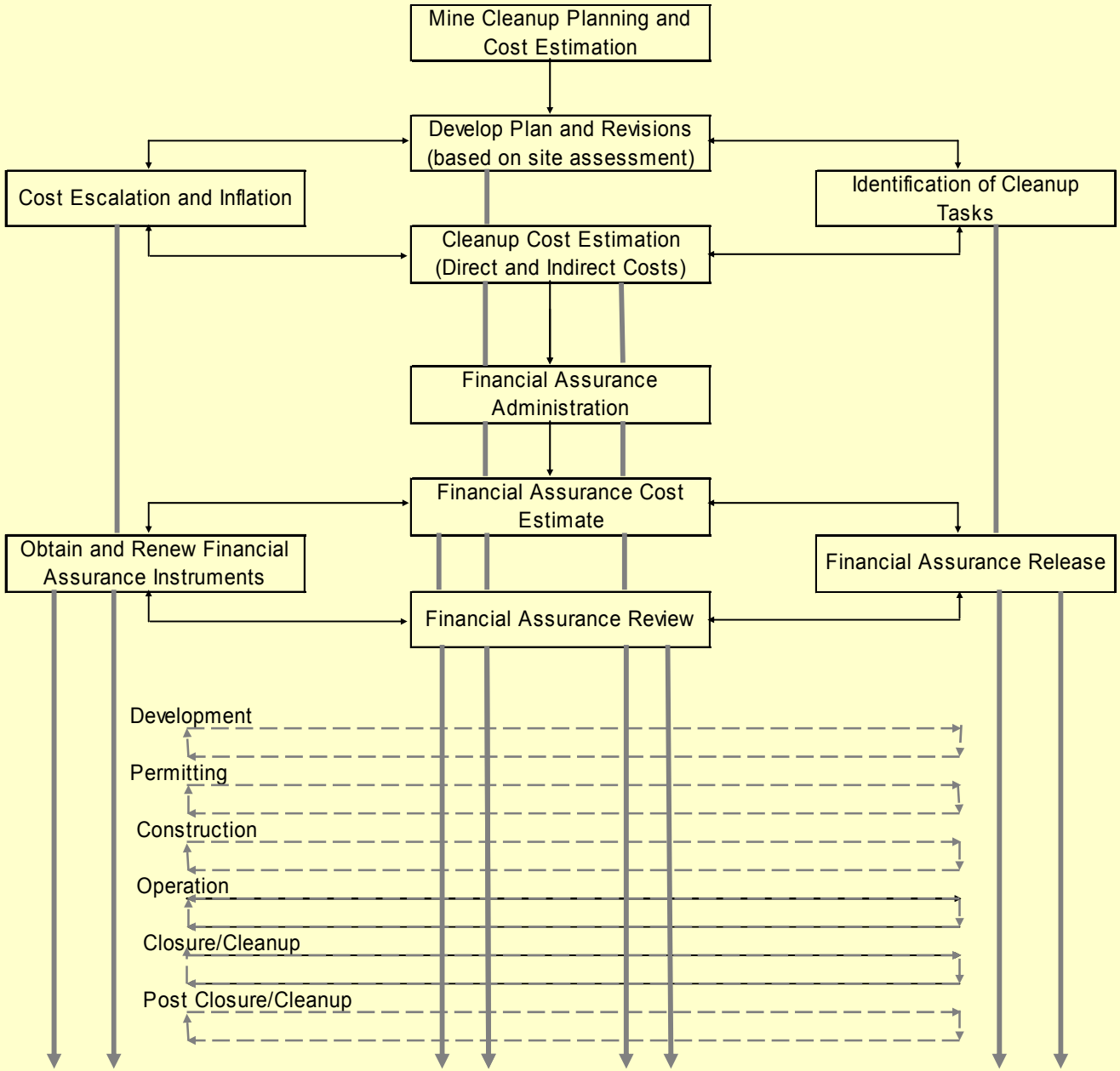

Financial Assurance Administration
Financial Assurance Cost Estimate
Obtain and Renew Financial Assurance Instruments
Financial Assurance Release
Financial Assurance Review

Figure 1. Cyclic Determination of Mine Cleanup Financial Assurance



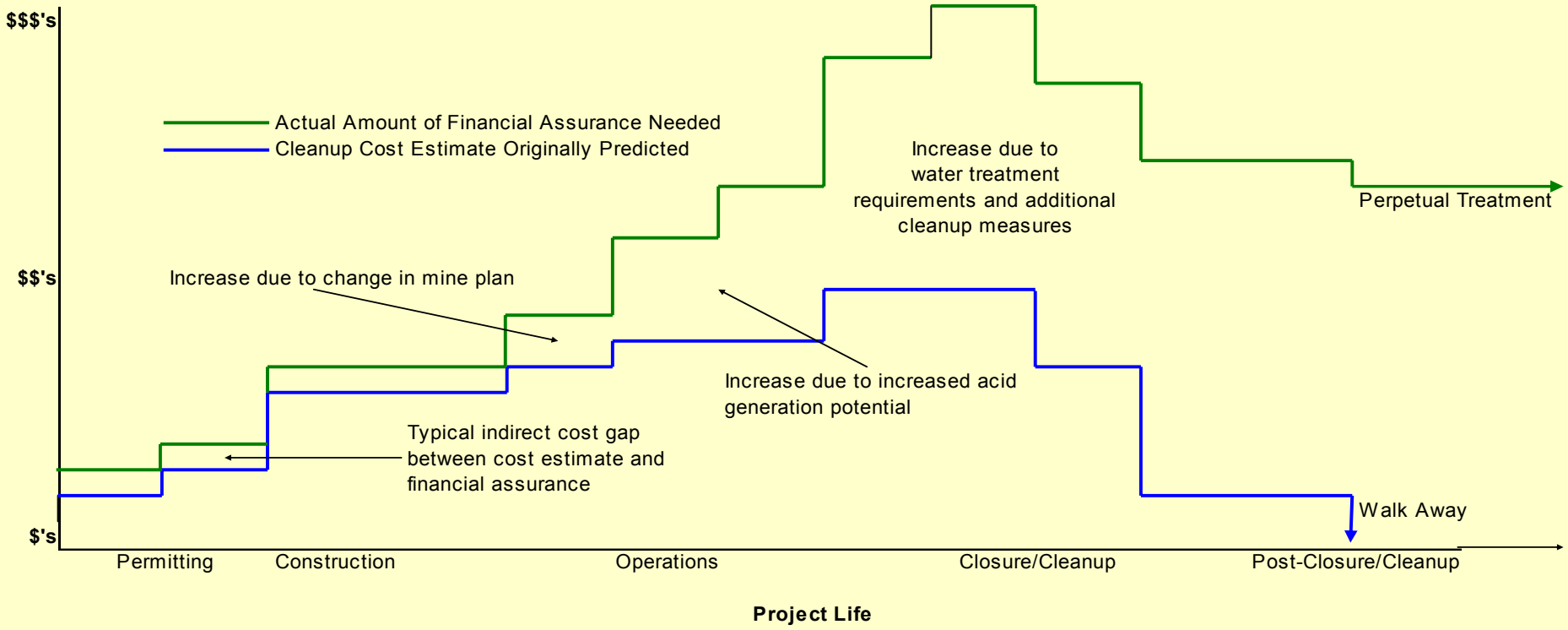
Mine Cleanup Planning

- Required Information
  - Identification of cleanup requirements
  - Location of features and facilities
  - Description of surface disturbance
  - Description of facilities and equipment
  - Description of operations
  - Description of maintenance
  - Description of monitoring
  - Description of mitigations
  - Description of other activities

Identification of Mine Cleanup Tasks

- Categories of Tasks
  - Interim Operations and Maintenance
  - Water Management and Treatment
  - Hazardous Materials
  - Demolition, Removal and Disposal of Facilities and Equipment
  - Earthwork (sloping, backfill, grading)
  - Revegetation
  - Mitigations
  - Long-Term Operations and Maintenance
  - Monitoring

Figure 2. Mine Cleanup Cost and Project Life



Mine Cleanup Cost Estimation

- Direct Costs
  - Direct costs include capital costs for cleanup tasks related to surface disturbances, facilities and other capital items necessary for ongoing processes (such as groundwater pumping and water treatment facilities).
- Indirect Costs
  - Indirect costs include contingency, engineering redesign, mobilization/demobilization, contractor overhead and profit, agency contract administration and agency indirect costs.

Cost Escalation and Inflation

- Application
- Calculation
- Risk and Uncertainty
- Scheduling
- Cash Flow Analysis
- Estimate Checking

Financial Assurance Administration

- Financial Assurance Cost Estimation
- Financial Assurance Instruments
  - Cash or Equivalent Forms
  - Surety Bonds and Insurance
  - Self Guarantees
- Financial Assurance Review and Update
- Financial Assurance Release
- Approving and Renewing Instruments

Case Study
Zortman and Landusky Mines

Reclamation and Financial Assurance Case Study
Zortman and Landusky Mines and Fort Belknap Indian Community

Project History

- 1979 Original Zortman and Landusky Mine Permit Issued
- 1979-1988 Plan of Operations amended 11 times
- 1992 Submitted plans for major expansion - review of water monitoring data showed widespread acid generation
- 1995 Suits filed by EPA, MDEQ, FBIC and citizens groups
- 1996 Consent Decree ($32 million settlement)
- 1996 FEIS and ROD for mine expansion issued
- 1997 IBLA appeal by FBIC stayed expansion
- 1998 Pegasus Gold files for bankruptcy - expansion cancelled and reclamation and closure to proceed
- 1998 IBLA directs BLM to consult with FBIC on reclamation and closure

Following Bankruptcy

- FBIC develops alternative reclamation plan
- State takeover of site operations
- Technical Working Group – BLM, MDEQ, EPA, FBIC
- Multiple Accounts Analysis – Alternatives Evaluation
- Interim reclamation
- Water management and treatment modifications
- Supplemental Environmental Impact Statement

Case Study - Zortman and Landusky Mines

Results of Investigations

- Acid drainage to increase significantly and capture and treat in perpetuity to prevent groundwater and surface water contamination of FBIC water resources
- Effective source control is necessary to limit acid drainage generation rate to controllable levels
- Water treatment bond based on line items rather than total cost = significant shortfall
- Pre-treatment for nitrates, cyanide and selenium needed before land application disposal
- Backfilling with acid generating waste may increase water quality impacts in connected watersheds
- Prior revegetation efforts mostly unsuccessful and more progressive/long-term approach required
- Four 100-year storm events occurred in twenty years

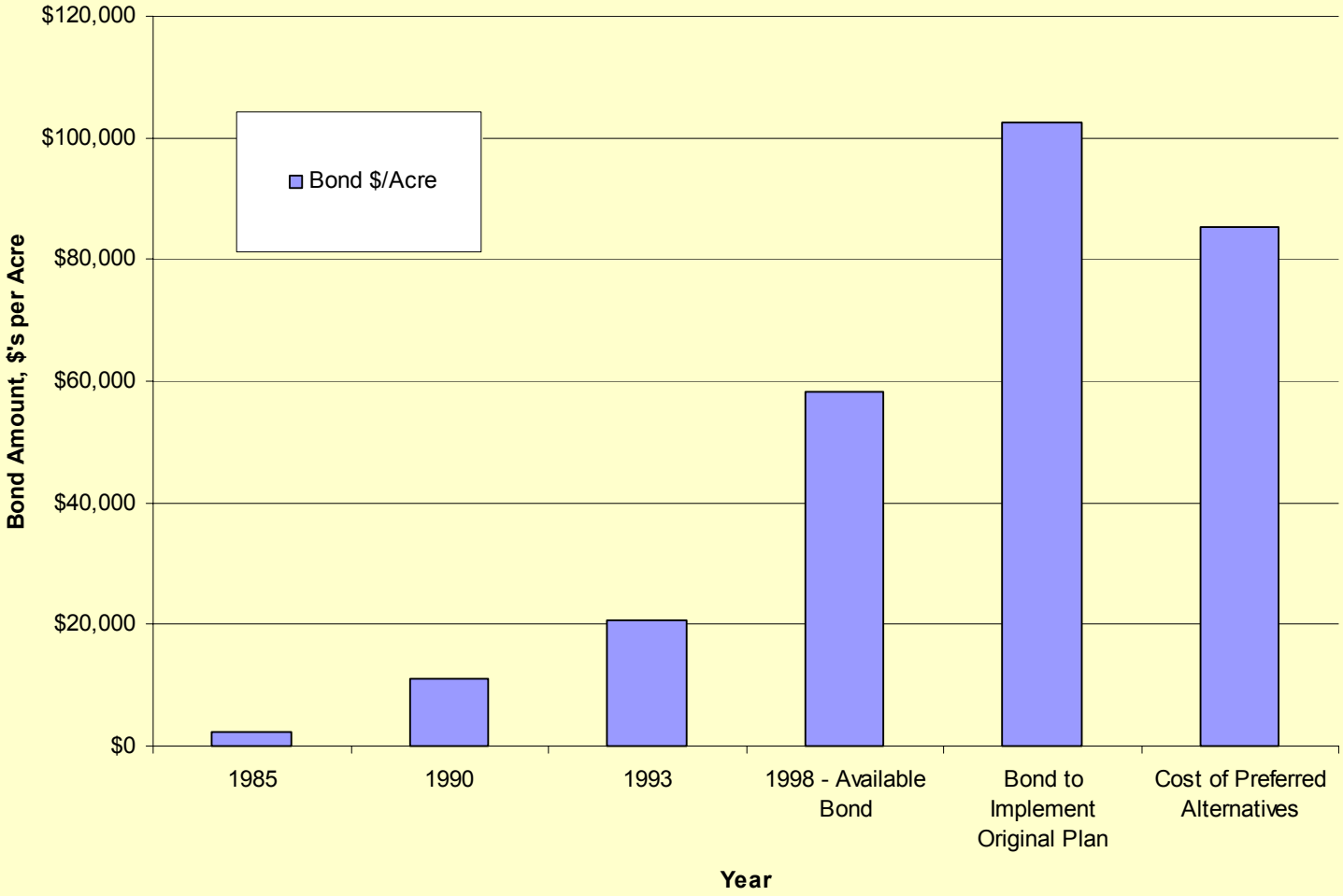
Results of Investigations
Financial Assurance

- Originally approved reclamation and closure plan would have cost $54 million more than available financial assurance
- Cost of agency preferred alternatives from MAA $33 million more than available financial assurance
- Currently FBIC, BLM, DEQ and EPA seeking additional funding of $33M + $15M to FBIC for violations of federal trust responsibility

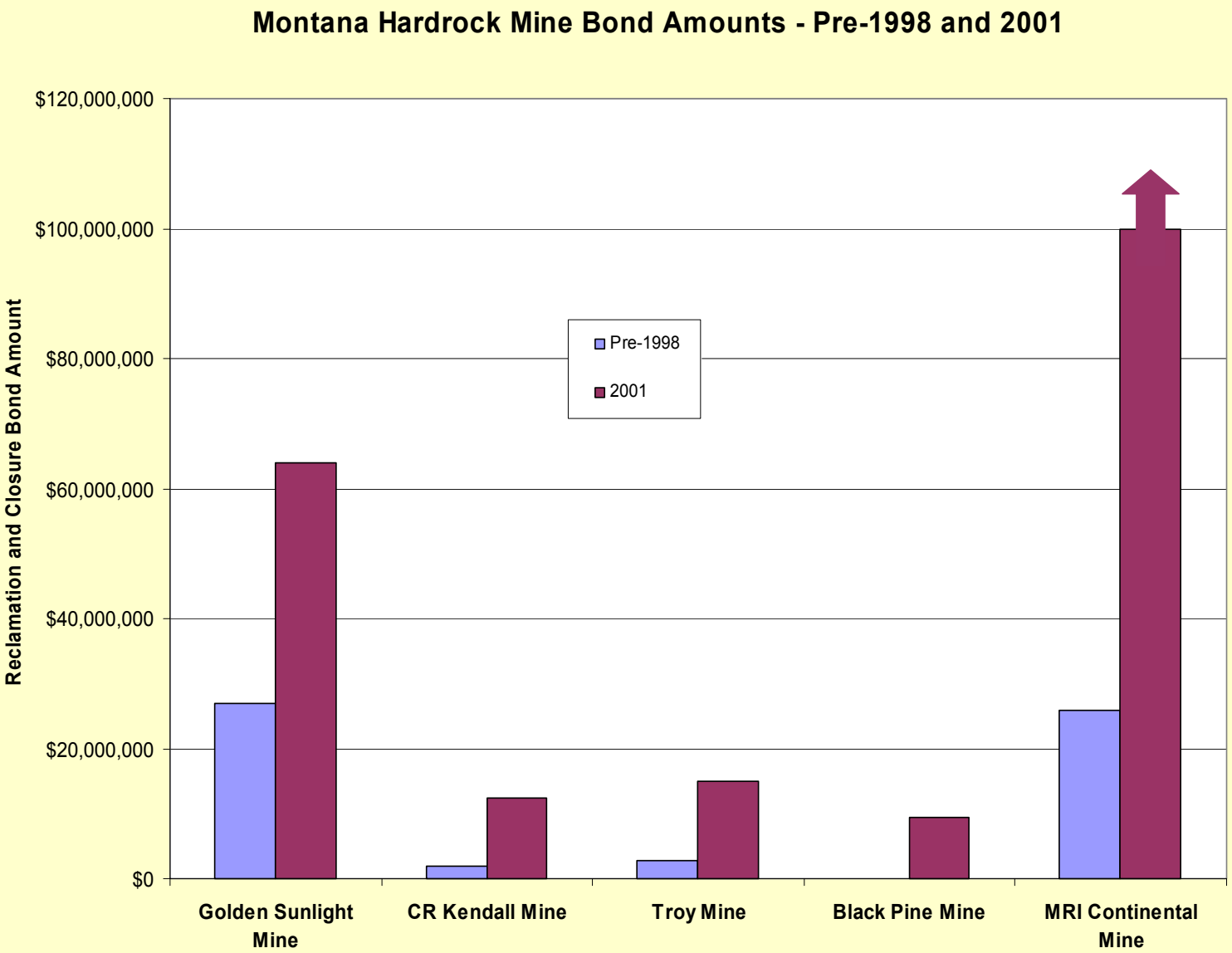
Case Study - Zortman and Landusky Mines

Results of Investigation – Financial Assurance

Zortman and Landusky Mines Reclamation Bond Change



Changes to Montana Bonding Practice and Regulation - Bond Amounts Statewide



Alaska Mine Statewide Review

- CSP² is conducting a statewide review of all major mines on behalf of Alaskans for Responsible Mining (ARM)

- Purpose: To determine the potential tax-payer liability statewide in the event of mine bankruptcy or default on reclamation at closure

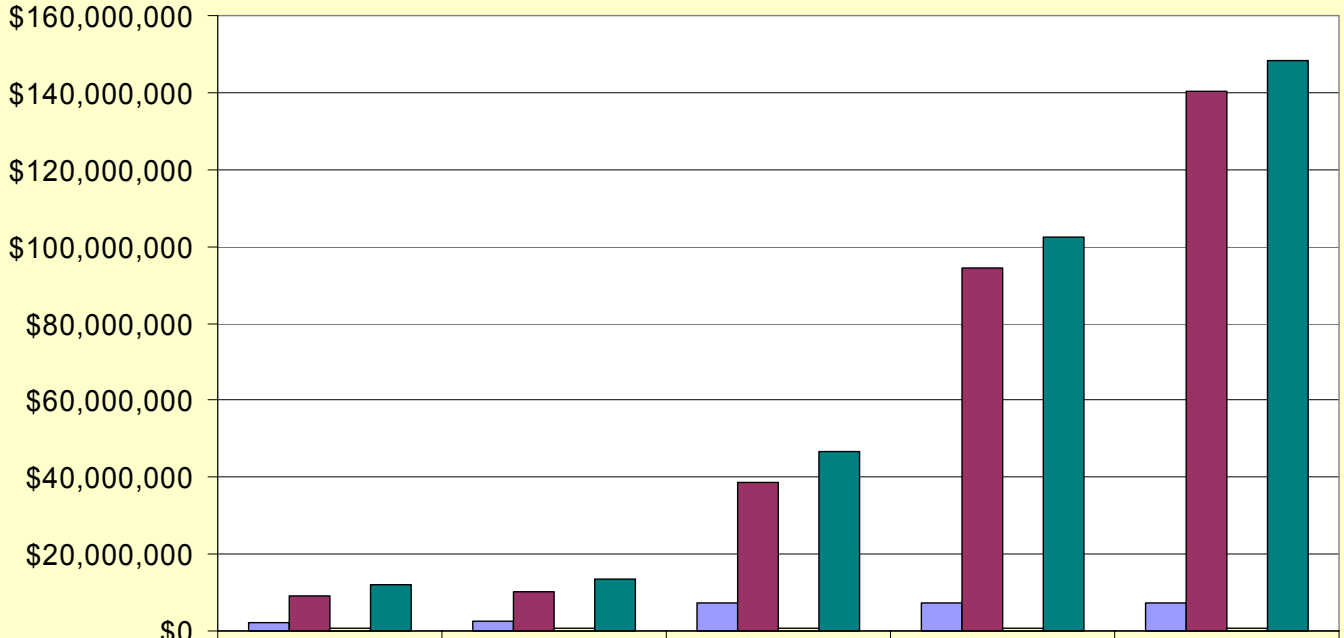
Alaska Mine Statewide Review

- Methods
  - Review the reclamation plan and associated cost estimate for each mine
  - Develop multiple scenarios to address reclamation plan deficiencies
    - Scenario 0 – Indirect costs evaluated
    - Scenario 1 – Unit costs ($/acre) for each task
    - Scenario 2,3,4 – Water treatment scenarios

Fort Knox Mine

- Open-pit gold mine and mill facility located northeast of Fairbanks

Fort Knox Mine Financial Assurance Summary

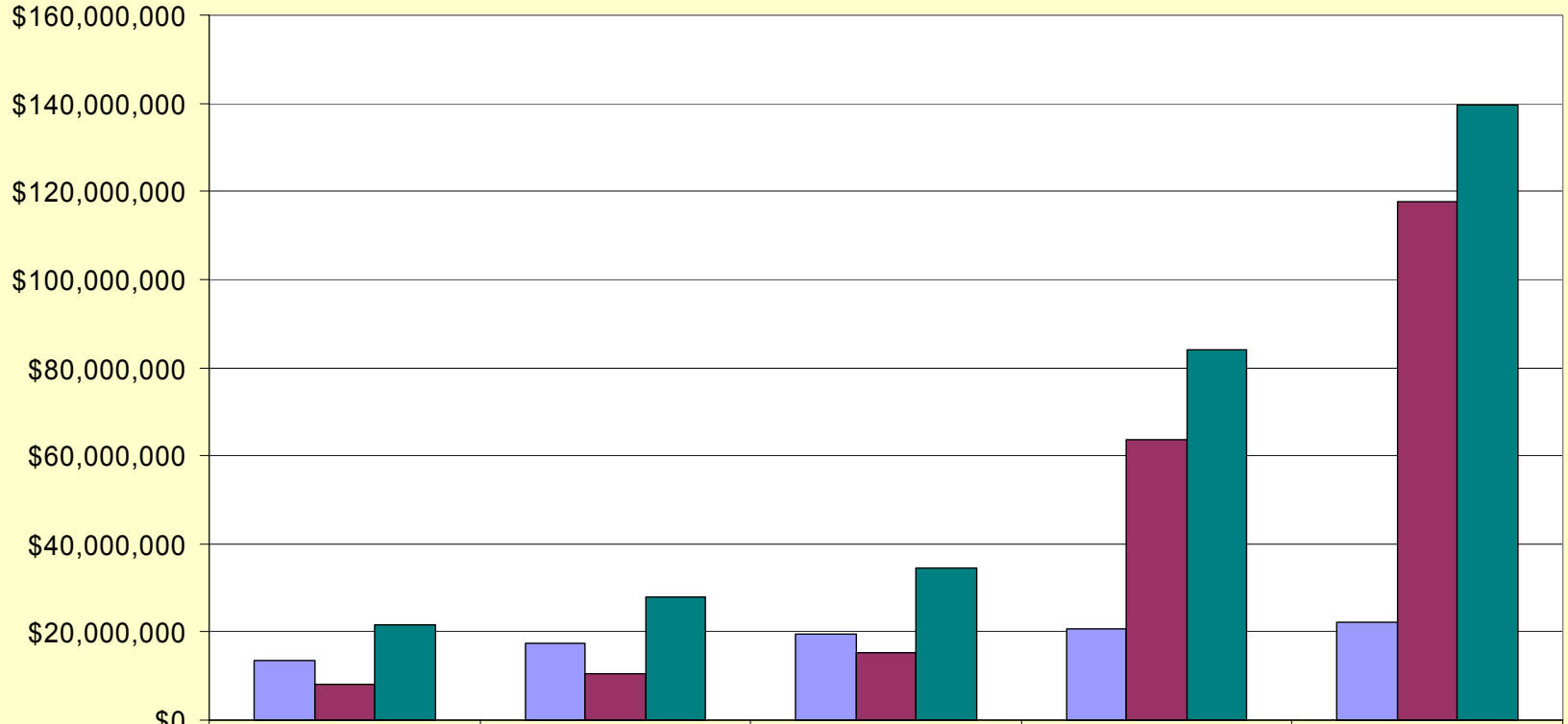


	Scenario 0	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Reclamation Plan	$2,105,383	$2,390,322	$7,224,521	$7,224,521	$7,224,521
Tailing Storage Raclamation & Closure	$9,104,984	$10,337,238	$38,681,742	$94,544,637	$140,341,737
Post Reclamation & Maintenance Fund	$714,536	$714,536	$714,536	$714,536	$714,536
Total	$11,924,903	$13,442,096	$46,647,799	$102,483,694	$148,280,794

Pogo Project

- Proposed underground gold mine and mill facility located near the Goodpaster River northeast of Delta, Alaska

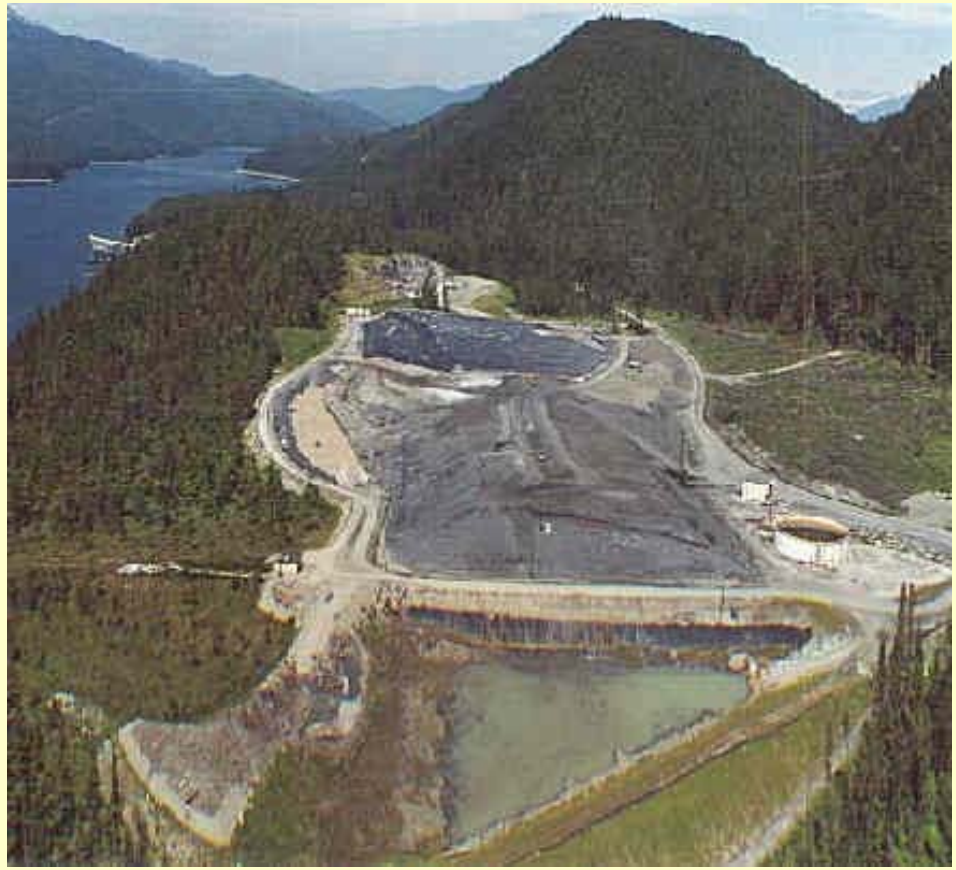
Pogo Project Financial Assurance Summary



	Scenario 0	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Capital Costs	$13,474,394	$17,292,139	$19,396,987	$20,628,987	$22,168,987
Operating Costs	$8,177,388	$10,494,315	$15,163,348	$63,572,115	$117,549,115
Total	$21,651,782	$27,786,454	$34,560,335	$84,201,102	$139,718,102

Case Study – Greens Creek Mine

- Located on Admiralty Island in the Tongass National Forest near Juneau
- Underground mine and mill facilities producing silver, zinc, lead, and gold concentrates
- Operated by Kennecott Minerals Company and Hecla Mining Company



Case Study – Greens Creek Mine

- Major Site Facilities
  - 30 acre dry tailings storage facility, 32 acre expansion proposed
  - 44 acres of production rock sites
  - 68 acres of road surface
    - 5.7 acres constructed with pyritic quarry rock
  - 29 acres of mine site facilities including the mill

Case Study – Greens Creek Mine

- Current financial assurance held by the USFS for the ADEC in the amount of $24,400,000
- Letter of credit for $18,400,000 and Surety Bond for $6,000,000
- Proposed tailings impoundment expansion is estimated to increase the financial assurance by $1,770,000 to a total of $26,170,000

Greens Creek – Scenario 0

- Labor, equipment, material costs, and acreages duplicate the Greens Creek Mine Reclamation Plan
- <0.5% difference when compared to Greens Creek generated numbers
- Scenario 0 estimated at $26,049,100

Greens Creek – Scenario 1

- Duplicates company generated capital and operating costs with changes made to indirect costs
- Scenario 1 adjustments result in an overall increase of 23% totaling $28,533,931

	Greens Creek (33%)	**CSP2 Scenario 1 (56%)**
Contingency	10%	10%
Mobilization / Demobilization	5%	5%
Engineering Redesign	--	3%
Engineering, Procurement, Const. Management	--	5%
Contractor Overhead	--	15%
Contractor Profit	10%	10%
Agency Administration	8%	8%
Inflation	--	3%

Greens Creek – Scenario 2

- Addition of indirect costs and changes to unit costs for specific reclamation tasks
  - Tailings impoundment capital costs
    - Unit costs for 32 expansion acres were adjusted to match unit costs estimated for the original 30 acres
    - Greens Creek estimates $4,407,377 ($71,087/acre)
    - CSP² estimates $6,291,884 ($101,482/acre)
  - Water treatment sludge disposal costs added
    - 7 years of disposal (including transport) estimated at $140,000 ($20,000/year)

Greens Creek – Scenario 2

- Maintenance and monitoring of engineered soil covers on tailings and waste rock
  - Time frame of activities increased from 5 years to 30 years due to potential for acid generation
  - Greens Creek estimates $414,000 ($82,800/year)
  - CSP² estimates $1,801,500 ($82,800/year for first 5 years then $55,500/year for years 6 through 30)
- Scenario 2 adjustment resulted in a 36% increase to $35,409,797

Greens Creek – Scenario 3

- Water treatment increased to 50 years (Greens Creek planned 7 years)
  - Sludge disposal $1,000,000 ($20,000/year)
  - Capital replacement costs $7,228,000 (includes 25% of capital costs in years 10 and 20, 50% of capital costs in year 50, and $2 million in year 10 for water management structures)

Greens Creek – Scenario 3

- Monitoring and Maintenance extended 30 years beyond operation of the water treatment facilities
  - General site operation and maintenance (labor, power, service) totals $34,722,543
  - Long-term operation and maintenance (surface water, groundwater, and reclamation monitoring) totals $10,479,851
- Scenario 3 adjustment resulted in a 263% increase to $94,590,373

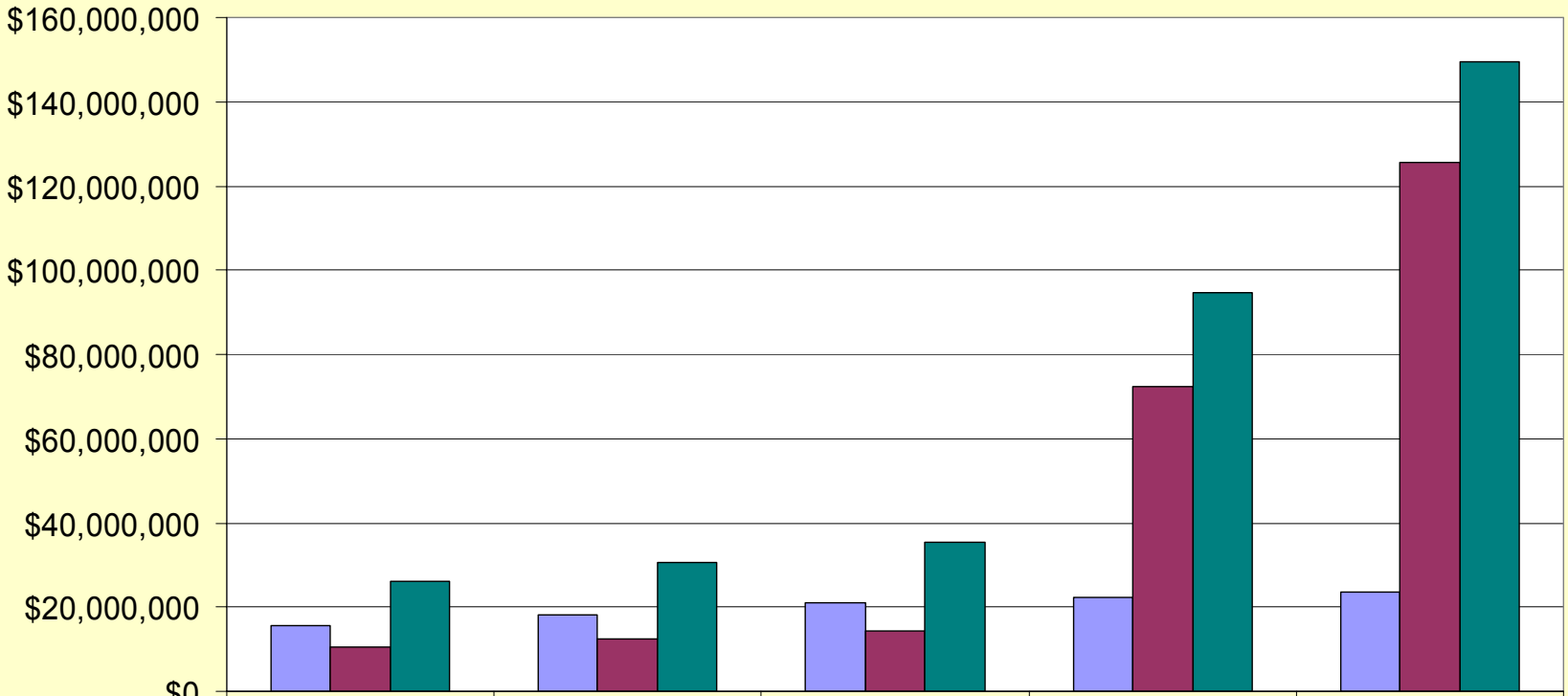
Greens Creek – Scenario 4

- Water treatment increased to 100 years (Greens Creek planned 7 years)
  - Sludge disposal $2,000,000 ($20,000/year)
  - Capital replacement costs $7,228,000 (includes 25% of capital costs in years 10 and 20, 50% of capital costs in year 50, and $2 million in year 10 for water management structures)

Greens Creek – Scenario 4

- Monitoring and Maintenance extended 30 years beyond operation of the water treatment facilities
  - General site operation and maintenance (labor, power, service) totals $65,359,926
  - Long-term operation and maintenance (surface water, groundwater, and reclamation monitoring) totals $16,888,501
- Scenario 3 adjustment resulted in a 473% increase to $149,376,667

Greens Creek Mine Financial Assurance Summary



	Scenario 0	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Capital Costs	$15,475,139	$18,117,236	$21,032,526	$22,270,926	$23,710,926
Operating Costs	$10,573,961	$12,379,271	$14,377,271	$72,319,447	$125,665,735
Total	$26,049,100	$30,496,507	$35,409,373	$94,590,373	$149,376,667

Financial Assurance Cost Estimate Case Study

Chino and Tyrone Mines
New Mexico

Chino and Tyrone Mines, NM

- Mining initiated late 1800's
- Major mining operations initiated 1950's-1960's
- Open pit copper mining with milling and dump leaching
- High acid generation potential
- Disturbed Area:
  - Chino = 9,200 acres
  - Tyrone = 6,000 acres
- Lead Regulatory Agencies
  - New Mexico Environment Department
  - New Mexico Mining and Minerals Division, NRD

Chino and Tyrone Mines, NM

- Financial Assurance Requirements
  - NM Mining Act enacted 1994
  - Required submittal of closure plan and financial assurance by 1996.
  - Requirement delayed in 1996, 1999 and 2001
  - NM Water Quality Act rules also require financial assurance for mine closeout
    - Has led to dual closure/closeout planning and financial assurance process

Chino and Tyrone Mines, NM

- Financial Assurance History
  - Prior to 1999 $1.8M
  - 1999 $114M
  - 2003 Chino $395M
    - Agreed upon by Phelps Dodge and NMED & MMD

      Tyrone $330-$440M
    - $330M proposed by PD, $440M by NMED

Comparison of Closure/Closeout Plans – Tyrone Mine

Total Costs

Task	PD Plan	PD Proposed Plan	NMED Proposed DP Plan
Capital Cost Items			
Total Capital Costs	$62,700,000	$122,643,000	$230,512,000
Operating Cost Items			
Total Operating Costs	$31,611,000	$205,446,000	$209,832,000
Total All Costs	$94,311,000	$328,089,000	$440,344,000

Financial Assurance Amounts in New Mexico versus ?