

NPS Abandoned Mineral Lands Inventory & Assessment Project (2010-2012)



# National Park System Abandoned Mineral Lands (AML) Inventory & Assessment Project

FY 2010 – 2012

John Burghardt  
NPS AML Program Coordinator

NRSS Webinar Series  
05/08/2013

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## Overview

- The Report (January 2013)
- Background
  - General Program Information
  - Data Collection
  - Prioritization for Mitigation Actions
- **Results**
- Assessment Details
  - Mitigation Techniques
  - Mitigation Cost Estimation
- Where we go from here

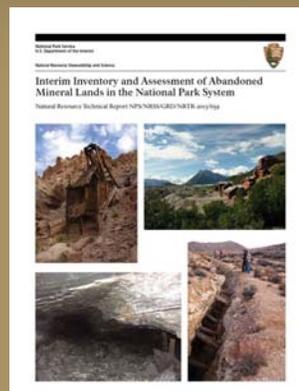
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## The Report



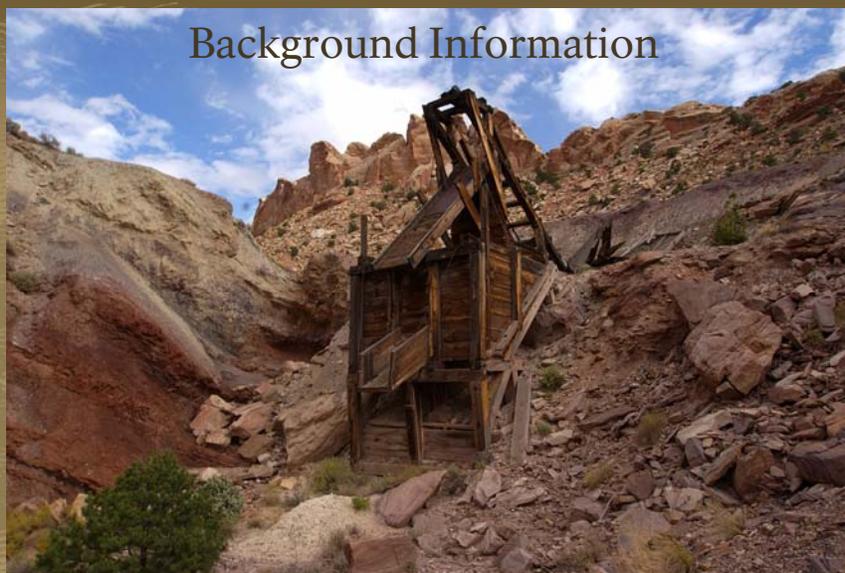
- Produced in January 2013
- **“Interim”** because California parks’ inventory is estimated at only ~50% complete (data to date included in the report)
  - California inventory to be completed in 2013
  - California may have 80% of Service-wide inventory
- **Final report – early 2014** including all California data



[http://nature.nps.gov/geology/aml/inventory/NPS\\_AM\\_L-landA\\_508\\_Compliant-2013-0308-FINAL.pdf](http://nature.nps.gov/geology/aml/inventory/NPS_AM_L-landA_508_Compliant-2013-0308-FINAL.pdf)

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## Background Information



Duchess Uranium Mine headframe over inclined shaft, Capitol Reef National Park

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## Service-wide AML Program

- 1989 – AML Program formally established
- 2011 – AML Advisory Committee (AMLAC) formally established (regional representatives)
- Program Coordination – through Geologic Resources Division (GRD)

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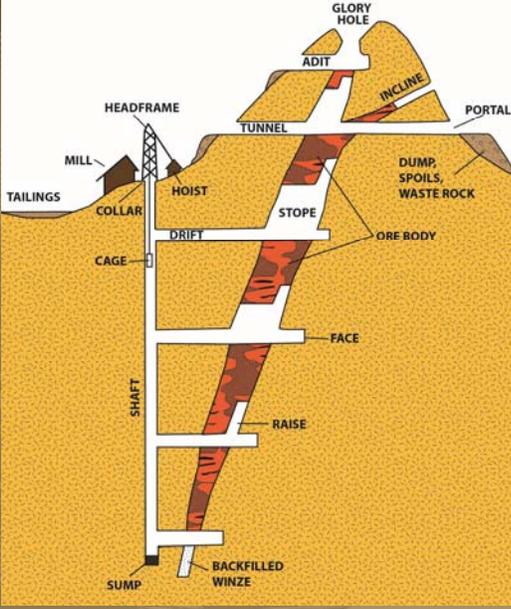
## What's out there and why?

- Legacy of mining when cleanup was not required
- Hazards
- Environmental Impacts
- Habitat destroyed & created
- Cultural assets to preserve



Slate Creek Antimony Mine  
(reclaimed August 2010 with fee funds)  
Denali National Park and Preserve

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***Distinction:***  
**SITE v. FEATURES**

***Main NPS Issues***

1. HAZARDS
  - Drowning (flooded quarries, underground)
  - Vertical drop-offs (It doesn't take a very deep hole!)
  - Bad air – low O<sub>2</sub>, gases
  - Unstable rock and structures
2. ENVIRONMENTAL IMPACTS
  - Metals / acid
    - soils and water
  - Wildlife and vegetation
  - Viewshed

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## Recent Noteworthy Developments

- July 2008 - OIG Audit of DOI AML Programs (BLM & NPS)
- October 2008 – NPS Director's Memo re: audit
- 2009 - American Recovery and Reinvestment Act (ARRA = "Stimulus")  
\$24.6M / 923 features / 31 parks / all 7 regions / 15 states)
- 2010 – Funding for this Inventory & Assessment Project

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## Data Collection



### **SAFETY!!**

- Underground work done only by qualified, equipped personnel
- This project – no extensive underground work
  - Just inside portals as far as needed to assess for closure

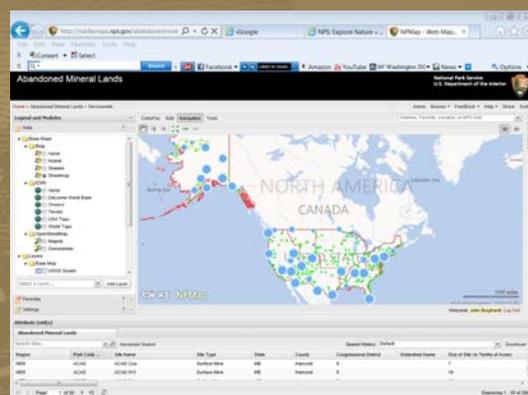


Crest Trail Copper Mine  
Coronado National Memorial

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## Servicewide AML Database – NPMMap



<http://insidemaps.nps.gov/>

- Real-time
- Field-interactive
  - Download data
  - Edit/update data
- **NPS Intranet only**
- **Access rights required**
  - AML application not visible without rights
  - See your regional or park AML contact(s)
    - 1 or more per park and region

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## Servicewide AML Database – NPMMap



### Mobile Software Synchronizes GPS datalogger with database

1. Download from database
2. Collect data in the field
3. Upload updated information to database

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## AML Information Collected



### SITE:

- General (region, park, state, site name, and type, notes)
- Geologic (commodities mined, notes)
- Resource impacts (to land, water, wildlife, vegetation, cultural resources, viewshed)
- Cultural resources (National Register or Cultural Landscape listing, interpretation of site)

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## AML Information Collected

### FEATURE:

- Identification
- Accessibility
- Geographic description
- Dimensions
- Biological resources
- Hazards
- **Mitigation required**
- Mitigation completed
- Sample data
- Ranking data – hazards, access, resource significance & impacts
  - Planning
    - hazards / impacts
  - Implementation
    - all 4 criteria + costs / budget

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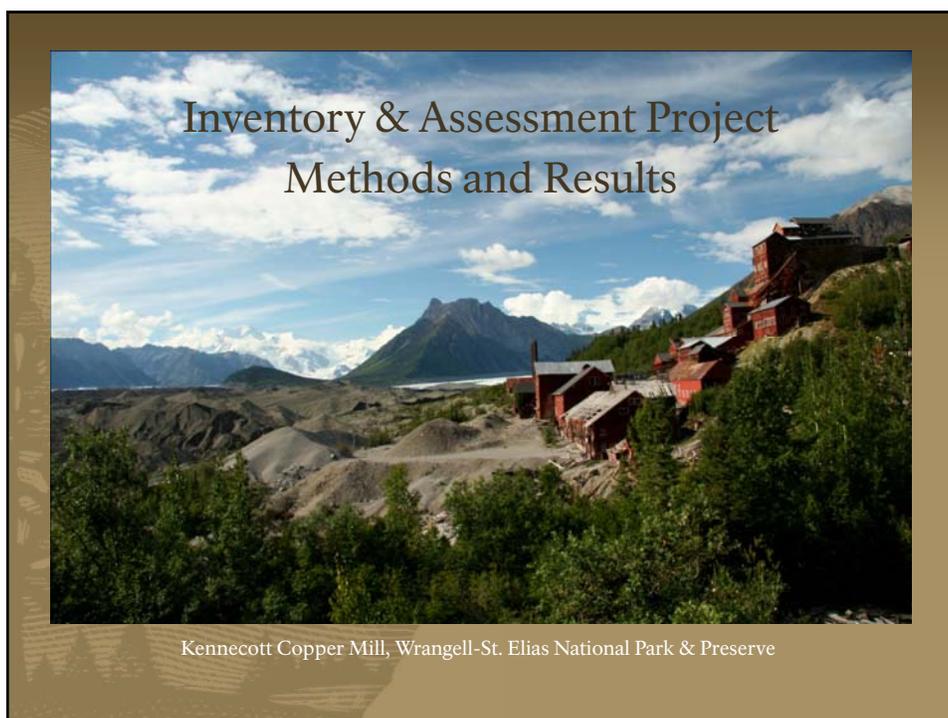
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## Feature Characterization

- **Action Required Features**
  - Prioritization by features and by sites
- **No Action Required Features - WHY??**
  - Already mitigated
    - monitoring & maintenance
      - vandalism, deterioration, collapse, erosion
  - Features that will aid in remedial actions
  - General site characterization
- Monitoring Fields
- Whatever else the park wants to record
  - Note fields for data not specifically in database

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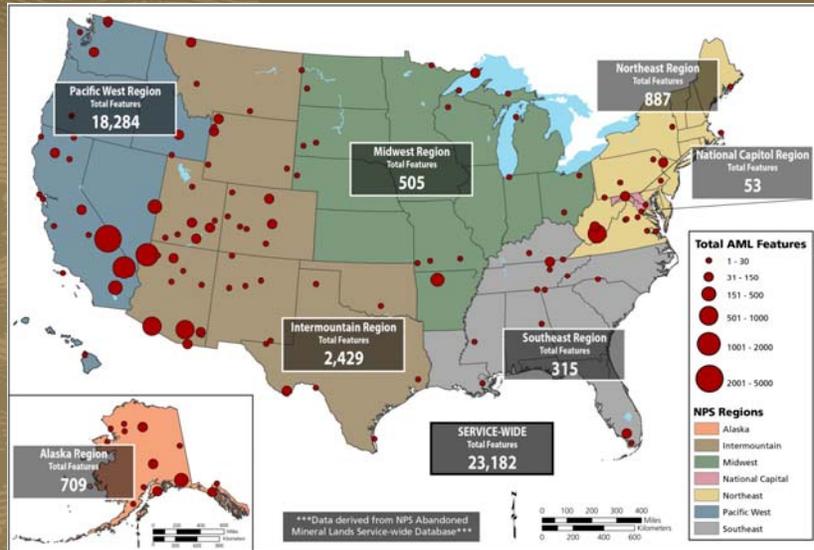


### Differing regional approaches to conducting inventory

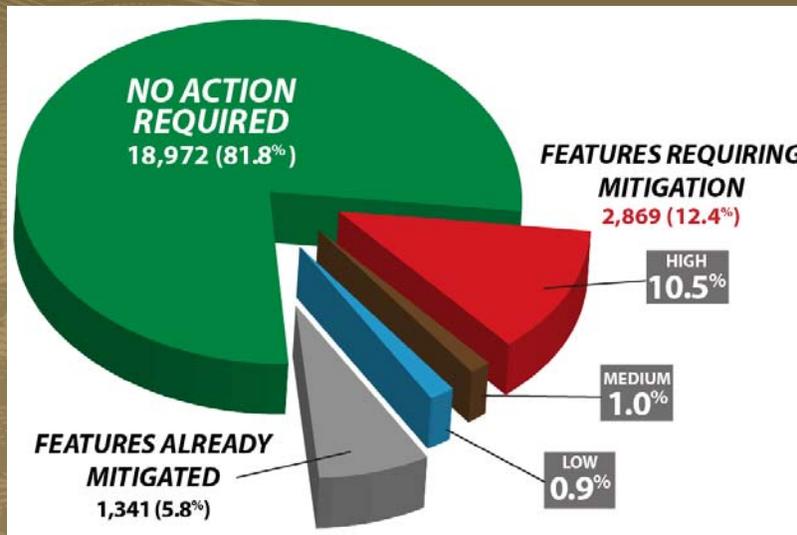
- Contract
- In-house: regions and parks with AML expertise
- California : Cooperative Agreement with State
  - As noted above
    - 53% complete at time of 2013 report
    - Final, complete report in early 2014

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### Distribution of 23,182 AML features in 129 NPS units

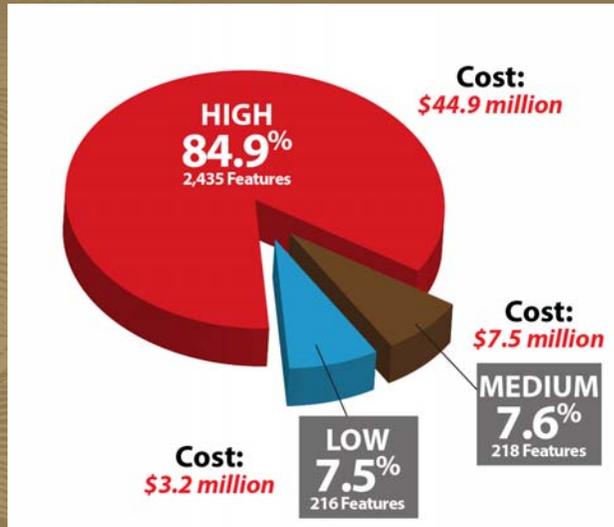


### 23,182 Features (Note: California incomplete)

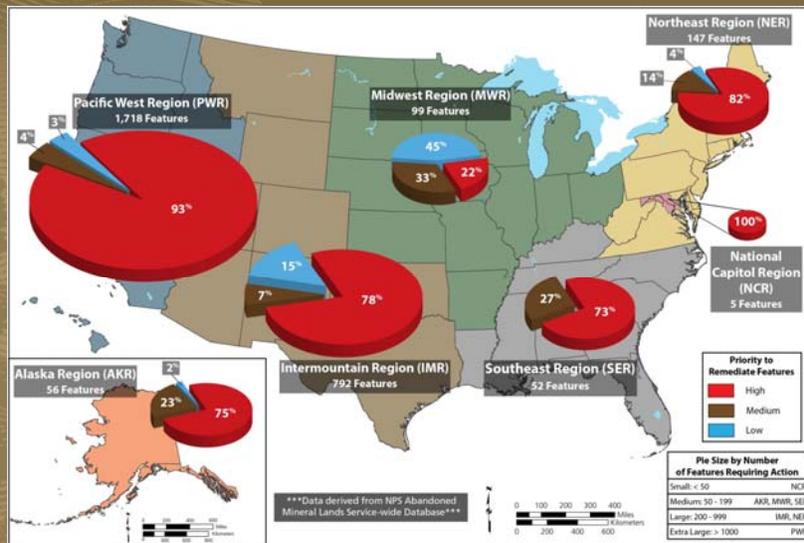


### Prioritizations and Costs

(Note: 2,869 features: 12.4 % of the inventory - \$55.6M)



### Results by Region (total: 2,869 features require action)



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## Results Summary Table

Region (# NPS units that have AML features)	Sites and Associated Features Requiring Mitigation									Total Regional Costs (x \$1,000)
	High			Medium			Low			
	Sites	Features	Cost (x \$1,000)	Sites	Features	Cost (x \$1,000)	Sites	Features	Cost (x \$1,000)	
Alaska (13)	29	42	6,342	9	13	2,058	1	1	32	8,432
Intermountain (44)	146	614	13,886	34	60	3,839	109	118	1,741	19,466
Midwest (18)	5	22	83	18	33	239	21	44	640	962
National Capital (3)	2	5	33	0	0	0	0	0	0	33
Northeast (15)	48	121	901	16	20	131	5	6	57	1,089
Pacific West (23)	379	1,593	19,943	42	78	797	36	47	716	21,456
Southeast (13)	17	38	3,690	14	14	434	0	0	0	4,124
<b>Service-wide Totals (129 NPS units)</b>	<b>626</b>	<b>2,435</b>	<b>\$44.9 million</b>	<b>133</b>	<b>218</b>	<b>\$7.5 million</b>	<b>172</b>	<b>216</b>	<b>\$3.2 million</b>	<b>\$55.6 million</b>

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## Assessment Details

- Mitigation Techniques
- Mitigation Cost Estimation



Keane Wonder Gold Mill - Death Valley National Park

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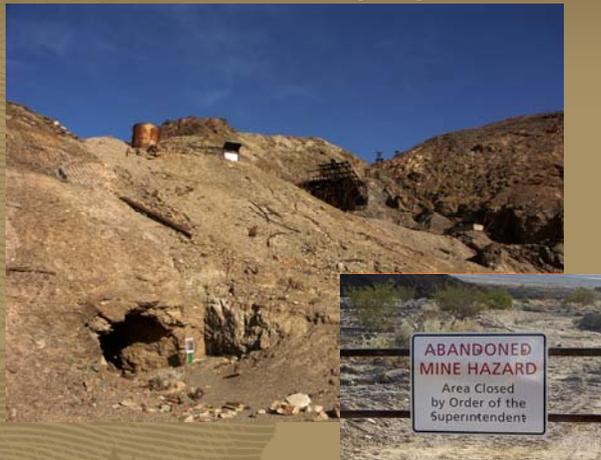
## Mitigation Techniques



For NPS Standard Closure Drawings and Specifications, see:  
<http://nature.nps.gov/geology/aml/publications.cfm>

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## Administrative Closure / Signage



Keane Wonder Gold Mine, Death Valley National Park

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## Fencing - temporary / long-term



El Portal Barite Mine - Yosemite National Park



Gold Standard Gold Mine - Mojave National Preserve



Red Cloud Zinc Mine - Buffalo National River

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## Steel Wire / Cable Nets



Skidoo Gold Mine, open stope and Greenwater Gold Mine Shaft 10  
Death Valley National Park



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## Backfill



Rainy Day Uranium Mine, Capitol Reef National Park

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## Polyurethane Foam (PUF) / Backfill



Mantle Gold Mine, Dinosaur National Monument

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## Native Rock Wall / Backfill



Jomac Uranium Mine – Glen Canyon National Recreation Area

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## Well Plugging / Pit Cleanup & Restoration



Two oil & gas wells before and after plugging  
Big South Fork National River and Recreation Area

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# Steel Grates



Mariscal Mercury Mine, Big Bend National Park

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# Bat Gates



Crest Trail Gold Mine  
Coronado National Memorial



Katherine Access Gold Mine  
Lake Mead National Recreation Area



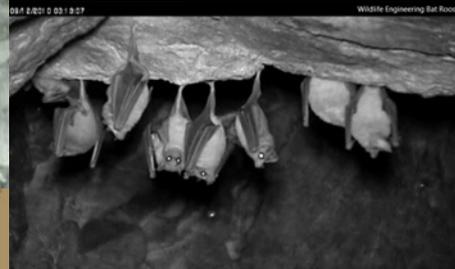
Kaymoor Coal Mine  
New River Gorge National River



Mariscal Mercury Mine  
culvert gate  
Big Bend National Park

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## Bat surveys (external and internal)



(Dave Dalton, Wildlife Engineering, photos taken from infrared videography)

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## Bat Cupolas



Mine 65 (gold) - Saguaro National Park



Rattlesnake Gold Mine  
Mojave National Preserve



Quillin Gold Mine - Fort Bowie National Memorial



State of Texas Gold Mine  
Coronado National Memorial

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## Reclamation / Restoration - Land



Sand Creek Gravel Pit, Great Sand Dunes National Park & Preserve

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## Restoration / Treatment - Water

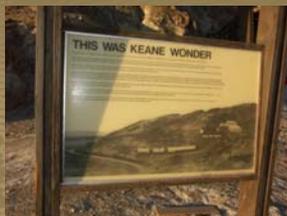


Miscellaneous Coal Mines – Acid Mine Drainage (not yet treated)  
Big South Fork National River and Recreation Area

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## Restoration of Structures / Interpretation



Keane Wonder Gold Mine tibble, Twenty Mule Team Borax Display, Death Valley National Park

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## Explosives Removal



El Cid Gold Mine, Joshua Tree National Park

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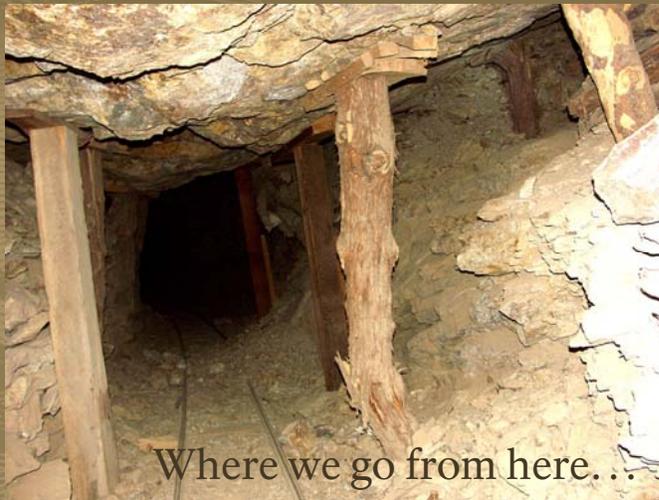


## Mitigation Cost Estimation

- Comparable costs of recent projects
  - ARRA and other recent projects
- Standard Cost Estimation Technique – Assess:
  - Labor
  - Equipment
  - Materials
  - Travel
  - Contractor mark-ups
  - Pre- and post-closure wildlife surveys
  - Compliance
    - NEPA
    - NHPA Section 106
    - ESA Section 7
    - Other

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Where we go from here. ...

Skidoo Mine stope, mid-level, Death Valley National Park

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## Where we go from here...

- Complete remaining inventory work
  - particularly California
  - refine / update information in other parks
- Prepare Final Report – release early in 2014
- Develop Action Plan –
  - AMLAC's top priority now
  - Region & park staff working with AML contacts
- Seek funding
- ***Ultimate Goal – Mitigate all features that need it!***

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National Park Service  
U.S. Department of the Interior

Natural Resource Stewardship and Science  
Geological Resources Division  
Energy and Minerals Team

### **AML Program website:**

**<http://nature.nps.gov/geology/aml/index.cfm>**

### **IRMA – AML I&A Report:**

**<https://irma.nps.gov/App/Reference/Profile/2192198>**

### **Regional and Park AML Contacts:**

**<http://nature.nps.gov/geology/aml/contacts.cfm>**

**AML SharePoint Site**

### **AML Program Coordinator:**

**[John\\_Burghardt@nps.gov](mailto:John_Burghardt@nps.gov), 303-969-2099**

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