

# **CLEANING-UP ABANDONED AND ORPHANED MINES IN CALIFORNIA**

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# Sustainable Conservation



## 4 Pillars

1. Clean Air
2. Clean Water
3. Biodiversity
4. Climate Protection

## Mission Statement:

Partners with business, industry, private landowners, and government agencies to address California's environmental problems in ways that makes economic sense.



# Generous Support for our Study

## **Public funding:**

- California's Department of Water Resources & Department of Conservation (CALFED Watershed Program)

## **Private funding:**

- San Francisco Foundation (San Francisco Bay Fund)

## **Key insights and advice:**

- Trout Unlimited, EPA, and the Central Valley Water Board

**THE SAN FRANCISCO FOUNDATION**

**DEPARTMENT OF  
WATER RESOURCES**



State of California  
**Department of Conservation**



# That's What *I'm* Talkin' About!

**Opportunities and challenges** for the voluntary clean-up of abandoned/orphaned mines under the federal Good Samaritan Initiative.

**Case comparison:**

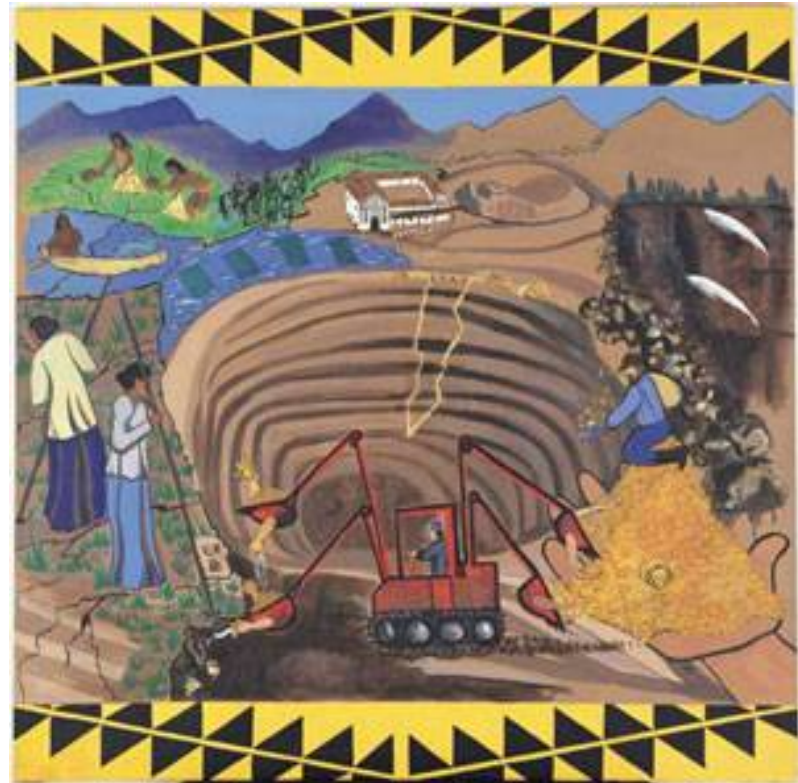
- Pacific Mine (Utah)
- Mt. Diablo Mercury Mine (CA)

*Definitions:*

- **Abandoned Mines:** owners/operators or successors can be identified.
- **Orphaned Mines:** owners/operators or successors cannot be identified.

# Digging a Hole

- ❑ 26 million lbs. of mercury used in Sierra Nevada and Klamath-Trinity Mountains.
- ❑ Most mercury extracted from cinnabar deposits in the Coast Range.



Loss of the Maidu Nation in *Gold, Greed & Genocide*. Denise Davis 1999

# After the Gold Rush

- ❑ Over 47,000 abandoned mines exist in California (CA DOC).
- ❑ A subset of this total (~5,200) pose hazards to the environment.
- ❑ About 900 of these hazardous sites are within the 9 county Bay-Delta region.
- ❑ 67% of the abandoned mines in California occur on *federal* lands.
- ❑ 31% of the abandoned mines in California occur on *private* lands.
- ❑ 2% of the abandoned mines in California occur on *State* or *local* properties.
- ❑ Few abandoned mines will ever be characterized or cleaned-up by government.



Metacinnabar:  $\text{HgS}$ ; Mt. Diablo Mercury Mine, Contra Costa County, CA. © Rob Lavinsky

# The Trouble with Acid Mine Drainage (AMD)

- AMD forms when precipitation, surface-water, or groundwater mixes with sulfur-laden waste rock above or below ground.
- Aluminum, Arsenic, Cadmium, Copper, Lead, Magnesium, Mercury, Nickel, and Zinc.
- AMD flows out of mine *adits* and piles of waste rock and into waterways.
- AMD is lethal for fish and wildlife, and can foul drinking water supplies (forever).



# Super Distilled Findings



- Our classic environmental laws were not written to address abandoned mines.
- Acid mine drainage is the central regulatory issue.
- The Good Samaritan Initiative increased regulatory flexibility, but *citizen suit* provisions remain.
- Most agencies and NGOs lack the necessary will to pursue voluntary cleanups.
- The mining industry is missing from the equation.



# Federal Clean Water Act (CWA)

- The heavy metals in AMD are *priority pollutants*.
- EPA or the States set water quality standards (WQS) -- *fishable and swimmable*.
- Process begins by setting *beneficial use designations* for individual waterbodies.
- EPA or the States set numeric or *non-numeric* WQS to protect beneficial uses.



The Cuyahoga River Fire of 1952 – 30 times larger than the infamous blaze on 22 June 1969.

# Federal Clean Water Act (CWA)

(...Continued)

- States designate and set *numeric effluent limits* for priority pollutants.
- States assume pollutant sources can be addressed or eliminated under the National Pollutant Discharge Elimination System (NPDES).
- EPA or the States restrict discharges of *pollutants* with NPDES permits.



Image courtesy of the Prairie Rivers Network.

# Discharge of a Pollutant



- Pollutant *discharge*: *addition* of a pollutant into *navigable waters* from a *point source*.
- Point sources: *discernible, confined, and discrete conveyance* such as pipes, ditches, channels, tunnels, conduits, wells, discrete fissures, (and, yes, adits).
- Such conveyances are commonplace at abandoned/orphaned mines.
- The CWA regulates pollutant discharges from abandoned/orphaned mines into navigable waters.

# Discharge of a Pollutant



- AMD resembles non-point source *stormwater* runoff
- AMD is influenced by weather and has fluctuating pollutant mixes, but it's regulated as a point-source (rather than being excluded from numeric effluent limits as is stormwater).
- *Continuous discharges* of AMD may persist even after rigorous cleanup actions.
- If one touches or manipulates features of the mine, then one risks becoming an owner/operator in the regulatory realm, and therefore subject to liability and NPDES requirements.

# CERCLA (Superfund)

- On 12/11/80, Congress enacted the Comprehensive Environmental Response, Compensation, and Liability Act.
- The most dangerous sites are ranked on the National Priorities List (NPL).



The *Valley of the Drums*, an infamous 23-acre site in Bullitt County, KY, circa 1979, USEPA.

# CERCLA (Superfund)

- CERCLA liability is retroactive and arises when:
  - ▣ *release of a hazardous substance from a facility...*
  - ▣ *by past or present owners or operators of the facility, or*
  - ▣ *by any person who arranges for the disposal/treatment of hazardous substance.*
- CERCLA contains “polluter pays” provisions:
  - ▣ EPA/states clean-up sites and seek reimbursement from PRPs.
  - ▣ EPA/states order PRPs to clean-up sites under government supervision.



The Schroeder children on 99th Street, Love Canal, NY (4 August 1978). Image courtesy of ABC News.

# Why am I Telling you This?



- The CWA and CERCLA were not written to regulate AMD from mines.
- The General Mining Law of 1872 disregards environmental protection altogether!
- AMD contains priority pollutants and “behaves” like non-point source stormwater.
- AMD discharges into navigable waters from point sources, and is therefore subject to numeric effluent limits under NPDES permits issued by agencies.



# Why am I Telling you This?



- Numeric limits are difficult to achieve even after cleanup (due to continuous discharges of AMD).
- Good Samaritans don't want to touch an abandoned/orphaned site where they might *discharge pollutants* under the CWA, or *release hazardous substances* under CERCLA.



# Regulatory Flexibility under Existing Law (or not)

- The CWA's stormwater regulations (for industrial and mining sites) contain liability exemptions for the diversion of clean water away from waste materials.
- CERCLA regulations exempt from liability the diversion of clean water away from waste materials as long as hazardous substances are not released.
- CERCLA's Good Samaritan provision (§107(d)) exempts from liability the voluntary capping of waste rock piles.
- CWA §505 allows 3<sup>rd</sup> party *citizen suits*, and this scares prospective Good Samaritans.

# Good Samaritan Model Settlement Agreement



- On 6 June 2007, EPA and DOJ released *Good Samaritan* guidance and a *Model Settlement Agreement* (Guidance and Model Agreement).
- Focuses on abandoned *hard rock* mines.
- Addresses sites not listed or proposed for listing on the NPL, nor the subject of ongoing or planned *removal actions*.
- Preserves CERLA's "polluter pays" principle.

# Good Samaritan

## Definitions and Provisions

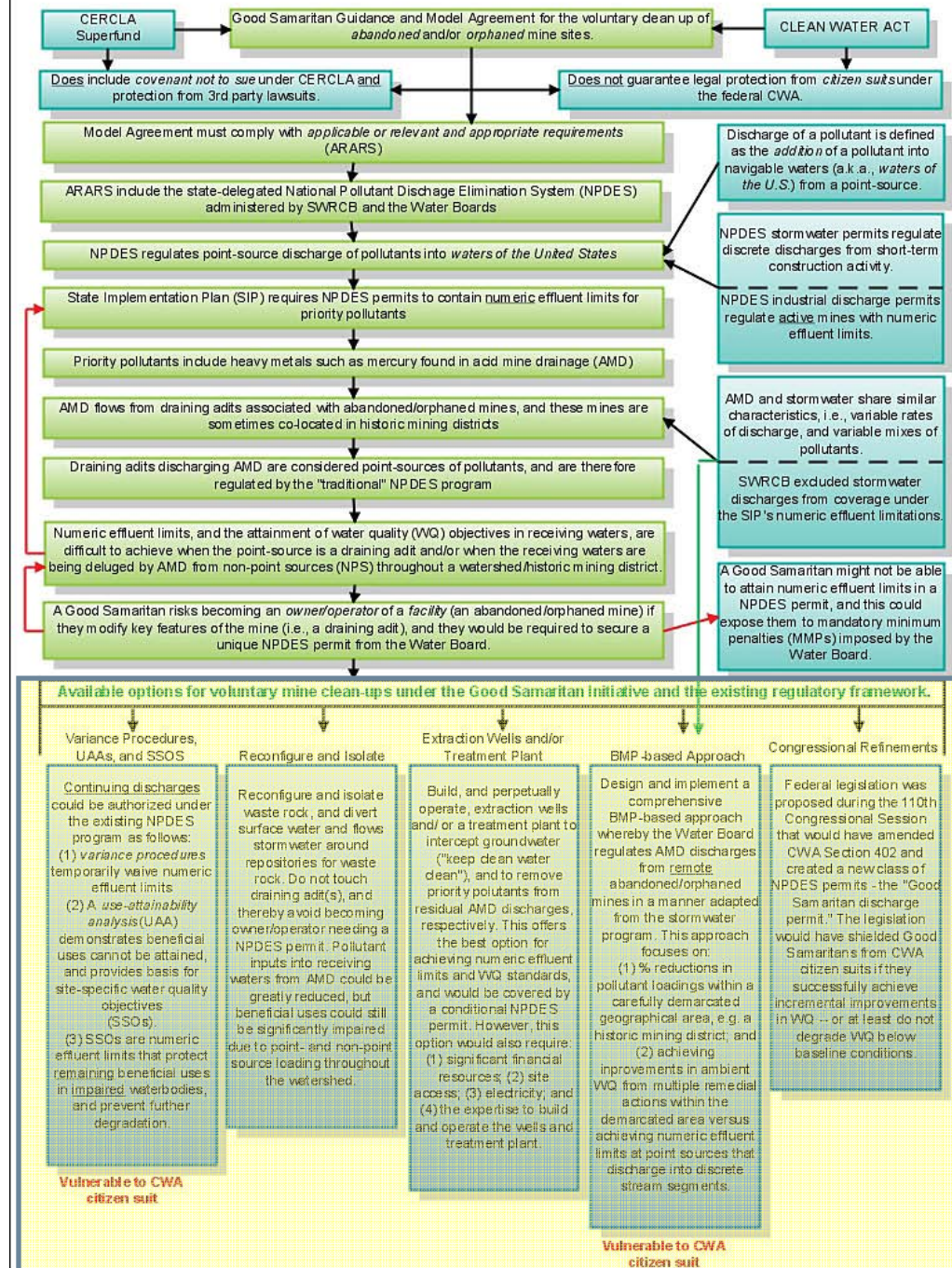


- A person not potentially liable under any other federal, state, or local law for the remediation of existing contamination.
- Individuals, corporations, non-profit organizations, states, local governments, and municipalities.
- Allows Good Samaritan cleanups to be funded with federal funds unrelated to CERCLA such as federal grants, or special Congressional appropriations.
- Provides legal protections (liability coverage) to Good Samaritans -- including a federal covenant not to sue under CERCLA, and protection from third-party lawsuits.
- Allows limited recycling or incidental reprocessing of historic mine tailings directly related to the cleanup.

# Game Over?! Bring on the Voluntary Cleanups! Hello, Anybody There?

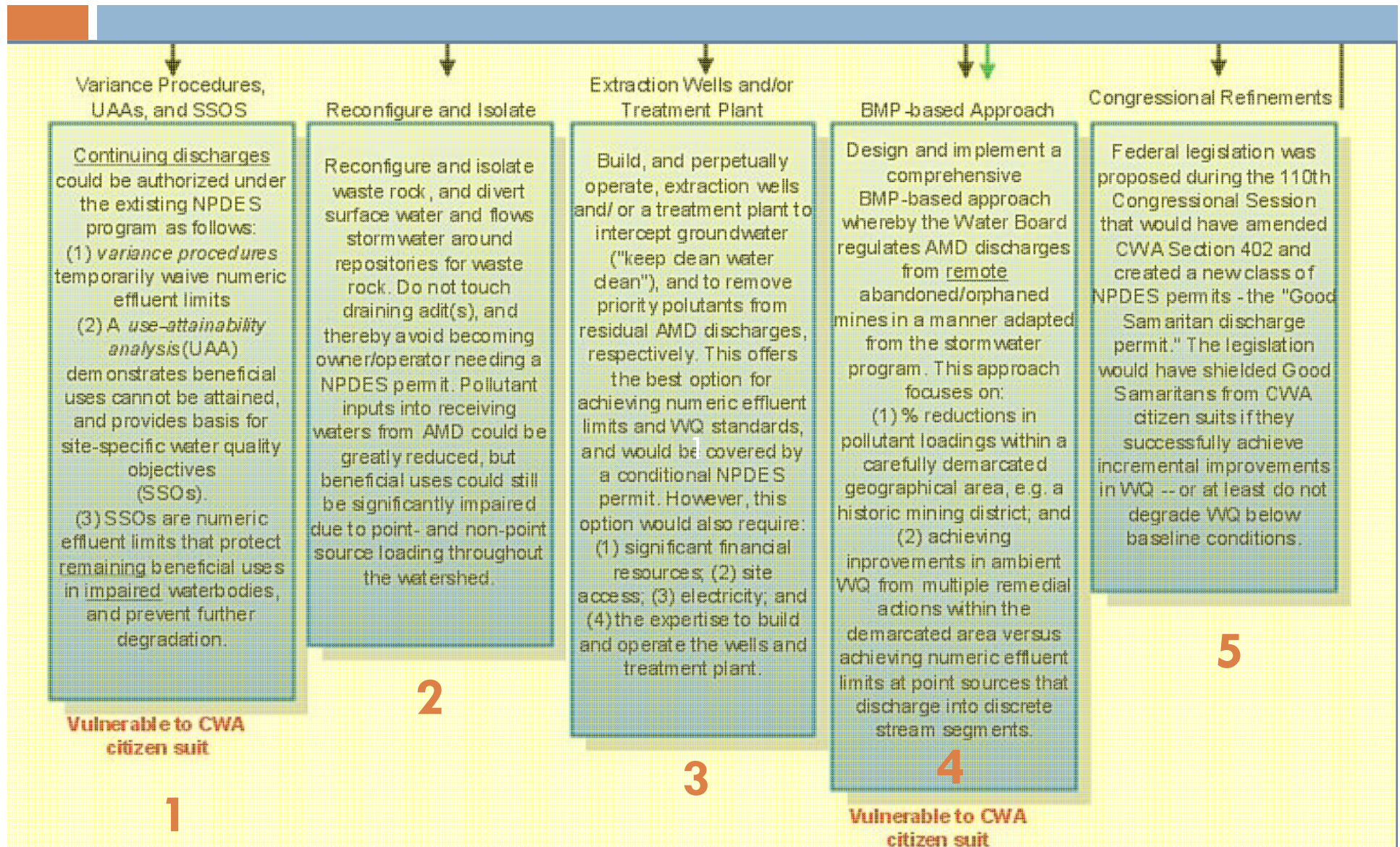
- Compared to the Coal Re-mining Rule, the Good Samaritan Initiative lacks economic incentives that encourage government supervised, voluntary cleanups.
- The Good Samaritan Initiative appears to rely on altruism – a rare commodity indeed.
- O&M and perpetual stewardship responsibilities after cleanup remain key questions.
- Time to look at the flow chart – five routes toward cleanup and compliance ;-)

## Good Samaritan Initiative





# Available options for voluntary mine clean-ups under the Good Samaritan Initiative and the existing regulatory framework.



# 1. Variance Procedures, UAAs, and SSOs

Continuing discharges could be authorized under the existing NPDES program as follows:

1. *Variance procedures* temporarily waive numeric effluent limits
2. A *use-attainability analysis* (UAA) demonstrates beneficial uses cannot be attained and provides basis for site-specific water quality objectives (SSOs)
3. SSOs are numeric effluent limits that protect remaining beneficial uses in impaired waterbodies and prevent further degradation.

**Vulnerable to CWA citizen suit**



## 2. Reconfigure and Isolate

- Reconfigure and isolate waste rock, and divert surface water and flows storm water around repositories for waste rock.
- Do not touch draining adit(s), and thereby avoid becoming owner/operator needing a NPDES permit.
- Pollutant inputs into receiving water from AMD could be greatly reduced, but beneficial uses could still be significantly impaired due to point- and non-point source loading throughout the watershed.



### 3. Extraction Wells and/or Treatment Plant

- Build, and perpetually operate, extraction wells and/or a treatment plant to intercept groundwater (“keep clean water clean”), and to remove priority pollutants from residual AMD discharges, respectively.
- This offers the best option for achieving numeric effluent limits and WQ standards, and would be covered by a conditional NPDES permit. However, this option would also require:
  1. Significant financial resources
  2. Site access
  3. Electricity
  4. The expertise to build and operate the wells and treatment plant.

## 4. BMP-based Approach

- Design and implement a comprehensive BMP-based approach whereby the Water Board regulates AMD discharges from remote abandoned/orphaned mines in a manner adapted from the storm water program.

This approach focuses on:

1. Percent reductions in pollutant loadings with a carefully demarcated geographical area, e.g. a historic mining district; and
2. Achieving improvements in ambient WQ from multiple remedial actions within the demarcated area versus achieving numeric effluent limits at point sources that discharge into discrete stream segments.

**Vulnerable to CWA citizen suit**

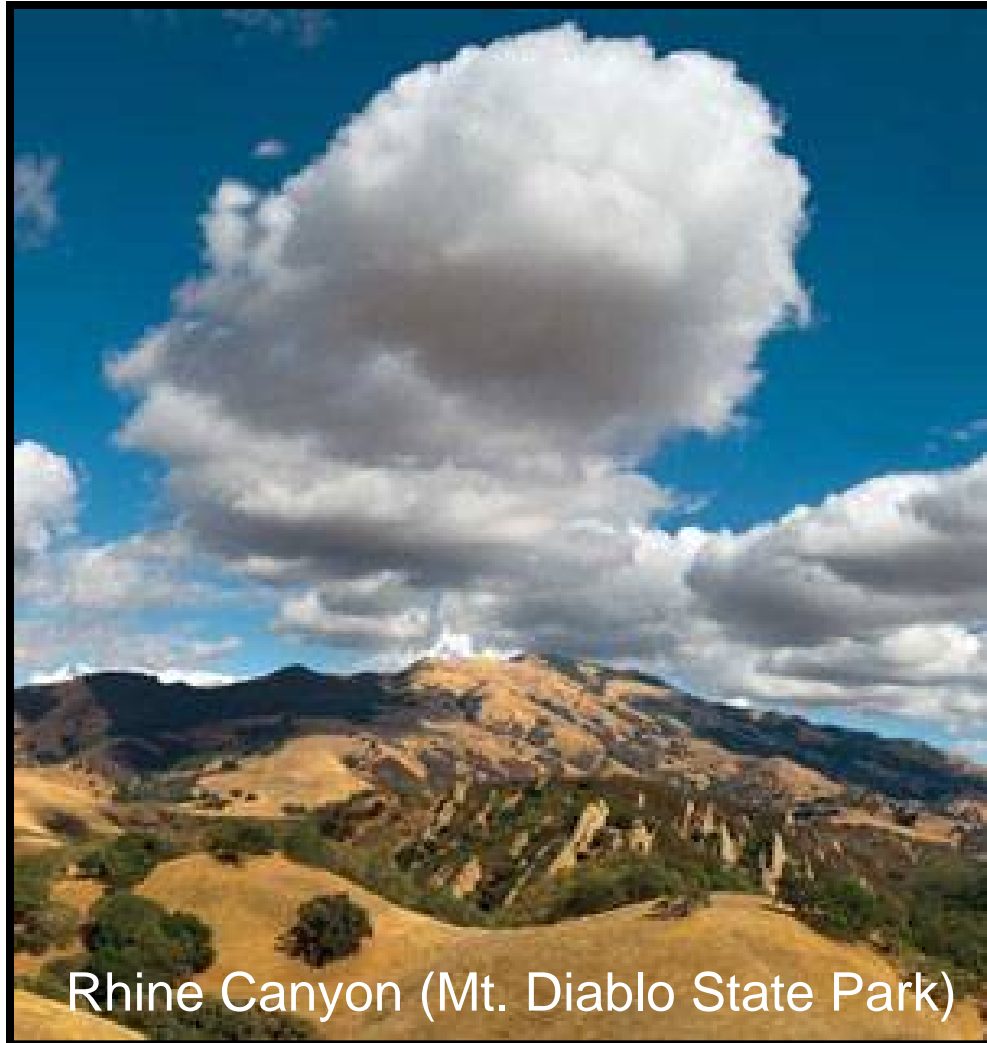
## 5. Congressional Refinements



Federal legislation was proposed during the 110<sup>th</sup> Congressional Session that would have amended CWA Section 402 and created a new class of NPDES permits – the “Good Samaritan discharge permit.”

The legislation would have shielded Good Samaritans from CWA citizen suits if they successfully achieve incremental improvements in WQ -- or at least do not degrade WQ below baseline conditions.

# Case Comparison: Mt. Diablo Mercury Mine (CA) vs. Pacific Mine (UT)



The American Fork Canyon River, U  
M. Strozewski



# Pacific Mine/Snowbird



Pacific Mine Repository Constructed by Trout Unlimited and Snowbird, 2006.

Published in *American Fork Canyon Home Rivers Project* Ted V



# Pacific Mine/Snowbird

- ❑ TU was undaunted despite technical, legal, and financial challenges.
- ❑ Without federal funding, the Good Samaritan cleanup of Pacific Mine would not have happened -- despite the vision and perseverance of TU, USFS, EPA, and Snowbird.
- ❑ The mining industry did not offer financial assistance, but Tiffany did.
- ❑ TU, USFS, and EPA reconfigured waste rock and established a sealed repository.



# Pacific Mine/Snowbird

- Continuing discharges of AMD from a plugged adit near the Pacific Mine were diverted away from the repository and routed to USFS' oxidation ponds.
- The adit was not plugged under the Good Samaritan Initiative, but it had been previously closed with an earthen plug



# Mt. Diablo Mercury Mine

- Mt. Diablo Mercury Mine (1875-1939) flows into Marsh Creek (Delta tributary).
- AMD from the mine comprises 95% of the total mercury inputs into Marsh Creek.
- Potential Good Samaritans in California need to take risks beyond their comfort zones.
- If “voluntary” cleanups actually depend upon federal funding, then the Good Samaritan Initiative is just a federally-funded alternative to Superfund cleanups.
- Extraction wells could be installed in the collapsed mine, and perpetually operated to intercept and divert clean groundwater, but this would be a complex and expensive.
- If a Good Samaritan obtained a NPDES permit from the Water Board, and the permit authorized some level of residual, *continuous discharges* of AMD, the exposure of all parties to litigation under CWA’s citizen suit provisions might be minimized.



# Mt. Diablo Mercury Mine



Two views of the main seep at the Mt. Diablo Mercury Mine from across the settling pond. In both cases, the photographers may have stood on the berm separating the pond from Dunn Creek. At left, the mine as it appeared in 1994 from the archives of R.W. Graymer, D.L. Jones, and E.E. Brabb; USGS Open-File Report 94-622. At right, the mine as it appeared on 31 July 2008 courtesy of John Hillenbrand, US EPA.

# Thank you & Discussion



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