

Prepared Statement of

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Committee on Natural Resources
Subcommittee on Energy and Mineral Resources
Concerning “Abandoned Mines and Mercury in California”
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Chairman Costa and members of the Subcommittee, thank you for the opportunity to appear today to discuss our experience with abandoned mines and mercury in California. California has a long history of mining and its environmental impacts, which dates back to the California Gold Rush, which began in Coloma just east of Sacramento in 1848. People from across the nation are drawn to our rivers and streams throughout California, from the rugged Coastal mountains and Sierra Nevadas to the extensive Sacramento and San Joaquin river systems and the Delta. We have many federal, state, and local parks and their lakes and rivers are a focal point for recreation. People journey to California to enjoy the outdoors, to swim and to fish, among other water sports. It is the responsibility of the State Water Resources Control Board to protect beneficial uses of water under both the Clean Water Act and under the California Water Code. These beneficial uses include drinking, swimming, fishing, and many other uses that are the foundation of peoples’ enjoyment of California’s vast natural resources.

California’s mines cause two serious water quality problems - acid mine drainage and mercury in waterways – which are both complex and will take generations to address effectively. Acid mine drainage has resulted in miles of streams that can no longer sustain aquatic life. Mercury poses one of the highest human health threats of all the water quality problems the Water Boards face.

Based on information acquired from state and federal agencies in 2007, there are an estimated 47,000 Abandoned Mine Land (AML) sites in California. Approximately 50% of AML sites are located on private lands, 48% are located on federal lands and 2% on state lands and they are widely distributed across the state. We have identified 121 of these abandoned mines as posing a substantial threat to public health and the environment by potential direct exposure to toxic constituents (e.g., arsenic, mercury, lead); by acid mine discharges to waters of the state; or by discharges of mercury and mercury mine waste into waters of the state.

ACID MINE DISCHARGES

The Problem: Of the 121 abandoned mines in California that have been identified as posing a significant threat, over 50% of the sites are abandoned mines that generate acid via a natural process of iron sulfide oxidation. The process is referred to as acid mine drainage. Mining initiated the natural process by exposing rock that contains iron sulfide minerals to air and water. Once initiated, acid generation is for all practical purposes impossible to stop. Therefore, acid mine drainage is the continuous and almost uncontrollable discharge of very acidic, metal-rich water from mines that enters streams and rivers resulting in miles of waterways barren of aquatic life. Acidic mine water discharges from such sites has virtually sterilized streams in the Sierra foothill copper belt (from Marysville to Fresno) and the East Carson River, and pollutes Shasta Lake, Lake Nacimiento, Lake Davis, Lake Tulloch, and the Delta. In fact the lowest acidity ever measured was at a Superfund/CERCLA site, Iron Mountain Mine near Redding, which had a negative pH.

Regulatory Authority: We regulate abandoned mines with acidic discharges under the authority of the federal Clean Water Act and California's Porter-Cologne Water Quality Control Act, but it is often a challenge to find a financially viable responsible party. In the case of abandoned mines where there are no viable, directly responsible parties, the state has issued orders to property owners who may not have resources and who often have no affiliation with the original mining activities. At times, the only option for reducing the adverse environmental impacts of acid mine drainage is for a public agency, such as the Water Boards, to take actions to reduce and treat the acid mine discharges. Although the Water Boards have remediated some sites, such as Penn Mine and Leviathan Mine, and significantly reduced the environmental impacts of acid mine discharges from these mines, there are two interrelated serious impediments to the cleanup of mines by anyone who is not the responsible party. First, the treatment technologies that are currently available for acid mine discharges are not sufficient to meet water quality standards prescribed by the Clean Water Act (and specifically U.S. EPA's "California Toxics Rule") and the second impediment is that violators of the Clean Water Act can be sued by third parties. Therefore, entities, such as the Water Boards, who are not responsible parties are VERY reluctant to try to take actions to remediate acid mine discharges because 1) they will become responsible parties under current law, 2) they often will not be able to meet federal Clean Water Act requirements due to the limitations of existing treatment technologies, and 3) they can be sued by third parties for failure to meet the federal regulatory requirements. These aspects of the Clean Water Act create strong disincentives for the Water Boards or other public or private agencies to cleanup abandoned mines.

Cleanup: The cost of acid mine drainage cleanups is extremely high. Not only is the existing cleanup technology expensive, but cleanup usually requires permanent operation and maintenance (O&M) which must be funded almost literally forever. Therefore it is left to state and federal agencies to pursue these cleanups. Mine cleanup costs can be over \$100 million for large sites such as Iron Mountain, Leviathan, and Sulfur Bank Mines. Cleaning up medium-sized sites like Spenceville

and Penn Mines have cost over \$10 million. Luckily, we probably won't be "discovering" any more "large" Iron Mountains or "medium" Spencevilles. Unfortunately, we will likely continue to discover many more "small" acid generating sites that will typically cost up to \$1 million to clean up.

Abandoned mines are found on both public and private land. Abandoned mines on federal land can be addressed under the existing federal Superfund (CERCLA) program, although obtaining funding is always an issue. It is much more difficult to clean up abandoned mines on private land. Cleanup would be a costly burden for a current private land owner, whether or not they were the responsible party. There has been discussion that non-governmental organizations or individuals would voluntarily choose to fund abandoned mine cleanups. From this discussion it seems possible these parties might want to fund some of the very small mine cleanups. However with the aforementioned disincentives, it is highly doubtful that non-governmental parties will take up the necessary cleanup activities.

Recommendations:

1. Recast the Clean Water Act and California Toxics Rule for abandoned mine discharges so that cleanup requirements rely on the use of Best Available Technologies, rather than meeting numeric effluent limitations.
2. Establish an effective good Samaritan law to ensure that innocent persons, including certain landowners who did not participate in or benefit from historical mining activities, who undertake activities to improve the environment at or downstream from an abandoned mine site will be shielded from liability for pre-existing discharges of pollutants under the Clean Water Act. Under a good Samaritan law, a good Samaritan's responsibilities under the Clean Water Act should focus on improvements in downstream water quality, rather than strict compliance with water quality standards.
3. Allow public entities to "take" an abandoned mine property for purposes of cleanup from a private land owner who cannot afford cleanup. Cleaned up property could be put up for sale if appropriate.
4. Provide a funding source (e.g., royalties on mines on federal land).

MERCURY

The Problem: In many water bodies, mercury levels in fish tissues are unsafe for human consumption. Although mercury is a natural element, mining activities primarily related to gold extraction have greatly increased its distribution in the environment. The original sources are a few mercury mines and many gold mining areas. However, at this point most "legacy" mercury has been transported into river sediments throughout Northern California and the San Francisco Bay and Bay Delta. There it persists and poses the greatest threat to the environment and human health. Primary areas affected by mining are Coast Range watersheds where mercury mining occurred and many small abandoned mercury mines exist; the Sierra Nevada watersheds where mercury

used for historic gold mining was lost, and the San Francisco Bay and Bay Delta where mercury mine waste and mercury has been deposited from abandoned mercury mines in the Coast Range and abandoned gold mines in the Sierra Nevada.

Elemental mercury can become methylated in the environment. Methylated mercury is bioavailable and is a potent neurotoxin. Fish consume plants with elevated methylmercury, which is then concentrated throughout the food chain. The greatest risk to humans is eating fish with mercury toxins. Unfortunately, environmental conditions conducive to the natural methylation process coincide with the wide distribution of mercury in California. Moreover, as evidenced by the recent San Francisco Estuary Institute Lakes Report, the more we investigate, the more we find water bodies that contain mercury-enriched fish. There is no easy fix to the mercury contaminated fish issue.

Another aspect of California's water quality problems associated with mercury is the disturbances caused by suction dredging. Suction dredging is the use of motorized floating equipment to literally vacuum up stream and river bottoms in order to recover gold. Use of this equipment not only disturbs sediments, which can adversely affect fish and fish habitat, but also re-mobilizes legacy mercury that is already present in the sediments in our waterways.

Regulatory Authority: Under the California Water Code, the Water Boards have the authority to regulate or prohibit discharges of waste including mercury, and to issue cleanup orders. In addition, under the federal Clean Water Act, states are required to list water bodies that are impaired by pollutants, then to require cleanup of the impaired water bodies through establishment of Total Maximum Daily Loads (TMDLs). Appendix I shows the numbers of mercury-impaired water bodies and TMDLs approved thus far to address mercury impaired water bodies in California. TMDL development and implementation is a resource-intensive approach, but it is allowing the Water Boards to begin to address our legacy mercury sites.

Cleanup and Other Actions: Cleaning up abandoned mercury mines (except for a few acid generating abandoned mercury mines) and cleaning up mercury at abandoned gold mines is straightforward and relatively inexpensive compared to cleaning up acid generating sites. Furthermore, these cleanups do not result in federal Clean Water Act liability. However, even though such cleanups do reduce human exposure to mercury, and mercury discharges to surface water bodies, they do not cause measurable reductions in fish tissue mercury levels either near or far from a mercury source site. This is due to the widespread distribution of mercury in sediment of Coastal and Sierran streams. Such sediment is continually transported into aquatic environments where it is methylated and biologically concentrated in fish. Cleanup through dredging of sediment is problematic because dredging churns up the mercury-laden sediment making it available to natural methylation.

Regarding the issue of suction dredging, the state is taking several actions to address water quality concerns associated with suction dredging. Earlier this year, the

Legislature passed, and the Governor signed, Senate Bill 670 (Wiggins, Ch. 62, Statutes of 2009), which prohibits suction dredging until the California Department of Fish and Game (DFG) updates its suction dredge regulations. The State Water Board is working closely with DFG on this regulatory update. Earlier this year, the State Water Board provided \$500,000 in funding to DFG to ensure that water quality issues are fully addressed in the environmental documents associated with the regulation update. An Initial Study was released on November 2, 2009. The state is in the process of holding public meetings to obtain input on the regulation update effort. DFG anticipates finalizing their regulation update by the end of 2011.

Recommendations:

1. Continue to clean up abandoned mercury mines when human exposure benefits are clear or mercury loading to surface water can be substantially reduced.
2. Continue to clean up mercury from abandoned gold mines to prevent human exposure and off site transport by recreational miners.
3. Continue assessing fish for mercury in water bodies contaminated by mercury (target the Sierra Nevada) so that affected water bodies can be listed as impaired for mercury and TMDLs are developed and implemented.
4. Continue funding studies aimed at developing land use management techniques that reduce mercury transformation into the biologically available methyl mercury.
5. Provide a funding source (e.g., royalties on mines on federal land).
6. Greatly expand efforts to issue and post consumption advisories so that the public knows the risk of eating contaminated fish.

CONCLUSION

The California Water Boards take seriously our mandate to protect beneficial uses. However, as I have just described, addressing abandoned mines is resource intensive, and as we have seen, the very nature of abandoned mines makes it impossible to protect beneficial uses perfectly. Acid mine drainage from abandoned mines will continue to plague us at some sites for thousands of years according to the best scientific estimates. Mercury lost to surface water bodies over a hundred years ago from gold and mercury mines continues to contaminate fish that people eat. This is a beneficial use but it is also a public health issue. Let me conclude by saying that California stands ready to work with Congress and the Obama Administration to help craft a comprehensive and science based strategy for addressing abandoned mines and mercury issues. We believe such an approach should be developed with a look toward all of our options including cleanup and prevention in concert with Clean Water Act amendments that would allow regulatory agencies to clean up abandoned sites without incurring liability.

APPENDIX I

WATER BODIES LISTED AS IMPAIRED FOR MERCURY [303(d)]

Number of Mercury listings from the 2006 Final List

Water	24
Tissue	105
Sediment	15

Total Number of Mercury listings expected for the 2008/2010 Integrated Report:

Water	106
Tissue	169
Sediment	92

TOTAL MAXIMUM DAILY LOADS (TMDLs) ADDRESSING WATER BODIES LISTED AS IMPAIRED FOR MERCURY

APPROVED:

Regional Board	TMDL	Number of listings
2 – San Francisco Bay	San Francisco Bay	16
2 – San Francisco Bay	Walker Creek	1
5 – Central Valley	Clear Lake	1
5 – Central Valley	Cache Creek	4

IN PROGRESS:

Regional Board	TMDL	Number of listings
2 – San Francisco Bay	Guadalupe	5
2 – San Francisco Bay	Tomales Bay	1
3 - Central Coast	Clear Creek and Hernandez Bay	2
5 – Central Valley	San Francisco Bay Delta	8
5 – Central Valley	Lower American River	1
7 – Colorado River Basin	New River	1
8 – Santa Ana	Big Bear	1