WHERE THE WATERS RUN RED

A Coastal Advocates investigation of mercury mining operations in the Central Coast region of California

1993-1995

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MERCURY MINING DISTRICTS:
Central Coast Region of California

- Oakville District -- Mount Diablo range, East Bay
- Almaden District -- South San Francisco Bay
- Idria District -- San Benito Mountain
- Clear Creek District -- San Benito Mountain
- Buena Vista/Klau mines -- Lake Nacimiento, San Luis Obispo
- Phoenix District -- Diablo Range, east of Alameden (Mt.Hamilton)
- Stayton District -- south of Phoenix District
- Santa Barbara reservoir
- Cachuma District -- east of Santa Inez

Mercury Toxicology

- Occupational and Other Human Health Problems due to Inorganic Mercury are well Documented
  - fingerprint photographers, dentists, hatters, hospital technicians
- 1976 - USEPA banned Mercury Containing Bactericides, Fungicides, Turf and seed treatments
- Biomagnification Occurs as Mercury Moves Through Food Chain & High Levels in Fish tissue Appear
- Minamatta Bay tragedy in Japan
  - 46 died from comsumption of contaminated fish
    - » 50% adults
    - » 33% children
    - » 13% infants exposed <u>in utero</u>
- Global Poisonings Due to Wheat and Seeds Treated with Mercury Fungicide
- Teratogenic Effects Alarming

Mercury in the Environment: Highlights From the Research Community

- Presence of Chloride and Ferric Iron increases the Rate of Hg^{2+} Release from HgS
  - Ferric Iron Occurs in Acid Drainage Waters From Mining Areas
- Algal Blooms and an Abundance of Organic Matter Increase CH^3Hg^+ Uptake
- High Concentrations of Soluble Salts Create a Negative Effect on Mercury Methylation
- The Binding Rate of Methyl Mercury to Tissue is Faster than the Rate of Methyl Mercury Excretion from Tissue
  - Conclusion: Bioaccumulation results in Toxicity to Susceptible Organisms

Mercury in the Environment: Highlights From the Research Community

- Concentration of HG^0 as high as 20 ug/m^{-3} measured in the atmosphere over Hg Deposits
  - Normal = 1 - 10 ng/ m-3
- Methyl mercury volatile
  - Complexes with
    - » Rhiol Groups of Protein-derived Organics
    - » Adsorbed to Clay Mineral particles
- Aerated Microbasin of Wabigoon River
  - CH^3Hg^+ Release of 60 ng/m^{2}day^1
- Hg Mining Wastes in California Reported to Contain 125 - 4,500 mg/kg (SWRCB, 1991)
- Methyl and Dimethyl Hg Diffuse Through Water
  - Highly Soluble in Lipids
    - » Absorption into Aquatic Organisms Facilitated

Environmental Estrogens or Endocrine Disrupters

- Hormone - Imitating Chemicals are Bioaccumulating in Animal and Human Tissue. Some of the Most Important Include:
  - DDT, PCB, Dioxin, Lead & Mercury
- Mimic Naturally Occurring Hormones Secreted by the Endocrine System
- Problems Observed in Wildlife
  - Reproductive effects in Harbor Seals, Snapping Turtles, Double - Crested Cormorants
  - Immune Suppression among Beluga Whales, Common and Forster's Terns, Various Gulls
  - Gender Distinctions Blurred
  - Rudimentary Sexual Organs in Alligators & Gulls
  - Metabolism and Growth Impaired

Consensus Statement Given by 21 Prominent Scientists at the Chemically-Induced Alterations in Sexual and Functional Development Work Shop

- **We are Certain of the Following:**
  - Environmental Estrogens Disrupt the Endocrine Systems of Humans and Animals
  - Wildlife Populations are Already Affected
    - » Decreased Hatching
    - » Gross Deformities
    - » Demasculinization and Feminization of Male Fish, Birds and Mammals
    - » Defeminization and Masculinization of Female Fish, Birds and Mammals
- Laboratory Studies Corroborate the Abnormal Sexual Development
- Humans have been Affected by Compounds
  - Effects are Estrogenic
    - » Genital Tract Abnormalities
    - » Abnormal Pregnancies
    - » Reduced Fertility
    - » Clear Cell Carcinomas

FEDERAL AND STATE STANDARDS AND GUIDELINES FOR MERCURY

Agency	Description	Value	Reference
NIOSH	Recommended Exposure Limit for Occupational Exposure to Mercury Vapor Time Weighted Average (TWA)	0.05 mg/m^3	ACG±H 1990
EPA ODW	Maximum Contaminant Level Goal (MCLG) Mercury (inorganic)	0.002 mg/L	USEPA 1991a
	Maximum Contaminant Level (MCL) Mercury (inorganic)	0.002 mg/L	
EPA OWRS	Ambient Water Quality Criteria to Protect Human Health Mercury Ingestion of water and aquatic organisms Ingestion of aquatic organisms only	 144 ng/L 146 ng/L	USEPA 1980
EPA	Carcinogenic classification Oral Reference Dose (RfD) Mercury: inorganic only Methylmercury	Group D $3x10^{-4}$ mg/kg/day $3x10^{-4}$ mg/kg/day	HEAST 1990 USEPA 1991a
	Inhalation Reference Concentration (RfC) Mercury, inorganic only	$3x10^{-4}$ mg/m^3	USEPA 1991a
	Inhalation Reference Dose (RfD) Mercury, inorganic only	$9x10^{-5}$ mg/kg/day	
CADHS	Chronic Acceptable Exposure Level Oral Inhalation	 $2x10^{-3}$ mg/kg/day $2x10^{-1}$ $\mu g/m^3$	CAPCOA 1991

COASTAL ADVOCATES

~Natural Wonders Need Strong Advocates~

July 3, 1997

MEETING NOTICE

You are cordially invited to attend an invitation-only **mercury discussion group** sponsored by Coastal Advocates at the Law Offices of Berman, DeValerio, Pease and Tabacco in downtown San Francisco in July.

Date	:	**Monday, July 21, 1997**
Time	:	**11:30 a.m. to 2:30 p.m.**
Location	:	**Berman, DeValerio, Pease and Tabacco, 425 California Street, Suite 2025, San Francisco**

Refreshments provided. The discussion group agenda will cover the following topics:

- New Idria SuperFund site assessment update and CERCLA emergency response procedures -- Matt Mitguard, SuperFund Division, U.S. EPA, Region IX
- United Anglers' Clean Water Act litigation -- Attorney Alan Beaven
- Brief update on the status of the Buena Vista/Klau, Hearst Corporation, and Cambria mercury mining clean-up and abatement efforts -- Kathleen Van Velsor for Coastal Advocates
- Brief CERCLA case study summary -- Matt Charney, Coastal Advocates summer law intern (U.C. Davis)
- U.S. Geological Survey, Menlo Park -- Jim Rytuba
- Ron Churchhill, State Div. of Mines and Geology

If you are unable to attend, we hope that you will designate another representative from your agency who is familiar with the New Idria site or mercury mining in general. The list of participants and invitees includes representatives from Coastal Advocates, the Central Valley and Central Coast Regional Water Quality Control Boards, the Water Division of EPA Region IX, the Panoche/Silver Creek Watershed CCRMP, the Calif. Dept. of Fish and Game, the U.S. Fish and Wildlife Service, the National Oceanic and Atmospheric Administration, the McCutchen, Doyle & Enersen law firm, the University of California at Santa Cruz, the University of California at Berkeley, the Bureau of Land Management, the U.S.Geological Survey, the Division of Mines and Geology, and Dames and Moore (civil engineers).

We look forward to hearing from you, and having your participation at this important discussion group.

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Projects: Ocean Defense Fund; Land Use & Law Project, Wetlands Protection Project, Coast Lectern Series, Trails on the Water Mapping Project.

Coastal Advocates was founded in 1987 to provide research, planning, and advocacy for the protection of coastal resources.
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