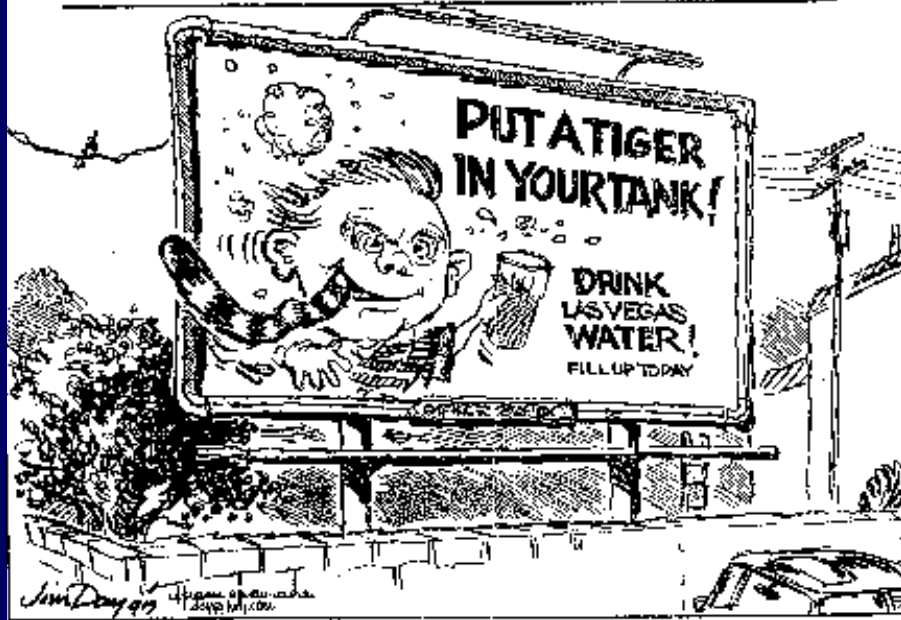


SOUTHERN NEVADA WATER AUTHORITY PUTS A POSITIVE SPIN ON REPORTS THAT A ROCKET FUEL CHEMICAL WAS DETECTED IN LAKE MEAD AND LOCAL WELLS.



# PERCHLORATE



Kevin Mayer - U.S. EPA, Region 9

**What is Perchlorate - Chemistry & Uses**  
**Brief History of Environmental Concern**  
**Occurrence in the U.S. and Southwest**  
**Colorado River**  
**State Action Levels**

# Perchlorate CHEMISTRY



**Highly Oxidized Chlorine,  $\text{ClO}_4^-$**

**Dissociated Salt, Anion, in Water**

**Highly Soluble, Mobile, Stable**

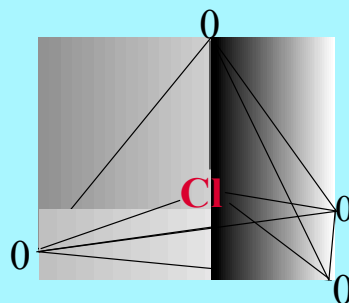
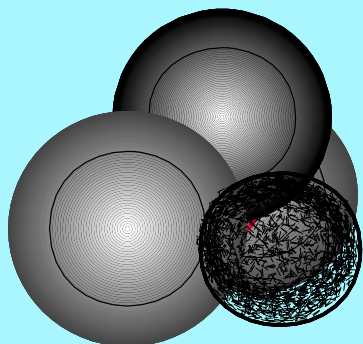
**Difficult to Detect, Difficult to Treat**

**Standard Ion Chromatography Method**

**- Detection > 400 ppb**

**- CA method to 4 ppb by March 1997**

# PERCHLORATE



# USES of PERCHLORATE

**90% used as Solid Rocket Fuel Oxidizer**

**Explosives**

**Fireworks and Pyrotechnics**

**Reported in Nitrate Fertilizer from Chile**





6

# PERCHLORATE HISTORY Before 1997

**1980s - Aware of Perchlorate in CA and NV**

**1985-86 - San Gabriel Valley Superfund Site**

**1990s - Rancho Cordova (Aerojet) ppm**

**1992 and 1995 - Provisional Reference Dose**

**1997 - Analytical Breakthrough to 4 ppb**



## Agency for Toxic Substances and Disease Registry - ATSDR (January 21, 1986):

"...Given the proprietary nature of the laboratory method for quantification and the poor quality assurance results noted, the **data do not prove that perchlorate ion has actually been found.** If the presence of perchlorate ion is confirmed, the **scientific database** on this ion is **insufficient to generate either an acute or longer-term health advisory for drinking water "**

"... The minimal acute toxicity data available suggest that one or two ppm perchlorate ion would not represent an immediately acute and substantial threat to the public health. The ATSDR does not consider this level to be "safe" in the absence of experimental data.."



# PERCHLORATE SHIPMENTS

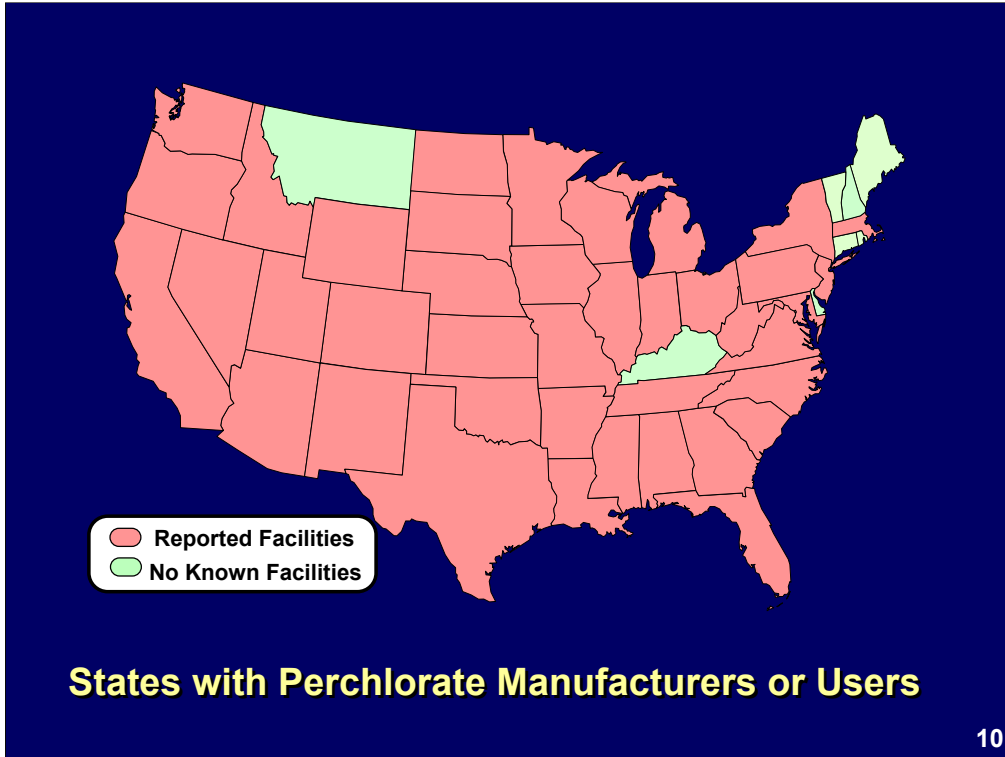
**Primarily Manufacturer's Information**

**Over 220 facilities**

**40+ States**

**Most Information in Last 20 Years**





# PERCHLORATE in the ENVIRONMENT



## RELEASES REPORTED IN 21 STATES

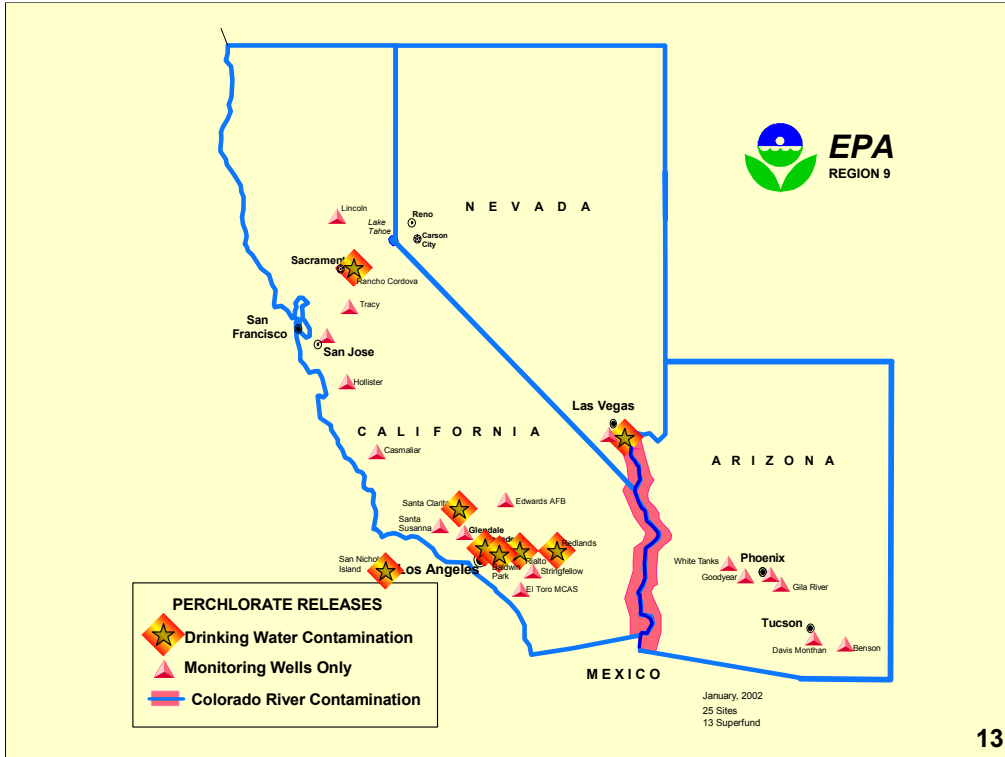
Alabama, Arizona, Arkansas, Colorado, Iowa, *Indiana*, Kansas, Maryland, Missouri, Massachusetts, Nebraska, Nevada, New Mexico, New York, Oregon, *Pennsylvania*, Texas, Utah, Washington, West Virginia

## CALIFORNIA

Over 4000 Water Supply Wells Tested  
Detected in 255 sources, 49 Wells over 18 ppb

11







# **COLORADO RIVER and LAKE MEAD**

**Southern California Aqueduct**

**Lake Havasu (Colorado River)**

**Lake Mead**

**Non-Detect Upstream of Lake Mead**

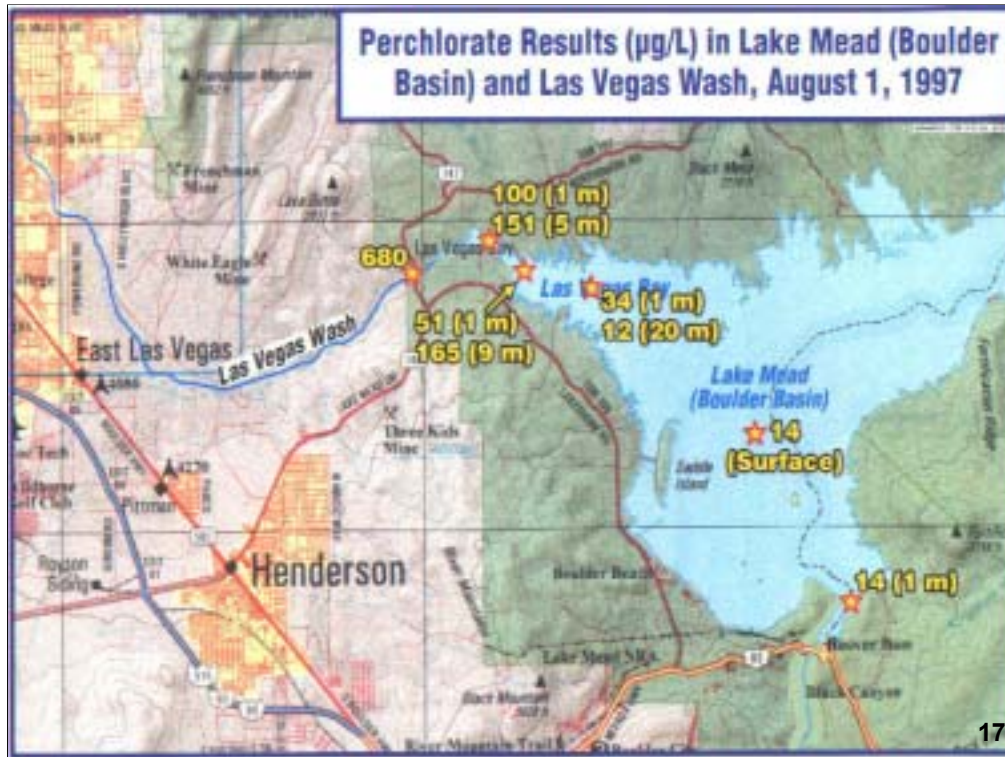
**CAP, SNWA, MWD, Tribes...**

**15+ million people**









# Colorado River PERCHLORATE

**Over 870 pounds per DAY into Lake Mead  
Transported through 3+ miles of groundwater**

**Since June 2000, less than 500 pounds/day**

**Hoover Dam, still up to 1000 pounds/day to  
Lower Colorado River, 5-9 ppb**

**Residence time in Lake/River - Years**

**Drinking Water Source for 15+ Million  
Irrigation Supply**





**BMI and Las Vegas Wash, Henderson NV**



## **“Advisories” from States**



**California - 4 ppb** 2002 Action Level, Lowered from 18 ppb

Draft Public Health Goal – 6 ppb

**New York 5 ppb and 18 ppb**

2-Tiered Action Levels, Planning and Action

**Texas 4 ppb** Action Level and Residential Cleanup Level

Lowered from 22 ppb in 2001

**Arizona 14 ppb** 1998 Health Based Guidance Level

Based on Child Exposure..will review after EPA final RfD

**Massachusetts 1 ppb** Precautionary Recommendation to  
a Local Water District for children and at-risk subpopulations

**New Mexico 1 ppb** Recent Drinking Water Screening Level

**Nevada 18 ppb** Public Notice Standard

20

## **Other Levels**



**Superfund Decisions in CA – 4 ppb**

**Superfund – Federal Facility in MA – 1.5 ppb**

**Chemehuevi Tribe (on Colorado River)  
establishing 5 ppb DW Standard in 2002**

**EPA Recommends Provisional Reference Dose  
4-18 ppb range for adult exposure until new RfD  
(Noonan Memo, 1999)**

