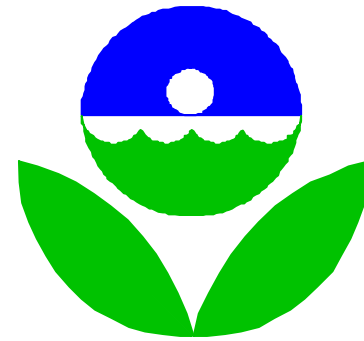


PERCHLORATE OCCURRENCE

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Superfund Program
U.S. EPA, Region 9



PERCHLORATE OCCURRENCE



- **History - Before 1997**
- **Perchlorate Users**
 - Facilities
 - Locations
- **Perchlorate in the Environment**
 - Occurrence Nationwide
 - California Wells
 - Nevada

HISTORY - Before 1997

- 1980s - Aware of Perchlorate in CA, NV
- 1985-86 - San Gabriel Valley
- 1990s - Rancho Cordova (ppm)
- 1992-95 - Provisional Reference Dose (ppb range)
- 1997 - Analytical breakthrough



San Gabriel Valley Superfund Site



- Large, complex groundwater site
- Perchlorate suspected
- Colorimetric test (0.02-0.05 mg/l) in 1985
- **Preliminary data positive**
- Toxicological request in Dec. 1985

San Gabriel Valley Superfund Site



- **Quality Assurance Problems**
 - Sample blanks - False positives
 - Cannot Validate Data
- **All Perchlorate Results Rejected**
- **ATSDR: Better Analysis First**
- **No Immediate Developments in Analysis**

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.."



Aerojet General Superfund Site (Rancho Cordova)

- **Perchlorate > 1 mg/l in groundwater**
 - Detectable by EPA method (Ion Chromatography)
- **Region 9 requests Provisional RfD from NCEA EF
Nat'l Center for Environmental Assessment**
- **December, 1992: 4 micrograms/liter (ppb)**
- **October, 1995 range: 4-18 ppb**
- **Analytical Limit 400 ppb**

USES of PERCHLORATE

- **90% Solid Rocket Fuel Oxidizer**
- **Explosives**
- **Fireworks and Pyrotechnics**



PERCHLORATE SHIPMENTS



- **Manufacturer's Information**
- **About 150 facilities**
- **35+ States**
- **Most Information in Last 20 Years**

PERCHLORATE in the ENVIRONMENT



- **UTAH wells, TEXAS surface water**
- **American Water Service Survey**
 - 425 wells, 7 hits (4 states)
- **CALIFORNIA**
 - Over 500 Water Supply Wells Tested
 - About 110 Reported, More than 30 Wells over 18 ppb

EXAMPLE FACILITIES

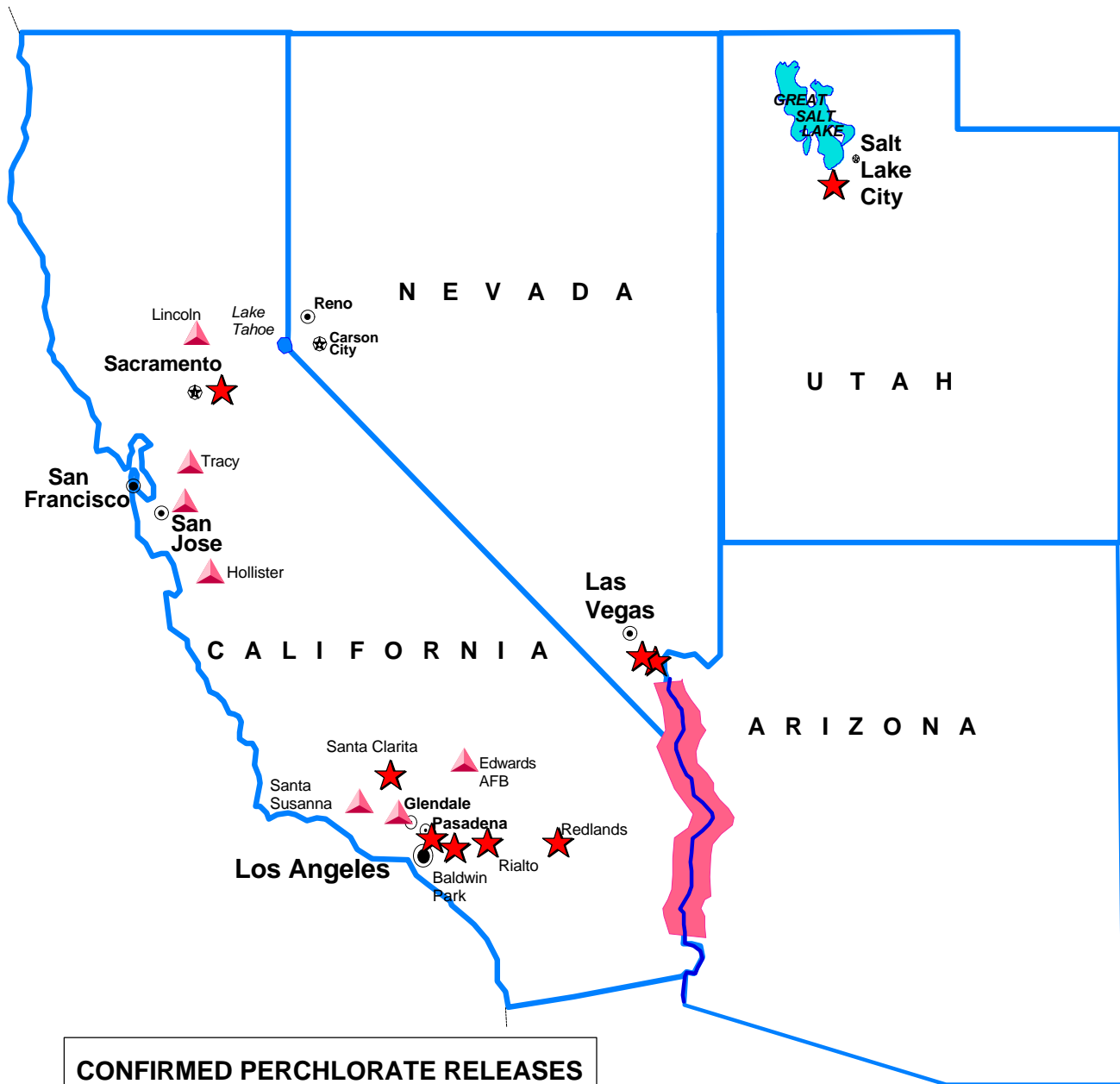


- **Many Rocket Manufacturing/Testing**
 - **Aerojet, Lockheed, JPL**
- **Whittaker - Ordnance and Missiles**
- **Rialto - Ammunition, Fireworks and Rockets**
- **LLNL Site 300 - Explosives (Alpha Explosives, Lincoln CA)**




COLORADO RIVER and LAKE MEAD

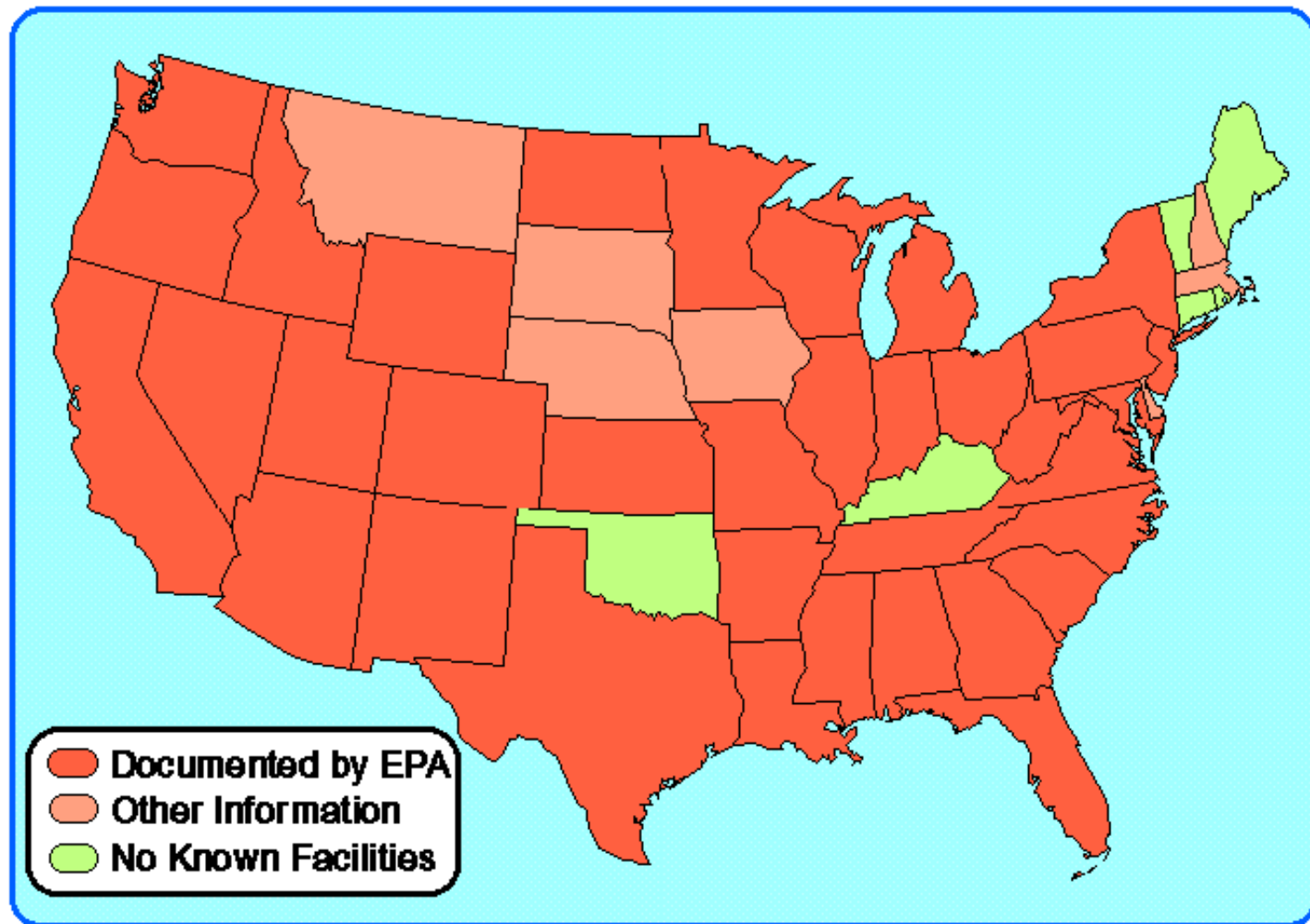


- Southern California Aqueduct
- Lake Havasu (Colorado River)
- Lake Mead
- Non-Detect Upstream



**CONFIRMED PERCHLORATE RELEASES
IN THE WESTERN STATES**

-  Drinking Water Contamination
-  Monitoring Wells Only
-  Colorado River Contamination



States with Perchlorate Manufacturers or Users