

Progress in Areas of Concern

AOC	Original # BUIs	BUIs remaining	BUIs delisted	Last update
Clinton River	8	8	0	2009
Deer Lake	3	1	2	2011
Detroit R.	11	10	1	2008
Kalamazoo R	8	6	2	2012
Manistique R.	5	2	3	2012
Menominee R.	6	5	1	2011
Muskegon L.	9	6	3	2011
River Rasin	9	8	1	2012
Rouge R.	9	9	0	2008
Saginaw Bay	12	10	2	2012
St. Clair R.	10	6	4	2008
St. Mary's R.	9	9	0	2012
Torch Lake	3	2	1	2007
White Lake	8	4	4	2011



Michigan Tech



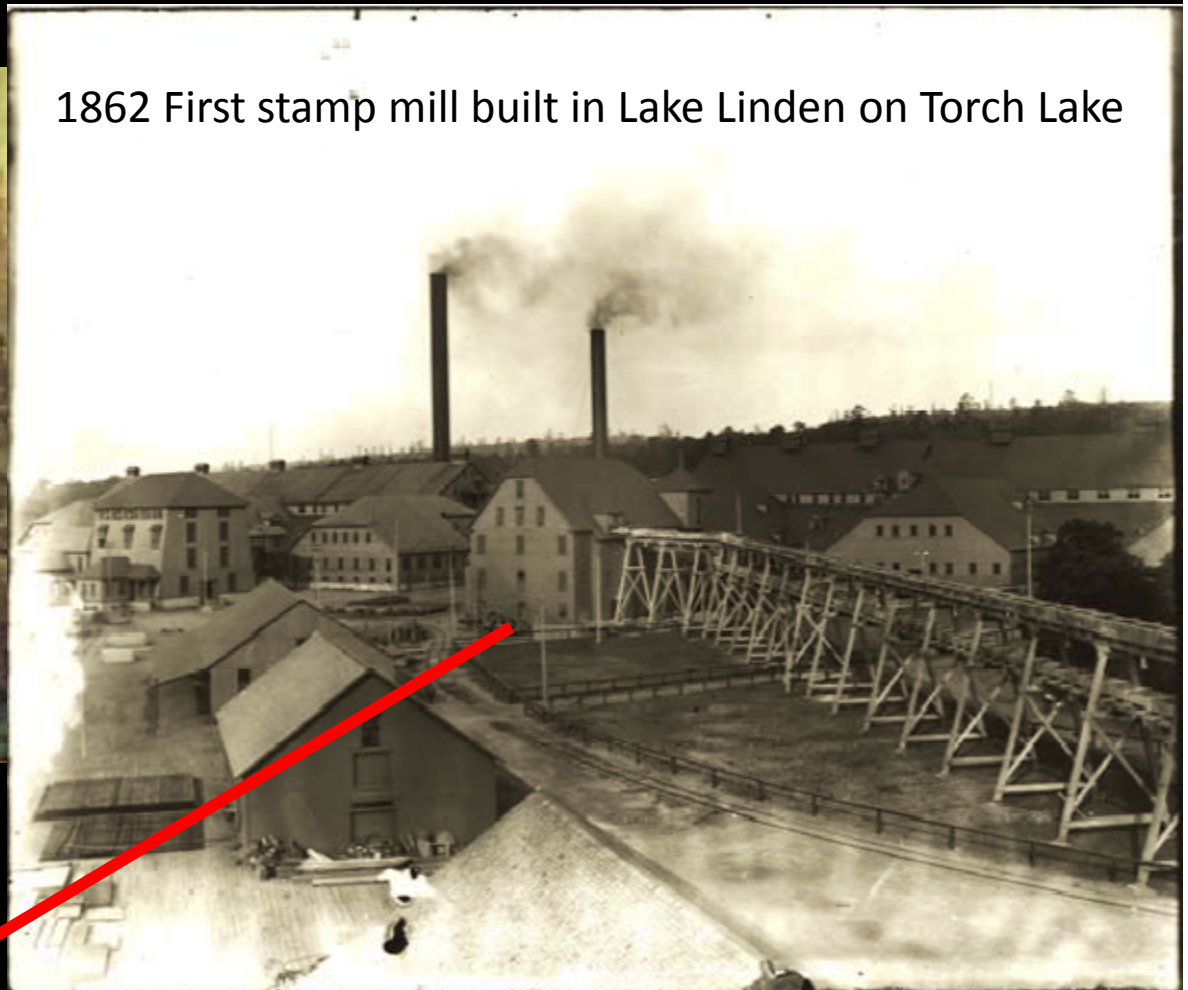
Department of Environmental Quality

Genesis of the Problems



Lehto 2009

State geologist
Douglass Houghton
makes 2nd mineral
exploration in
Copper Country



1862 First stamp mill built in Lake Linden on Torch Lake

Lankton 2005

1840

1855

1870

1885

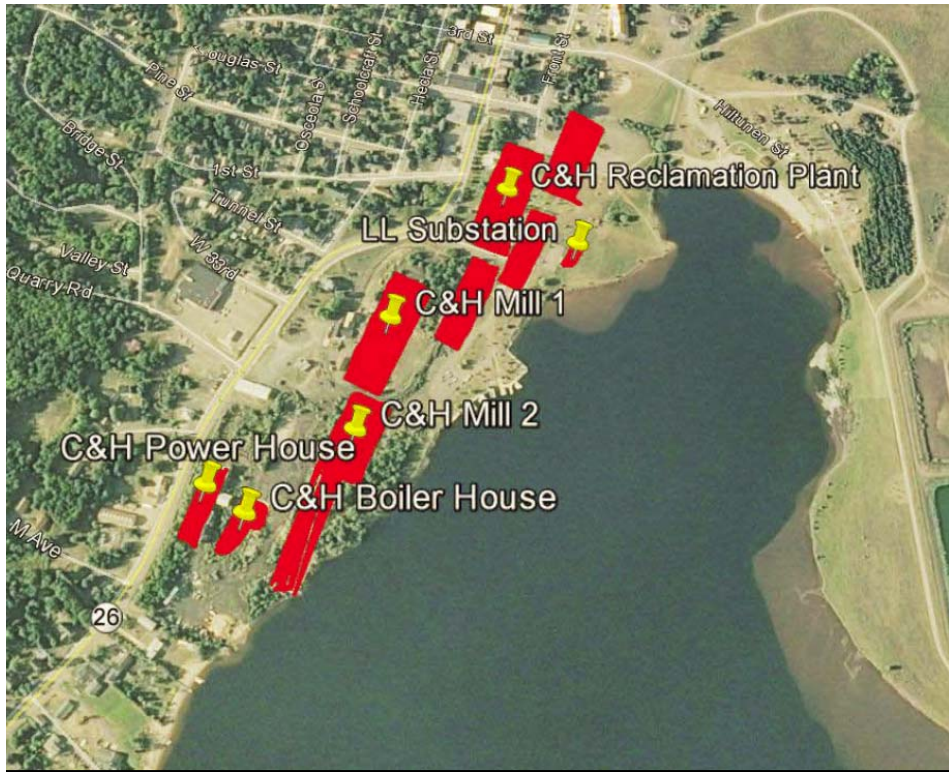
1900

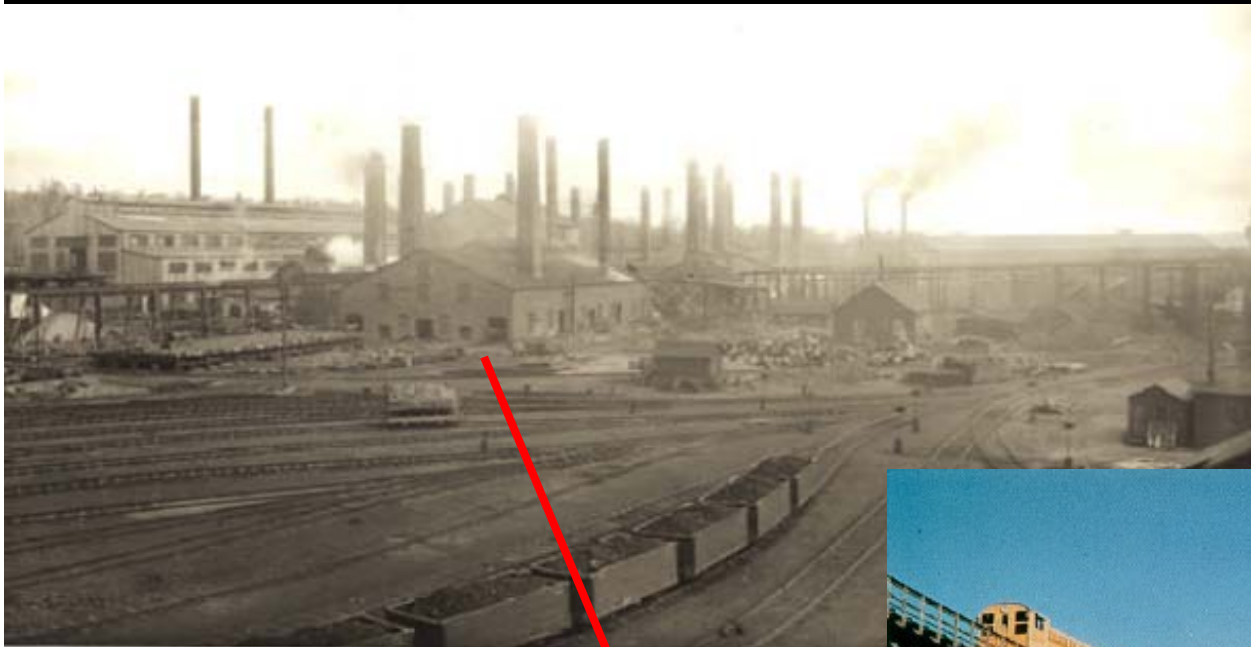
1915

1930

1945

1960



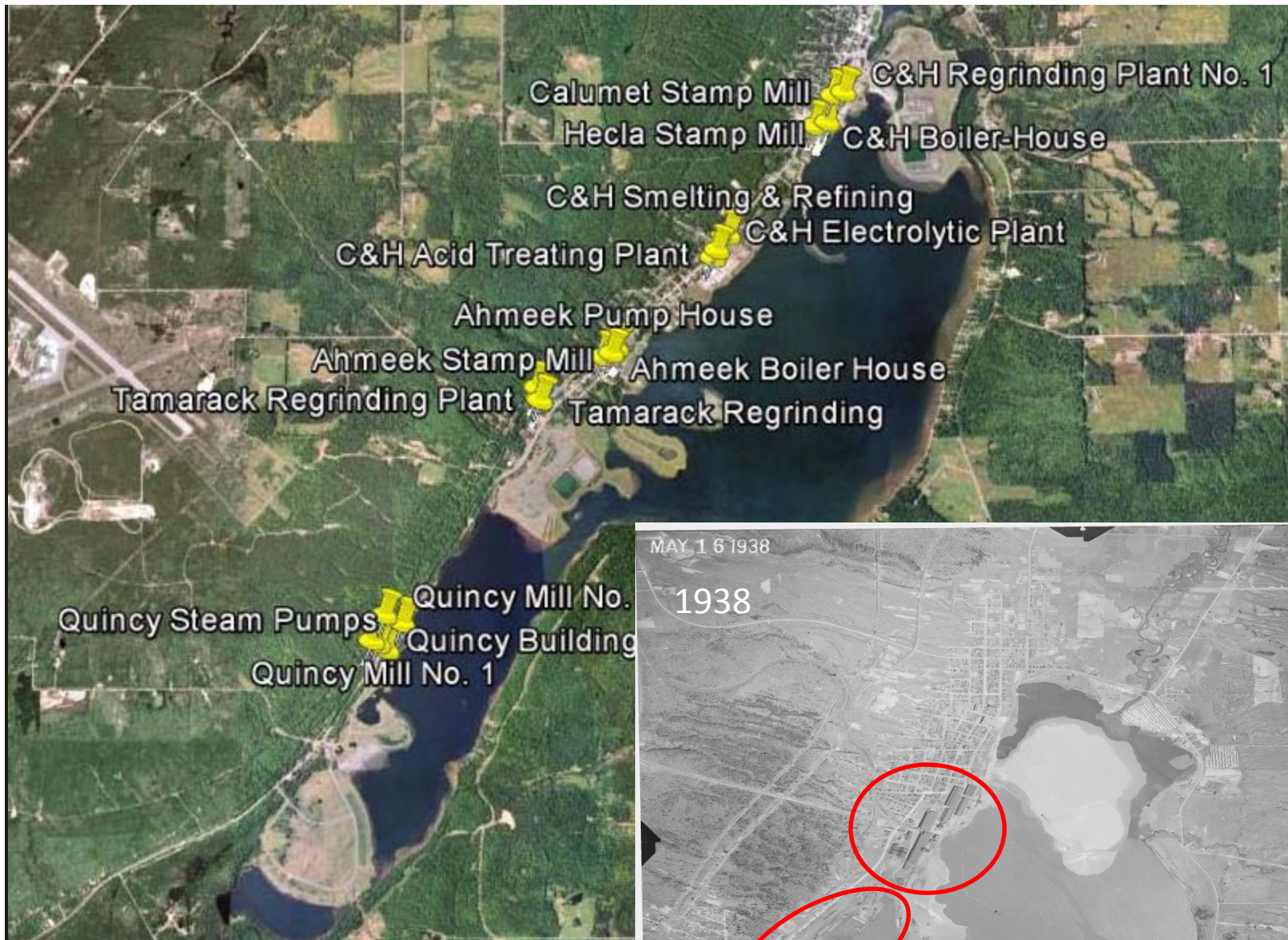


Lankton 2005

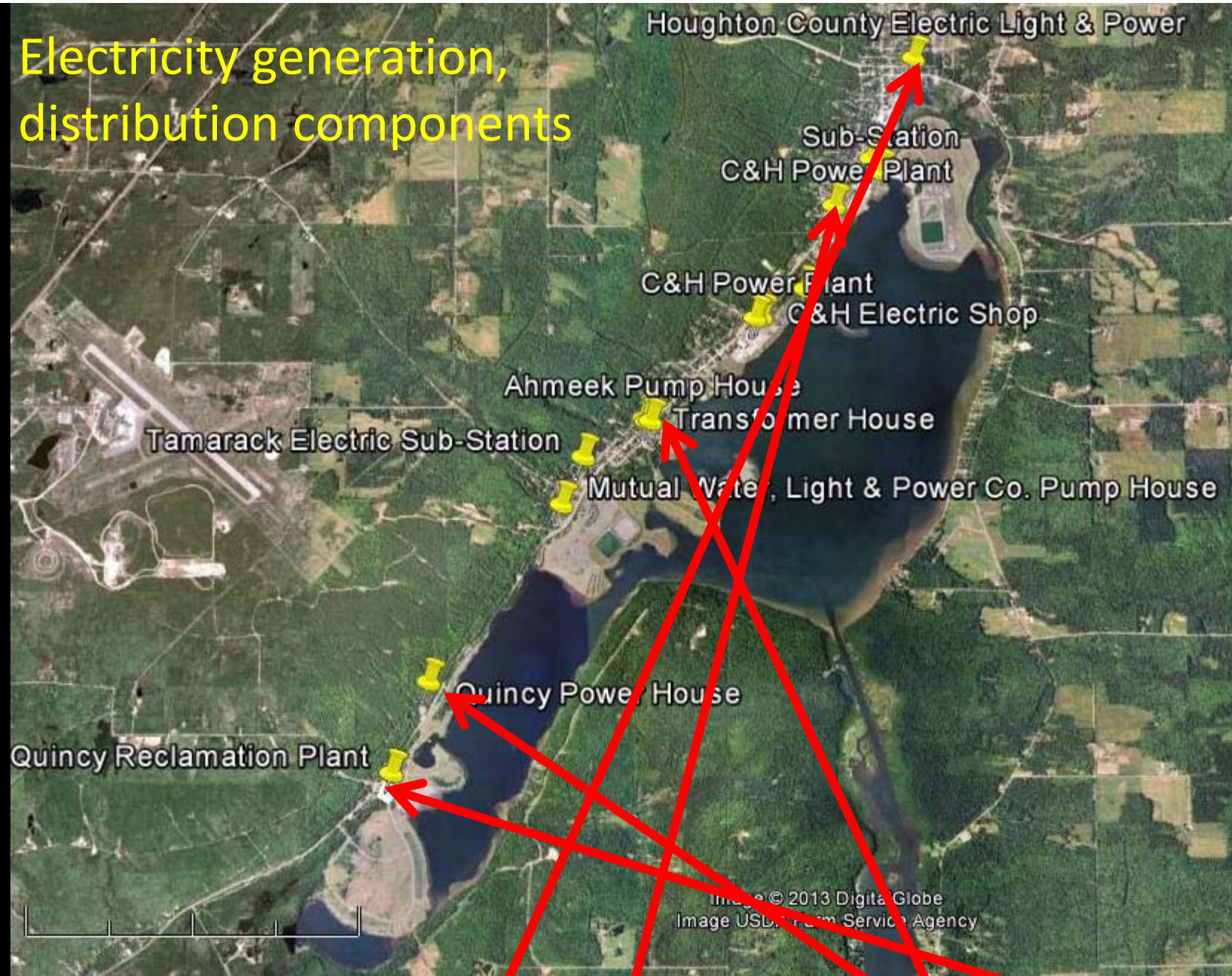
C & H smelter, 1887-1967;
Emitted mercury plume;
Removed arsenic with soda
treatment of slag;

Ahmeek Mill, 1910-1957

1840 1855 1870 1885 1900 1915 1930 1945 1960



Electricity generation, distribution components



1840

1855

1870

1885

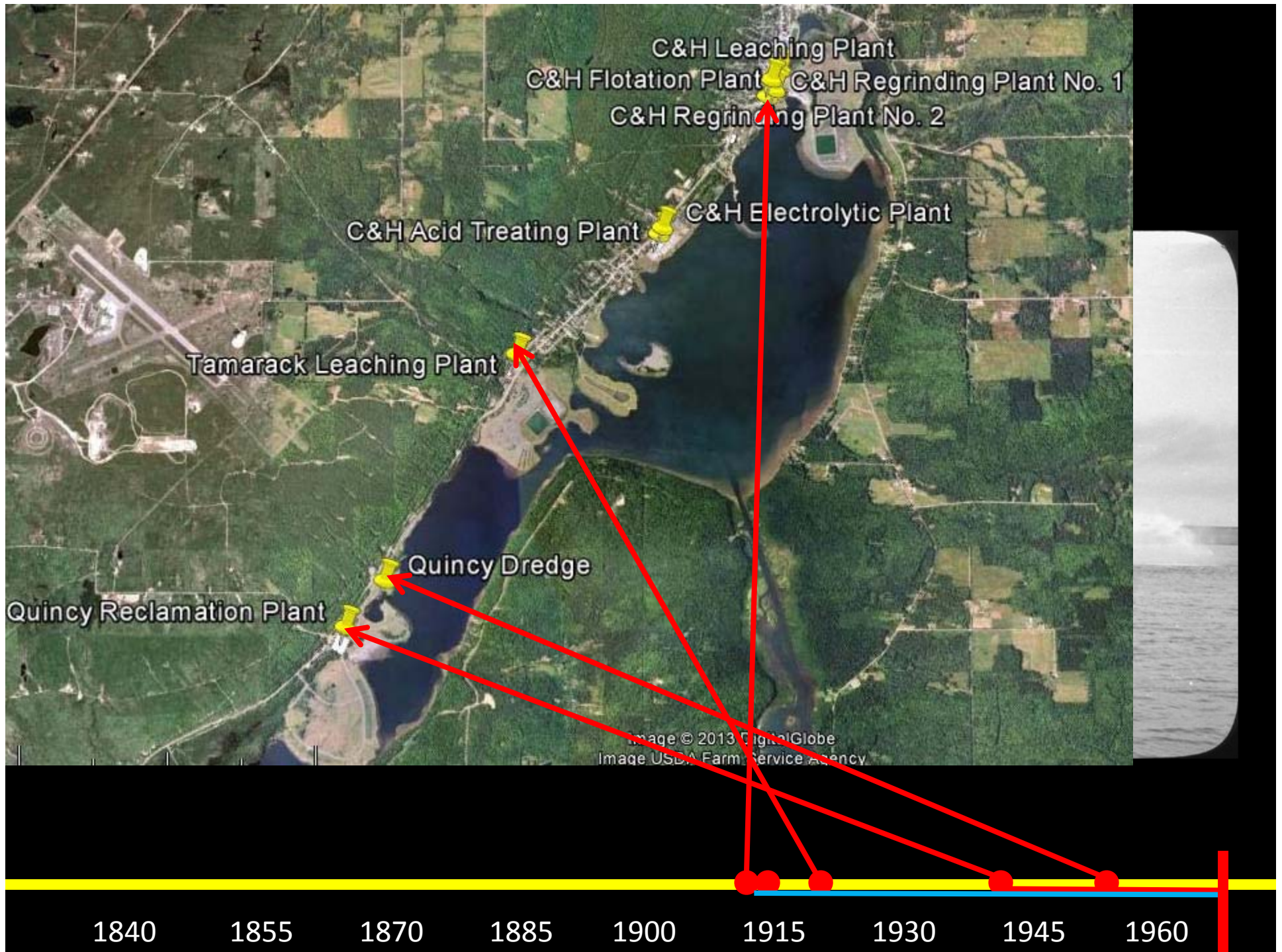
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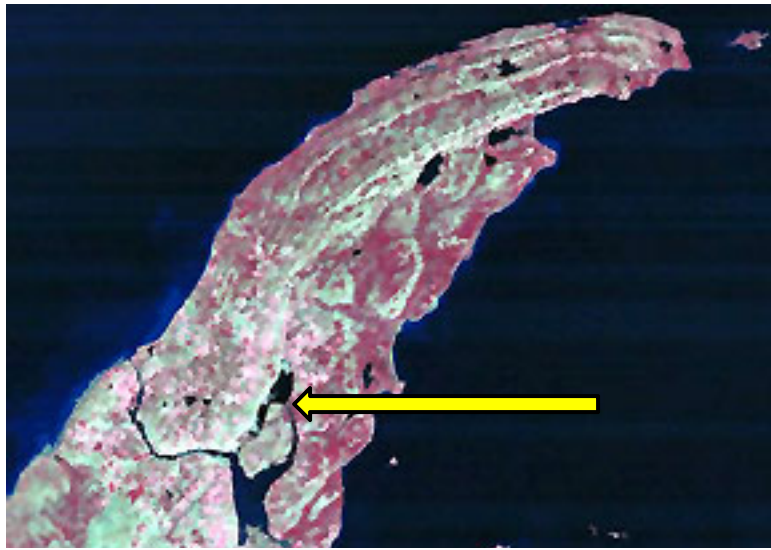


Fish tumors observed
Site investigation
Placed on NPL
PRPs sought
Listed as AOC
Remedial Investigation
Record of Decision

PAC elections
\$15M funding announced
Capping of tailings piles
AOC boundaries agreed upon
Partial site delistings
PAC request to delist
RAP Update, 2 BUIs remain

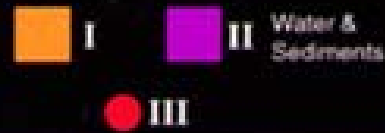
Public Meetings

1970 1975 1980 1985 1990 1995 2000 2005 2010

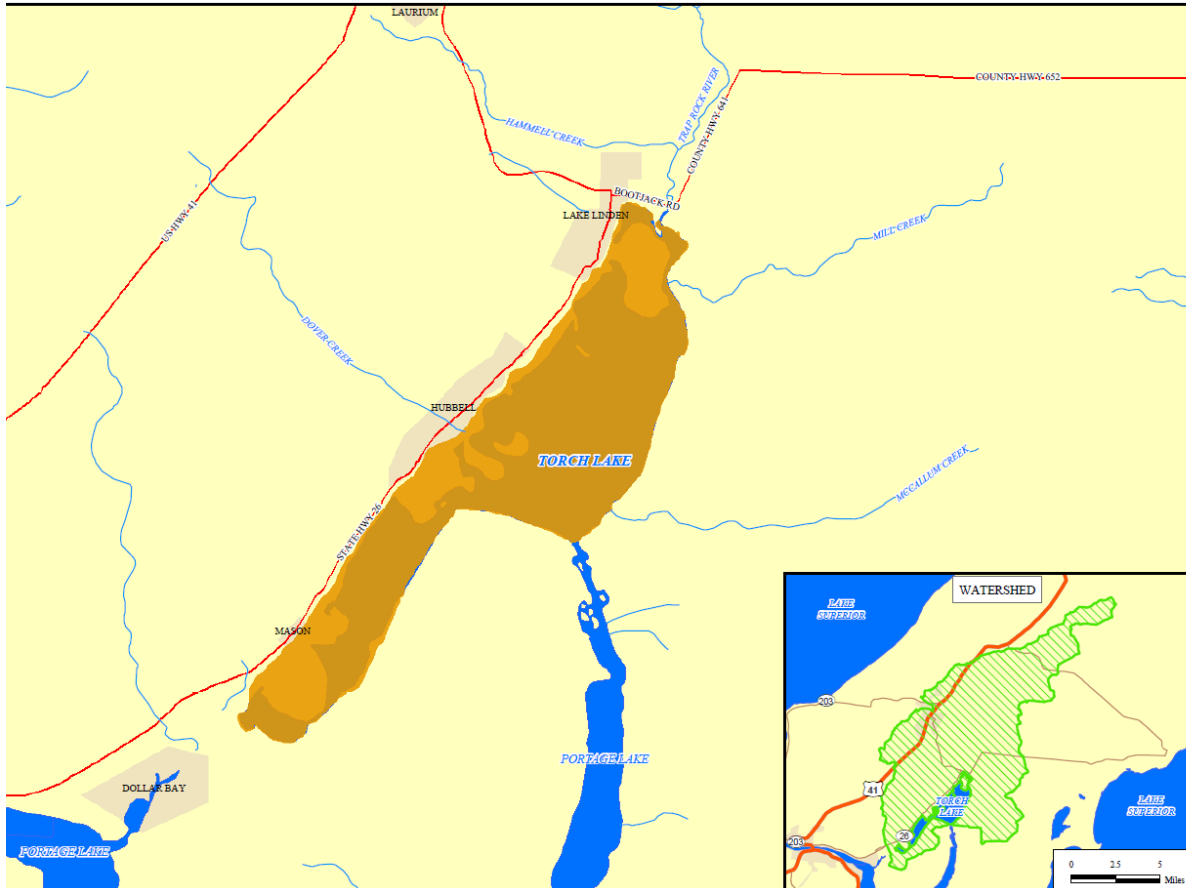
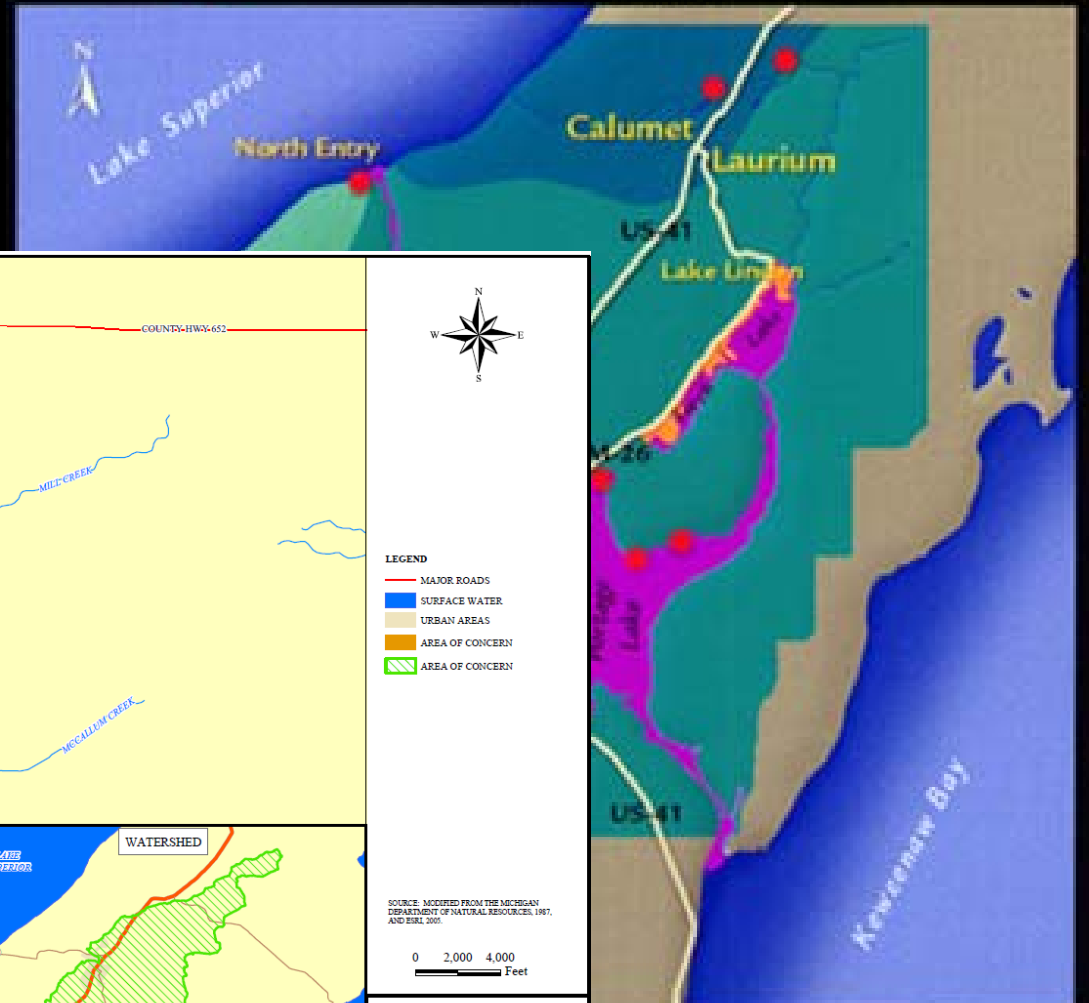


Torch Lake Area of Concern

Operable Units



Watershed Areas



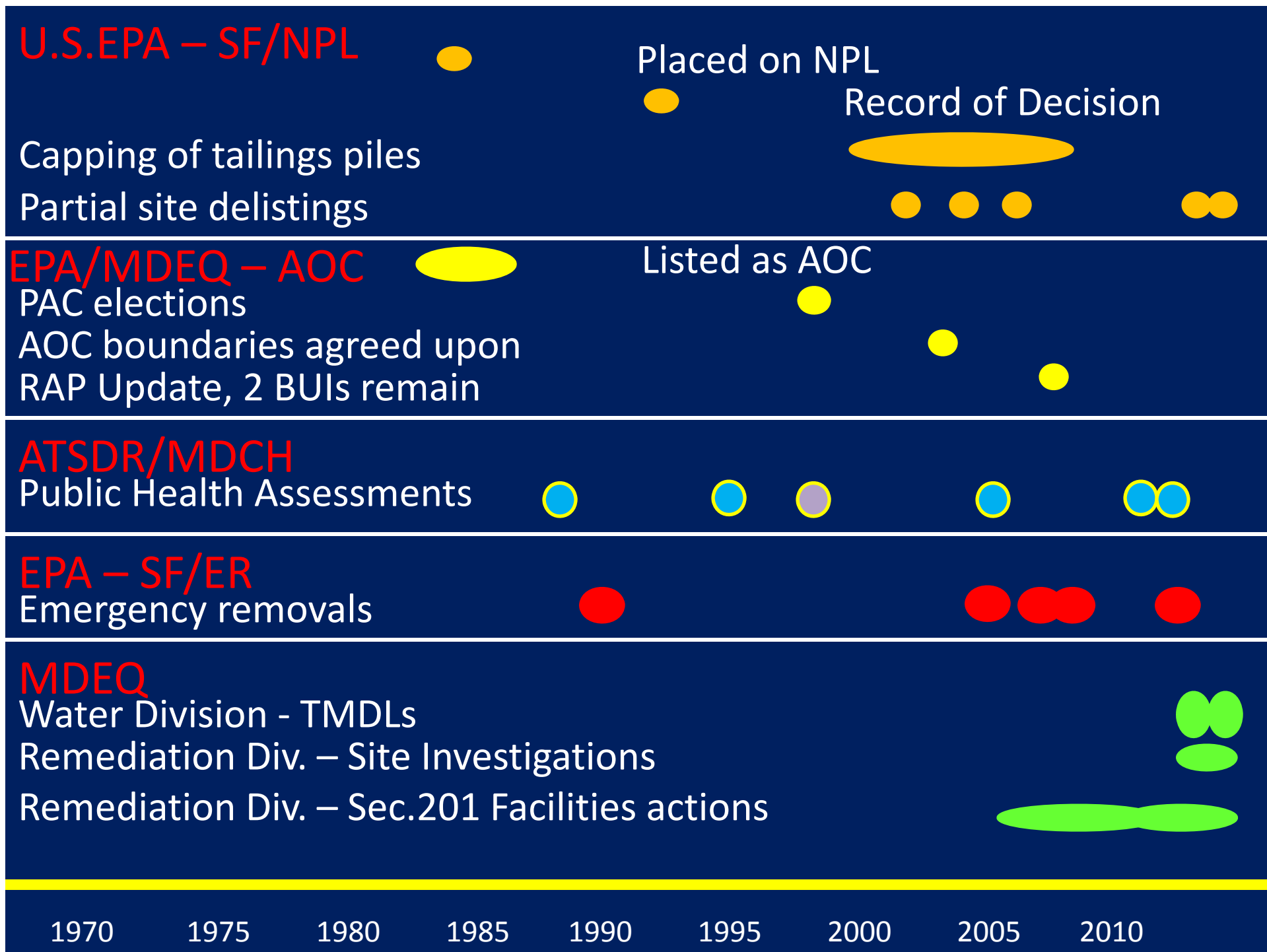
SOURCE: MODIFIED FROM THE MICHIGAN DEPARTMENT OF NATURAL RESOURCES, 1987, AND ERL, 2001.

0 2,000 4,000 Feet

TORCH LAKE, MICHIGAN
AREA OF CONCERN

Great Lakes
National
Program
Office





What is the problem?

1980

Fish tumors

Fish Consumption Adv.

MDPH

Copper (ecol. Harm)

Cap tailings

EPA

Airborne metals

Cap tailings

EPA

Benthos, toxins & tumors in fish

AOC

1990

PAHs in soil

ATSDR

Mercury, PCBs in fish

Fish Consumption Adv.

MDCH

2000

Arsenic, lead, PCBs

Emergency removal

EPA

Benthos, toxins in fish

AOC

2010

Metals in soils

Site investigation

MDEQ

Asbestos, PCBs

Emergency removal

MDEQ

Physical hazards, metals in soil

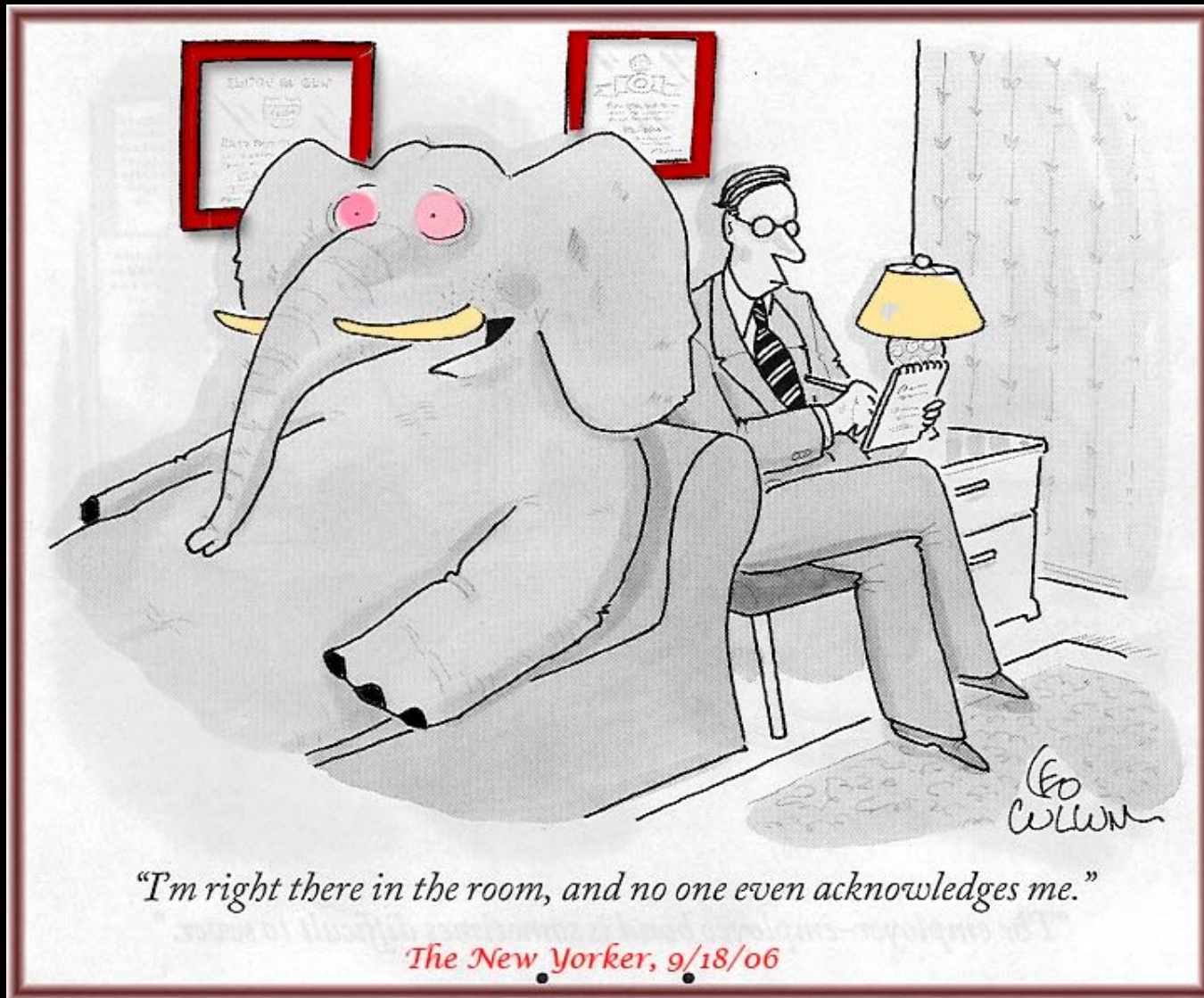
ATSDR

Public Perceptions after 30 years?

PAC: We've been going hard at this for 30 years ...
We got the money to remediate the place!
We don't understand why it can't be delisted; nothing has
changed for 10-15 years ...
We say that EPA and MDEQ have broken their contract ...
We're about ready to retire from this ...

Cancer incidence

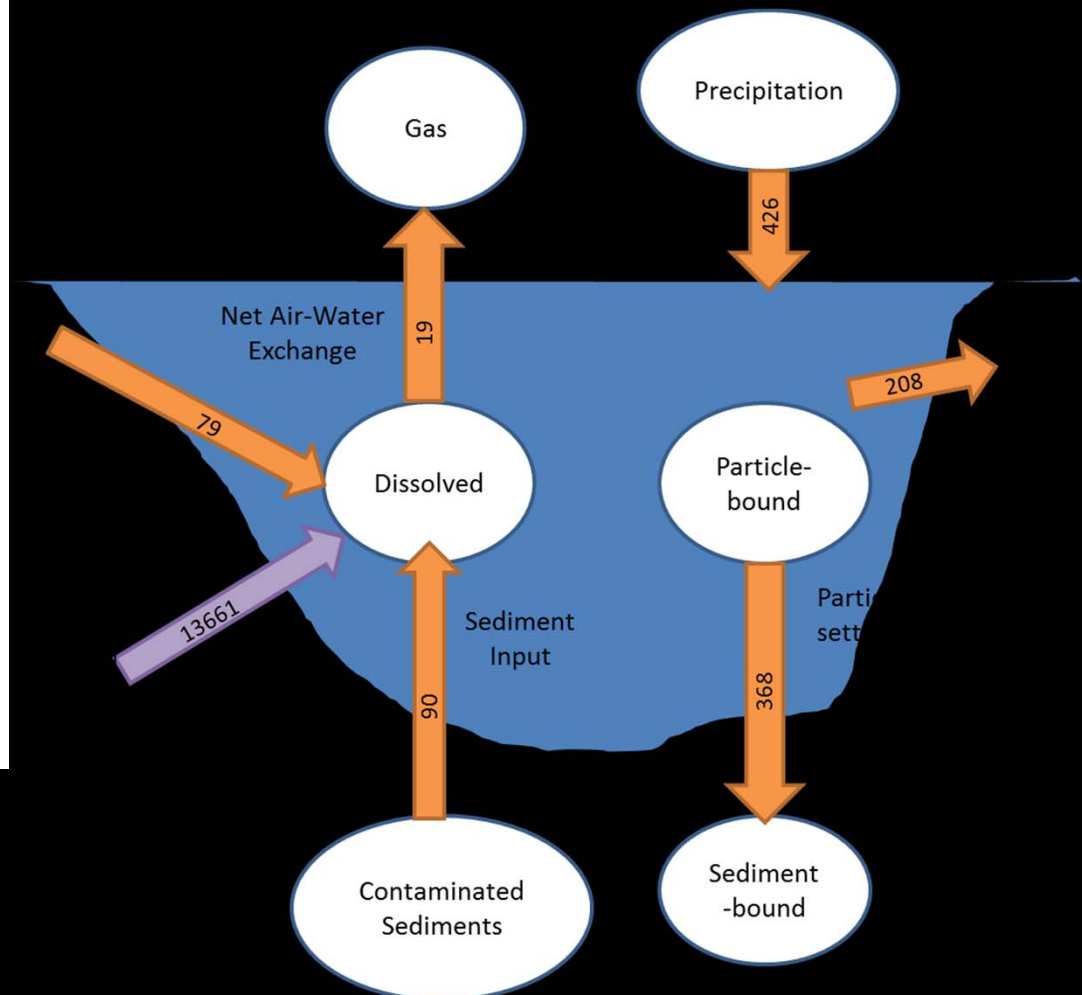
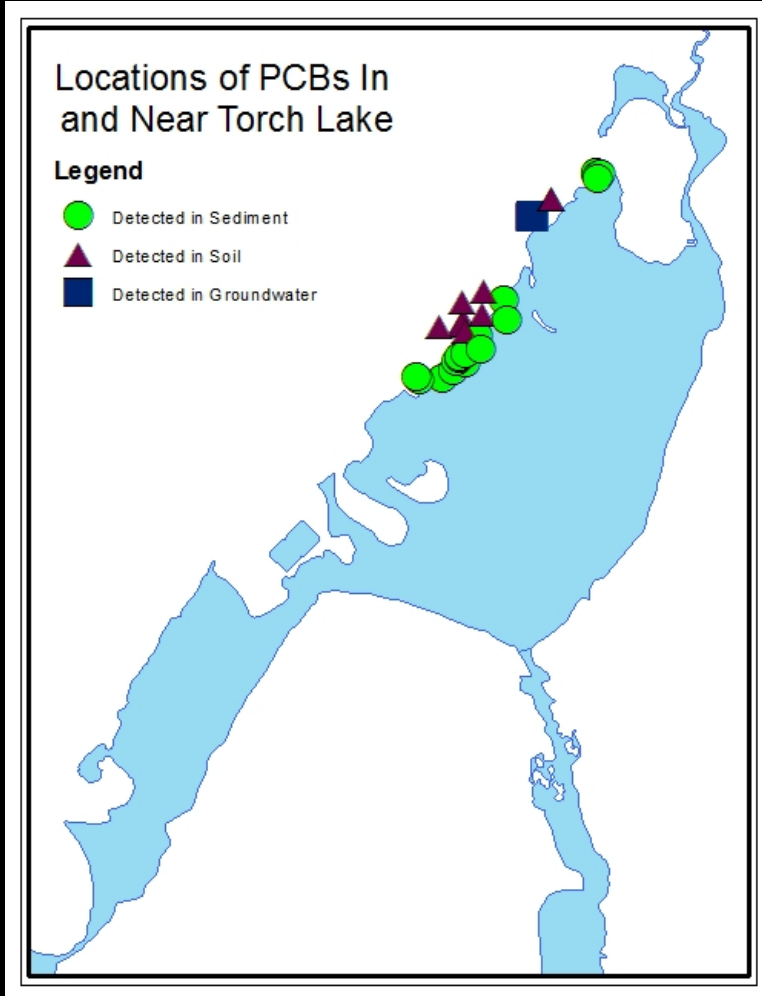
Would you let your kids swim/play there?



Soil contamination: metals, PAHs, PCBs

Benthos degradation (copper), toxics in fish (PCBs, Hg)

PCBs in Torch Lake



Summary

- Torch Lake AOC has complex mixture of pollutants, human and ecosystem health threats;
- Multiple governmental agencies are working independently on multiple facets of problems;
- Even concerned and involved members of the public do not understand the scope of the problem or possible solutions;
- Integrated assessments can provide a) new insights from new approaches; b) bridges between numerous parties; c) some level of oversight.