

ICI/Orica Botany

ChlorAlkali Plant

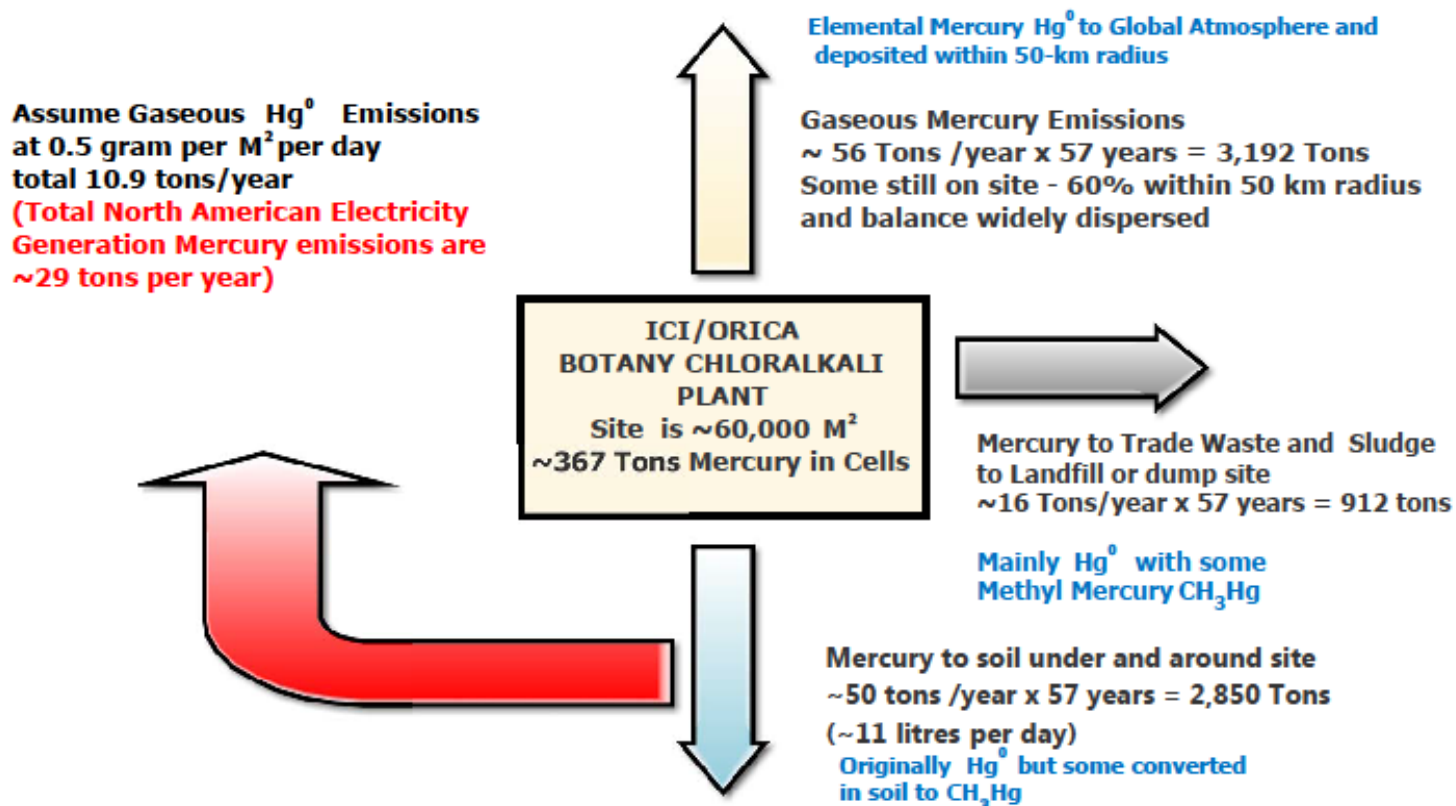
1941-2002

MERCURY POLLUTION ISSUES

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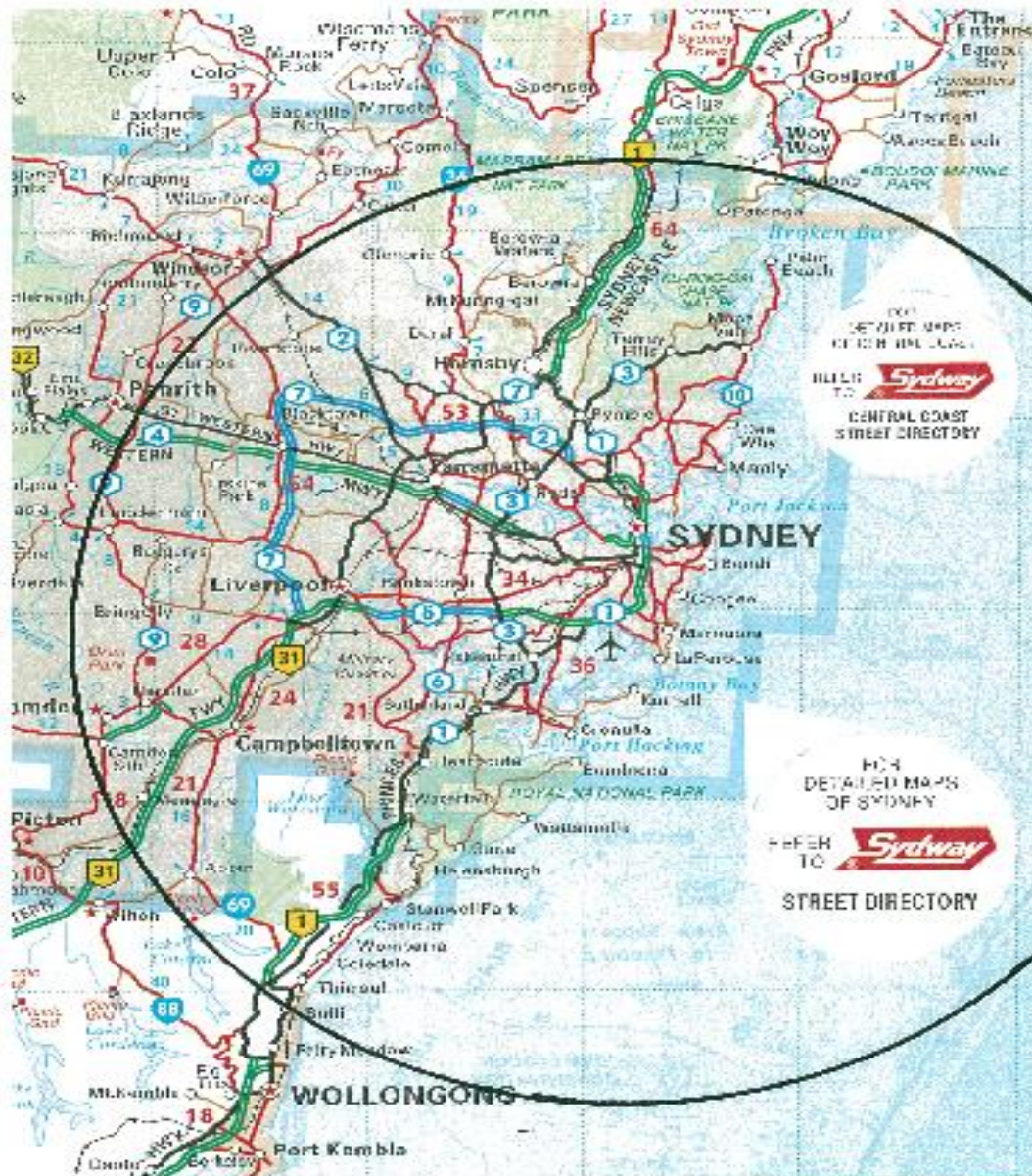
ICI/Orica Port Botany ChlorAlkali Plant



Particulate Mercury and Particle Bound Mercury carried on shoes, boots and clothing into Workplaces, Homes, Shops and Public Spaces is Unknown
Drawing does not account for mercury losses at VCM plant and pesticide production

7289.sdr

50 km Radius
around
Port Botany:
Potential Mercury
Impact Area



Deposition Quantum

- The estimated 10.9 tons of current mercury emissions from the CAP site applied at only 60% of the total to a 50 km Radius around the CAP equals approx. 830 micro grams of mercury per M^2 (including that deposited on the ocean).
- The worst of the USA power generation deposition is in the range of 10 to 99 micro grams per M^2 .

Deposition Quantum (2)

- The estimated 56 tons per year of historical annual emissions from the CAP site when applied at only 60% of the total to a 50km Radius around the CAP equals approx. 243,000 micro grams of mercury per M² (including that deposited on the ocean).
- Some of this mercury, deposited continuously since 1941, will have washed into waterways (and ultimately the ocean), some will still be bound in the soil thus presenting an ongoing risk to the community; some will have vaporised into the global atmospheric pool.

Deposition Quantum (3)

- The figures on the previous two slides demonstrate the intensity of mercury emissions from ChlorAlkali plants.
- These estimated mercury emission data demonstrate that widespread sampling of residential areas must be undertaken immediately; commencing initially in the Botany area to identify mercury deposition hotspots
- Residents should remember that ORICA has never presented any historical data on mercury usage

ChlorAlkali Plants

- Originally designed to make chlorine for the manufacture of war-time mustard gas
- ICI/Orica plants designed in the 1930's
- Botany cell lines operated on a dirt floor until around 1962
- Dirt floors were preferred as spilled mercury percolated into the soil and could easily be shovelled into bins for subsequent dumping

The Global Urgency

- The International Community is focussed on the closure of mercury based ChlorAlkali plants and the complete remediation of contaminated former sites.
- Despite the plants being closed years earlier these sites continue to emit mercury pollution and endanger humans and the environment for very long periods (100's of years)

The Missing Data

- Orica have created voluminous reports on the various issues surrounding clean up of the former ChlorAlkali plant site
- Levels of mercury pollution on this site are exceptionally high and as of 2013 have not been appropriately investigated
- No investigations have taken place offsite to account for the gaseous emissions from this site or elemental (liquid) mercury that has been disposed of into the sewer or other dump sites

The Invisible Killer

- Overseas data (UNEP 2010) indicates that mercury either partially or totally disables 20 - 35 times as many people than it actually kills.
- Mercury causes cerebral palsy, aspects of Autism and/or impaired neurological impacts in developing human fetuses
- Most at risk are pregnant women, infants and young children
- Mercury effects everyone who contacts it, ingests it or breathes its vapor, to differing extents
- Mercury poisoning can masquerade as Alzheimer's and Parkinson's in the elderly or infirmed

Gaseous Mercury

- **US EPA Data from other international sites indicates that the Orica site has lost an average of 56 tons of mercury per year to the atmosphere over 57 years of plant operation**
- **Our work in other areas of Australia indicates that up to 60% of this mercury would have been deposited within 50 km of the ChlorAlkali site – because of the marine environment the bulk would have been deposited within 10 km.**

Mercury Deposition

- **Gaseous mercury deposited in built up areas creates three major health risks:**
 - 1. Mercury that becomes bound to soil particles is transported into buildings and houses and can then convert back to a gaseous form;**
 - 2. Mercury bound to soil particles can bio-accumulate through the food chain via vegetables and fruit;**
 - 3. Mercury bound to soil particles is a major risk to young infants and children playing outside on lawns, in sand or soil.**

Gaseous Mercury

- **Orica's own data indicates that mercury still residing in the soil under the present site is offgassing in significant volumes**
- **Based on known data it is reasonable to estimate a conservative mercury emission figure of 0.5 gram per square meter being released from the Orica site per day – this equates to 10.9 tons per year still being emitted into the Botany environment.**

Gaseous Mercury

- The entire coal fired generation industry in the USA is only emitting ~29 tons per year of mercury according to the latest USEPA figures.
- The ICI/ORICA ChlorAlkali site is probably currently emitting the equivalent of 37.5% of the USA coal fired generation capacity

USA Risk Data

US Public Law Act 110-414 - Oct 14, 2008 122 Stat.4341.

SEC 2. FINDINGS.

Congress finds that –

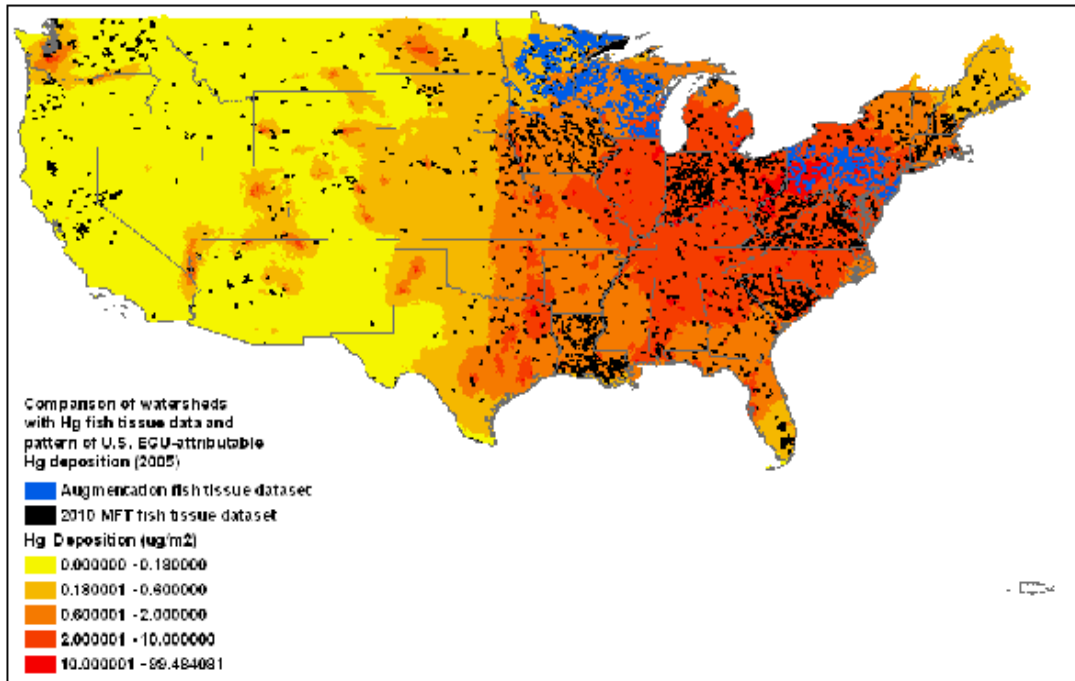
- (1) Mercury is highly toxic to humans, ecosystems and wildlife;**
- (2) 10% of women of childbearing in the USA have mercury blood levels which places their babies at risk of neurological damage;**
- (3) This means 630,000 US children are born at risk of mercury induced neurological damage, annually.**

USA Risk Data

- (4) Most significant source of mercury exposure for US population is ingestion of mercury contaminated fish;
- (5) US EPA reports (as of 2004):
 - (a) 44 states have fish advisories covering in excess of 13,000,000 lake acres and 750,000 river miles;
 - (b) 21 States have statewide freshwater advisories; and
 - (c) 12 States have statewide coastal advisories;
- (6) Long-term solution to mercury pollution is minimizing global mercury use and releases thus reducing environmental contamination, rather than reducing fish consumption
- (7) Uncontaminated fish represents a critical and healthy source of nutrition world-wide;
- (7) Mercury pollution is depositing locally, regionally, and globally, (termed trans-boundary pollution) which affects water bodies near industrial sources (e.g., Great Lakes) and remote areas (e.g., Arctic Circle);

NSW

- **The Sydney population in 2008 was 4.2 million people.**
- **The US population in 2008 was 304 million.**
- **Applying the USA figures to Sydney babies born in 2008 at risk of mercury induced neurological problems equates to approximately 8,700 babies**
- **Compared to the USA data, the 8,700 'at risk Sydney babies' per year is very conservative since mercury exposure across the Sydney area is very much higher than US exposures.**



Data Source:
 US EPA:
 452/R-11-009

Figure 2-15 Comparison of Locations of Watersheds with Fish Tissue Hg Data* with Pattern of U.S. EGU-attributable Hg Deposition (2005 scenario)

* Fish tissue Hg data includes (a) 2010 MFT data used in March version of the risk assessment and (b) augmentation data added for this revised version.

NSW Data Verses USA Data

- The highest mercury deposition rate in the USA (the dark red areas on the previous slide) range from 10 to 99 micro grams per square meter.
- This deposition rate is equivalent to the TOTAL emission of mercury from all coal fired power stations in the USA, which equalled 29 tons in 2010.

BOTANY RESIDENTIAL

- There is a critical need to carry out halo testing of the Residential areas within at least 1.25km of the ICI/Orica ChlorAlkali plant site
- This investigation comprises testing soil samples in residential areas, nature strips/verges, parks, gardens and the shoreline for elemental (liquid) mercury.
- Testing of houses, commercial premises, shops and open areas for gaseous mercury.

Mercury Deposition in Botany

- **Very limited testing has been conducted on sediments in Botany Bay, the adjacent RAMSAR Wetland, or the marine sediments offshore from Malabar WTP**
- **The 2003 URS Report on Contamination Issues Associated with the Port Botany expansion identified mercury levels in Penrhyn Estuary at up to 183 mg/kg and Chromium up to 130 mg/kg – these are alarming levels of toxic element pollution for a marine environment.**

Mercury Deposition in Botany

- Full spectrum testing of sediment, fish, crustacea and seaweed needs to be carried out as a matter of urgency.
- Multi-lingual warning signs need to be installed at all common recreational fishing locations.
- A mandatory catch and release policy for fish should be applied until such time as all the required testing has been carried out and evaluated;
- the 'precautionary principle' must apply.

Mercury

- **It is the Botany community that is at risk from legacy mercury issues emanating from the ICI/Orica site**
- **The current remediation process outlined by the NSW EPA will not deliver any certainty regarding the basic right to live in a safe environment for the Botany and Sydney communities**

Meanwhile...

- The EPA is carrying out “*a thorough analysis of available data to determine if any further information is needed to assess residual health risks to the adjacent community associated with mercury emissions from the former plant*”
- ORICA have clearly stated publicly, “that all the historical data from the Botany plant has been destroyed”
- You decide!

What about the babies?

- 8,700 Sydney babies at risk every year.
- This is potentially 23+ babies each day!
- Will one of these babies be your baby, your niece, nephew, or grandchild?
- Will future generations call these children “*the Botany Children*”, in the same way that mercury impacted children from the Minamata Disaster in Japan have come to be known as “*the Minamata Children*”?
- The fate of your children rests in your hands!