Sea-Dumped Chemical Munitions

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United Nations Second Committee
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Chemical Weapons Convention

- 1993 Opened for signature
- 1997 Entry into Force
- 188 States Parties
- Located in The Hague
- 525 employees
- 175 inspectors
- 7 CW possessor states
Chemical Weapons Stockpiles

- Russia – 40,000 MT
- USA – 28,577
- India – 2,000 MT (est)
- South Korea – 2,000 MT (est)
- Libya – 23 MT
- Albania – 16 MT
- Iraq – unknown
- TOTAL – 72,616 MT
Chemical Weapons Elimination

- RF – 19,500 MT (49%)
- USA – 23,150 MT (81%)
- India – 100%
- South Korea – 100%
- Libya – 1%
- Albania – 100%
- Iraq – unknown
- TOTAL – 46,663 MT (64%)
Chemical Weapons Burial

- 13 CWC States Parties
- 87,000 munitions recovered to date
- Spring Valley cleanup in Washington DC since 1993 – $250M
- 200+ CW dump sites in the US
- Japan cleanup in China
Sea-Dumped Chemical Weapons

- Dumped by all 20th century warring parties
- Every ocean except the Antarctic
- Mikhail Gorbachev: “A major mistake…”
- Threat to environment, safety, and public health
Challenges

- **Geography**
  - Post-1918 CW dumped in North Atlantic, Baltic, Mediterranean, and Pacific Ocean

- **Countries**
  - Major military powers, mainly US, USSR, UK, Japan

- **Quantities**
  - 300,000 tons of chemical and biological warfare agents dumped in oceans by major military powers 1946-1965
  - US 1918-1970: 29,000 + metric tons, and 400,000 gas filled-bombs and rockets in US waters
  - 40,000-60,000 tons of CW in the Baltic Sea
Eurasian SDCW

The Army also has identified chemical weapons dumpsites off five other countries after World War II but considers that information classified. Countries known to have unaccounted-for U.S. stockpiles at the close the war include New Zealand, China, the former Soviet Union and Panama.

What is Known

- **Data**
  - Detailed US data, but often inaccurate (depths, locations)
  - Drift from original dumpsites
  - No coordinated global database
  - Inconsistency of statistics

- **Chemicals**
  - Mustard, lewisite, phosgene, other arsenic compounds
  - Blister agents, and blood agents, including hydrogen cyanide and cyanogen chloride (Japan)

- **Incidents**
  - Bornholm fishermen
  - Japanese civilians
  - Economic/pipelines
The Baltic

- 1946-1947 estimated 50-150,000 tons of chemical munitions dumped
- Allies, disposing of captured German chemical munitions, also disposed of some of their own obsolete and excess weapons
- Over 60,000 tons of CW and 14,000 tons of chemical agent dumped in the Baltic Sea
Baltic – Quantities of SDCW Agents in the Bornholm Basin

Source: http://www.akadeemia.ee/_repository/File/Veiderma_ettekanneINGL.pdf
Baltic – Location of SDCW

Source: http://www.akadeemia.ee/_repository/File/Veiderma_ettekannelNGL.pdf
### Baltic – Reported SDCW Sites

<table>
<thead>
<tr>
<th>Location</th>
<th>Munitions Quantity</th>
<th>Chemical Agent Quantity</th>
<th>Chemical Agent Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bornholm basins</td>
<td>35,300 to 43,399 tons</td>
<td>5,300 to 6,500 tons</td>
<td>mustard, Clark I, Clark II, Adamsite, chloroacetophenone, phosgene, nitrogen mustards, Tabun</td>
</tr>
<tr>
<td>Southwest of Bornholm</td>
<td>Up to 15,000 tons</td>
<td>2,250 tons</td>
<td>unknown</td>
</tr>
<tr>
<td>Gotland basin</td>
<td>2,000 tons</td>
<td>300 tons</td>
<td>unknown</td>
</tr>
<tr>
<td>Little Belt</td>
<td>5,000 tons</td>
<td>750 tons</td>
<td>Tabun, phosgene</td>
</tr>
</tbody>
</table>

Source: [http://www.noblis.org/MissionAreas/ni/BackgroundonChemicalWarfare/OceanDumpingofChemicalWeapons/Pages/default.aspx](http://www.noblis.org/MissionAreas/ni/BackgroundonChemicalWarfare/OceanDumpingofChemicalWeapons/Pages/default.aspx)
Baltic – Reported CW Accidents

- 1995 – 2000, Danish fishermen recovered approximately 8 chemical munitions per year with 236 kilograms of active agents
- In 2000, 512 kilograms of active agents recovered
- Berg Rasmussen, head of the Fishermen’s Association of Bornholm, reported that people came across munitions ten times in 2002
- Near Bornholm Island, dumpsites contain 250% more arsenic contamination than is allowed under Russian environmental standards
- pH values near the dumpsites ranged from 6.31 to 6.78 while the normal values for those waters should have been 7.2 to 7.6 at dumpsites in Skagerrak and Bornholm
- From 1985 until 1995, Dutch fishermen also reported 350 incidents of chemical weapons being recovered in fishing nets
WMDs close to home

Key to chemicals:
- Arsenic trichloride (AT)
- Hydrogen cyanide (HC)
- Lewisite (L)
- Mustard gas (M)
- Nerve gas (NC)
- Phosgene (P)
- White phosphorus (WP)

Source: U.S. Army reports
Hawaii - History of SDCW

- 1932 - 1944, CW discarded in waters off Hawaii, mainly off island of Oahu
- 2005 *Virginian Daily Press* drew attention to the dumpsites around Oahu Island
- President Bush signed fiscal year 2008 defense appropriations bill covering some dumped CW
- Researchers from University of Hawaii conducted a study on behalf of the Army in February 2009 to assess munitions at Pearl Harbor sites
Hawaii – Quantities of SDCW

- U.S. Army dumped over 8,000 tons of chemical weapons off Hawaiian coasts
- 2,000 tons were dumped in an area 10 miles west of the Waianae Coast
- At least 600 tons of mustard gas were dumped only five miles offshore from Pearl Harbor

Source: http://pubs.acs.org/cen/government/87/8713gov1.html
Sea-dumped Chemical Weapons in Japan

- Dumped by the Japanese Army during WWII or by the Allied Forces mainly under US command between 1945 and 1948
- 44 definite, and up to 138 suspected dump sites exist inside the country and offshore, including 29 in ocean, rivers, and lakes
- The Japanese army used colors to describe toxic agents

<table>
<thead>
<tr>
<th>Army Naming</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow</td>
<td>German type Yperit (Mustard), French type Yperit (Mustard), Lewisite</td>
</tr>
<tr>
<td>Blue</td>
<td>Phosgene</td>
</tr>
<tr>
<td>Brown</td>
<td>Hydrogen cyanide</td>
</tr>
<tr>
<td>Red</td>
<td>Diphenylcyanoarsine and Chloroacetophenone (Phenyl cyan arsen)</td>
</tr>
<tr>
<td>Green</td>
<td>Chloroacetophenone (Riot control)</td>
</tr>
<tr>
<td>White</td>
<td>Trichloroarsine (Smoke-producing agent)</td>
</tr>
</tbody>
</table>
Japan – Reported CW Dump Sites

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Circle</td>
<td>Reliable information about the existence of chemical weapons</td>
</tr>
<tr>
<td></td>
<td>Specified location</td>
</tr>
<tr>
<td>Purple Circle</td>
<td>Reliable information about the existence of chemical weapons</td>
</tr>
<tr>
<td></td>
<td>Unspecified location</td>
</tr>
<tr>
<td>Orange Circle</td>
<td>Unreliable information about the existence of chemical weapons</td>
</tr>
<tr>
<td></td>
<td>Specified location</td>
</tr>
<tr>
<td>Green Circle</td>
<td>Insufficient dump sites data</td>
</tr>
<tr>
<td>Blue Circle</td>
<td>Dump sites in Oceans, Rivers, Lakes</td>
</tr>
</tbody>
</table>

Source: Japanese Ministry of the Environment official Website
Japan – Reported CW Accidents

- Total of more than 830 cases (including the discoveries of CW, incidents of human health accidents and the government’s handling of chemical weapons)
- During the past 65 years, more than 10 people have died, and more than 400 people have suffered illness
- These 10 deaths all resulted from CW dumped in Japanese waters
Legal Considerations

- **1993 Chemical Weapons Convention (CWC)** does not generally apply to underwater or buried munitions – Part IVB of Verification Annex on “Old and Abandoned Chemical Weapons”

- **1982 UN Convention on Law of the Sea (UNCLOS)** – Section 2 on “Conservation and Management of the Living Resources…”

- **UNCLOS** – Part XII on “Protection and Preservation of the Marine Environment”

- **1972 Stockholm Convention** – Part B on “Marine Pollution”
Conclusions

- **Increased awareness in the global community** through international conferences, discussions, and dialogue
- **Improved training** for at-risk individuals
- **Global database** of dumpsite locations and types and quantities of munitions
- **Assessment of threats** to marine and human life
- **Better understanding** and evaluation of remediation options
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