It has been frequently mentioned that Canada has long been a repository for the disposal of high concentrations of mercury bearing materials. The following information discusses the issues regarding mercury exportation to Canada as well as an industry estimation of waste volumes exported. The attached exhibit will outline regulatory requirements for the exportation of mercury.

Mercury Export Summary
The exportation of high sub category mercury waste streams has been at issue for many years. Due to the requirements and cost to treat mercury to a technology based standard (RMERC), many generators, transporters, brokers, and TSDF’s have looked north to Canada to gain a financial advantage in managing mercury waste.

Land Disposal Restrictions in the US require that mercury waste identified as a Non-wastewater (NWW) that exceeds TCLP concentration limit (0.2mg/l) and is also greater than 260ppm (>260ppm) in total mercury concentration must be treated to the five-digit treatment technology standard (technology based standard) of RMERC. Mercury wastes that fail TCLP and are >260ppm in total mercury concentration are identified within the land disposal restrictions as High Subcategory Mercury Wastes.

There are no federal or Provincial-wide standards in Canada that prohibit the land disposal of high sub category mercury wastes. Canadian facilities are instead governed by facility specific standards that prescribe treatment methods and acceptable treatment technologies. In most cases the treatment methods used by Canadian facilities are more liberal, and less responsible in treating wastes, specifically when dealing with mercury.

Less stringent treatment requirements allow Canadian facilities to spend less time, materials, and money on treatment when compared to the processes mandated by the USEPA to treat the same wastes in the US (For example, the RMERC treatment standard-well researched and mandated by USEPA, does not exist in Canada.)

To save money on waste disposal, US generators of high subcategory (>260ppm) mercury wastes take advantage of lower cost, and less responsible, treatment standards offered by Canadian facilities. While these generators are saving money they are also circumventing LDR requirements mandated by the USEPA for the treatment of mercury and other wastes. It is interesting to note that there are currently no regulations that would prohibit generators from exporting waste for
treatment to processes that are less responsible and ineffective when compared to US standards.

It is standard practice in the US to commingle waste streams that are treated by similar standards (i.e. the same treatment method will treat all types of waste in the commingled “bulked” waste). Waste is routinely bulked to take advantage of cost savings that come with treating larger volumes per shipment.

It is, however, not permissible to dilute a wastestream or bypass a treatment standard for any or all of the waste stream as a result of consolidation under US regulations. Unfortunately, waste streams transported to Canada circumvent these regulations and dilution has now turned into the new treatment solution.

High subcategory mercury waste sent to Canada is often consolidated with other waste streams, which reduces the concentration of mercury in the consolidated volume of waste by diluting the mercury with other wastes. Because Canada does not have specific regulations prohibiting dilution or waste specific treatment technologies for waste streams, US generators routinely circumvent US requirements for the more liberal Canadian standard. Again, a USEPA mandated standard is violated, because similar standards do not exist in Canada.

In an attempt to defend Canadian facilities treatment of mercury proponents argue that many Canadian facilities have limits on the amount of mercury (even these limits do not meet US standards) that they will accept. This argument is invalid because wastes are diluted during consolidation or bulking as stated above and facility quality control procedures for waste acceptance are less stringent than in the US with again no federal standards for facilities. Some facilities state that they will not accept mercury that is “visible”. “Visible” uses no scientific standard to quantify the level of contamination in the waste. Therefore, a waste could have very high (i.e. >260ppm) mercury concentration but the mercury would go undetected because the mercury was either commingled with other wastes or not be visible to the naked eye.

US generators of high subcategory (>260 ppm/ >0.2 mg/l TCLP) are motivated to export mercury to Canada because of the cost savings in treatment. This savings comes at the cost of ineffective, below USEPA standard- and mandated, treatment that was established to protect human health and the environment. USEPA tested and mandated RMERC treatment for high mercury subcategory wastes has no equal under any Canadian facility standard. Additionally, the quality control requirements for acceptance, and levels accepted for treatment, are sub-standard when compared to USEPA mandated standards. There presently exists no
deterrent for the export of waste and the bypass of USEPA LDR standards because there are no laws to prevent the movement of the subject wastes to Canada and insufficient reporting requirements for wastes that are exported.

In general, US facilities will not export mercury waste to Canada unless it falls under the Technology Based Treatment Standard, or it has additional hazardous characteristics, which makes RMERC treatment unavailable. The reason for this is that all US stabilization and landfill operations will accept as much mercury waste as regulations and permits allow. Pricing for stabilization and landfill in the US is comparable with their Canadian counterparts. Thereby the only reason to ship to Canada is to avoid LDR requirements and save money.

Ontario is proposing pretreatment requirements for hazardous wastes prior to landfill. As a interim step prior to the pre treatment steps being finalized, the Ministry is considering a requirement that any imported hazardous waste destined for disposal in Ontario, would have to meet any pre-treatment standards from which they originated. The US EPA should propose similar language requiring all exported waste to meet pre-treatment standards prior to landfill.

**Cost Comparison (Canadian landfill vs. RMERC treatment)**

**Stabilization and landfill**
- **Stablex** ~$350.00 per ton plus transportation
- Stablex has no upper limit on mercury contamination allowed in the waste.
- Stablex states they will not accept waste with visible mercury.
- Stablex will routinely accept co-mingled “generic” waste streams which include mercury.
- Many US exporters to Stablex co-mingle or bulk waste streams to ship under pre existing export notifications.
- The US EPA’s Technical Background Document for Mercury Wastes indicated that stabilization of High mercury subcategory D009 waste streams is ineffective in immobilizing mercury and in fact increases the leachability of the waste due to the alkalinity of the media. The Stablex process for stabilization utilizes a high alkaline media in its process.
Direct Landfill
Safety Kleen/Clean Harbors – Sarnia facility ~$250.00 per ton plus transport

• The Sarnia facility has a 500 ppm maximum limit on mercury
• The Sarnia facility will routinely accept co-mingled “generic” waste streams which include mercury.
• Many US exporters to the Sarnia facility co-mingle or bulk waste streams to ship under pre existing export notifications.

Horizon Environment ~$200.00 per ton plus transport
• Facility designed for disposal of soils

RMERC technology
RMERC treatment facilities $2400.00 per ton plus transport
• Focuses on the recovery of all available mercury.
• Is an EPA approved treatment technology for high sub category mercury waste streams.
• Allows for the purification and concentration of mercury in its elemental form to be used to sequester mercury supplies and focus on the ultimate retirement of mercury.

Mercury exports to Canada: Volume Summary

It is a difficult task to track high sub category mercury shipment exported to Canada given the fact that a single waste stream may move through 2-3 facilities in the US prior to being shipped to Canada. Along the way that single waste stream may be co-mingled with other waste material to create a more uniform or generic waste stream. The only identifying feature to distinguish high sub category mercury shipments is found on the LDR form—which is a requirement for all shipments within the US. This form however, is not tracked by, or submitted to EPA during export. In addition, the available services for tracking exports to Canada are incomplete, due to individual States reporting waste shipments in different years.
Verification of mercury volumes can be achieved by working with the following:

USEPA Import/Export office
- Utilize export notifications to extract information
- Mary Gosly (202) 564-4118

Environment Canada
- Utilize import notification to compare information
- Francine Pretty (819) 953-2825

Information as available through Haz-Search. (Data incomplete)
- Haz-Search is a data collection program tracking manifested shipments throughout the US.

1999-2001 mercury shipments to Canada

<table>
<thead>
<tr>
<th>Waste Code</th>
<th>Description</th>
<th>Quantity</th>
</tr>
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<tbody>
<tr>
<td>D009, U151</td>
<td>Only waste shipped directly to Canada</td>
<td>4,581 tons</td>
</tr>
<tr>
<td>K106, K071</td>
<td>Only waste shipped directly to Canada</td>
<td>785 tons</td>
</tr>
<tr>
<td>Calgon Corporation</td>
<td>Direct shipments D009 waste</td>
<td>38,830 tons</td>
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<tr>
<td>Co-mingled or bulked waste, which have a D009</td>
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<td></td>
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<tr>
<td>Waste code as well as other waste codes</td>
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<td>26,770 tons</td>
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<tr>
<td>Conservative industry estimate as % of mercury</td>
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<td>5%</td>
</tr>
<tr>
<td>Volume of mercury in mixedloads to Canada</td>
<td></td>
<td>1,338 tons</td>
</tr>
<tr>
<td><strong>Total Volume 1999-2001</strong></td>
<td></td>
<td><strong>45,534 tons</strong></td>
</tr>
</tbody>
</table>

Waste Code information

D009 – Characteristic mercury

U151 – Unused mercury (Elemental Mercury)

K106 - Wastewater treatment sludge from mercury cell process of chlorine

K071 – Brine cell sludge from mercury cell process of chlorine

Calgon Corporation – operates mercury cell process for chlorine production
Exhibit 1
Outline of regulatory requirements for the exportation of mercury.

I. US Regulations Covering US Import/Exports

A. RCRA
   1. Importers, Generators, Primary Exporters (40 CFR 262)
   2. Transporters (40 CFR 263)
   3. TSD’s or Receiving Facilities (40 CFR 264, 265)

B. Exemptions
   1. Universal Waste
   2. CESQG and Household Waste Exemptions
   3. Waste sent for recycling or disposal must be packaged to prevent releases and labeled
   4. Exports of Universal Waste, notice requirements only, no hazardous waste manifest needed

C. Canadian-US Bilateral Agreement
   1. Import/Export Notices
      a. Thirty (30) days from the receipt of a notice in the receiving country until the consent or objection is made to sending country
      b. Consent once given, may be withdrawn or modified with good cause
      c. Sending country must readmit any hazardous waste that may be returned to the receiving country

II. Notifications
A. Canadian Import Notification Procedures
   1. Canadian importer must complete and sign Canadian Notification Form
   2. Contract between exporter and imported must be attached
      a. Appropriate recycling or disposal code
      b. The importer agrees to send a copy of the manifest within 3 days after receiving shipment
      c. The importer agrees to send confirmation 30 days after recycling/disposal of waste
   3. Proof of insurance for importer and carriers submitted
      a. Carriers and importers must be insured
      b. Same levels of exporters
4. Obtaining Consent
   a. Canadian Import Notice needs to match Foreign Export notice exactly
   b. Once EC reviews, sent to Province of import for approval
   c. Generally valid for 12 months

B. US Export Notification Procedures
   1. Notification of Export to EPA
      a. Containing similar information as on Canadian Import Notice except the identification of transporter(s) is not required by EPA
      b. Canadian regulations require this information however to be initially processed. This info can be amended on the Canadian side without submitting a renotification to the EPA
      c. Exporter may never ship in anticipation of notification. Any shipment prior to consent is unlawful. Shipments can only be made with an Acknowledgement of Consent
      d. The exporter must furnish any additional information Canada requests to the EPA
      e. Exporter must furnish an Annual Export Report to the EPA by March 1.

C. Manifests
   1. US manifests are required for all exports out of the US which are subject to manifesting requirements
   2. Universal waste does not require a manifest
   3. Include the EPA and Acknowledgment of Consent number on the manifest.