



# Storing and Disposing Excess Mercury in South America

Advancing National Initiatives in Argentina and Uruguay



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**Final report of the**  
**“Mercury Storage and Disposal Two Countries Project in Latin America”**

**UNEP CHEMICALS**

*This report was prepared by Gustavo Solórzano, consultant, under contract with UNEP Chemicals, with all reasonable care and diligence. While the author has greatly benefited from valuable contributions and comments from a number of colleagues, he accepts complete responsibility for the accuracy of the final product. Nevertheless, third parties who rely on information contained in this document, or their own interpretation thereof, do so at their own risk.*

## **Executive summary**

Studies dealing with mercury supply and mercury waste management have been conducted in recent years in different regions of the world by the Chemicals Branch of the United Nations Environment Programme's (UNEP) Division of Technology, Industry and Economics (DTIE), including the Asia-Pacific and Latin America and the Caribbean regions. The storage of mercury and mercury-containing waste emerges as a crucial issue in these studies, since in many developing countries there are no favorable conditions for the effective and economically viable long-term storage of mercury. This situation has also been mentioned at various events, such as the meeting of the Executive Committee of the LAC Mercury Storage Project (21-22 October 2010, Santiago, Chile), and the second session of the Intergovernmental Negotiating Committee on Mercury (INC 2; 24-28 January 2011, Chiba, Japan). Delegates attending the Santiago meeting also expressed the need to develop temporary or interim facilities to store elemental mercury and to manage mercury-containing waste.

In order to find solutions to the mercury storage problem, Argentina and Uruguay were selected for the "Mercury Storage and Disposal Two Countries Project in Latin America" as a follow-up to the above-mentioned projects. The methodology followed in this project is based on the "Suggested framework for decision making for the safe management of surplus mercury", an important output of the workshop organized by the Integrating Knowledge to Inform Mercury Policy (IKIMP) Initiative held on October 2009 at the University of Oxford in the UK. Following this methodology, the project included the following steps to be taken in each of the two countries: 1) Survey and analysis of possible temporary storage locations within the country; 2) Review of the regulatory framework; 3) Establishment of a decision-making process; 4) Technology status/Assessing basic management options; and 5) Developing a national storage and waste management action plan. Data from previous sectoral mercury release inventories was likewise an important input to project development. Although options like stabilization, distillation and landfilling are briefly referred to in this document, this project focuses mainly on above-ground temporary storage in an existing facility selected for each of the two countries from amongst a number of potential sites.

## **RESULTS**

### **Argentina**

The health sector is the largest source for releases of mercury waste in the country (2.050 Kg/year), followed by the chlor-alkali plants (1.777 Kg/year) and light bulbs (468 Kg/year). Argentina reported four potential facilities for temporary in-country storage (security landfills for hazardous waste disposal); two of these four facilities are also authorized for mercury waste treatment. Both facilities offer a chemical treatment consisting of a sulphur-based stabilization technique applied to mercury waste.

As regards the regulatory framework in Argentina, a total of nineteen national instruments (laws, regulations, decrees and resolutions) are in place, one of which is currently not operational. At the regional level, three relevant instruments adopted under MERCOSUR (two framework agreement and one action plan) can be identified. As regards the international sphere, Argentina has adopted national laws implementing both the Basel and the Rotterdam Convention. Provincial regulatory instruments were also referred to in a general manner, in relation to the import of hazardous waste into their territories. Only five Argentine provinces (Chaco, Corrientes, Córdoba, Mendoza and Santa Fe) allow the importation of hazardous waste.

A National Working Group (NWG) comprised of representatives from the public sector, chlor-alkali industry, laboratories, civil society organizations (CSOs), and others was formed as part of the decision making process. The NWG met and worked together on different issues, including the first draft of Argentina's National Action Plan (NAP). As regards technology status and management options, mercury waste generators in Argentina can send their waste for stabilization and final disposal in security landfills. Currently there is no in-country distillation (retorting) treatment option. Nevertheless a technical proposal developed at the National Institute for Industrial Technology (INTI) is being considered for the permanent (underground) storage of mercury and mercury waste, initially developed in 2007 for the permanent storage of radioactive waste.

A draft NAP has been proposed, in which five sub-objectives have been prioritized: 1) Strengthen national capacities for strategy definition; 2) strengthen information availability on mercury sources; 3) assess state-of-the art options for elemental mercury storage; 4) assess alternatives for mercury waste storage/final disposal in Argentina; and 5) regularly review/update the regulatory framework. General guidelines and four to six actions have been formulated for achieving each of the five sub-objectives.

## **Uruguay**

In 2010 total mercury releases to the environment were estimated at a minimum of 2.201 Kg. and a maximum of 3.616 Kg. The chlor-alkali sector was the most significant category, with 1.140 Kg/year, followed by dental amalgam with 550 Kg/year. The range for electrical switches is between 66.9 Kg and 836 Kg/year. Mercury thermometers accounted for 185 Kg/year.

A total of sixteen potential sites were listed for the temporary storage of mercury waste, including a chlor-alkali plant, cement kilns, an oil refinery, non-coal-fired power plants, hazardous/medical waste incinerators, landfills, and others. Two of these sites were identified as apparently best suited to the above-mentioned purpose: the chlor-alkali plant and an industrial waste landfill.

Twenty-five regulatory instruments were identified during the legal framework review. Departmental guidelines complement nineteen national instruments, two of which also apply at the municipal level. At the regional level, two framework agreement and one

action plan are relevant, all of which were adopted under MERCOSUR. With regard to the international level, Uruguay has implemented the Basel and Rotterdam Conventions via national laws. However particular regulations for hazardous waste and substances are still incipient and non-specific in Uruguay.

In Uruguay the stakeholders group involved in mercury issues participated in different activities related to informing, training and discussion. This group is characterized by its wide participation, including representatives from national and local governments, academia, professional associations, public service utilities, chambers of commerce and industry, private waste treatment companies and civil society organizations. The group met and worked on various issues, such as defining control measures for facilities using mercury, and the drafting of the National Action Plan.

Relative to the project, Uruguay focused more on technology status and management options particularly exploring retorting as well as stabilization as treatment options for mercury waste arising from the two main sources: the chlor-alkali sector (mercury-containing waste such as sludge) and mercury added products. The only facility currently in operation to treat mercury containing waste is a lamp crusher. No security landfills for hazardous waste are currently in operation in Uruguay.

Uruguay's draft NAP was developed by identifying the various major mercury waste streams in the country, which originate from three sources: 1) industrial processes (chlor-alkali plants), 2) end-of-life products (lamps, batteries, thermometers, etc.), and 3) others. A summary matrix was developed, featuring the following items: mercury waste source, type of mercury waste, lines of action, performance indicators/goals, deadline, resources needed, and institutions responsible.

## **ANALYSIS AND RECOMMENDATIONS**

### **Argentina**

From a technical point of view, any of the four reported sites is a potential temporary storage facility for the purpose of this project: each one of them has the advantage of currently being an authorized receptor of hazardous waste. Nevertheless it is advisable to enhance the analysis of possible storage locations in Argentina, and make a detailed assessment of the sources of mercury waste and their location in the country, the results of which will be useful in defining the best storage option.

A solid regulatory framework covering hazardous waste management exists in Argentina, although it is still necessary to advance on particular legal instruments addressing mercury waste management. The most significant characteristics of the regulatory framework are the restrictions on hazardous waste transportation between the various provinces—a condition that will undoubtedly influence the site selection process. Recommendations arising from review of the regulatory framework include the need to develop a thorough

assessment of the provincial/ municipal regulatory framework related to hazardous waste management, and moving ahead in passing appropriate legal instruments, taking into consideration the ongoing negotiations for a Global Legally Binding Instrument on Mercury.

Although certain steps have been taken regarding the decision-making process, it is still necessary to define subsequent activities and increase the involvement of all relevant stakeholders. It is recommended to involve the working group in the finalization and implementation of the NAP, as well as taking into account the items recommended in the IKIMP framework.

As regards the issue of technology status and management options, Argentina has a relatively comprehensive treatment/disposal infrastructure in place, including the option for solidification/ stabilization of mercury waste (an option not yet available in most of the GRULAC countries). Nevertheless current regulations may inhibit the domestic transfer of wastes to facilities within the country.

INTI's proposal offers interesting potential as an underground storage option. Further assessment of this proposed technology is recommended to determine its potential for the permanent storage of mercury and mercury waste.

The National Action Plan is still in an early stage. It is recommended to carry on with its development, involving other participants who will be responsible along with those authorities already engaged.

## **Uruguay**

Uruguay encountered two options for potential temporary storage facilities within its territory, with each one having both advantages and disadvantages. In order to select the best option, it is recommended that additional and more specific information be obtained regarding each of the two potential sites. It is also necessary to contact the owners/operators of the potential sites and inquire as to the possibility of these becoming storage facilities.

The lack of particular legal instruments in operation in Uruguay to address hazardous waste management might be an obstacle to finding an adequate solution to the mercury waste management problem. In this case it would be recommended to proceed with the preparation and adoption of the Waste Act, examine the draft and determine if the provisions take all necessary elements into account.

Similar to Argentina, Uruguay is fairly advanced in the decision-making process, this could still be strengthened. It is recommended to engage the working group participants in line with their responsibilities in the drawing up of the NAP, and also to take the items recommended into consideration in the IKIMP framework described.

In terms of technical options, Uruguay currently lacks the necessary infrastructure for hazardous waste treatment/disposal, including for mercury waste. This offers an opportunity to invest in creating the necessary infrastructure to treat mercury waste (end-of-life products) within an as-yet unexploited market. For the mercury containing waste, such as chlor-alkali waste, the development of a more comprehensive analysis is recommended in order to find the right alternative for its disposal.

Uruguay's NAP is also at an early stage of its development, with several activities being outlined. At this stage it is recommended to incorporate additional activities in the NAP dealing with general issues such as regulatory instruments, awareness raising, communication, and others.

## **CONCLUSIONS**

The project provided a pre-selection of potential sites for the temporary storage of mercury waste in both countries. Four waste management facilities in Argentina have been identified as potential sites, one of them having the decisive advantage of being located in a Province that allows the import of mercury waste. In Uruguay, two sites with a large potential of becoming a temporary mercury waste storage facility were selected, one of which has experience in activities related to mercury waste.

Each country has established a solid basis from which it can develop a comprehensive National Action Plan for the environmentally sound management of elemental mercury and mercury waste. Nonetheless, it is important to stress the need to move ahead in the development of these Plans, engaging the stakeholders involved in each of the activities designed for the action plans.

Both countries improved their knowledge and understanding of both the existing legislative framework and those regulatory instruments that are still missing and that are necessary to attain environmentally sound management of mercury and mercury waste.

Finally, the possibility of replicating this project in other countries in the GRULAC region should be considered. Such follow-up projects could build upon the experiences gained and lessons learned during the implementation of this project.

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