**República Argentina - Poder Ejecutivo Nacional**
2019 - Año de la Exportación

**Informe**

**Número:** IF-2019-09733836-APN-DR#SGP

CIUDAD DE BUENOS AIRES
Lunes 18 de Febrero de 2019

**Referencia:** Minamata Convention - Decision MC-2/2 - Mercury Waste

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Mercury Waste

Pursuant to Decision MC-2/2, Parties and other stakeholders are invited to submit the following information, taking into account relevant information contained in the Technical Guidelines on Environmentally Sound Management of Wastes Consisting of, Containing or Contaminated with Mercury or Mercury Compounds (UNEP/CHW.12/5/Add.8/Rev.l):

a. Examples of wastes to be added to the annex to document UNEP/MC/COP.2/6, including, for wastes consisting of mercury compounds, specific names of compounds, and, for wastes containing mercury or mercury compounds (i.e., mercury-added products), the names and types of the mercury or mercury compounds, and pictures, if available;
b. Current practices of managing overburden, waste rock and tailings from mining other than primary mercury mining (e.g., laws, regulations and guidelines) and various approaches to thresholds for special care/handling, if any; and
c. Sampling and analysis methods that may be useful for verifying waste thresholds.

Abbreviations referenced in this document:

A: Wastes consisting of mercury or mercury compounds (Hereafter “A category”)

B: Wastes containing mercury or mercury compounds; (Hereafter “B category”)

C: Wastes contaminated with mercury or mercury compounds. (Hereafter “C category”)

MC: Minamata Convention on Mercury

BC: Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their disposal.

**a. Examples of wastes to be added to the annex to document UNEP/MC/COP.2/6, including, for wastes consisting of mercury compounds, specific names of compounds, and, for wastes containing mercury or mercury compounds (i.e., mercury-added products), the names and types of the mercury or mercury compounds, and pictures, if available;**

Stockpiles as raw material obtained as a by-product were identified as source of “A category”

Sources identified: oil and gas industry and mining (metal extraction and processing Au, Ag).

Even if it is obvious that consisting mercury wastes are hazardous waste under the definitions of the Basel Convention, thresholds have a very

important role, since concentration limits will differentiate between Hazardous Waste and non-hazardous waste. This is a fundamental aspect for environmental sound management and design disposal methods and monitoring operations.

Oil & Gas industry: Mercury is often present in natural gas, petrochemical and some refinery feed streams. The primary reason for removing mercury from natural gas is to protect downstream aluminium equipment's, because, mercury could amalgamate with aluminium and the resultant weakening of the metal through corrosion and embrittlement.

Since the level of mercury that can be tolerated in the equipment is not established, most companies want to remove it. In that case, mercury is recovered by using special unit operation.

Another reason for removing mercury is to produce mercury-free product streams.[1] For example, if ethane or propane is used as feed for an ethylene plant, the mercury needs to be removed to prevent heat exchanger and catalyst deactivation problems in the ethylene plants.

Mercury in natural gas is present predominantly as elemental mercury. However, in theory, the mercury could be present in other forms: inorganic (such as $HgCl_2$), organic (such as $CH_3HgCH_3$, $C_2H_5HgC_2H_5$) and organo-ionic (such as $ClHgCH_3$) compounds[2].

Mercury drops are frequently observed in the gas separator equipment.

This metal recovered, turns into waste since no-use and intention to disposal is intended by producer, so, it´s necessary to identify this stream as waste consistent in mercury, in order to allow ESM to disposal.

This stream should fall under "A category", depending on operations used to recover mercury (like adsorption/condensation, drying systems or other).

In the other hand, processes of adsorption or some other contact processes from oil & gas source, may generate for example, contaminated absorbents that fall under C category, like spent activated carbon contaminated with Hg or spend catalysers.

Mining / metal processing:

The Merrill-Crowe gold recovery process removes precious metals from a cyanide solution by zinc precipitation. Since mercury is present in some minerals (depending of geological aspects), is also present in leaching of minerals (pregnant solution) then, must be removed before refining the metal of interest (gold, for example). In this context, mercury is obtained as a by-product mercury and collected.

If there is no market or use allowed is identified, mercury recovered must be disposed as hazardous waste. It is important to be specific on concentration levels and thresholds, since a concentration limit can leave a "loophole in law" related to classification of "A category" as hazardous. In general, is a very pure metal (>95%), but 94.5% could happened…or 99.7%.

This metal should fall under A category, and all instruments and filters used in this processes, should fall under C category. The concentration of mercury caught on carbon filters, will depend on the sophistication and frequency of maintenance of the equipment. Therefore, it would not be possible to predict a standard concentration.

Other processes or methods are used to refine gold (where no retorts are used), and pregnant solution is absorbed in activated carbon. Then, carbon is desorbed and regenerated. In one instance, process have a regeneration unit operation, but, spent carbon and carbon powder – that, in fact can contain gold and other metals, are in general processed in other process unit or if allowed, re-processed in leaching valley. If gold law is not economic, probably should be intended to dispose, so in that case, if mineral processed have mercury traces, it will be absorbed and – probably, be present on spend activated carbon and powders ("C category").

**b. Current practices of managing overburden, waste rock and tailings from mining other than primary mercury mining (e.g., laws, regulations and guidelines) and various approaches to thresholds for special care/handling, if any; ((Source of information: Secretariat of Mining Policy – Ministry of Production and Labour – Argentina)**

The Secretariat of Mining Policy of the Ministry of Production of the Government of Argentina presents a brief summary of the regulatory framework and current practices regarding mine waste, as well as the proposed approach for establishing thresholds for overburden, waste rock and tailings, except for primary mercury mining, in accordance with paragraph 2 of article 11 of the Convention.

*Regulatory Framework regarding mine waste in Argentina*

In Argentina, the mining activity is regulated through the Mining Code, which comprises a management framework for the distribution of powers between federal and provincial governments, not only for mineral tenure aspects, but also for environmental regulations[3]. These

environmental regulations have been introduced to the Mining Code through National Law 24.585, referred to as "Environmental Protection in Mining Activity". This law establishes the minimum requirements for the environmental impact assessment prior to commencement of mining activities at the different stages (prospection, exploration and mining). Each province defines the application body for the law and the specific procedures within its administration.

National Law 24.585 is accompanied by a group of Annexes, approved by the COFEMIN (in Spanish: *Consejo Federal de Minería*), the administrative council that groups the mining authorities of each province:

- Annex I, II and III specify the scope and requirements for the preparation of Environmental Impact Reports for the prospection, exploration and mining phase, respectively;
- Annex IV defines guidelines for water, soil and air quality.

Regarding mine wastes, Annex III requires that the project description for the mining stage includes a detailed description of the processes used to treat the mineral (technologies, equipment, flowcharts for raw materials, supplies, effluents, emissions and wastes, water balance). Regarding waste rock dumps and tailings dams, the description should include:

- Design, location and construction
- Effluents
- Studies and essays
- Acid drainage prediction
- Studies to determine the possibilities of transport and neutralization of contaminants.

Annex IV establishes water quality guidelines with different objectives or uses (drinking water source, protection of aquatic life in surface freshwater and brackish waters, irrigation and animal drinking) and soil quality guidelines for agricultural and industrial uses, in both cases including guidelines for total mercury concentration. Air quality guidelines do not include mercury.

The application of these guidelines is subject to considerations on baseline studies (required for the EIR) and naturally occurring presence of compounds (including mercury).

The regulatory framework does not define thresholds for any substances in waste rock and/or tailings.

The EIR should include, as well as the description of the project and its environmental and social baseline, the identification and evaluation of impacts, an environmental management plan (including a monitoring plan, closure and post closure monitoring) and an emergency action plan and the description of the methodologies and regular

*Current practices for the management of overburden, waste rock and tailings in the mining sector in Argentina*

As it was mentioned in the description of regulatory requirements, the mining projects must include measures to predict and address acid mine drainage and leaching of metals from waste rock dumps and tailings disposal facilities. These measures include:

- Geochemical characterization of mine wastes in order to determine their acid generation potential and neutralization potential of waste materials;
- Distribution strategies of acid generating material and neutralizing materials within mine waste facilities in order to minimize acid drainage and heavy metals leaching;
- Water management plans to minimize the generation of contact waters by diversion of runoff water, minimization and/or collection of infiltration waters / seepage (channels, drains and membranes), addition of neutralizing materials and placement of covers.
- Water monitoring plans.

*Proposed approach for the establishment of thresholds for overburden, waste rock and tailings under Minamata Convention*

Considering the current legal framework and practices regarding mine waste management in Argentina, the difficulties regarding the definition of threshold levels for metals in soil and its similarity with mining waste (overburden, waste rock and tailings) and the evolution of environmental regulations towards a risk-based approach, this Secretariat proposes, rather than the definition of threshold values applicable to all mine wastes, a multi-factor, risk-oriented approach that takes into account the socio-environmental conditions of the site, the geochemical characterization of waste materials, potential transportation routes for mercury in the environment under normal and contingency conditions, environmental management, monitoring and emergency plans implemented by the mine operators and potential human and environmental exposure to mercury in waste.

**c. Sampling and analysis methods that may be useful for verifying waste thresholds.**

Taking into consideration the following facts:

- MC Art. 11 call to Basel Convention definitions when wastes are involved, except the particularity of overburden, waste rock and tailings in mining (...)
- BC Art. 2 defines “Wastes” as “substances or objects which are disposed of or are

Intended to be disposed of or are required to be disposed of by the provisions of national law;”

- The scope of control of BC are transboundary movements of hazardous wastes intended as Wastes that belong to any category contained in Annex I, unless they do not possess any of the characteristics contained in Annex III: and those defined as well under domestic legislation of Parties.

An approach to stablish thresholds could be based on the selection of methods in order to stablish if a waste constituted by mercury or mercury compounds (Y29), exhibit, at least one of hazard characteristics listed in annex III of the BC.

This approach could be applied to A, B and C types of wastes, but is limited to mining massive wastes, where a different approach should be considered.

Interim guidelines are published in this matter under BC. It is important to highlight that annexes of BC are currently under revision.

Other approach could be to analyse the possibility of using the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) methods in order to stablish thresholds, and adopt decision´s tree methodology in classification. GHS classification is based on the intrinsic properties (the hazards) of the chemical substance or mixture concerned and does not address exposure to the chemical or mixture (in contrast to BC hazard characteristics that, in some cases, suppose a risk-based criteria). Mercury stockpiles, mercury obtained as by-product and end-of-life mercury-added products, are cases where, in analogy, GHS could be used (hazardous substances//hazardous wastes consisting or containing mercury).

Sampling methods will depend on each the following aspects: waste matrix (liquid, solid, powder, sludge), concentration, and quantity (depending on each particular stream). Representative sampling it is a key aspect to consider, in special for “C category”. This means that category C is produced in a non-continuous or uniform processes (so non uniform concentrations are expected). “A and B categories” would have predictable concentrations, since their source / process is well known, so sampling method could be based on periodic sampling.

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[1] In Argentina, IRAM-IAPG A 6874 (norm: General guidelines for the selection of test methods for the determination of total mercury in natural Gas).

[2] Distribución del Mercurio en las Plantas de Procesamiento de Gas - Autores: Peter J H Carnell, Neil Eckersley (Johnson Matthey)

[3] “Integrating Sustainability into Legal Frameworks for Mining in Some Selected Latin American Countries”. Elizabeth Bastida. Centre for Energy, Petroleum and Mineral Law & Policy, University of Dundee, UK. Mining, Metals and Sustainable Development (MMSD), January 2002.

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