M E R S A D E

MERCURY SAFETY DEPOSIT

LIFE Project Number

<LIFE06 ENV/ES/PRE/03>

LIFE PROJECT NAME

<MERSADE>

Task 1

State of Art

T1.1. Literature review.
(Included each following parts).

T1.2

Estimation of figures for total quantity for possible storage from EU countries and in adhesion process taking in account the caustic-soda industry and others.

Status Report

Reporting Period: October 2006 – January 2007

Report Authors: M. Ramos.

Date of Issue: 24.07.2007

TASK 1.2. ESTIMATED QUANTITY OF MERCURY METAL TO BE STORAGE FROM THE EUROPEAN UNION OF THE 27 COUNTRIES, (27' EU) AFTER THE EXPORT BAN.

INTRODUCTION

To set the main milestone on the temporal dimension, the more recent reference issued at Document 114767 / 07 of the Council of the European Union that took place in Brussels on last June the 28th, clearly set on the Article 1: "*the export of metallic mercury (Hg, CAS RN 7439-97-6) from the Community shall be prohibited from 1 July 2011"*. It is obvious to say that the temporal dimension on this study is mainly affected by this date.

Considering that after the 1st of July 2011 exports are not be permitted, we can understand that all mercury inside the European Union of the 27's, will be the minimum amount of Hg that will be for safety storage or disposal. As a closed system since that date the 27's EU are considered and target looked for here is to reach an approach of such a mercury either is use at that moment or in other form but recoverable into liquid metal. Under this circumstances the imports are considered null or very limited as will be justified later after.

The end of use for Hg technology at the chloro-alcali production voluntary agreed and endorsed by the Commission, marks other limit to this scenario with a large influence on the quantities to handle. Those two dates are considered as principal on the frame scenario because they mark steps on the decision process for largest industry user of mercury in EU, being far from any other.

Based on those main lines, an estimation have been made for the quantity of mercury metal **currently in use** into the European Union of 27's countries that adjusted by the evolution of flow of this metal from today onwards to the 1st of July 2011, will provide the quantity for store or disposal in a safety manner.

The approach is going to be expressed in estimated tones of metallic mercury as it is assumed that all other mercury contained in wastes or in other forms, will have the same treatment or destination than today. It is considered also that there is no any important change on the pathways of uses during the next four years and market from now up to the export ban fixed date.

The mathematical expression of this function refers to quantities considered as involved, may be expressed :

$$\text{Hg}_{\textit{for storage}} = (\text{Hg}\,c + \text{Hg}\,s + \text{Hg}\,p + \text{Hg}\,bp + \text{Hg}\,w + \text{Hg}\,i) - (\text{Hg}\,co + \text{Hg}\,ex)$$

being:

- Hg $_{for\ storage}$: *Mercury metal to storage.*
- Hg *c* : *Mercury metal in electrolitical **c**ells plants.*
- Hg *s* : *Mercury metal currently in **s**tocks.*
- Hg *p* : *Mercury metal **p**rimary produced.*
- Hg *bp : Mercury metal as **b**y **p**roduct from other metals metallurgy and gas cleaning.*
- Hg *w* : *Mercury metal recovered from **w**astes.*
- Hg *i* : *Mercury metal **i**mported.*
- Hg *co* : *Mercury metal **co**nsumed.*
- Hg *ex* : *Mercury metal **ex**ported.*

Conclusions:

According to the restrictions set above for the model described and summarising, the estimated value of Hg $_{for\ storage}$ in European Union for the 27's on the next 1st of July 2011 will be around 8000 t with a volume of about 600 m^3. This amount is expected not be modify by the mercury recovered that as was argued, only the mercury collected directly as a metal can increase this amount. All others that must be recovered by waste treatment is assumed will not be treated and directly disposed avoiding the treatment cost and potential emissions from treatment process.

References.-

1. B.O.E. nº 141 of 13th of June 2007, pag 25790-25791: Resolución de 3 de mayo de 2007, de la Direccion General de Calidad y Evaluación ambiental por la que se publica el Acuerdo Voluntario entre el Ministerio de Medio Ambiente, la Consejería de Medio Ambiente de la Junta de Andalucía, la Asociación Nacional de Electroquímica y Aragonesas Industria y Energía, S.A. para la protección ambiental y control de emisiones del Sector Cloro-Álcali Español.

2. Euro Chlor (2006) –Chlorine industry review 2005-2006. Brussels. (www.eurochlor.org)

3. Euro Chlor (2006) –Industry urges Council to back mercury storage plan. Brussels. (https://www.eurochlor.org/news/detail/index.asp?id=230)

4. European Commission (2005) Communication on the Community Strategy Concerning Mercury, Brussels, 28.01.2005 COM(2005) 20 final {SECC(2005) 101}.

5. Mayasa internal reports and personal communications (2006-2007).

6. Maxson (2006) –Mercury flows and safe storage of surplus mercury". Concorde East/West Sprl for the European Commission –Environmental Directorate, August 2006. At https://ec.europe.eu/environment/chemicals/mercury/pdf/gh_flows_safe_storage.pdf

7. Opensshaw and Woodward (2001) –"New developments in mercury removal", AlChE Spring National meeting, April 22-26, 2001, Houston, Texas. At http://www.jmcatalysts.com/pct/pdfs-uploaded/gas%20processing/aiche.pdf

8. UNEP (2005) –Toolkit for identification and quantification of mercury releases –pilot draft of November 2005. United Nations Environmental Programme, Chemicals Branch, Geneva, 2005, at http://www.chem.unep.ch/Guidance-training-materials.htm.