

# **Y.T.S. FIELD REVIEW OF THE GLOBAL MERCURY PROJECT**

Post-Project Period : April – October 2007

## **Summary**

Since the close of the GMP in March 2007, Yayasan Tambuhak Sinta has continued to conduct monitoring and follow-up activities in the town of Kereng Pangi.

Between April and October 2007, YTS staff :

- monitored the results of the existing fumehood modifications in gold shops.
- continued to install mercury-capture systems in gold shops, and to train operators directly in mercury-recycling techniques.
- tested the efficiency of the fumehood condensor system, and found that, when fitted correctly, the water barrier alone has a capture rate of 75%.
- distributed forms to gold shops and collected further data on amalgam burning rates as well as Hg recovery rates. In some gold shops, the amount of Hg recovered from amalgam burned, is estimated to enter the 80% - 90% range.
- compiled the data and completed a study that quantifies the amount of mercury captured and recycled during 2007 as a result of these modifications: by year-end a total of 645kg of Hg will have been recycled as a result of these interventions. This figure is expected to be around 900kg over the upcoming 12 months of 2008.
- distributed project documentation to stakeholders and other interested parties in both multimedia form (as CD-ROM) and as printed binder volumes; and also continued working towards the completion and launch of a stand-alone website dedicated to making the results of the project available to the general public.
- continued to liaise with government, provide advice to government, and monitor changes in government policy and implementation regarding mercury.

## 1. Installation of Mercury Capture Systems

By the close of the Global Mercury Project in March 2007, a total of 17 mercury capture systems had been delivered to Kereng Pangi. YTS staff have continued to visit the town on a monthly basis, to check on the progress of these gold shops, and to deliver and install new systems. Thus, all gold shops have been given the opportunity to adopt the technology, and as a result, a further 19 systems have been delivered and installed.

Of the 36 systems that have now been delivered to Kereng Pangi, 23 were installed directly by YTS, and 13 were distributed to partner field sites by gold shop owners.

The technology that YTS has promoted and field tested has been found to be appropriate for the needs of gold shops. It consists of PVC piping, a sealable plastic container, and a blower. It is important to note that the spread of the technology is due to local demand.

## 2. Mercury Recycling Rates

A controlled experiment was conducted on 25 October 2007 to test the efficiency of the unit under field conditions. The following steps were undertaken in one gold shop:

- A clean container with clean water was fitted in the unit.
- 102 grams of liquid mercury was measured out, using the shop's gold scales.
- The entire amount was vaporised in the chimney with the blower running.
- The container was wholly removed and sealed.
- A pinch of detergent was added, the solution agitated, and left to settle overnight.
- The clear water was separated from the residual mercury.
- The residual mercury was carefully extracted and weighed using gold scales.
- From the original 102g vaporised, 77g was successfully recovered.

**Thus, the capture rate of the unit was determined to be 75%.**

Field experience shows that some mercury also condenses within the chimney and exit pipe prior to capture by the water trap, therefore the efficiency of the unit is **above 75%.**

The attached tables detail:

- **the actual of amount of mercury captured and recycled month-to-month by systems installed in 2007**
- **the quantity of mercury projected to be captured and recycled by these existing systems throughout the course of 2008**

For both 2007 and 2008, a cumulative total is given for urban and field locations

**Mercury Recovery in Kereng Panggi 2007**  
Urban Installations

| No.                            | Gold Shop       | Jan         | Feb         | March       | April       | May         | Jun         | July        | Aug         | Sep         | Oct         | Nov         | Dec         | Shop Totals  |
|--------------------------------|-----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|
| 1.                             | H. Barbakti     |             | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 11.0         |
| 2.                             | H. Anwar        |             | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 11.0         |
| 3.                             | Jonito          | 5.0         | 5.0         | 5.0         | 5.0         | 5.0         | 5.0         | 5.0         | 5.0         | 5.0         | 5.0         | 5.0         | 5.0         | 60.0         |
| 4.                             | Delta           |             | 7.0         | 7.0         | 7.0         | 7.0         | 7.0         | 7.0         | 7.0         | 7.0         | 7.0         | 7.0         | 7.0         | 77.0         |
| 5.                             | Anugerah        | 3.0         | 3.0         | 3.0         | 3.0         | 3.0         | 3.0         | 3.0         | 3.0         | 3.0         | 3.0         | 3.0         | 3.0         | 36.0         |
| 6.                             | Kenangan Baru   |             |             |             |             |             |             | 1.5         | 1.5         | 1.5         | 1.5         | 1.5         | 1.5         | 9.0          |
| 7.                             | Noryahya        | 4.0         | 4.0         | 4.0         | 4.0         | 4.0         | 4.0         | 4.0         | 4.0         | 4.0         | 4.0         | 4.0         | 4.0         | 48.0         |
| 8.                             | Karya Baru      |             |             | 2.5         | 2.5         | 2.5         | 2.5         | 2.5         | 2.5         | 2.5         | 2.5         | 2.5         | 2.5         | 25.0         |
| 9.                             | Al Karomah      |             |             |             |             |             |             |             | 2.0         | 2.0         | 2.0         | 2.0         | 2.0         | 10.0         |
| 10.                            | Pancar Indah    |             |             |             |             |             |             | 1.5         | 1.5         | 1.5         | 1.5         | 3.0         | 3.0         | 12.0         |
| 11.                            | Anggun          |             |             |             |             |             |             | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 6.0          |
| 12.                            | Sumber Rezqi    |             |             | 1.5         | 1.5         | 1.5         | 1.5         | 1.5         | 1.5         | 1.5         | 1.5         | 1.5         | 1.5         | 15.0         |
| 13.                            | Huda            | 2.3         | 2.3         | 2.3         | 2.3         | 2.3         | 2.3         | 2.3         | 2.3         | 2.3         | 2.3         | 2.3         | 2.3         | 27.6         |
| 14.                            | Sumber Kayu Mas |             |             |             |             |             |             | 3.5         | 3.5         | 3.5         | 3.5         | 3.5         | 3.5         | 21.0         |
| 15.                            | Sahabat Baru    |             |             | 1.5         | 1.5         | 1.5         | 1.5         | 1.5         | 1.5         | 1.5         | 1.5         | 1.5         | 1.5         | 15.0         |
| 16.                            | Setia Kawan     | 2.0         | 2.0         | 2.0         | 2.0         | 2.0         | 2.0         | 2.0         | 2.0         | 2.0         | 2.0         | 2.0         | 2.0         | 24.0         |
| 17.                            | Swarga          |             |             |             |             |             |             | 1.5         | 1.5         | 1.5         | 1.5         | 1.5         | 1.5         | 9.0          |
| 18.                            | Karya Family    |             |             | 0.2         | 0.2         | 0.2         | 0.2         | 0.2         | 0.2         | 0.2         | 0.2         | 0.2         | 0.2         | 2.0          |
| 19.                            | Adinda          | 0.0         | 0.0         | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 10.0         |
| 20.                            | Central         | 0.0         | 0.0         | 1.5         | 1.5         | 1.5         | 1.5         | 1.5         | 1.5         | 1.5         | 1.5         | 1.5         | 1.5         | 15.0         |
| 21.                            | Global          | 0.0         | 0.0         | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 10.0         |
| 22.                            | Pancar Aulia    | 0.0         | 0.0         | 0.0         | 0.0         | 0.0         | 0.0         | 0.0         | 0.0         | 0.0         | 0.0         | 2.0         | 2.0         | 4.0          |
| 23.                            | H. Bani         | 0.0         | 0.0         | 0.0         | 0.0         | 0.0         | 0.0         | 0.0         | 0.0         | 0.0         | 0.0         | 1.0         | 1.0         | 2.0          |
| <b>Total Urban Recovery Kg</b> |                 | <b>16.3</b> | <b>25.3</b> | <b>34.5</b> | <b>34.5</b> | <b>34.5</b> | <b>34.5</b> | <b>43.5</b> | <b>45.5</b> | <b>45.5</b> | <b>45.5</b> | <b>50.0</b> | <b>50.0</b> | <b>459.6</b> |

**Field Installations**

| No.                            | Field Sites           | Jan        | Feb        | March      | April      | May        | Jun         | July        | Aug         | Sep         | Oct         | Nov         | Dec         | Site Totals  |
|--------------------------------|-----------------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|
| 1.                             | Galangan (Anum)       | 5.0        | 5.0        | 5.0        | 5.0        | 5.0        | 5.0         | 5.0         | 5.0         | 5.0         | 5.0         | 5.0         | 5.0         | 60.0         |
| 2.                             | Galangan (Jama'an)    |            |            | 2.0        | 2.0        | 2.0        | 2.0         | 2.0         | 2.0         | 2.0         | 2.0         | 2.0         | 2.0         | 20.0         |
| 3.                             | Galangan (Unay)       |            |            | 1.0        | 1.0        | 1.0        | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 10.0         |
| 4.                             | Kelanaman (Saharil)   |            |            | 1.0        | 1.0        | 1.0        | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 10.0         |
| 5.                             | Koperasi (Muhajir)    |            |            |            |            |            | 5.0         | 5.0         | 5.0         | 5.0         | 5.0         | 5.0         | 5.0         | 35.0         |
| 6.                             | Sampit (Liga Electro) |            |            |            |            |            | 1.5         | 1.5         | 1.5         | 1.5         | 1.5         | 1.5         | 1.5         | 10.5         |
| 7.                             | Galangan (Karya Baru) |            |            |            |            |            | 1.5         | 1.5         | 1.5         | 1.5         | 1.5         | 1.5         | 1.5         | 10.5         |
| 8.                             | Galangan (Karya Baru) |            |            |            |            |            | 1.5         | 1.5         | 1.5         | 1.5         | 1.5         | 1.5         | 1.5         | 10.5         |
| 9.                             | Galangan (Delta)      |            |            |            |            |            | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 1.0         | 7.0          |
| 10.                            | Kelaruh (Anugerah)    |            |            |            |            |            |             |             |             |             |             | 2.0         | 2.0         | 4.0          |
| 11.                            | Kelaruh (Anugerah)    |            |            |            |            |            |             |             |             |             |             | 2.0         | 2.0         | 4.0          |
| 12.                            | Kasay (Anugerah)      |            |            |            |            |            |             |             |             |             |             | 1.0         | 1.0         | 2.0          |
| 13.                            | Kasay (Anugerah)      |            |            |            |            |            |             |             |             |             |             | 1.0         | 1.0         | 2.0          |
| <b>Total Field Recovery Kg</b> |                       | <b>5.0</b> | <b>5.0</b> | <b>9.0</b> | <b>9.0</b> | <b>9.0</b> | <b>19.5</b> | <b>19.5</b> | <b>19.5</b> | <b>19.5</b> | <b>19.5</b> | <b>25.5</b> | <b>25.5</b> | <b>185.5</b> |

**Kilograms of Mercury Recovered: Urban Installations Plus Field Installations**

|                                  |             |             |             |             |             |             |             |             |             |             |             |             |             | Total 2007   |
|----------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|
| <b>Total Recovery (Kg of Hg)</b> | <b>21.3</b> | <b>30.3</b> | <b>43.5</b> | <b>43.5</b> | <b>43.5</b> | <b>54.0</b> | <b>63.0</b> | <b>65.0</b> | <b>65.0</b> | <b>65.0</b> | <b>75.5</b> | <b>75.5</b> | <b>75.5</b> | <b>645.1</b> |



### **3. Monitoring of Government Initiatives and Policy**

The District Government is presently undergoing a rotation of Department Heads and many decisions on the exact nature of program activities are therefore still pending the formal institution of these new decision makers. YTS intends to continue in its efforts to coordinate with the new department heads, and assist them with information and advice.

#### The Department of Mining

A resolution has been made, and a new District Regulation has been drafted, regarding the need for safer technology for gold processing.

This draft regulation has already been discussed with the Department of Industry and awaits further discussions with other Departments, including Health and Environment.

The department has already allocated a budget towards 'Monitoring of Air Pollution' therefore activities regarding the monitoring of mercury emissions will definitely result, although the actual policy and the form of programs for 2008 will remain at the discretion of the new departmental head. The new head has been contacted, and he wishes to meet with YTS to better understand the nature of the program to date.

#### The Department of Trade and Industry

In 2006, this department performed socialization activities in Kereng Pangi to inform the public about the existence of Provincial Regulation (PERDA) No. 6, 2004, which forbids the use of mercury. As there is no licenced distributor of Hg in the province, the department takes the position that all trade in Hg is illegal.

To further the preventative actions of the GMP's Social Awareness Campaign, the department has already made the commitment to:

1. Provide Rp.50 million in funds during 2008, for a program entitled "Handling the Circulation of Mercury" which will aim to realize careful handling by Hg consumers. The program will first be implemented in 2 sub-districts and may eventually be extended up to 11 sub-districts.
2. Recommend to the provincial governor that a licenced mercury distributorship system be sought for Kalimantan Tengah.

However, the endorsement of follow up letters concerning the mercury issue to the Ministry in Jakarta is still delayed as the department head feels he does not yet have a clear picture about the uses of mercury in the province. As the GMP data only covers the vicinity of Kereng Pangi he wishes to compile more data from other locations.

Further promotion of the appropriate technology developed by YTS is not included in the new budget because of a potential clash between authorities in the department.

### The Department of Health

The arrival of YTS staff, together with staff from the Department of the Environment, stimulated and reminded the Head to budget for a mercury-related health activity in the upcoming year, in accordance with the commitments made at the campaign wrap-up meeting. The involvement of the department will follow its 'Plan of Work for 2008'.

The Head is planning an activity named 'Monitoring and Sampling of People Affected by Mercury'. This activity will be undertaken in the upriver regions of the Katingan river. The program is still in the planning stages as there is yet to be agreement on future allocation of funds. Even so, the budget for the department is relatively small and there is a lot to be included, and this will require further discussion within the local parliament.

### Office of the District Legal Secretary

The secretary for the subdistrict of Katingan Hulu, who will remain on at his post, advised YTS about what stage the draft District Regulation on Mercury Use had reached in the legal process. He informed YTS that the Legal Office had consulted together with the Department of Mining and the Department of Trade and Industry, to produce a revised draft that must subsequently be discussed with other departments: primarily, the Departments of Health and Environment. A multi-department meeting must be held to provide the authority for the regulation to be enacted. It was suggested that YTS follow the process and facilitate the process with open discussion, as there have been recent leadership changes in both the Office of Law and the Department of Mining.

If the regulation is enacted, then the Department of Mining will be responsible for socialization activities to publicize the legislation, while monitoring and execution of the law will fall under the authority of the Department of Environment.

Programs and budgets for these activities will be set by the respective departments, however, it is unlikely that these will be set for 2008 as the regulation has yet to be enacted and the current leadership will only serve until the end of November.

### Department of Education

As the Department was meeting to compose a plan of work for 2008, the arrival of YTS once again stimulated their level of interest in the mercury issue and reminded them of the commitments made by the department. The staff present assured YTS that the matter would be discussed with the Head regarding the design of the work program for 2008.

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**YTS has made an official request that a meeting be held between all these relevant government departments as well as ranking local government officers, so that they may be informed of the results of this review and further stimulated to take action. It is hoped that the meeting will be held on the 7th November 2007.**

#### **4. Increasing the Level of Public Participation**

##### Public Exhibitions

On Indonesian National Day, the Department exhibited mercury-recycling equipment in an effort to promote use of this appropriate technology, both to the public and within government. A chemistry class from the local high school asked for an explanation of how the system worked, and were very interested as the information was new to them. This instance serves as a simple example that, for many people in the greater area, there remains a low level of awareness of the threat of releasing mercury into the environment. Thus, the staff of the Department of the Environment remain interested in extending their knowledge throughout the various regions of the District, and to the provincial level.

##### Media

YTS met once again with the local news reporter who has provided extensive coverage of the activities of the GMP to date. He was interested to hear of the further progress and very enthusiastic when informed that all gold shops burning amalgam in Kereng Panggi had adopted the appropriate technology and were now capturing and recycling mercury.

##### The Importance of Local Entrepreneurship

Another important figure who has been featured prominently in local newspapers is Pak Fauzi, a local expert on mercury capture and recycling and inventor of the 'Fauzi Retort'. Pak Fauzi will soon promote the use of retorts and the appropriate technology for fumehoods as a representative for Central Kalimantan in an appropriate technology exhibition to be held by the Indonesian government in Manado, Sulawesi in 2007.

In addition to providing valuable services to YTS, Pak Fauzi has been actively promoting the use of his retort through mining suppliers networks. As a result, over 200 such retorts have been sold to miners working along the Kahayan and Kapuas rivers of Central Kalimantan. This commercial activity has been the driving force behind the spread of the technology to remote upriver regions and has been driven by demand.

YTS is working with Pak Fauzi to enable the distribution of appropriate fumehood technology to these regions in addition to retorts. As small-scale mining activities have seen a huge increase along the Katingan river recently, YTS will assist him with the promotion and spread of this technology to the upriver regions of this district as well.

##### Conclusion

It can be said that the primary success of the program revolves around the adoption of an appropriate technology that meets the needs of gold buyers and processors. Demand for this technology is spreading, driven primarily by the economic incentive of recycling. This commercial activity should nevertheless be accompanied by good information and on-the-spot training in safe handling and techniques for recycling and re-use.