Ways of Exposure to Mercury

People can be contaminated by mercury in a number of ways:

- **The retail process.**
  Mercury vapourizes at room temperature. Shopkeepers / buyers must be careful when handling mercury which is bought in large containers from wholesalers and decanted for retail sale into smaller sized containers. They should wash their hands immediately after pouring the mercury. Buyers (miners) must use safe containers to store the mercury they buy.
- **The amalgamation process.** Handling mercury when mixing with black sand to amalgamate gold. Rubber gloves should be worn but if you have none, then a stick or a spoon should be used to mix the mercury with the black sand to form the amalgam.
- **The recovery process.**
  Using mercury in sluice boxes or gold dishes to capture the fine gold when mining. When the mercury is spread on the collection plate, use a flat knife or a similar object and the same when scraping off the amalgam after the gold has attached itself to the plate. Try not to use bare hands and wash your hands afterwards.
  When squeezing the amalgam to have it ready for heating in a retort. Always wear gloves and always make sure that you wash your hands well before starting the next activity or going to eat.
  When burning the amalgam. Always burn the amalgam outside of the huts, so that the mercury vapour does not get into your lungs and always use mercury retort.

No smoking of cigarettes near the burning of the amalgam, since this can increase the risk of inhaling the mercury vapour.

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Small children and pregnant women should be kept away from the site where the amalgam is being burnt, since they are the ones most at risk.

Don't breathe the smoke given off by the burning of amalgam. Do not eat near the site where the amalgam is being burnt.

Eating the fish caught from mercury contaminated rivers, creeks, lakes, ponds, etc.

Picture showing main components of retort

Retort designed by N. Clementson & A. Legasse.Fabrication, JANICO Industrial Engineering Co. Testing, N. Clementson, R. Solomon & M. Rampersad. Brochure Compiled by Environmental Officer, N. Clementson. Layout and Graphics by K. Husbands. Edited by Mrs. Karen Livan, Environmental, GGMC & A. Legasse, Gencapd Field Manager. Funding provided by CIDA-GENCAPD. For further information or comments contact the Information & Documentation Officer, Guyana Geology And Mines Commission, Upper Brickdam, Georgetown. Tel. # 225-9479, 227-1232; Fax 225-3047; E-mail ggmc@sdnp.org.gy

MERCURY RETORT

RECYCLE MERCURY

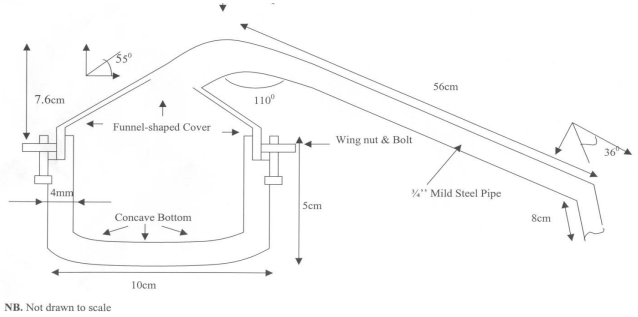
Recycle mercury as much as possible by capturing it through the use of a **retort**. You can repeatedly recycle mercury, each time recovering more than 95% (± 5%) of your initial mass i.e. when retorting is conducted using the GG&MC/GENCAPD retort.

By capturing and recycling used mercury, you are:

- **Saving Money,**
- **Protecting the Environment,**
- **Saving yourself and others from mercury poisoning.**

Retort designed by N. Clementson & A. Legasse

Retort Description



Sketch of retort

The condensate discharge pipe is 64 cm long and rises 7.6 cm above the top of the crucible at an angle of 55^0 before it takes a 15^0 (to the horizontal axis) decent. It also incorporates (optional) three detachable (threaded at the upper end) legs. Two of the legs (43 cm in length) are situated closer to the crucible, and the other (35 cm long), closer to the condensate discharge end of the retort. The end (final 8 cm) of the discharge pipe has a further 36^0 (to the slope of the pipe) downward curve to facilitate the immersion of the end of the pipe into a receptacle containing water. The cover is fitted to the crucible by means of wing nuts and bolts attached to the crucible. A male-female arrangement of the crucible and cover respectively, creates a very effective vapour seal. The vapour seal consists of two precision-machined surfaces (cover and crucible) fitting within very close tolerances. The cover is fitted to the crucible by means of symmetrically located wing nuts and bolts attached to the crucible. Vapour exits the crucible through a funnel-shaped opening in the cover. The retort weighs 2.6 Kg (crucible-0.9 Kg, cover and condensate discharge pipe-1.7 Kg), excluding legs, which weigh 1.02 Kg) and costs G$12,000.

Safety Rules for using Mercury

Always Wear Appropriate safety gear before handling mercury.
Always wear hand gloves.
Do not let mercury touch your skin
Do not handle mercury directly. Use a spoon or a stick, when no hand gloves are available.
Do not eat or smoke when using mercury.
Keep children and pregnant women away from where mercury is being used.
Do not store food or drinks in mercury containers.
If you are in possession of mercury always mark or label the containers so it is easy to identify.
Keep mercury covered with water, since the vapour is easily transmitted into your lungs on exposure to the atmosphere.
Never use mercury in or near a house, or any enclosed area.
When cooking or retorting mercury and gold, always observe the wind direction. Place yourself where the wind blows the smoke away from you. Never inhale the smoke given off during cooking/ retorting of mercury and gold. Cook your mercury and gold in a proper retort so that most of the mercury is recovered. For further use.
Dispose of waste from cooking mercury by burying it at least 45 cm below the surface. Make sure it is well away from where domestic animals could dig it out or where it won't be accidentally dug up in farms. Record the location of disposal sites
Keep mercury out of the reach of small children.

Retort being used by wood fire

Instructions for Use

1. Remove cover from crucible of retort
2. Place the gold/mercury amalgam into the crucible
3. Immediately place cover over crucible and tighten (using wing nuts – available)
4. Place mud on the contact between the cover and crucible
5. Place retort on the fire (wood or charcoal)
6. Ensure that crucible is in an horizontal or near-horizontal position
7. Point the condensate discharge pipe away from anyone present
8. Place the end of the pipe into a container with water (at least one (1) inch of the pipe must be under water)
9. Wet rags may be draped over the pipe to make the mercury vapour change back to liquid metal before coming out of the end of the pipe. Rewetting the rags occasionally may be necessary while you are burning the amalgam.
10. Never use eating utensils to collect liquid mercury at the end of the pipe.
11. Heat (above 600^0c) for at least 25-30 minutes, depending on the size of the amalgam
12. Remove the retort from the fire and allow to cool for approximately 30 minutes
13. Remove (unscrew) the cover and remove the gold
14. Decant water from the container and pour mercury into a plastic container
15. Tightly cover the container with mercury inside and store for further use
16. Wash the hands when the task is completed.