

# Reduction of Unintentionally Produced Persistent Organic Pollutants (UPOPs) emissions by improving waste management practices at landfills

*HWISF – Operations Resourcing*

GEF Project ID: 5558 – Component 2 - Development and Implementation of a Sustainable Management Mechanism for POPs in the Caribbean

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Resources & Waste  
Advisory Group



# Resources required for hazardous waste management – human and other resources

# Facility Manager

Qualified technician and manager responsible for:

- a) Examining requests for storage of hazardous wastes at the facility and evaluating information on hazardous wastes obtained from generators
- b) Determines initial analyses and confirmatory tests required for each type of hazardous waste
- c) Ensures the smooth operation of the laboratory and that all equipment are always in working conditions and are duly calibrated and all measures are taken to ensure the integrity of the results of the testing
- d) Evaluates analysis results from on-site laboratory and determine whether hazardous wastes may be accepted for storage at the facility
- e) Ensures the proper packaging and labelling of hazardous wastes at generators' premises

# Facility Manager

- f) Ensures the proper collection and transportation of hazardous wastes from generators premises to the facility
- g) Ensures the proper, receipt, unloading, inspection, weighing, sorting, transferring, regrouping, bulking, reconditioning, repackaging, labelling, segregation and storage of hazardous wastes in the facility
- h) Carries out regular inspection of each storage sub-compartment and containers of hazardous wastes to ensure their integrity.
- i) Makes all arrangements for the exportation and recovery/treatment/disposal of hazardous wastes at licensed facilities
- j) Prepares and submits application for exportation of hazardous wastes

# Facility Manager

- k) Ensures the proper packing and securing of hazardous waste cargoes in freight containers and placarding of freight containers
- l) Conducts tracking of hazardous wastes from the time the hazardous wastes leave the facility to delivery at licensed recovery/ treatment/ disposal facilities
- m) Submits certificate of completion of the recovery/treatment/disposal operations to the Client
- n) Overall responsible for dealing with spills and other incidents during transportation and on-site.
- o) Sets-up and maintaining a hazardous waste management tracking system from the point a request for disposal of hazardous wastes to the completion of recovery/treatment/disposal operations

# Other Supporting staff

## **Laboratory Technician**

- a) Collects samples of hazardous wastes
- b) Analyses hazardous waste samples at on-site laboratory
- c) Samples hazardous wastes upon receipt at the facility and performs confirmatory testing
- d) Report writing
- e) Archives samples
- f) Record keeping

## **Foreman**

## **Driver/Helper**

# Training

## Training must include:

- Training in First Aid – at least two trained staff are required
- Emergency Procedures e.g. during a fire or chemical accident
- Training on the Health and Safety Requirements of the HWSF as required by the national legislation including the use of PPE
- Toolbox Talks: these must short (10 to 15 minutes) talks given to general staff on site that may not be scientifically trained. They should include illustrated short talks on the chemical and other hazards that are present on site and the action to be taken should some incident occur
- External courses: waste management including laboratory techniques develop rapidly and appropriate staff should take courses offered externally that will keep them up to date with the legal and techniques of chemical and waste management.
- Must keep training register

# Office equipment and furniture

- Desks
- Office chairs
- Meeting table
- Cupboards and Shelves
- First aid kits 2
- Personal computers
- Internet with E-mail
- Printer / photocopy / scan machine
- Fire Extinguishers



# Testing requirements

The following tests are required for the confirmatory screening analysis:

- pH
- Flash Point
- Calorific Value of Organic Wastes
- Electrical Conductivity of Liquids
- Selected Total Heavy Metals
- Total Organic Chlorine/Halogen
- Corrosivity, e.g. to the drum or other storage container

# Laboratory equipment

- ❖ UV-Vis spectrophotometer for chlorine
- ❖ pH/EC meter x 2
- ❖ magnetic stirrer x 2
- ❖ flask shaker
- ❖ flash point apparatus - closed cup 0 to 200 ° C
- ❖ calorimeter for determining calorific value
- ❖ balance x 2 weigh to 0.01 g

# Laboratory equipment

- Fume cupboard
- Cupboards/shelves/sinks & sumps
- Glassware - flasks, beakers
- Refrigerator - vapour proof
- Test kits for spot checks
- Chemicals for performing analysis
- Air conditioner for each room
- Eye wash station
- GC-ECD detector for organics limit of detection < 0.1 mg/kg
- AAS

# Other Miscellaneous items

- Equipment for the transfer of hazardous wastes from one container to the other, e.g. pumps
- Forklift
- Vehicle transporting hazardous wastes be equipped with spill management equipment appropriate to the types of hazardous wastes being transported.
- Appropriate PPE, including full body hazmat suits
- Shredder for containers

# Financial resources

The total cost to be incurred in the implementation of such a project



Construction costs

Operation and  
maintenance costs

# Construction costs

Earthworks

Concrete works

Structural works

Wall paint

Gates

Roofing

Electrical installations

Mechanical and other installations

Water supply and distribution

Fence /gate

Platform

Water basin

Banister

# Operational and Maintenance costs

- Personnel Salary
- Office and laboratory equipment
- Consumables( reagents, containers etc)
- Vehicles
- Fuel and maintenance
- Exportation and treatment / disposal costs

Largely dependent on amount of wastes received at the facility(theoretical v/s capture rate)

# Cost recovery mechanisms

Generator pays either full or Partial cost

Disposal fee can be based on the following scenarios (not including Construction costs)

**Scenario 1:** Full Operation and Maintenance cost including exportation costs

**Scenario 2:** Operation and Maintenance costs only (No exportation costs)

**Scenario 3:** Exportation Cost only

**Scenario 4:** Full exportation costs and Partial Costs for Operation & Maintenance

**Scenario 5:** Partial costs for operation and maintenance and Partial costs of Exportation



# Reasonable fee

- Create a win-win situation for both the operator and the hazardous waste generators. Financial subsidy to facilitate the transition
- A reasonable disposal fee would provide an incentive to the hazardous waste generators to come forward their disposal requests and not illegally dump them

# Awareness, legislation / enforcement, institutional strengthening and support services

## Awareness

- Awareness of stakeholders in relation to hazardous wastes should be raised. Mainly related to environmental and public health risks
- Costs of hazardous wastes to the economy
- Good practices in terms of sorting, segregation labelling and storage
- Use of the hazardous waste facility

## Legal

- Registration of hazardous waste generators
- Operational control of waste transport
- Control of transboundary movements of hazardous wastes
- Manifest system
- Fees and fines against uncontrolled dumping

# Awareness, legislation / enforcement, institutional strengthening and support services

## Institution

- Dedicated staff to conduct awareness, enforcement and compliance. Trained inspectorate is of prime importance
- Training of staff on the basic aspects of hazardous waste management such as identification and classification, segregation, good storage practices and testing of hazardous wastes
- Staff should also be trained on Inventory of hazardous wastes

## Support services

- Laboratory
- Monitoring and data collection system