

COVID-19 waste management in Papua New Guinea



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COVID-19 pandemic

When the global pandemic happened:

- Many countries were not prepared;
- Developed and developing countries were affected;
- Developing countries in the Pacific were reacted very quickly by closing their borders;
- Internally, many deficiencies surfaced;
- Health systems were stretched;
- Management plans were hastily drawn up.

In Papua New Guinea:

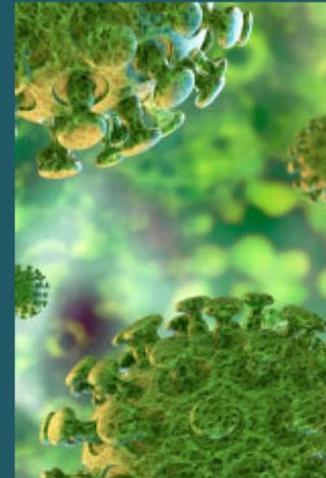
The national government:

- Declared a national State of Emergency (SoE);
- Appointed a SoE Controller with executive powers;
- Put in place emergency orders to manage the pandemic;
- Put resources into the health measures to manage the pandemic;
- Developed emergency preparedness and response plan;

The Papua New Guinea COVID-19 Emergency Preparedness and Response Plan



Papua New Guinea **Emergency Preparedness and Response Plan** Coronavirus disease 2019 (COVID-19)



Version 17 -- as of 02 March 2020
(This is a live document and will be periodically updated based on the evolving situation.)

PRIORITY AREAS OF THE PLAN

The preparedness and response plan for COVID-19 in Papua New Guinea will focus on 10 priority areas that are interlinked:

1. Incident management and planning;
2. Surveillance, risk assessment and rapid response;
3. Laboratory;
4. Clinical management and health care services;
5. ***Infection prevention and control;***
6. Non-pharmaceutical public health measures
7. Risk communication and community engagement
8. Points of entry
9. Operational logistics
10. Partner coordination.

Under *Infection prevention and control* area

The plan call for:

- Development of a waste management plan and to ensure supplies are available for managing wastes;
- *Standard precautions for all patients*: Standard precautions include hand and respiratory hygiene; appropriate use of personal protective equipment (PPE); safe waste management; environmental cleaning and sterilization of patient-care equipment and linen;
- *Environmental and waste disposal*: Basic infrastructure of health care facilities must be maintained including adequate ventilation, environmental cleaning and disinfection.

At the operational level (in Port Moresby):

The contract to handle COVID-19 waste:

- Awarded to the **Total Waste Management** company - a local company recognized globally for their waste and environmental services;
- Their Standard Operational Procedures are all ISO certified;
- The COVID-19 waste are managed using these procedures and are consistent with WHO/UNEP requirements;

- The procedure...

The procedure used:

A three-step procedure is being used:

1. Decontamination (waste bins, waste bags, equipment and personnel)
2. Collection & Transportation
3. Incineration (High Temperature Incineration between (850°C – 1000°C))

The fly ash is then transferred to their specially constructed waste cell for handling infectious materials, soil covered and compacted

WHO Guidelines used:

WHO Guidelines from which TWM procedures are guided by are as follows:

- Cleaning and disinfection of environmental surfaces in the context of COVID-19 (WHO ref# WHO/2019-nCoV/Disinfection/2020.1).
- Water, sanitation, and waste management for the COVID-19 virus (WHO ref# WHO/2019-nCoV/IPC_WASH/2020.3)

1. Decontamination step

Following the WHO guidelines:

- TWM has developed procedures for the decontamination of quarantine waste from skip bins upon collection from health facilities testing, accommodating or treating patients exposed to COVID-19;
- The purpose is to ensure the skip bins containing quarantine waste from health facilities directly managing cases of COVID-19 virus are handled safely during collection and transportation;
- This is to ensure minimal exposure of personnel and the public to any biohazardous associated with this quarantine waste.

1. Decontamination step

- Decontamination is the process of applying a disinfectant chemical on skips bins, quarantine waste and personnel PPE from COVID-19 health facilities;
- Disinfectant used are those recommended under WHO Guidelines. Concentrations used are above the minimum recommended requirements, determined by TWM Chemists;
- Disinfectants are transferred to knapsack sprayers that can be hand carried or mounted as back packs prior to applying on surfaces for disinfection;
- PPE used include Face Shields, Red PVC Gloves, Disposable Nitrile / Latex Gloves, Gumboots, Safety Goggles, Clear Safety Glasses, Tyvex Suits, P2 or N95 Masks, Half Face Respirators;

1. Decontamination step



2. Collect and transportation

At the TWM site, there are two lock down areas:

- One is at the main gate (lock down area 1) and the other at the incinerator (lock down area 2);
- Once the truck with COVID-19 waste enters these areas, all movement of personnel and traffic is halted;
- There are decontamination personnel or technicians stationed at the mentioned decontamination areas

2. Collect and transportation

At the TWM site, there are two lock down areas:

- At lock down area 1, skip bins are decontaminated similar to the practice done prior to collection at the COVID-19 facility;
- The truck is also externally decontaminated;
- Once done, the truck and skip bin proceed to lock down area 2;
- At lock down area 2, the contents of the bins are removed then each bag is decontaminated individually;
- Once the bin is empty, the internals of the bins are decontaminated;

3. Incineration

- Once all waste is decontaminated, waste are then weighed and then recorded on worksheets;
- Waste is then loaded into the high temperature incinerator;
- Waste is incinerated between 850°C – 1000°C;
- Duration of combustion is usually 20 -30 minutes before the next batch of waste is loaded for incineration;
- Upon complete destruction of all COVID-19 waste through incineration is complete, the incinerator is turned off and allowed to cooled down for 12 hours;

3. Incineration



ROKU IWMF INCINERATOR

CLIENTS: Oil, Gas, Mining, Industrial, Commercial, Food and Health Sectors.

LOCATION: Roku, Napa Napa Road, Central Province.

TREATMENT: The high temperature incinerator can dispose of a variety of waste streams ranging from paper, cardboard, plastics, oily rags, medical wastes, hazardous wastes, contaminated soils and grease.

OVERVIEW

TWM operates high temperature incinerator (HTI) at its Roku Integrated Waste Management Facility (IWMF).

The incinerator has dual combustion chambers, the main chamber has a capacity of 6.75m³ and a burn rate of approximately 500kg per hour. Diesel fuel or PFO is fed to the burners at consumption rate of approximately 40-50 litres per hour. The equipment is also equipped with a pollution control system.

Operating temperatures in the primary chamber are in excess of 850°C and in the secondary chamber are can reach up to 1100 °C, which optimises combustion and pollutant destruction. The temperatures in both chambers are maintained by automatic control.

The system has a constant ventilation with adjustable air flow to provide optimal combustions conditions and efficient gradual cooling of the system. Combustion efficiency is >99% and approximately 3-5% ash residue is generated through the process. The incinerator stack is 2.8 metres above the body of the secondary chamber which also serves to control ground level concentrations of residual pollutants in the ambient air.



Lukautim kantri bilong yumi

Caring for our country

SUMMARY

Project management

- To ensure that the Incinerator is operating within manufacturer specifications and are in compliance with regulatory requirements;
- TWM operators are trained, qualified and knowledgeable in all operations, troubleshooting and maintenance of the Incinerator.

Operations

- The Incinerator is being operated by qualified incinerator operators 10 hours a day.
- Ash samples are taken after every burn cycle to determine contaminants prior to landfilling.
- Monitoring and records are taken during every burn cycle and necessary adjustments are implemented when required.

Maintenance

- Preventive maintenance and troubleshooting are regularly performed.
- Repairs and servicing of fans, compressor, solenoid valves, hydraulics, switches, motors, refractory lining and thermocouples.

Design/Engineering

- The role of the secondary chamber is to re-burn exhaust gasses at a high temperature, thereby reducing emissions and complying with certain worldwide regulations.
- The pollution control system is designed to treat the emissions to atmosphere.

Partner relationships

- Stack testing undertaken by accredited third-party service providers.

3. Incineration

- The ash is collected the next day then weighed and recorded;
- Incinerator ash undergoes Toxicity Characteristic Leaching Procedure (TCLP) analysis to prior to landfill;
- Should the ash meet landfill TCLP requirements, it is sent to landfill;
- If not, the ash is further treated (incinerated), tested then upon meet landfill requirements it sent to landfill for disposal.
- As part of TWM's Environmental Permit compliance requirements, it is required to incinerate COVID-19 waste within 24 hours;
- Data generated from COVID-19 waste management operations are reported on a weekly basis to CEPA

3. Incineration

Part of the TWM's Environmental Permit

Environmental Permit Extract EP-L2(486) Condition 70

72. The Permit Holder shall ensure that quarantine waste collection from health facilities directly managing cases of COVID-19 virus (that is facilities testing, accommodating or treating patients exposed to Covid-19) are handled safely during collection and transportation of these wastes to TWM's IWMF at Roku in strict accordance with TWM's Standard Operating Procedures for COVID-19 quarantine wastes including:
 - a. Collection Site Skip in Decontamination Procedures;
 - b. Roku (IWMF) Decontamination Procedure;and that the requirements and procedures set out in TWM's Job Safety Analysis Forms and Hazard Management Forms (March 2020) for:
 - a. Decontamination of Skip Bins & Quarantine Waste Using Disinfectant Chemicals; and,
 - b. Decontamination of Roku Skip Bins and Personnel;are strictly complied with and properly completed and filed for reference and reporting.
73. The Permit Holder shall ensure that all Quarantine Medical Wastes from COVID-19 health facilities received at the incinerator building is incinerated immediately and that there is no storage of quarantine waste overnight.
74. The Permit Holder shall ensure that:
 - a. all incineration operational staff (Incineration Operations Manager, Operations Supervisor and Operator) conduct the incineration of Quarantine Medical Wastes from COVID-19 health facilities in strict compliance with TWM's Quarantine Medical Waste Incineration Procedure, March 2020; and,
 - b. that the requirements and procedures set out in TWM's Job Safety Analysis Forms and Hazard Management Forms for Incinerator Operations (March 2020) are strictly complied with and properly completed and filed for reference and reporting.
75. The Permit Holders shall ensure that all personnel operating the incinerator are equipped with and employ all the prescribed Personal Protective Equipment (PPE) for handling hazardous wastes and operating high-temperature incinerators.
76. The Permit Holder shall carry out routine inspection and maintenance of the incinerator and waste stockpile areas in order to maintain the operational efficiency, integrity and safety of these facilities.

Environmental Permit Extract EP-L2(486) Condition 100

115. The Permit Holder shall submit to the Managing Director, CEPA, weekly records of the amount of COVID-19 quarantine wastes collected / received from each COVID-19 health facility site, the amount incinerated and the method and site of disposal of the incinerator ash, until such time as the COVID-19 restrictions no longer apply and the Government of Papua New Guinea confirm conditions have returned to normal.

**Tenk yu tumas
Faafetai lava
Arigato gozaimas**

