Project Summary for Collection and Transportation of Bio-Hazardous Waste

CEVONS WASTE MANAGEMENT

21/04/2023.

Standard for Hazardous Waste Collection.

Collection Point

The standard for collection of hazardous waste follows guidelines depending on the type of hazardous waste. Workers shall undergo training to handle hazardous waste before conducting any work. Personal Protective items shall also be supplied to workers before the commencement of any work. Below are guidelines which must be maintained.

- Workers are sensitized on hazardous waste collection.
- Workers are properly equipped with PPE.
- The collection site is surveyed for hazard identification before any collection happens.
- Contents to be collected would be reviewed for effective job planning.
- Spill response prevention and spill response plans shall be given to the collection crew.
- Trucks shall be equipped with spill kits.
- All collection shall be done on an impervious base.

Personal Protective Equipment will include but not be limited to.

- **Safety Gloves**
- **Hard hats**
- **Reflective vest**
- **Safety boots (steel toe)**
- **Safety glasses**

Waste Acceptance / rejection.

The project will have the capacity to collect the waste listed within the "Types of medical waste" category. The below-mentioned waste will not be received, if identified by the waste generator in the pre-receipt process. In instances where the waste was received without any indication of the constituents mentioned above from the generator, and it is revealed in the screening process, the generator will be notified, and the waste will be returned immediately.

List of rejected bio-hazardous waste.

- The following are unacceptable wastes: hazardous chemicals (e.g. phenol, chloroform, agarose gels with ethidium bromide, etc.); radioactive wastes; liquid wastes, pathological waste such as human/animal bulk blood, tissues, or animal carcasses (human fetal remains, limbs, or cadavers; compressed gas cylinders; controlled substances; etc.

Types of Medical Waste

- **Used Gauze**
- **Used Cotton pads**
- **Used syringes**

- **Used Needles**
- **Expired medication**
- **Used tubes**
- **Vials**

Quantity of Waste being Transported.

Waste will be transported within two varying medical waste bins. The type of medical waste bins to be used High-density Polyethylene plastic.

- 660 Litres
- 80 Liters

Facility Designated for Medical Waste Collection

Georgetown Public hospital will be the off-loading point for medical waste collected from varying clients. The waste collection will be treated at GPHC. (Please see attached waste acceptance receipt from GPHC as reference)

Disposal for Expired Medication

Expired Medication will be collected separately from other bio-hazardous waste such as gauze, cotton etc., and placed within sealed and labelled bins and then transported to be incinerated. Medications that have been deemed hazardous waste (collected expired medication) will go into incinerators which run at higher temperatures and turn hazardous medicine waste into nonhazardous waste. (See below specs for incinerator)

Machinery for incineration

A compact high-capacity general waste incinerator can treat (via combustion) 100kg of mixed waste per hour. The incinerator design will include front loading through the main access door. At the end of every incineration process, ash (de-ashing) will be discharged through the loading door into the supplied catcher tray before being loaded for the next burn. The incinerator will include water steamers/scrubbers, which will trap ash and toxins from exiting the machinery into the environment. The biproducts of incineration will include fly ash, steam and smoke emissions. The incinerator will be powered by diesel generated from the base oil recovery operation.

Expected Emissions	% By Volume
Carbon Dioxide (CO2)	5%
Water (H2O)	29%
Oxygen (O2)	6%
Nitrogen (N2)	54%
Smoke	0%
(Not detectable under standard operating conditions)	
Odour	0%
(Not detectable under standard operating conditions)	
Volume of Ash	1-3%
(Dependant on waste streams)	
Machine Specification	
External L x W x H (mm)	5025 x 2050 x 3600/5400
Internal L x W x H (mm)	3035 x 1170 Ø
Chamber Volume (m3)	3
Weight (approx tonnes)	8.6
Nominal Burn Rate	<100
Thermal Capacity (kW)	640
Power Supply 50/60 hz (3 Phase)	380v
Door Aperture	1170 Ø
Control Panel	PLC
Fuel Types	Diesel
Fire Brick (Alumina)	42.50%
Insulation Fire Brick	Grade E23

Operating Procedures to be followed.

Steps	Task being performed	Procedure to be followed
1	**Collection of medical waste**	Employees shall undergo training for collection of bio-haz-waste and be made aware of the physical and environmental impacts of bio-hazardous waste.
2		Waste shall only be collected from customers in bags which are labelled 'bio-hazardous waste' or the specific waste type.
2		Bags shall be placed into bins with lids and locks and shall be locked by the operations supervisor.
3		Bins will be placed onto a box truck. Rachet straps will be used to strap down bins for double security, to ensure bins do not fall.
4		Medical Waste will be transported to GPHC where final treatment and disposal shall be done.

Potential Impacts to the Environment and Preventative Measures.

Haz Waste	Potential Environmental Impact	Mitigation
Medical Waste	Risk of spreading infections to others. Risk of mishandling and polluting the environment / waterways.	1.Ensuring that collection vehicles are properly checked and all equipment needed for the operations such as bio-haz bins and locks are available. 2.Ensuring collection is done on an impervious basis. 3.Providing workers with spill prevention plans and spill kits. 4.Providing workers with spill kits and spill response plans. 5. Ensuring containments are properly sealed, locked and strapped. 6. Ensuring roadways with minimum traffic is used. 7. Ensuring proper communication is made with collection facility to have a smooth and seamless transition of the waste.

Transportation Plan for Transporting Hazardous and Biohazardous Waste.

Collection Vehicles

Box trucks, and Canter trucks shall be designated for the collection of biohazardous waste. These trucks shall be equipped with spill kits in the event of a spill emergency, however spill prevention plans and training on bio-hazardous material handling shall be conducted with the designated crew for handling bio-haz waste. Crews shall also be equipped with spill response training, spill response plans and spill kits, if there is a spill, which is unlikely as the operations will have triple prevention methods.

1. Waste will be stored in bio-haz bags.
2. Waste will also be placed into bio-haz bins with lids and locks.
3. Bins will be placed into canter or box trucks and strapped utilizing rachet straps.
4. Designated low traffic routes will be followed.

Transportation Routes

Transportation routes will be curtailed to various areas. Collection will mainly be done in Georgetown; however, trucks will be advised to follow driving instructions given by the operations department. The routes to be taken shall be ones which are less congested with traffic, which would aid in the smooth transition of bio-haz waste from one route to its respective facility.

Weather Condition

Collection will be done with priority on dry days. This will allow for a safer transport route, especially around Georgetown, which is prone to flooding.

Spill Response Plan

Please see attached the spill response plan for the transportation of hazardous and biohazardous waste.

Environmental Protection Agency - Guyana

ENVIRONMENTAL PROTECTION AGENCY (EPA)-GUYANA

ENVIRONMENTAL AUTHORISATION SCREENING REPORT

NAME OF COMPANY: **Cevon's Waste Management.**

TYPE OF PROJECT: **Transportation of Biohazardous Waste**

PROJECT LOCATION: **Within Regions 3 and 4**

1.0 INTRODUCTION

PROJECT OVERVIEW AND DESCRIPTION

On **April 25, 2023**, Cevon's Waste Management submitted an Application for Variance of an Environmental Authorisation for the Transportation of Biohazardous Waste within Regions 3 and 4. A pre-screening of the application submitted revealed that an incorrect application was submitted; consequently, a request was made for the application to be amended as a New Application.

On **July 17, 2023**, the Application for Environmental Authorisation (New) for the Transport of Biohazardous Waste within Regions 3 and 4 was submitted. A review of this new submission revealed that the application was insufficient/incomplete. Hence, several requests were made for the submission of the following information:

Date Requested	Information Requested	Date Submission
August 23, 2023	Waste manifest	August 24, 2023
October 6, 2023	Clarification on the biohazardous waste streams accepted for transport to the treatment facility.	October 10, 2023
October 13, 2023	Clarification on the biohazardous waste streams not, particularly expired pharmaceuticals, not accepted for transport to the treatment facility.	October 18, 2023

Nevertheless, before the resubmission of the Application, a verification inspection was conducted on **June 14, 2023**. The inspection confirmed the following:

1. Biohazardous waste will be collected from clients and transported to the Georgetown Public Hospital Complex for treatment.
2. The biohazardous will be transported in locked bins on a flatbed canter truck.
3. While the plastic bags in which biohazardous waste will be placed are labelled, the bin had no signage or labels.
4. The canter truck had no drip pan; however, a spill kit was maintained on the truck.

PROJECT DESCRIPTION

Biohazardous wastes are collected from Courts Optical (Grove, Main Street, Parika & Giftland), Medical Arts (Thomas Street), Davis Memorial (Durban Backland), Dr. Wilson's Clinic (Thomas Street), Health Centers (Agricola, Sophia, East La Penitence and West Ruimveldt). These wastes are then transported to the Georgetown Public Hospital Complex (GPHC), where it is off-loaded for treatment (Please see the attached waste acceptance receipt from GPHC).

The wastes are transported in two sizes of medical waste bins (660 litres and 80 litres). The type of medical waste bins used are High-density Polyethylene plastic. Further, the types of Medical Waste to be collected are:

- Used Gauze
- Used Cotton pads
- Used syringes
- Used Needles
- Expired medication
- Used tubes

WASTE ACCEPTANCE/REJECTION.

The below-mentioned waste will not be received. The following are ***unacceptable wastes***: hazardous chemicals (e.g. phenol, chloroform, agarose gels with ethidium bromide, etc.); radioactive wastes; liquid wastes, pathological waste such as human/animal bulk blood, tissues, or animal carcasses (human fetal remains, limbs, or cadavers; compressed gas cylinders; controlled substances; etc.).

In instances where the waste was received without any indication of the constituents mentioned above from the generator, and it is revealed in the screening process, the generator will be notified, and the waste will be returned immediately.

NB: Biohazardous waste is not one of the waste streams authorised under Permit Ref# 20200709-PHWRC for the operation of an incinerator. Therefore, expired medication, which the Developer proposed to incinerate, will not be included in the authorisation.

1.1 PROJECT LOCATION

This is a service-oriented project, and the collection and transportation of biohazardous waste will be done within Regions 3 and 4. Transportation routes will be curtailed in various areas.

2.0 CHARACTERISTICS OF POTENTIAL IMPACTS

SURFACE WATER AND SOIL POLLUTION

During transportation, collection, and drop-off of the above biohazardous waste (solid), there is a potential to contaminate resources such as surface water quality (rivers, canals, earthen trenches, etc.) and soil that may be near the area of the liquid hazardous material spill such as waste oils and greases.

To reduce the impacts of this risk on the environment, the project will implement the following mitigation measures:

1. Waste will be stored in biohazardous bags.
2. Waste will also be placed into biohazardous bins with lids and locks.
3. Bins will be placed into canter or box trucks and strapped utilising ratchet straps.
4. Designated low-traffic routes will be followed.
5. The hazardous waste will be segregated based on its dangerous identification/classification/type and collected by the appropriate vessels.
6. Employees will be trained on hazardous material management and in keeping with the standard operation procedures submitted to the EPA.
7. Transport trucks will be equipped with spill kits to aid in spill control, containment, and cleaning up during a waste spill.
8. Collection will mainly be done in Georgetown; however, trucks will be advised to follow driving instructions given by the operations department. The routes to be taken shall be less congested with traffic, which would aid in the smooth transition of bio-haz waste from one route to its respective facility.
9. Ensure that collection vehicles are properly checked and all equipment needed for the operations, such as biohazardous bins and locks, are available.
10. Ensure collection is done on an impervious base.
11. Ensure containments are adequately sealed, locked, and strapped.
12. Ensure roadways with minimum traffic are used.
13. Ensure proper communication with the collection facility for a smooth and seamless handover of biohazardous waste.

SURFACE WATER & SOIL QUALITY IMPACT SIGNIFICANCE

Given the nature of the materials to be transported, this impact will be temporary and localized to the immediate surrounding environment. Additionally, with the implementation of the above-mentioned mitigation measures, the impact will not be significant.

HUMAN HEALTH AND SOCIAL IMPACTS

The biohazardous waste being transported poses a high risk to human health in the event of an accidental spill, given the nature and constituents of the waste. This impact is specifically applicable to the employees who are directly involved in the collection and transportation process. According to the World Health Organisation (WHO), healthcare waste contains potentially harmful microorganisms that can infect hospital patients, health workers and the general public. Should a spill occur during biohazardous waste transportation, there is potential for the following specific impacts.

- Sharps-inflicted injuries - hazards occur from scavenging at waste disposal sites and handling and manually sorting hazardous waste from healthcare facilities. Notably, the waste handlers are at direct risk of needle-stick injuries and contact with contaminated or infectious materials (WHO, 2018); and

- "Toxic exposure to pharmaceutical products, in particular, antibiotics and cytotoxic drugs released into the surrounding environment, and to substances such as mercury or dioxins, during the handling or incineration of health care wastes" (WHO, 2018).

The following mitigation measures are proposed to reduce any potential impact:

1. All employees will be equipped with PPE, protective overalls, safety eyewear, gloves, and safety boots.
2. Employees shall undergo training to collect biohazardous waste and be made aware of the physical and environmental impacts of biohazardous waste.
3. Daily Vehicle Checklist and Inspection will be conducted to ensure transport trucks are not compromised.
4. Transport trucks will be equipped with spill kits to aid in spill control, containment, and cleaning up during a waste spill.
5. Ensure that collection vehicles are properly checked and all equipment needed for the operations, such as biohazardous bins and locks, are available.
6. Ensure collection is done on an impervious base.
7. Ensure containments are adequately sealed, locked, and strapped.
8. Ensure roadways with minimum traffic are used.
9. Ensure proper communication with the collection facility for a smooth and seamless handover of biohazardous waste.

IMPACT SIGNIFICANCE

With the implementation of the mitigation measures, impacts will not be significant. Further, impacts will be reversible and minor with the implementation of the embedded control measures.

2.1 PROJECT SIGNIFICANCE

Impact	Significance	Summary of Reasons
Soil Pollution	Not Significant	There is potential to contaminate soil and surface water quality via accidental spill of biohazardous waste and expired medication. Given the nature of the materials to be transported, this impact will be temporary and localized to the immediate surrounding environment. Additionally, with the implementation of the above-mentioned mitigation measures, the impact will **not be significant**.
Human health	Not Significant	With the implementation of the

and social impacts		mitigation measures, impacts will not be significant. Further, impacts will be reversible and minor with the implementation of the embedded control measures.

4.0 RECOMMENDATION/CONCLUSION:

Potential environmental impacts that the project may cause during the operation phases have been identified, screened, and assessed. With the proper implementation of the embedded control measures in the project design and mitigation measures proposed by the Developer, it can be ascertained that the project is unlikely to cause significant environmental, health, and social impacts since many of the potentially adverse impacts are localized, short-term and/or temporary.

Given the aforementioned, it is recommended that the project is exempted from an Environmental Impact Assessment (EIA), as set out in section 11(2) of the Environmental Protection Act, Cap. 20:05, Laws of Guyana. However, given that Cevons Waste Management is not permitted for the incineration of pharmaceutical chemicals, it is recommended that environmental authorisation be granted for the **Collection and Transportation of the Biohazardous Waste streams that can be treated by the GPHC autoclave**. Additionally, this project shall be placed on the 30-day public notice, after which an Environmental Permit shall be issued to the facility if there are no objections.

PHOTOS

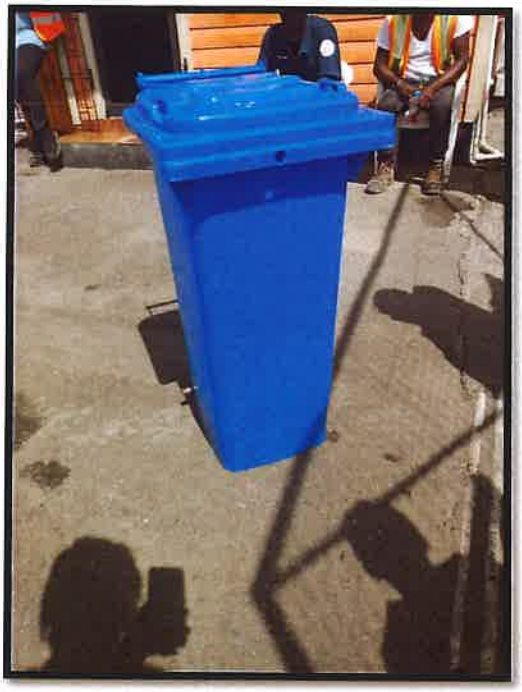

Image 1: Plastic bin to be used for the collection of biohazardous waste.

Image 2: Labelled (biohazardous) plastic bags to be used for the collection of waste.

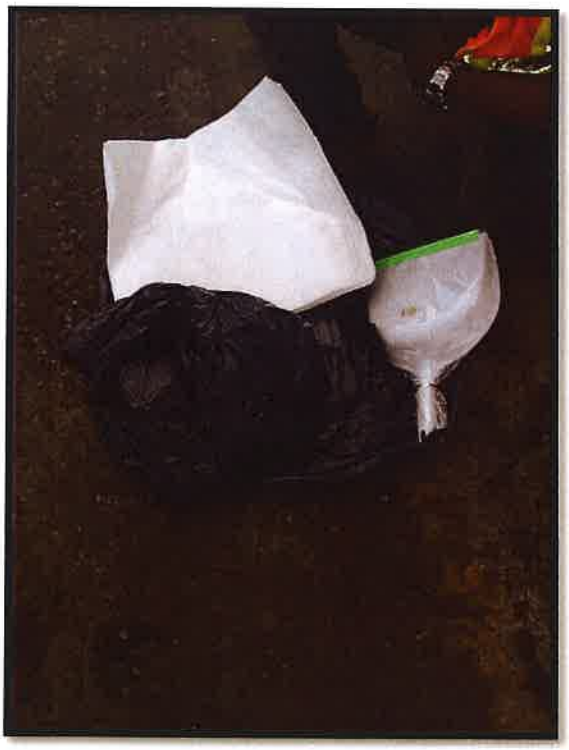

Image 3: Spill kit to be kept on trucks.

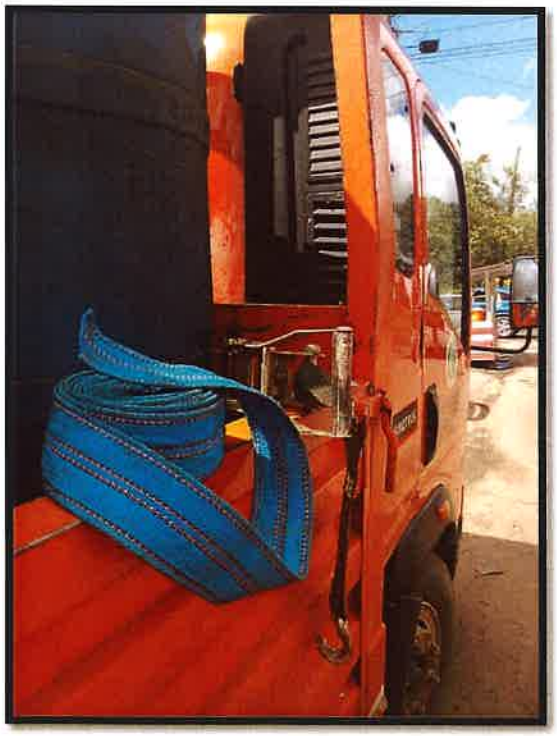

Image 4: Straps used to secure bins during transportation.

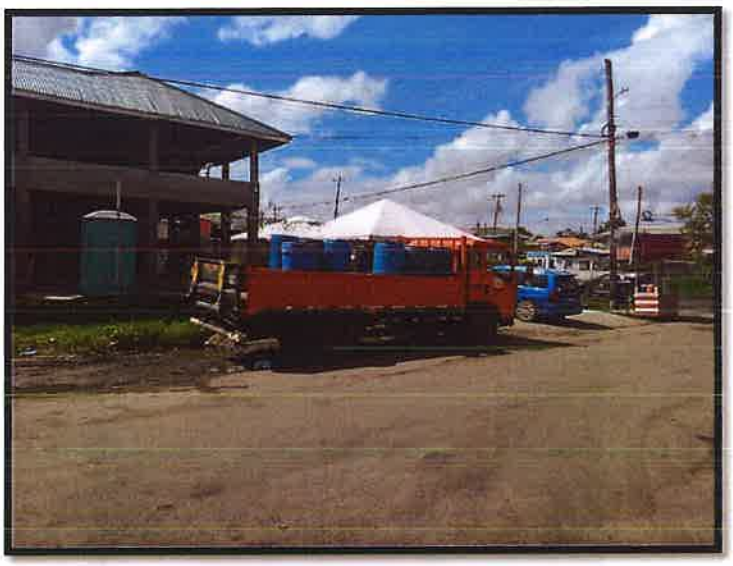

Image 5: Truck that will be used to transport biohazardous waste.

World Health Organization (2018). Health-care waste. Retrieved from https://www.who.int/news-room/fact-sheets/detail/health-care-waste#:~:text=Health%2Dcare%20waste%20contains%20potentially,health%20facilities%20into%20the%20environment.