

Approved by:		
	General Manager	Radiation Safety Officer

## STANDARD OPERATING PROCEDURE

### 15.OPS.05

## OPERATION OF GATE MONITOR DETECTORS

### 1.0 OBJECTIVE

Provide a procedure for using the Clean Harbors Deer Trail (CHDT) gate monitor systems to monitor incoming waste shipments and provide a procedure for screening NORM/TENORM waste at the generating site to ensure that it meets CHDT's acceptance criteria.

### 2.0 SCOPE

This standard operating procedure (SOP) applies to the operation of the Ludlum 3502 gate monitor and the Ludlum 375-20 gate monitor at CHDT or waste generating sites. This SOP may be used for alternate or backup systems at the discretion of the CHDT Radiation Safety Officer (RSO) or designee.

### 3.0 POLICY

Incoming waste shipments to the CHDT landfill will be monitored for gamma radiation levels by the Ludlum 3502 gate monitor system, the Ludlum 375-20 gate monitor system, or its equivalent. Incoming wastes not classified as radioactive will be subject to a limit of 16 microRoentgens per hour ( $\mu\text{R/hr}$ ), or another value set by the CHDT RSO. ~~equivalent to approximately twice the background levels at the CHDT gate.~~ The system will be used to monitor incoming radioactive loads to identify any exposure concerns or noncompliance with Department of Transportation (DOT) regulations. The CHDT RSO will be notified of any incoming shipments greater than 500  $\mu\text{R/hr}$ . The equipment and procedure may also be utilized at waste generating sites to monitor waste shipments. For large projects, waste specific and geometry specific exposure rate limits may be designated by the CHDT RSO.

### 4.0 RESPONSIBILITIES

Responsibilities of the CHDT RSO, management, and staff are defined in the CHDT Radiation Protection Plan (SOP 15.RPP.01).

### 5.0 GENERAL PROCEDURE

#### 5.1 Instrument Description

The Ludlum 3502 gate monitor system consists of two sodium-iodide (NaI) detectors mounted approximately 6 feet above the incoming scale at CHDT. The detectors are each coupled with an alarming analog exposure rate meter in the scale house. The Ludlum 375-20 gate monitor system consists of two sodium-iodide (NaI) detectors also mounted approximately 6 feet above the incoming scale. The 375-20 utilizes an alarming digital rate meter that provides the average of the measurements of the two detectors. The 375-20 also contains an internal battery which

allows for remote operations in areas without line power. Quality control (QC) measurements consisting of a background check and measurement with a known cesium-137 ( $^{137}\text{Cs}$ ) source will be conducted and recorded every workday. Daily measurements are expected to be within plus or minus 20% of the established background and source measurements. The CHDT RSO or designee must be notified of any deviations outside the expected parameters.

## 5.2 Routine Operations

Each waste shipment shall pass slowly (at a speed less than 5 miles per hour) between the detectors. During this time, staff within the guard house will monitor the meter displays to identify the maximum reading for each detector. The maximum results will be recorded on the weight ticket. If the shipment is a radioactive shipment, the measurements will also be recorded on a Radiation Survey Report.

## 6.0 STANDARDS AND CRITERIA

### 6.1 Quality Control

In addition to the daily QC measurements required by each individual instrument ~~SOP~~, survey forms must be reviewed and approved by the CHDT RSO or designee. The frequency of review and approval will be dictated by the frequency of the surveys.

An annual instrument calibration must be performed by a qualified vendor. Copies of the instrument calibration certificates must be maintained for a period of five years. Current calibration certificates should be maintained with the instrument daily QC measurement logs.

### 6.2 Rejected Wastes

Any waste shipments that are not profiled as radioactive shipments with gate measurements at 16  $\mu\text{R/hr}$  or greater, or NORM/TENORM shipments that are not in compliance with (DOT) regulations, will be subject to the following procedures:

- Step 1 - Record the gate monitor measurements on a Radiation Survey Report along with the hauler's identity and truck number.
- Step 2 – Perform isotopic identification survey using portable gamma spectroscopy units per SOP 15.OPS.03.
- Step 3 – Perform package receipt survey for exposure rate and removable contamination per SOP 15.OPS.21.
- Step 4 - Inform the hauler and the waste generator that the waste load exceeds CHDT policy limits for radioactive materials. Attempt to determine the source of the radioactivity and if possible more accurately profile the waste. If CHDT management believes the waste can meet the CHDT License waste acceptance criteria (WAC), and suitable arrangements are made with the waste generator, the waste may be stored at CHDT without being disposed of until all documentation and analytical requirements are met. If this is not possible, arrangements to reject the shipment back to the waste generator will be made.
- Step 5 - If the shipment must be rejected, contact CDPHE Radiation Management Unit to notify them of the issue and if needed, obtain a special DOT permit to transport the waste back to the generating site.

Radioactive shipments with measured exposure rates greater than 500 uR/hr will be further inspected by the CHDT RSO or designee with handheld instruments to determine if the shipment is in compliance with the CHDT waste acceptance criteria and DOT regulations.

## **7.0 REFERENCES**

49 CFR 173. *Shippers – General Requirements for Shipments and Packagings*. Current Version.