Approved by:	General Manager	Radiation Safety Officer

STANDARD OPERATING PROCEDURE

15.OPS.01

LANDFILL OPERATIONS

1.0 OBJECTIVE

To define the general operational procedures for the control, handling, processing, and disposing of radioactive materials within the Clean Harbors Deer Trail (CHDT) landfill cell.

2.0 SCOPE

This standard operating procedure (SOP) defines and directs procedures for the proper operation of the landfill, and procedures for unloading operations involving radioactive materials. It also directs and prescribes procedures to prevent radioactive contamination from leaving the landfill.

3.0 POLICY

Landfill operations shall be performed as appropriate to prevent radioactive contamination from leaving the landfill. The goal is to prevent the spread of radioactive contamination to site personnel, equipment, and the environment and to keep other parts of the CHDT facility free from radioactive contamination.

4.0 RESPONSIBILITIES

Responsibilities of the CHDT RSO, CHDT management, and other Clean Harbors staff are defined in the *Radiation Protection Plan* (DR 15.RPP.01).

5.0 DEFINITIONS

- **Landfill**: the area or space located inside the landfill liner cell system.
- **Decon Area**: the area immediately outside the landfill exit that will be used to conduct inspections, exit surveys, and/or decontamination of trucks exiting the landfill immediately after unloading radioactive shipments. The area shall be marked and designated by signs, paint or chalk markings, traffic cones, barricades, or other means.
- **Bed Liner**: means a sheet of plastic material that is used to form an impervious liner in the bed of a dump truck, dump trailer, or roll-off box.
- **Clean Equipment**: any CHDT trucks or equipment of which the equipment exterior does not come directly into contact with radioactive materials. Examples of this may include the CAT D8 Bulldozer, the Dresser Bulldozer, Volvo A-25 haul trucks, pickups, service trucks and other site equipment that operate on clean fill material.
- **Contaminated Equipment**: any CHDT trucks or equipment whose exteriors come into direct contact with radioactive materials. Examples include the CAT D6 Bulldozer and CAT 815 Compactor used in the landfill. Contaminated equipment shall undergo

decontamination procedures and a radiation survey, as defined in the DR 15.OPS.13, *Equipment and Vehicle Release Surveys*, before it can be considered to be clean equipment.

- **Landfill Equipment**: means earthmoving equipment (e.g., CAT D6 bulldozer and/or CAT 815 compactor) that is normally located inside the landfill and used in the landfill to push, spread and compact waste material.
- **Clean Area**: means areas of the facility that are not associated with radioactive materials handling, treatment, or disposal and landfill areas that have been covered with two inches of soil to prevent individuals or equipment (e.g., trucks, earthmoving equipment, etc.) from potentially contacting radioactive materials.

6.0 LANDFILL OPERATIONS

The CHDT facility may conduct RCRA-only or radioactive materials operations, depending on the type of waste received. The following describes the two different modes of operation and the different general operations that will occur in the landfill.

6.1 RCRA-Only Operations

The RCRA-Only mode of operation will allow for the disposal of hazardous and nonhazardous waste in the landfill in accordance with the RCRA hazardous waste facility permit. After a load of hazardous waste or nonhazardous waste has met the waste acceptance criteria specified in the Waste Analysis Plan (WAP) in the RCRA hazardous waste permit, the truck will proceed to the landfill as directed by facility staff. The truck will enter the landfill via a dirt haul road. The truck will proceed to an area and discharge the waste load in an unloading area specified by facility personnel. The dirt haul road inside the landfill will be marked using signs, paint, chalk, traffic cones, barricades or some other means to direct truck traffic to the designated area. After the waste has been unloaded, the truck will exit the landfill, usually via the entrance road. In future cells, the landfill may be constructed with a separate entrance and exit dirt haul road(s). The waste in the unloading area will be pushed by a bulldozer or compactor to its burial location and compacted as described in Section 6.4 of this SOP. CHDT anticipates that the landfill will be operated mainly in this mode of operation. This mode of operation will not require an assessment for radionuclide contamination since the truck will be traveling on clean soil and will not contact radioactive material. In addition, the unloading area location and haul road(s) locations will be modified to support operations as the landfill is filled to capacity.

6.2 Radioactive Materials Operations

During radioactive materials operations, activities shall consist of facility personnel directing the transporter to the landfill, the truck traveling on clean dirt haul roads inside the landfill, where the haul road(s) and unloading area shall be delineated as mentioned in the RCRA only mode of operation in Section 6.1, and the waste being compacted as described in Section 6.4. As the truck exits the landfill, the truck shall be required to follow the procedures in Section 6.3 depending on whether or not the truck was transporting radioactive materials. Covering the radioactive disposal area with clean soil may occur any time during the operating day or at the end of the operating day depending on the time of day, the amount of hazardous and/or nonhazardous waste to be received, or the amount of radioactive materials to be accepted. In any

event, the burial area shall be covered with clean soil prior to returning the landfill to the RCRA only mode of operation. CHDT intents to coordinate its operations by having loads of radioactive materials scheduled for acceptance to limit the amount of time the landfill will be operated in the radioactive materials mode of operation.

6.3 Landfill Exiting Procedures for Trucks Transporting Radioactive Materials

The landfill exiting procedures for a truck transporting radioactive materials are as follows. After a truck containing radioactive materials is unloaded and the interior of the truck bed or roll-off bin is inspected for residual waste material, the truck shall exit the landfill and proceed to the decon area. The truck bed will be inspected in the unloading area to verify that all of the materials have been removed from the truck. Typically, the truck bed or roll-off-bin will be lined with a bed liner which prevents the waste from contacting the inside of the truck bed or roll-off bin. After all visible evidence of waste residue has been removed, the truck will travel to the decontamination area at the exit of the landfill.

The truck tires will not routinely be surveyed for radioactive contamination since the truck travels on haul roads and unloading areas constructed of clean soil, separating the vehicle tires from the radioactive material (i.e., truck tires will not contact radioactive materials) and since a survey of the haul road will be performed in accordance with Section 6.6. If the truck tires contact radioactive material (e.g., the truck driver accidentally backs over a pile of radioactive material or drives off the clean soil onto contaminated areas), the truck tires shall be swept or rinsed to remove soil particles. After sweeping, the truck tires shall be surveyed for the presence of radioactivity per SOP 15.OPS.13, *Equipment and Vehicle Release Surveys*. If radioactivity is detected above the survey limits, the truck tires shall be decontaminated and re-surveyed.

For trucks transporting radioactive materials, the interior of the truck dump trailer or roll-off bin will be surveyed for radioactive contamination in accordance with SOP 15.OPS.13, *Equipment and Vehicle Release Surveys*. If contamination is detected above the survey limit, the interior of the truck dump trail or roll-off bin trailer will be swept and/or washed, if necessary, until the interior of the truck dump trailer or roll-off bin is determined to meet the release criteria in SOP 15.OPS.13, *Equipment and Vehicle Release Surveys*.

6.4 Waste Placement and Compaction

Radioactive materials shall placed in the landfill in lifts of 2-4 feet high. Waste locations are measured on a 50-foot by 50-foot grid system. The location of each load of waste shall be recorded. Location is determined by a number and letter sequence for north-south, and east-west grids. The grid location and the elevation level of the top of the lift will document the location of each load. Waste shall be compacted in place to meet the standards required by the RCRA permit. Multiple passes with the CAT D6 Bulldozer, the CAT 815 compactor, or other similar equipment shall accomplish compaction. Debris-like waste shall be mixed with soil like waste and compacted in place. All void spaces in the waste shall be filled with waste or eliminated through compaction. No debris placement shall be permitted near the liner. In order to protect the synthetic liner from possible punctures, a two-foot thick protective soil layer shall be placed on the immediate liner surface. All waste placement and compaction shall be done in compliance with the requirements of the RCRA Operating permit.

6.5 Prevention of Wind Dispersal

Several mechanisms shall be used to prevent the wind dispersal of waste outside the landfill. Cover material shall be placed over the waste at the end of each landfill shift. Types of cover material may include 2 inches of soil, geotextile fabrics, spray foam, or other effective materials. The facility is equipped with a wind gauge and an alarm system which provides a warning if sustained wind speeds exceed 35 miles per hour. If the wind speed exceeds a sustained speed of 35 miles per hour, truck-unloading operations in the landfill will cease. A stockpile of cover material shall be kept in the landfill whenever waste placement is above the rim of the landfill liner system. If 35 mile per hour sustained wind speeds occur, any exposed areas of waste shall be covered immediately.

6.6 Maintenance of Haul Roads

At the end of each operating day of radioactive materials disposal in the landfill, clean soil shall be brought into the landfill and spread over the haul road and the dumping area. Clean soil shall be placed using the clean equipment. Equipment contaminated by radioactive materials shall stay off all designated clean areas. Landfill haul roads shall have dry soil placed on them after a precipitation event, if necessary. Area surveys shall be conducted each time clean soil is emplaced using DR 15.SOP.11, *Routine Contamination Surveys*, to ensure isolation of radioactive materials.

6.7 Removal of Landfill Equipment from the Landfill

Equipment contaminated by radioactive materials (e.g., CAT D6 bulldozer, CAT 815 compactor) shall be decontaminated before removal from the landfill. Alternatively, it may be transported to the treatment building for washing and decontamination. Equipment release surveys (SOP 15.OPS.13, *Equipment and Vehicle Release Surveys*) will be performed following decontamination.

6.8 CHDT Haul Trucks and Clean Equipment

Clean equipment may enter and leave the landfill, as needed, provided they only travel on areas of the landfill that are covered with clean soil. Frisk out shall not be done on this equipment unless it leaves the clean areas of the landfill.

6.9 Run-On/ Run-Off Controls

Run-On/Run-Off Controls and procedures are presented in detail in Section VI of the RCRA operating permit.

6.10 Leachate Collection

Requirements for leachate collection are presented in detail in Section VI of the RCRA operating permit

7.0 PERSONAL PROTECTIVE EQUIPMENT AND PERSONNEL DECONTAMINATION

Standard personal protective equipment (PPE) for use in the landfill consists of a full face air purifying respirator and combination cartridges, a porous disposable Tyvek suit, plastic liner gloves with cloth or leather over gloves, and boots. Additional discussion of PPE requirements

at CHDT is presented in SOP 15.RPP.09, *Personal Protective Equipment*, and the other documents listed in Section 8. Personnel may leave the landfill whether on foot or on a vehicle. Persons entering the vehicle on clean vehicles may not leave the vehicle within the landfill except in clean areas such as the haul road and the dump area. Persons working in equipment handling radioactive materials or walking on emplaced radioactive materials shall be surveyed after leaving the landfill using DR 15.OPS.12, *Personnel Contamination Surveys*. If the survey results determine that radioactive material is present, the PPE shall if be removed and disposed and the individual surveyed again. Reusable PPE such as boots and respirators may be decontaminated, if necessary, and reused. Other PPE may be used as long as they provide equivalent protection.

8.0 REFERENCES

CHDT RCRA Permit, current version

Clean Harbors Environmental Services, 2006. *Personal Protective Equipment Guidelines*, Revision 4. February.

Clean Harbors Environmental Services, 2008. *Respiratory Protection Guidelines*, Revision 5. May.

Clean Harbors Environmental Services, 2009. *US Landfill Division PPE Hazard Assessment Summary*, Revision 11. October.