#### APPENDIX 3 MANAGEMENT OF REMEDIATION WASTE

## 1.0 Purpose

The proper management, characterization, treatment, and disposal of the materials generated during the implementation of Resource Conservation and Recovery Act (RCRA) corrective action investigations and/or cleanup activities can be confusing, difficult and expensive. The Department believes that the difficulties and expense of managing, treating and disposing of waste generated during cleanup should not be a roadblock to the rapid clean up of RCRA corrective action facilities so long as the continued protection of human health and the environment is assured. It is the Department's intent to help facilities employ the regulations, policies and approaches described in this Appendix to achieve clean up goals quickly and efficiently.

The purpose of this Appendix is to clarify and summarize the Department's requirements for management and disposal of materials that are generated during investigation or cleanup activities. The guidance describes regulatory mechanisms (e.g., the contained-out policy) that have been created specifically to reduce some of the regulatory hurdles, which in the past have encumbered the management of materials generated during RCRA corrective actions and provides a flow chart (Flowchart A3-1) that can be followed when planning and implementing RCRA corrective actions.

#### 2.0 Definition of Remediation Waste

The first step to take when dealing with materials generated during a RCRA corrective action investigation or cleanup activities is to determine whether it is a remediation waste. The term remediation waste is specifically defined in the Colorado Hazardous Waste Regulations, 6 Code of Colorado Regulations 1007-3, Part 260, Section 260.10 (6 CCR 1007-3 §260.10) as "all solid and hazardous wastes, and all media (including ground water, surface water, soils and sediments) and debris that contain listed hazardous wastes or that themselves exhibit a hazardous waste characteristic and are managed for implementing cleanup". The term remediation waste management site "means a facility where an owner or operator is or will be treating, storing or disposing of hazardous remediation wastes."

Examples of remediation waste include:

- soil that is removed from the ground during drilling of soil borings/monitoring wells, soil sampling or excavation of contaminated soil;
- ground water extracted from a well during sampling or implementation of pumping tests;
- construction rubble or old synthetic liner material from the demolition of a building or structure;
- disposable sampling equipment or personal protective equipment;
- decontamination water generated during and investigation.

If a material does not meet the definition of remediation waste, it is most likely a process waste generated during normal facility operations. The management of disposal of non-remediation waste is outside the scope of this Appendix. For additional information regarding the management of non-remediation waste, please refer to the Department's "Guide to Generator Requirements of the Colorado Hazardous Waste Regulations," Fourth Edition, October 2001.

## 3.0 Procedures for Management of Remediation Waste

#### 3.1 Making a Hazardous Waste Determination for Remediation Waste

The second step to take when managing a remediation waste is to determine whether the remediation waste contains a solid waste or is itself a solid waste as defined in 6 CCR 1007-3 Section 261.2. If the

remediation waste does not contain a solid waste and is not a solid waste itself, then there are no requirements for management or disposal of the material under RCRA. If the remediation waste does contain a solid waste, or is a solid waste, then the next step is to determine whether the remediation waste contains, or is, a hazardous waste. The methods for making these determinations are described below.

The investigation and clean up of RCRA corrective action facilities almost always involves the generation of remediation waste. The remediation waste can typically be grouped into two categories: (1) a contaminated environmental media (e.g., soil, ground water, surface water and sediment) that may contain a solid waste or 2) a material that is known to meet the definition of solid waste under 6 CCR 1007-3 Section 261.2 (e.g., disposable sampling equipment, decontamination water or demolition debris, etc.).

The collection of adequate waste characterization information is crucial to determining whether a remediation waste is a solid waste and whether it is, or contains, a hazardous waste. Waste characterization information can consist of process knowledge information (particularly for determining whether the waste contains a listed hazardous waste) where the origin of the waste is known from facility records and/or the results of sampling and laboratory analytical efforts on the waste itself. In some cases, adequate waste characterization data will be available prior to actual generation of the waste and the waste can be managed in the appropriate manner as it is generated. In other cases, waste characterization will be performed after the remediation waste is generated. In cases where it is reasonably suspected that contamination is present, the Department strongly recommends that facilities manage the waste as if is hazardous waste upon generation in order to ensure compliance with the Colorado Hazardous Waste Regulations in the event it does prove to be a hazardous waste.

Information regarding characterization of waste and how to make solid waste and hazardous waste determinations is available in the Department's Hazardous Waste Identification Guidance Document, First Edition, September 1998. Commercial or public waste treatment or waste disposal facilities will also be able to help with planning waste characterization activities and hazardous waste determinations.

#### 3.1.1 Contaminated Environmental Media Remediation Waste

Environmental media by itself is not a solid waste, and therefore cannot be a hazardous waste. However, it is possible for the environmental media to "contain" a solid waste if it has been contaminated with a hazardous constituent due to a release from the facility. To determine whether an environmental media contains a solid waste, samples should be collected from the media for laboratory analysis to determine whether the environmental media is contaminated with a hazardous constituent. In general, the Department considers an environmental media to be contaminated with (or contain) a solid waste if it contains a hazardous constituent at a concentration above the analytical method detection limit for organic constituents, or above background concentrations for inorganic constituents.

If the environmental media does not contain a solid waste, then there are no requirements for management or disposal of the material under RCRA. If the environmental media does contain a solid waste, then the next step is to make a hazardous waste determination. The environmental media containing a solid waste may be classified as hazardous waste if it contains a listed hazardous waste, as defined under 6 CCR 1007-3 Part 261 Subpart D, and the constituent concentrations are at levels that may pose a risk to human health and the environment. For example, soil that has been contaminated due to a release of a spent halogenated solvent that had been used for degreasing (F001 hazardous waste listing) would be considered to "contain" F001 hazardous waste once the soil was removed from the ground. Note that even if a waste was disposed of prior to the 1980 effective date of the RCRA hazardous waste regulations, the RCRA hazardous waste listing may still apply if the waste is treated stored, disposed of or otherwise handled after 1980. See Appendix 2 to determine whether the environmental media contaminated with listed constituents poses a risk and should therefore be managed as a hazardous waste.

The environmental media may also contain enough of a particular hazardous constituent(s) that samples of the contaminated environmental media itself exhibits a characteristic of hazardous waste as defined under 6 CCR 1007-3 Part 261, Subpart C. For example, soil that has been contaminated due to a release of lead dust may exceed the maximum concentration of contaminants for the toxicity characteristic of Table 1 of 6 CCR 1007-3 §261.24. The contaminated soil would then exhibit the characteristic of hazardous waste and be classified as "D008" characteristic hazardous waste.

If contaminated environmental media contain hazardous waste, they are subject to all applicable RCRA requirements until they no longer contain hazardous waste. See the discussion of disposal of hazardous remediation waste below in Section 3.2.

### 3.1.2 Solid Waste Remediation Waste

Examples of remediation waste that are classified as solid waste include: disposable personal protective equipment (PPE), disposable sampling equipment, concrete or asphalt pavement rubble, used synthetic liner materials, decontamination water generated during site investigations, residual process waste from a pre-RCRA surface impoundment or landfill and residuals from the treatment of remediation waste. Since these materials are solid waste, they can be hazardous waste if they are contaminated with listed hazardous waste or exhibit a characteristic of hazardous waste. If a remediation waste is known to be a solid waste, then the next step is to determine whether the remediation waste also meets the definition of hazardous waste under 6 CCR 1007-3 Section 261.3.

This type of remediation waste is a hazardous waste if it exhibits a characteristic of hazardous waste as defined in under 6 CCR 1007-3 Part 261, Subpart C. A characteristic hazardous waste determination is typically based on the results of testing performed on a representative sample of the solid waste. These tests include a flash point test for ignitability (6 CCR 1007-3 Section 261.21), a pH test and corrosion of steel test for corrosivity (6 CCR 1007-3 Section 261.22), and a toxicity characteristic leaching procedure (TCLP) analysis to determine the toxicity characteristic (6 CCR 1007-3 Section 261.24). There are also a number of different tests specified in 6 CCR 1007-3 Section 261.23 to determine whether a waste is a reactive hazardous waste.

A solid waste remediation waste is a hazardous waste if it is itself a listed hazardous waste, or it is derived from, or mixed with, any listed hazardous waste as defined under 6 CCR 1007-3 Part 261, Subpart D. A listed hazardous waste determination may be made based on "process knowledge" of how that solid waste was generated and/or the results of totals analyses of samples of the solid waste.

If a solid waste remediation waste is determined to be non-hazardous waste, then the remediation waste must be managed in accordance with the guidelines and protocols specified in the Colorado Solid Waste Disposal Site and Facilities Act and the Colorado Solid Waste Regulations at 6 CCR 1007-2. If the solid waste remediation waste is determined to be a hazardous waste, it is subject to all applicable RCRA requirements until they no longer contain hazardous waste.

#### 3.2 Disposal of Hazardous Remediation Waste

## 3.2.1 Disposal of Contaminated Environmental Media Hazardous Remediation Waste

In an acknowledgement that contaminated environmental media, of itself, is generally not a process waste generated during normal business operations at a facility, and therefore not the original "target" of the RCRA Regulations, the Department has developed the Contained-Out Determination Criteria to help ease the burden of disposal of contaminated environmental media that contain hazardous waste. This procedure is presented in Appendix 2. Under the contained-out determination procedure, the Department considers that contaminated environmental media no longer contain a hazardous waste when: (1) they no

longer exhibit the characteristic of hazardous waste; and (2) when concentrations of hazardous constituents from listed hazardous wastes are below human health-risk based levels; and (3) they are protective of water quality. Generally, contaminated environmental media that have met the contained-out criteria are not subject to RCRA hazardous waste requirements. However, in some cases, contaminated environmental media that contained a hazardous when first generated (i.e., removed from the ground) remain subject to the RCRA land disposal restrictions of 6 CCR 1007-3 Part 268.

The Department has developed contained-out criteria that identify two different disposal options for contaminated environmental media depending of the actual concentration of hazardous constituents remaining in the media. The first disposal option is a restricted use contained-out determination, where the concentrations of hazardous constituents remaining in the media are low enough that the media is deemed to no longer contain hazardous waste, but are high enough to require disposal in accordance with the guidelines and protocols specified in the Colorado Solid Waste Disposal Site and Facilities Act and the Colorado Solid Waste Regulations at 6 CCR 1007-2. The second disposal option is the unrestricted use contained-out determination where the concentrations of hazardous constituents are deemed to no longer represent a threat to human health and the environment. There are no restrictions under RCRA for the management of environmental media that have obtained an unrestricted use designation. However, prior to final disposition of the material, the owner/operator should ensure that there are no other regulatory requirements (e.g., discharge permits for the pumping of ground water to a surface water body) associated with selected method for final disposition of the uncontaminated environmental media.

A detailed description of the Department's Contained-Out Determination Criteria is provided in Appendix 2 of this Corrective Action Guidance Document. Appendix 2 also provides a flowchart for determining whether the contained-out environmental media remain subject to the RCRA land disposal restrictions of 6 CCR 1007-3 Part 268.

If the concentrations of a hazardous constituent(s) in a contaminated environmental media is such that a contained-out determination cannot be made, then the environmental media must be managed as a hazardous waste from the time of generation (i.e., removal from the ground) and treated and/or disposed of accordingly. There are a number of options available for the initial management and storage of contaminated environmental media, ranging in complexity from simple containerization (drum or roll-off dumpster) and off-site disposal, to storage, treatment and/or disposal in an on-site RCRA Corrective Action Management Unit (CAMU). The various storage, treatment and/or disposal options for hazardous remediation waste are discussed in Section 3.3 of this Appendix.

#### 3.2.2 Disposal of Solid Waste Hazardous Remediation Waste

In order to decide the appropriate method for disposal of a hazardous remediation waste, it is first necessary to determine whether or not the hazardous remediation waste is a "debris." This determination is important due to promulgation of the "debris rule" in the Colorado Hazardous Waste Regulations, which under 6 CCR 1007-3 §261.3(f) allows exclusion of hazardous debris waste from the RCRA hazardous waste management and disposal requirements under specific conditions.

## Disposal of Hazardous Remediation Debris Waste

The term "debris" is specifically defined in the Colorado Hazardous Waste Regulations, 6 CCR 1007-3, Part 268, Section 268.2(g) as "solid material exceeding a 60 mm particle size that is intended for disposal and that is: a manufactured object; or plant or animal matter; or natural geologic material". The term "hazardous debris" (Section 268.2(h)) is defined as "debris that contains a hazardous waste listed in Subpart D of Part 261 of these regulations, or that exhibits a characteristic of hazardous waste identified in Subpart C of Part 261 of these regulations". The definition of debris excludes any material for which a specific treatment standard is provided in Subpart D of Part 268 (e.g., lead-acid and cadmium batteries) and also excludes process wastes and residues from the treatment of waste. A mixture of debris and other

materials, such as soil or sludge, is considered a debris if the mixture is comprised primarily of debris based on visual inspection. Examples of debris waste include: disposable personal protective equipment (PPE), disposable sampling equipment, concrete or asphalt pavement rubble, used synthetic liner materials, and building demolition rubble.

The Colorado Hazardous Waste Regulations at 6 CCR 1007-3 Section 268.45 specify treatment standards and treatment technologies for hazardous debris waste that must be satisfied prior to land disposal. The exclusion for debris waste from RCRA requirements under 6 CCR 1007-3 Section 261.3(f)(1) states that, provided the debris does not exhibit a characteristic of hazardous waste, hazardous debris that has been treated using one of the technologies in Table 1 of Section 268.45 is no longer subject to regulation as hazardous waste. For example, an old high density polyethylene liner that would be classified as hazardous debris due to contact with a listed hazardous waste could be treated with a high pressure water spray to remove hazardous contaminants from the surface to meet the treatment standard. The facility claiming this exclusion should keep records of the disposition of the wastes that include documentation of the specific type of treatment used and that the treatment qualifies for the technology in Section 268.45. Records must kept to show that the actual treatment of the waste met the performance requirements for the specific extraction or destruction technology employed.

The exclusion for debris waste from RCRA requirements under 6 CCR 1007-3 Section 261.3(f)(2) allows the Department Director, considering the extent of contamination, to determine that a debris is no longer contaminated with hazardous waste and therefore, is no longer subject to regulation as hazardous waste. For example, the Department Director could determine that personal protective equipment and/or disposable sampling equipment hazardous debris waste that is classified as a listed hazardous waste due to contact with ground water containing listed hazardous waste is not subject to regulation as hazardous waste because the debris waste would not be expected to be highly contaminated with hazardous constituents. A facility wishing to claim this exclusion must submit information to the Department that shows that the concentration of hazardous waste contained in the debris does not pose a significant threat. For those debris waste that lend themselves to the collection of samples for laboratory analysis, the demonstration could be made in a manner similar to the contained out procedure for environmental media described in Appendix 2 of this guidance document. Other information regarding the nature of the debris and its management may also be considered by the Department in making this determination. For the example of the personal protective equipment or disposable sampling equipment described above, the demonstration could be made through written documentation of visual observations of the cleanliness of the debris waste. This exclusion should only be used with the concurrence of the Department.

It is important to remember when these exclusions are used that the debris is still a solid waste that must be managed in accordance with the guidelines and protocols specified in the Colorado Solid Waste Disposal Site and Facilities Act and the Colorado Solid Waste Regulations at 6 CCR 1007-2.

#### Disposal of Non-Debris Hazardous Remediation Waste

If the hazardous remediation waste is not a debris, or it is a hazardous debris that cannot meet the requirements for exclusion noted above, then it must be managed as a hazardous waste from the time of generation (i.e., removal from the ground) and treated and/or disposed of accordingly. Examples of hazardous remediation waste that are not considered debris include: decontamination water generated during site investigations, residual process waste from a pre-RCRA surface impoundment or landfill and residuals from the treatment of remediation waste. There are a number of options available for the initial management and storage of hazardous remediation debris, some of which (e.g., staging piles and CAMUs) are not available for managing hazardous process waste. The various storage, treatment and/or disposal options for hazardous remediation waste are discussed in Section 3.3 of this Appendix.

#### 3.3 Options for the Management and Disposal of Hazardous Remediation Waste

If a remediation waste has been characterized and is known to be a hazardous waste, or there is reason to believe that an uncharacterized remediation waste will be hazardous, there are a number of options available for the management, treatment, and disposal of remediation waste. The management options include:

- containerization (drum or roll-off dumpster), storage and possibly treatment in a generator or permitted hazardous waste storage unit until off-site disposal;
- storage or storage/treatment in a generator or permitted storage tank, drip pad or containment building;
- storage/treatment in a wastewater treatment unit;
- storage in a Staging Pile;
- storage, treatment and/or disposal in a RCRA Corrective Action Management Unit (CAMU);
- storage and/or treatment in a Temporary Unit (TU).

The various storage, treatment and/or disposal options for hazardous remediation waste are discussed below in order of increasing regulatory complexity and oversight. Table A3-1 identifies the hazardous waste remediation disposal options discussed in this section and summarizes the requirements for implementation of each option.

#### 3.3.1 Generator 90-Day Storage and Treatment

#### Generator Storage

The simplest method for managing hazardous remediation waste is to containerize the waste as it is generated (i.e., removed from the ground or discarded), store it temporarily in a generator storage area, and then ship the waste off-site for treatment and/or disposal. Under 6 CCR 1007-3 Section 262.34(a), a generator may accumulate (and store and treat) hazardous waste on-site for 90 days or less without a RCRA permit or without having RCRA interim status provided the waste is placed in a container, tank, drip pad, or containment building. The generator storage areas are also known as 90-day accumulation or storage units. At the end of the 90-days, the generator must ship the waste off-site for treatment and/or disposal.

The generator storage unit with the least onerous regulatory requirements is the container storage unit since the generator need only comply with the requirements of Subpart I (use and management of containers), AA (air emission standards for process vents) and BB (air emission standards for equipment leaks) of 6 CCR 1007-3 Part 265. Note that the requirements of Subpart CC (air emission standards for tanks, surface impoundments and containers) of 6 CCR 1007-3 Part 265 do not apply to a waste management unit that is used solely for on-site treatment or storage of hazardous remediation waste that is placed in the unit as a result of implementing remedial activities. Essentially, the regulations require the generator to accumulate remediation waste in containers that are in good condition and compatible with the waste. The containers must be kept closed/covered when not in use and not handled in a manner that may rupture the container or cause a leak. There are no requirements for secondary containment, but the prudent generator will provide some sort of secondary containment to minimize the potential for release in the event of a leak. As defined in 6 CCR 1007-3 Section 260.10, a container means any portable device in which material is stored, transported, treated, disposed of, or otherwise managed. This definition extends to steel, plastic or fiberboard drums or boxes, tank trucks or trailers, wheeled or portable "frac tanks" and roll-off dumpsters.

For the remaining types of units available for generator storage, the generator must comply with the requirements of the 6 CCR 1007-3 Part 265 Subpart applicable to that unit. The 6 CCR 1007-3 Part 265 Subpart requirements applicable to tanks (Subparts J, AA, BB and CC), drip pads (Subpart W) and

containment buildings (Subpart DD) are considerably more complex than the requirements for containers and include the need for certified engineered designs for the unit and secondary containment and written operating and inspection procedures at a minimum. The facility should contact the Department for guidance prior to beginning operation of one of these types of generator 90-day units.

#### **Generator Treatment**

It is possible for a generator of hazardous waste to save a considerable amount of money by performing treatment of their hazardous waste prior to off-site treatment and/or disposal. Each of the generator storage units described above can also be used for the treatment of hazardous waste without first getting a hazardous waste permit.

The term treatment means any method, technique, or process, including neutralization or incineration, designed to change the physical, chemical, or biological character or composition of a hazardous waste, so as to neutralize such waste or render such waste less hazardous, safer for transport, amenable for recovery or reuse, amenable for storage, or reduced in volume.

Under 6 CCR 1007-3 Part 100.10(a), a generator may perform the following types of treatment activities without a hazardous waste permit and with little or no interaction with the Department prior to conducting the treatment:

- owners or operators of totally enclosed treatment facilities as defined in 6 CCR 1007-3 Section 260.10:
- generators adding absorbent material to a waste container or adding waste to absorbent material in a container provided that these actions occur at the time the waste is first placed in the container
- owners or operators of elementary neutralization units as defined in 6 CCR 1007-3 Section 260.10;
- owners or operators of wastewater treatment units as defined in 6 CCR 1007-3 Section 260.10 (see Section 3.3.3 below); and
- Conditionally Exempt Small Quantity Generators treating their own waste (6 CCR 1007-3 Section 261.5).

There are two additional ways that generators may treat their own waste without going through the entire RCRA permitting process. First, under 6 CCR 1007-3 Section 268.7(a)(5), generators who treat their own waste only to meet the land disposal restrictions are not required to obtain a permit. Second, generators may treat their own waste under the permit by rule provisions of 6 CCR 1007-3 Section 100.21(d). However, both of these methods require interaction with the Department in the form of notifications and submittal of waste analysis plans prior to conducting the treatment activities. See the Department's guidance document titled "Treatment of Hazardous Waste by Generators", Second Edition, April 2000 for a detailed description of the options available for generator treatment and the requirements that must be met for each generator treatment option. Although these two options may have been developed with the treatment of waste products in mind, they are also used to treat remediation wastes to a) comply with the land disposal treatment standards, b) treat remediation wastes so that they are no longer hazardous wastes, and c) to treat contaminated environmental media to the extent necessary to obtain a contained-out determination. For example, soil contaminated with listed hazardous waste constituents is treated in a roll-off box using vapor extraction. The treatment, performed in accordance with a waste analysis plan, is successful and a contained-out determination is made, thereby allowing the soil to be transported off-site for disposal at a local solid waste landfill.

## 3.3.2 RCRA Permitted Storage, Treatment or Disposal Units

If the generating facility happens to already operate a RCRA permitted unit such as a container storage area or tank system that is capable of storing and/or treating the remediation waste, then this would likely be the most appropriate option for managing the hazardous remediation waste until treatment and/or

disposal is accomplished. However, if the generating facility does not have a RCRA permit, then it is not likely to be cost-effective or time efficient to try and obtain a RCRA permit since there are other options such as CAMU or Remedial Action Plans that are easier to implement.

## 3.3.3 Wastewater Treatment Storage and Treatment Units

A very important option for the storage, treatment and disposal of liquid hazardous remediation waste (decontamination fluids, highly contaminated ground water from well purging, etc.) is regulated under the wastewater treatment unit exemption. Under 6 CCR 1007-3 Section 100.10(a)(6), the owner or operator of a wastewater treatment unit as defined in 6 CCR 1007-3 Section 260.10 is specifically excluded from the RCRA permit requirements. A wastewater treatment unit is defined as a device which:

- is part of a wastewater treatment facility that is subject to regulation under either Section 402 or Section 307(b) of the Clean Water Act; and
- receives, treats, or stores an influent wastewater that is a hazardous wastes, or generates and
  accumulates a hazardous wastewater treatment sludge, or treats or stores a hazardous wastewater
  treatment sludge; and
- meets the Section 260.10 definition of tank or tank system.

The first requirement limits the exemption to those wastewater treatment systems that are subject to regulation under a National Pollution Discharge Elimination System (NPDES) permit, a Colorado Discharge Permit System (CDPS) permit, or which are subject to regulation under the Clean Water Act (CWA) pretreatment requirements that apply to dischargers to publicly owned treatment works. The Department generally defines the term wastewater to mean wastes that have a water content of at least 90% by weight and contain less than 1% total organic carbon and less than 1% by weight total suspended solids. The term tank means a <u>stationary</u> device designed to contain an accumulation of hazardous waste that is constructed primarily of non-earthen materials (e.g., wood, concrete, steel, plastic) that provide structural support. A tank system means the tank plus its associated ancillary equipment and containment system.

Under 6 CCR 1007-3 Section 264.1(g)(6), a facility can store and treat a liquid hazardous remediation waste on-site in a tank system without a RCRA permit and without meeting the Part 264 minimum technology standard for tanks as long as the discharge from the wastewater treatment system is permitted under NPDES or CDPS, or is regulated by the CWA pretreatment requirements. See the Department's "Guide to Implementing the Division's Wastewater Treatment Unit Policy", First Edition, January 2000.

## 3.3.4 Storage in a Staging Pile

The Hazardous Waste Identification Rule established a new type of unit called a staging pile specifically for the short term, land-based storage of hazardous remediation waste. As defined in 6 CCR 1007-3 Section 260.10, staging pile means an accumulation of solid, non-flowing remediation waste that is not a containment building and that is used only during remedial operations for temporary storage at a facility. Staging piles must be designated by the Department Director in a RCRA operating or post-closure permit (including a Remedial Action Plan under 6 CCR 1007-3 Section 100.27), a Closure Plan, a Compliance Order on Consent, or Unilateral Order in accordance with the requirements of 6 CCR 1007-3 Section 264.554. The most important distinction of a staging pile is that it is not considered a land disposal unit, and as such, the hazardous remediation waste stored in a staging pile is not subject to the RCRA land disposal restrictions. In addition, a staging pile may be used to consolidate hazardous remediation waste from other areas of the facility that are not contiguous to the unit.

A staging pile cannot be used for treatment or disposal, but can be used for storage of a hazardous remediation waste for up to two (2) years, with an opportunity for on 180-day extension. There are no minimum technology requirements specified for a staging pile. Instead, the design and operation and

closure of a staging pile must meet the performance criteria specified in 6 CCR 1007-3 Section 264.554(d) through (k), and the staging pile must be clean closed. The design drawings and specifications, engineering studies and technical data submitted to support the staging pile designation must be certified by an independent, qualified, registered professional engineer. The staging pile does not have to comply with the ground water monitoring requirements of 6 CCR 1007-3 Section 264.91 through 100 since it is not a surface impoundment, waste pile, land treatment unit or landfill.

If the facility operating the staging pile is a remediation waste management site that does not also operate units that are subject to traditional RCRA permitting requirements, then under 6 CCR 1007-3 Section 261.1(j), the requirements of Part 264, Subparts B (General Facility Standards), C (Preparedness and Prevention), and D (Contingency Plan and Emergency Procedure) and the corrective action for solid waste management units requirements of 264.101 do not apply. Instead, the owners or operators of the staging pile must meet the requirements of 6 CCR 1007-3 Section 264.1(j)(1) through (13). The facility should contact the Department prior to selecting the staging pile option for management of hazardous remediation waste in order to obtain guidance regarding the type of information that must be submitted to allow formal designation of this unit.

# 3.3.5 Storage, Treatment and/or Disposal in a RCRA Corrective Action Management Unit

The Corrective Action Management Unit (CAMU) is a RCRA unit specifically intended for the treatment, storage and/or disposal of hazardous remediation waste. As defined in 6 CCR 1007-3 Section 260.10, a CAMU means an area within a facility that is used only for managing remediation wastes for implementing corrective action or cleanup at the facility. A CAMU is typically similar to a RCRA land-based unit such as a surface impoundment, waste pile, land treatment unit or landfill and may be located within a RCRA permitted or interim status unit undergoing closure, an area of the facility that is already contaminated, or in an uncontaminated area of the facility. In order to create a CAMU, the owner/operator submits documentation to the Department Director that describes how the CAMU will be designed, operated and closed in accordance with the criteria in 6 CCR 1007-3 Section 264.552. Once the criteria are satisfied, the CAMU is designated by the Department Director in a RCRA operating or post-closure permit (including a Remedial Action Plan under 6 CCR 1007-3 Section 100.27), a Closure Plan, a Compliance Order on Consent, or Unilateral Order in accordance with the requirements of 6 CCR 1007-3 Section 264.552.

There are several key advantages of using a CAMU for the management of hazardous remediation waste including:

- 1) placement of remediation waste in a CAMU (including final disposal) does not constitute land disposal of hazardous waste, and as such, the hazardous remediation waste is not subject to the RCRA land disposal restrictions. This means that the remediation waste can be generated (removed from the ground), treated on-site, and placed back on the ground in the CAMU.
- 2) the design and operation of the CAMU does not have to meet the minimum technology requirements for RCRA land-based units. Instead, they have to meet the design, operating, closure and post-closure performance standards specified in 6 CCR 1007-3 Section 264.552.
- 3) the CAMU regulation does not specifically require compliance with the ground water monitoring requirements of 6 CCR 1007-3 Section 264.91 through 100. However, the Department Director may require ground water monitoring for a CAMU if it is deemed necessary to protect human health and the environment.
- 4) the CAMU may be used to consolidate hazardous remediation waste from other areas of the facility that are not contiguous to the CAMU.

One example of the use of a CAMU would be at an operating wood treating facility where the surface soil throughout the site was highly contaminated with pentachlorophenol and polyaromatic hydrocarbons

from releases of wood treating solutions. The contaminated soil would likely be characterized as a listed hazardous waste (F027 or F032) since it was mixed with a listed hazardous waste. The cost of removing the surface soil and disposing of it off-site could be quite high. It is possible to treat pentachlorophenol contaminated soil to non-hazardous levels using land farming techniques, but this would typically trigger the need for a RCRA permitted land treatment unit. However, since the contaminated soil is a remediation waste, the facility could request that a portion of the site be designated a CAMU for the consolidation and land treatment of the contaminated soil throughout the facility without having to meet the minimum technology standards for land treatment units specified in Part 264, Subpart M.

When hazardous remediation wastes are placed in a CAMU, the CAMU must comply with the requirements of Part 264, Subparts B (General Facility Standards), C (Preparedness and Prevention), D (Contingency Plan and Emergency Procedure) and E (Manifest System, Record keeping, and Reporting). The Department has a strong preference that a CAMU be used to facilitate treatment of hazardous remediation waste prior to final disposal (either off-site or within the CAMU), but treatment is not an absolute necessity. If hazardous remediation waste is to remain in place after closure of a CAMU, the CAMU must to comply with the regulations for the siting of hazardous waste disposal sites in 6 CCR 1007-2 Part 2. The facility should contact the Department prior to selecting the CAMU as their preferred option for management of hazardous remediation waste in order to obtain guidance regarding the type of design and operation information that must be submitted to allow designation of the CAMU.

## 3.3.6 Storage and/or Treatment in a RCRA Temporary Unit

Temporary Units (TUs) are also specific types of RCRA units created specifically for the management of remediation waste. However, TUs are non-land based units (container storage or tank unit) used for the storage and/or treatment of hazardous remediation waste. TUs may operate for one year, with an opportunity for a one year extension. As with CAMUs, a TU must be designated by the Department Director in a RCRA operating or post-closure permit (including a Remedial Action Plan under 6 CCR 1007-3 §100.27), a Closure Plan, a Compliance Order on Consent, or Unilateral Order in accordance with the requirements of 6 CCR 1007-3 §264.553.

The major advantage of using a TU container storage instead of a generator container storage unit is that a TU may be designated for one year, with an opportunity for a one year extension, rather than the 90-days allowed for a generator container unit. The major advantage of a TU container storage area over a RCRA permitted storage area is that the Department Director may modify the standard minimum technology design, operating and closure standards that normally apply to a permitted hazardous container storage area provided they are replaced with alternative requirement that are protective of human health and the environment. The advantage of the increase in time from 90-days to up to two years also applies to TU tank storage/treatment versus generator tank storage/treatment and the ability to modify the minimum technology requirements for tank storage applies to both generator and RCRA permitted tank storage/treatment.

#### 4.0 Summary

The Department believes that contaminant characterization and remedy selection and implementation at RCRA corrective action facilities should be based on sound science, engineering practices and what is the best for the protection of human health and the environment. Site cleanup should not driven by the regulatory roadblocks and financial burdens associated with the management of remediation wastes as long as the continued protection of human health and the environment is assured. The Department is committed to helping facilities employ the hazardous remediation waste regulations and policies described in this Appendix to achieve clean up goals as quickly and efficiently as possible.

#### Flowchart A3-1 Management Of Remediation Waste

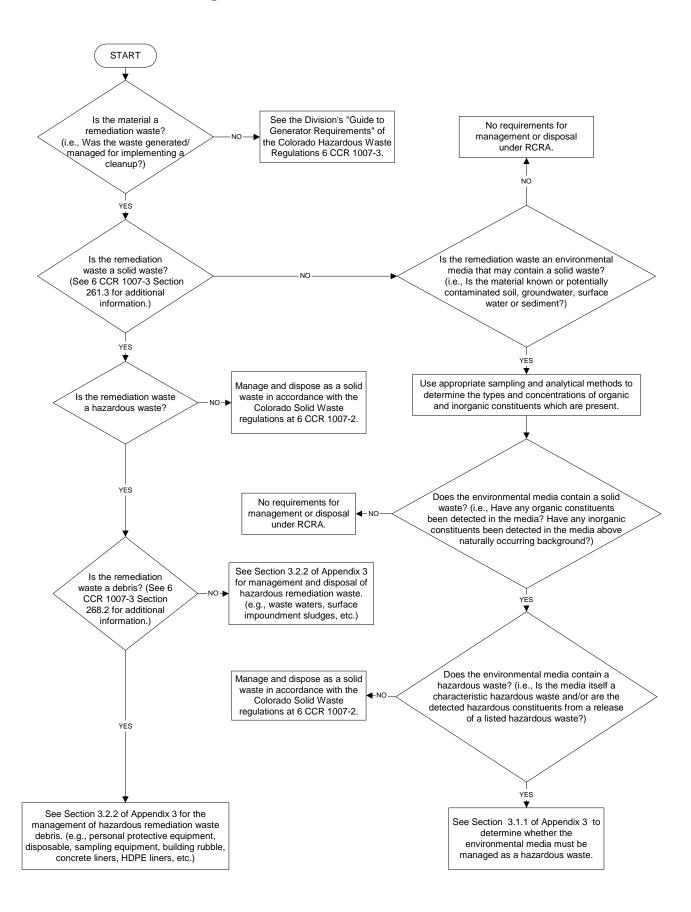


Table A3-1 Desired Management Method For Hazardous Remediation Waste

DESIRED MANAGEMENT METHOD FOR HAZARDOUS REMEDIATION WASTE	Generator Accumulation Unit	Wastewater Treatment Unit	Staging Pile	Corrective Action Management Unit	Temporary Unit
Advance Agency Approval Required	$NO^1$	$YES^2$	YES	YES	YES
<b>Use Container Unit for Treatment or Storage</b>	YES	NO	NO	NO	YES
Time Limit on Treatment/Storage -	90-DAYS	N/A	N/A	N/A	1 YEAR <sup>3</sup>
Must Meet Part 265, Subpart I	YES	N/A	N/A	N/A	NO
requirements at a minimum –					
<b>Use Tank Unit For Treatment or Storage</b>	YES	YES	NO	NO	YES
Time Limit on Treatment/Storage -	90-Days	NONE	N/A	N/A	1 YEAR <sup>3</sup>
Must Meet Part 265, Subpart J	YES	NO	N/A	N/A	NO
requirements at a minimum –					
Must Meet Part 264 Subpart J	NO	NO	N/A	N/A	NO
requirements at a minimum –					
Use Land-Based Unit for Treatment, Storage, or	NO	NO	YES	YES	NO
Disposal					
Time Limit	N/A	N/A	2 YEARS <sup>4</sup>	NONE	N/A
Consolidate Hazardous Remediation Waste from	YES	YES	YES	YES	YES
Different Units at the Facility					
Subject to RCRA Land Disposal Restrictions	N/A	NO	NO	NO	N/A

#### Notes:

- 1. 30 day prior notification required, in accordance with 6 CCR 1007-3, § 100.21(d).
- 2. Discharge from wastewater treatment unit must be permitted under Section 402 or 307(b) of the Clean Water Act or State of Colorado equivalent.
- 3. There is an opportunity for a TU to be granted one extension for an additional year.
- 4. There is an opportunity for a Staging Pile to be granted one extension of 180-days.