

## PERMIT ATTACHMENT 6

### CLOSURE PLAN

#### I. FACILITY CONDITIONS

##### I.A. GENERAL INFORMATION

###### I.A.1. Facility Description - Waste Management Units

The currently permitted site occupies approximately 325 acres. The Facility, at the time of closure, will include:

- I.A.1.a. Six closed, capped, graded and vegetated Secure Disposal Cells occupying approximately 90 acres;
- I.A.1.b. One open, active Secure Disposal Cell occupying approximately 10.3 acres of surface area, with approximately 12,500 yd<sup>3</sup> of capacity available (Secure Disposal Cell 7);
- I.A.1.c. Two Contaminated Water Storage Tanks with a capacity of approximately 250,000 gallons each;
- I.A.1.d. One Treatment Building with 15,000 ft<sup>2</sup> of Treatment Area. The Treatment Area includes 4 steel lined treatment mixing basins (each 20 ft wide x 80 ft long x 10 ft deep) of which 3 are available for treating waste (1,800 yd<sup>3</sup> capacity). The Treatment Building is underlain with a clay, synthetic, and concrete lining system that occupies approximately 89,000 ft<sup>2</sup>;
- I.A.1.e. One 2,760 ft<sup>2</sup> Off-site Truck Wash building, including a 3,300 gallon wash water recycling system with lined collection sump (17,000 gallon capacity) and lift pump to the Contaminated Water Storage Tanks;
- I.A.1.g. An On-Site Truck Wash bay with a 4,000 gallon underground sump collection tank;
- I.A.1.h. A 4,000 gallon Operations Building/Laboratory/Sampling Station underground collection tank;
- I.A.1.i. Two packed column air scrubber systems with 2,500 gallon liquid capacity each;

- I.A.1.j. Three dust conveyer systems from the Treatment Building baghouses;
- I.A.1.k. One decontamination room attached to the south side of the Treatment Building with a 500 gallon capacity sump; and
- I.A.1.l. One Container Management Area located within the Treatment Building, including a Class I and II drum storage area (11,000 gallon capacity), Class III drum storage area (22,000 gallon capacity), drum shredder and conveyor system.
- I.A.1.m. Two Container Storage Areas totalling 65,400 ft<sup>2</sup> of concrete paving plus curbing.

#### I.A.2. Secure Disposal Cell Description

The Secure Disposal Cells within the Facility receive processed waste from drums, treated waste, and direct-bury wastes. The Secure Disposal Cells vary in size from approximately 300 ft by 600 ft by 40 ft deep for Secure Cells 1 and 2 to approximately 500 ft by 900 ft by 60 ft deep for Secure Cells 3 and 7 to approximately 500 ft by 600 ft by 70 ft deep for Secure Cells 4, 5 and 6.

Each Secure Disposal Cell design incorporates a clay and synthetic double composite liner system. A complete description of the Secure Disposal Cell design is provided in Part VI of the Permit.

#### I.A.3. Facility Description - Non-waste management Units

The following buildings and facilities are on-site, however they do not and are not anticipated to be used for waste management activities. The closure of these units is not covered by this closure plan, nor are the costs associated with the closure of these units included in the Closure Cost Estimate. If at any time, the Permittee or the Department determines that hazardous wastes have been managed in these units, the Closure Plan and Closure Cost Estimate must be modified. The Department must be notified within 15 days of the determination and the Modification Request must be submitted within 30 days of the determination.

- I.A.3.a. One truck ramp shelter and containment sump (8,900 gallon capacity);

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- I.A.3.b. One 2,400 ft<sup>2</sup> truck Sampling Station;
  - I.A.3.c. One 250 ft<sup>2</sup> Guard/Scale House and 1,200 ft<sup>2</sup> weigh station;
  - I.A.3.d. One 12,000 ft<sup>2</sup> Maintenance Building;
  - I.A.3.e. Two 11,050 ft<sup>3</sup> and one 22,100 ft<sup>3</sup> dry treatment reagent silos; two 4200 gallon tanks and one 2600 gallon mixing tank for liquid reagent;
  - I.A.3.f. One 7,500 ft<sup>2</sup> Operations Building with office space, employee areas, drivers' lounge, and laboratory ;
  - I.A.3.g. Two 10,000 gallon diesel fuel underground tanks and one 3,000 gallon gasoline underground tank;
  - I.A.3.h. Approximately 150,000 square feet of gravel base roadways (approximately 3.4 acres);
  - I.A.3.i. Approximately 60,000 square feet of segregated stormwater drainage ditches (approximately 1.4 acres);
  - I.A.3.j. One Segregated Stormwater Retention Basin (SSRB) occupying approximately 1.5 acres with approximately 3.5 million gallons capacity;
  - I.A.3.k. One closed lift station (segregated stormwater) occupying approximately 0.25 acres;
  - I.A.3.l. Approximately 784,700 ft<sup>2</sup> of concrete paved access roads and parking areas, including the access road from Highway 36 (approximately 16 acres);

## **I.B. PARTIAL CLOSURE REQUIREMENTS**

Partial closure activities associated with the Facility will consist of closing individual Secure Disposal Cells and dedicated cell haul roads. Phased development, background sampling and testing, phased closure sampling and testing, and final cover construction activities are described below:

### **I.B.1. Phased Development**

After Secure Disposal Cells 1 and 2 are excavated, filled and capped in sequence, closure activities for this area will be initiated. Temporary drainage ditches and channels will be restored to permanent drainage structures. Closure of all Secure Disposal Cells 1 and 2, and access roads will be carried out as described in Sections III and IV of this Closure Plan.

Secure Disposal Cells 3 through 7 will be constructed, filled, and closed in the general sequence shown in the Site Development Drawings.

At the time of final closure of the Facility, all Secure Disposal Cells except Secure Disposal Cell No. 7 will have been capped, graded, and vegetated. The activities remaining to complete final closure of the Facility consist primarily of decontamination of appropriate structures and equipment, closure of the Treatment Building Surface Impoundment and closure of Secure Disposal Cell No. 7, final grading of the Facility as a whole to provide uniform drainage, and vegetation of graded and previously unvegetated areas to prevent erosion. These activities are described in Sections III and IV of this Closure Plan.

In order to maintain the security of the closed Secure Disposal Cells, the partially closed areas will be inspected as part of the Facility's normal operations in accordance with the Inspection Plan. Maintenance will be performed as required in response to inspections and in accordance with procedures outlined within this Closure Plan.

I.B.2. A background soil sampling and testing program was completed after initial construction of the Facility but prior to waste acceptance at the Facility. Results of this background soil sampling and testing program are maintained as part of the Operating Record. Additional background testing will be performed in accordance with Part VII.D.2. of this Permit.

I.B.3. Closure Soil Sampling and Testing

At closure of each Secure Disposal Cell and its associated structures, a soil sampling and testing program will be conducted over the area to be closed. Samples will be taken in areas of obvious contamination. Representative soil samples will be taken at a depth of 0 to 6 inches, and analyzed for soil pH and 6 CCR 1007-3, §261, Appendix VIII constituents.

For each phase's closure, the sampling and testing program will include a minimum of 5 samples taken for every 400 ft of roadway within the area to be closed. If contamination is found, the extent of contamination must be determined in a horizontal and vertical direction. Contaminated soils must be removed until a 6-inch vertical stratum of soil in the contaminated area meets the following decontamination criteria.

Soils will be considered decontaminated when analyses of soil pH and 6 CCR 1007-3, §261, Appendix VIII results indicate that background levels have been met. Test methods and procedures will be those specified in the Waste Analysis Plan. Sampling methods, procedures, recordkeeping protocol and soil sampling equipment will be those specified in Section III. Contaminated soils will be transferred to Secure Disposal Cell 7 or to a permitted hazardous waste disposal facility.

#### I.B.4. Special Requirements for Secure Disposal Cell Final Cover Systems

Cover systems for each Secure Disposal Cell will be constructed in increments as soon as weather conditions permit after final waste placement. The construction of each Secure Disposal Cell's final cover system will be in accordance with the Secure Disposal Cell cover plans and specifications included in Attachment 10 of this Permit. Vegetative cover will be applied and completed for each Secure Disposal Cell as soon as weather conditions permit according to the specifications in this Closure Plan. Vegetative cover seeding will be completed within a maximum of 6 months after the final cover system construction is completed. If vegetative cover can not be installed in the optimal planting times (May or October/November), then the covers will be seeded with field crops such as millet, oats, alfalfa, or other appropriate crop. The final vegetative cover will then be drilled at an optimal planting time.

### I.C. NOTIFICATION REQUIREMENTS

The Department will be notified a minimum of 180 days prior to the date the Facility is expected to begin final closure. In addition, the Director will be notified in writing at least 60 days prior to the date on which the facility expects to begin closure of a landfill unit, and the Director will be notified in writing at least 45 days prior to the date on which the facility expects to begin closure of the storage tanks or container storage area. The Director will be notified at least 30 days prior to the date the Permittee expects to begin closure of the final increment of each Secure Disposal Cell synthetic cover.

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**I.D. AMENDMENT REQUIREMENTS**

This Closure Plan can be amended at any time during the life of the Facility. At a minimum, this plan will be amended whenever changes in the Facility operating plans or design affect the Closure Plan or whenever there is a change in the expected year of closure. Whenever the Permittee requests a permit modification to authorize a change in the Facility operating plans or design, a request to modify the Closure Plan will be submitted at the same time. If a permit modification is not needed to authorize the change in the Facility operating plans or design, the request for modification of the Closure Plan must be made within 60 days after implementing the change in plans or designs. The Director of the Colorado Department of Public Health and Environment (CDPHE) will review and approve any proposed modifications to the plan prior to the amended plan becoming effective.

**I.E. Maximum Waste Inventory**

An estimate of the maximum inventory of hazardous waste treated or stored on-site over the active life of the facility is as follows:

- I.E.1. 2,400 yd<sup>3</sup> (484,700 gallons) of treated sludge/solids located in the Treatment Area portion of the Treatment Building;
- I.E.2. 11,355 gallons of wash and rinse water in 3 sumps in the Operations, Maintenance, and Truck Wash Buildings, including 55 gallons of solids from the Truck Wash Recycling System;
- I.E.3. 33,000 gallons (600 containers) of assorted waste in the Container Management Building;
- I.E.4. 500,000 gallons of contaminated water in the contaminated water collection tanks;
- I.E.5. Fourteen yd<sup>3</sup> of solids from various floor sumps and drains located in the Truck Wash, Truck Ramps, Truck Sampling Areas.
- I.E.6. Less than 2,484,000 yd<sup>3</sup> of hazardous waste disposed of in the 7 Secure Cells.
- I.E.7. 1,980 yd<sup>3</sup> of treated waste in the Container Storage Area with 50 percent having been treated.

**I.F. AUXILIARY EQUIPMENT INVENTORY**

The following is an example list of equipment that will be used to facilitate the handling of waste and other materials during the closure period:

- bulldozers
- backhoes
- dump trucks
- graders
- water trucks
- pickup trucks
- vacuum trucks
- loaders
- steam cleaning units
- forklifts
- compactors.

## **I.G. FINAL CLOSURE SCHEDULE**

### **I.G.1. Overview:**

Final Closure of the Facility is ultimately dependent on consumption of disposal capacity. Final closure activities will be completed in accordance with this plan and within 180 days after receiving the final volume of hazardous waste.

### **I.G.2. Anticipated Schedule**

The schedule of closure for each disposal cell will be dependent on waste receipts. However, the following schedule includes estimated closure milestone dates which will allow tracking of the progress of closure of each secure cell:

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| CLOSURE ELEMENT   | DAYS ELAPSED |
|---|--------------|
| Final receipt of waste  | 0            |
| Active waste management area surrounding cell, access roads, decontaminated | 130          |
| Secure Cell Backfilled and compacted  | 130          |
| Secure Cell cap completed   | 155          |
| Secure vegetated  | 175          |
| Secure Cell Closure Certification   | 180          |

The following schedule includes estimated closure milestones for final Facility Closure. These milestones will allow tracking of the progress of closure. The initial element of closure will be final receipt of wastes at the Facility:

| CLOSURE ELEMENT   | DAYS ELAPSED |
|---|--------------|
| Final receipt of waste  | 0            |
| All drums and other containers processed and transferred off-site or treated and disposed of in Secure Disposal Cell 7        | 36           |
| All waste treated and transferred to Secure Disposal Cell 7   | 36           |
| Solvent/Oil Storage Tanks contents shipped off-site   | 36           |
| Container Management Building decontaminated  | 45           |
| Reagent Silos, Tanks and ancillary components decontaminated  | 45           |
| Treatment Building, truck unloading, roll-off loading areas decontaminated  | 50           |
| Treatment Process and Staging Areas within the Treatment Building decontaminated  | 65           |
| Solvent/Oil Storage Tanks decontaminated  | 75           |
| Contaminated Water Storage Tanks emptied  | 90           |
| Treatment Building removed from site  | 95           |
| Contaminated Water Storage Tanks decontaminated   | 115          |
| Treatment Building lining system removed  | 125          |
| Off-site Truck Wash decontaminated  | 130          |
| Active Waste Management Area (Secure Disposal Cell 7 access road and most of process area, including Container Storage Areas) | 130          |
| Secure Disposal Cell 7 backfilled and compacted   | 130          |
| Treatment Building area backfilled  | 145          |
| Gravel roads and Site Access Roads (if necessary) decontaminated  | 145          |
| Secure Disposal Cell 7 capped   | 155          |
| Fuel Tanks emptied and decontaminated   | 155          |
| On-site Truck Wash decontaminated   | 165          |
| Operations Building laboratory decontaminated   | 165          |
| Auxiliary equipment decontaminated  | 165          |
| Secure Disposal Cell 7, and Treatment Building liner area, vegetated;   | 175          |
| Closure certified   | 180          |

## II. TREATMENT AND DISPOSAL OF WASTE INVENTORY

### II.A. MAXIMUM VOLUME OF WATER ON-SITE AT FINAL CLOSURE

This Closure Plan assumes that the Facility's various waste storage units listed will be filled to capacity when the closure period begins. The actual volume of wastes on-site when the closure period begins will likely be less.

II.A.1. Liquids - 539,800 gallons as follows:

- II.A.1.a. 11,000 gallons (200 drums) of oils and solvents in the Class I and II Drum Storage Area;
- II.A.1.b. 500,000 gallons of contaminated water in the Contaminated Water Storage Tanks;
- II.A.1.c. 28,800 gallons of contaminated water in the following locations:
  - 3,300 gallons in the Off-site Truck Wash recycle tanks
  - 17,000 gallons in the Off-site Truck Wash sump
  - 4,000 gallons in the Maintenance Building sump collection tank
  - 4,000 gallons in the Operations Building/Sampling Station sump collection tank
  - 500 gallons in the Treatment Building decontamination room sump

The water in the Contaminated Water Storage Tanks will be treated on-site with the available waste water treatment systems. The treated water will be discharged in accordance with the Permittee's CDPS Permit. The discharge will go to either the 2 on-site Construction Water Storage Tanks (capacity = 1 million gallons each) or to the Uncontaminated Drainage Channels.

II.A.2. Sludges - 2,509 yd<sup>3</sup> of untreated waste as follows:

- II.A.2.a. 109 yd<sup>3</sup> (22,000 gallons) of untreated containerized waste (assumed to be sludge) in the Class III Drum Storage Area. (136 yd<sup>3</sup> after treatment assuming a volume basis portland cement reagent ratio of 0.25); and

II.A.2.b. 2400 yd<sup>3</sup> of untreated waste in the treatment mixing basins (1,200 yd<sup>3</sup> after treatment assuming a volume basis portland cement reagent ratio of 0.25).

II.A.3. Solids - 1,994 yd<sup>3</sup> as follows:

II.A.3.a. 14 yd<sup>3</sup> of solids in the floor drains, collection tanks, and the Truck Wash recycle unit; and

II.A.3.b. 1,980 yd<sup>3</sup> of untreated containerized waste in the Container Storage Area

## **II.B. OFF-SITE DISPOSAL**

II.B.1. Drum Storage Areas

Approximately 200 drums of oils and solvents could be stored in the Class I and II Drum Storage Area of the Container Management Area. Therefore, approximately 11,000 gallons may require shipment to an off-site disposal facility. Class III or other containerized waste not excluded for disposal at the Facility will be treated and disposed of in Secure Disposal Cell 7 as described in II.C. of this Closure Plan.

II.B.2. Approved Commercial Treatment, Storage, and Disposal Facilities

Facilities that might be used for disposal of waste inventory during closure will only be those that are properly permitted for the type of waste being shipped off-site.

II.B.4. Maximum Inventory Requiring Off-Site Disposal

a. Aqueous Materials - none

## **II.C. ON-SITE TREATMENT AND DISPOSAL**

Maximum inventory requiring on-site treatment and/or disposal:

### **II.C.1. Treatment**

1,980 yd<sup>3</sup> in Container Storage Area  
109 yd<sup>3</sup> of materials in drums  
2,400 yds<sup>3</sup> in treatment mixing basins  
14 yd<sup>3</sup> materials from drains and sumps  
4,503 yd<sup>3</sup> TOTAL requiring treatment

### **II.C.2. Secure Disposal Cell Placement**

4,500 yd<sup>3</sup> of treated material x 1.06 = 7,205 yd<sup>3</sup> TOTAL

### **II.C.3. Wastewater Treatment**

500,000 gal Contaminated Water Storage Tanks  
28,800 gal in the Facility sumps  
528,800 gal TOTAL

## **III. DECONTAMINATING THE FACILITY**

### **III.A. PROCESS AND OPERATIONS AREA/ROADS**

III.A.1. The process area and site roads that may require decontamination consist of:

- III.A.1.a. The concrete paved entrance road from Highway 36 to the bermed processing area within the Facility (approximately 413,400 ft<sup>2</sup>)
- III.A.1.b. The concrete paving within the active waste management area of the Facility including the Secure Disposal Cell 7 haul road (approximately 371,300 ft<sup>2</sup>).
- III.A.1.c. The concrete paving within the Container Storage Area (approximately 65,400 ft<sup>2</sup>).
- III.A.1.d. The gravel roadways around the Secure Disposal Cell area (approximately 150,000 ft<sup>2</sup>).

III.A.2. All roadways within the Facility are designated for either on-site or off-site vehicle use. Off-site vehicles will travel only on the paved site entrance road and the roadways within the Facility process and operations area or on designated gravel roads for construction support or Facility monitoring. Vehicles leaving the active waste management area are required to be washed in either the On-site or Off-site Truck Washes, therefore contamination of the paved and unpaved roadways outside the active waste management area is not anticipated. All roads (including the access road) will be inspected for areas of obvious contamination and the facility operating record will be consulted to determine locations of past spills or contamination. The active waste management area is expected to consist of the concrete paved process area north of the Maintenance Building and the concrete paved access road to Secure Disposal Cell 7.

III.A.3. The background sampling and testing, decontamination, and closure procedures for the above listed roadways are described below.

III.A.3.a. Background Sampling and Testing

A background soil sampling and testing program was conducted in the process and operations areas and access roads after initial construction and prior to acceptance of hazardous wastes at the Facility. Representative samples were taken and analyzed as described in Section I.B.2. of this Closure Plan.

III.A.3.b. Concrete Paved Areas

As discussed above, this Closure Plan assumes that only the concrete paved areas including the Container Storage Area within the active waste management area will require decontamination (approximately 436,700 ft<sup>2</sup>). Decontamination of the active waste management area will employ the on-site high pressure water cleaning unit. These concrete surfaces will be hydroblasted with an appropriate industrial strength detergent solution. Wash water will drain into adjacent Segregated Stormwater drainage ditches and into the SSRB or temporary storage containers.

Representative rinsate samples will be collected from either the ditches, SSRB, or temporary storage containers.

The paved areas will be considered decontaminated on the removal of all visible residues and when a final rinsate volume of 300 gallons or less, at 400 foot intervals, produces a TOC level of less

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than 50 ppm or less than 1 ppm of 6 CCR 1007-3, §261, Appendix VIII constituents at no greater than maximum contaminant levels for drinking water, and pH between 6 and 9. Test methods will be those specified in the Waste Analysis Plan.

Contaminated rinse water will be collected for either on-site treatment or for disposal at an interim status or permitted hazardous waste disposal facility.

### III.A.3.c. Gravel Roads

This closure plan assumes that there will be no gravel roads requiring decontamination. If decontamination is necessary, the decontamination of all gravel roads that have been used to transport waste material will employ the procedures described below:

#### III.A.3.c.i) Sampling:

A sampling program will be initiated to determine the existence and extent of any contamination that may be present on the gravel roadways.

The gravel and soil sampling program will be conducted utilizing a grid system. Samples will be obtained in any areas of obvious contamination and within the grid system. Samples will be taken at a depth of 0 to 6 inches. Composites will be prepared from these samples at a ratio of 2 to 1 and analyzed. The dimensions of the grids will be 400 ft by 50 ft with the long axis of the grids parallel to the center line of the access roads.

Five sampling locations within each grid will be selected randomly. However, within each grid, if an area(s) of potential contamination is noted (i.e., soil discoloration and/or odor), 1 of the sampling locations will be located in that area.

At each sampling location (5 per grid), the sample will be obtained by advancing a bucket or hand auger to a depth of 0 to 6 inches. Each sample will be visually characterized, noted in a field log book and placed in precleaned glassware with teflon-lined caps. Each sample container will be labeled as to sample location and

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depth interval, and the chain of custody will be initiated for shipment to an approved analytical laboratory facility. During the sampling activity, the bucket-type hand auger and auxiliary sampling equipment will be cleaned using detergent, distilled water and acetone. The sampling equipment will be rinsed using distilled water to avoid cross contamination.

A minimum of 5 samples will be taken for every 400 ft of gravel roadway within the landfill area.

III.A.3.c.ii) Decontamination:

Samples will be taken in the areas described above and analyzed for soil pH and 6 CCR 1007-3 §261, Appendix VIII.

If contamination is found, the extent of contamination must be determined in a horizontal and vertical direction. Contaminated soils must be removed until a 6-inch horizontal and vertical stratum of soil in the contaminated area meets the requirements specified below for decontamination as determined by representative soil samples within the contamination zone.

Soils will be considered decontaminated when analysis of soil pH and 6 CCR 1007-3 §261, Appendix VIII results indicate that background levels have been met. Test methods and procedures will be those specified in the Waste Analysis Plan. Contaminated soils will be transferred to Secure Disposal Cell 7 or to an off-site permitted hazardous waste disposal facility.

III.A.4. Treatment Building - Primary and Secondary Containment

Treatment Building closures will include the Treatment Building primary and secondary liner systems.

III.A.4.a. Background Sampling and Testing:

Prior to placement of the Treatment Building liner systems, a background soil sampling program was conducted in the area of each impoundment. This pre-operational data was used to establish background parameters and to specify the extent of closure activities.

Ten representative soil samples were taken at a depth of 0 to 6 inches for each unit impoundment and analyzed for soil pH, heavy metals, priority pollutants, and the first 10 major peaks that are quantifiable above 25 percent of the internal standard of 10 ppb, as identified by GC/MS. Background levels for inorganics (except pH) were established at the mean value plus 2 standards deviations; and for organics, background was established at the practical quantification limit. The sampling methods, procedures, recordkeeping protocol and the soil sampling equipment were those specified in this Closure Plan. Soil samples may have been composited in a ratio of 2:1. Test methods and procedures were those specified in the Waste Analysis Plan.

#### III.A.4.b. Disposal Volumes:

During closure, the concrete floor, HDPE liners, clay liners, and all associated components including the leak detection systems, riser pipes and geotextiles will be removed. These removed materials will be transferred to Secure Disposal Cell 7 or to an appropriately permitted waste disposal facility.

If during the life of the building monitoring of the leak detection system has indicated a failure of the primary containment system, a soil sampling program will be conducted in the excavated area. If required, the soil sampling program will be conducted following removal of the liners.

The following estimated volumes of materials of the Treatment Building's primary and secondary containment systems:

#### Treatment Building Primary and Secondary Containment Systems

|                    |                        |
|--------------------|------------------------|
| Backfill Between   |                        |
| Building and Liner | 14,600 yd <sup>3</sup> |
| Clay Liner         | 17,000 yd <sup>3</sup> |
| Concrete           | 3,822 yd <sup>3</sup>  |
| Steel Plate Liner  | 150 yd <sup>3</sup>    |
| HDPE/Geonet        | 318 yd <sup>3</sup>    |
| Total              | 35,890 yd <sup>3</sup> |

#### III.A.4.c. Closure Sampling Program:

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For purposes of this Closure Plan, it is assumed that the closure sampling program will not be required. If at any time during the active life of the facility a leak is detected in the Leak Detection System of the Treatment Building, the Closure Plan and Closure Cost Estimate must be modified. The Department must be notified within 15 days of the determination and the Modification Request must be submitted within 30 days of the determination.

If required, the sampling program for the excavated area will be conducted utilizing a grid system. Samples will be obtained within the grid system from a depth of 0 to 6 inches. Composites will be prepared from these samples at a ratio of 2:1 and analyzed. The dimensions of the grids will be 100 ft by 100 ft.

Five sampling locations within each grid will be selected randomly. At each sampling location, samples will be obtained by advancing a bucket type hand auger to a depth of 0 to 6 inches. The samples will be visually characterized, noted in a field log book and placed in precleaned glassware with teflon-lined caps. Each sample container will be labeled as to sample location and depth interval and the chain of custody initiated for shipment to an approved analytical laboratory facility. During the sampling activity, the bucket-type hand auger and auxiliary sampling equipment will be cleaned using detergent, distilled water and acetone. The sampling equipment will be rinsed using distilled water to avoid cross contamination.

#### III.A.4.d. Decontamination:

The soil sampling program described above will generate at least 20 representative samples (that may be composited into 10 samples) taken at a depth of 0 to 6 inches. Samples will be taken in areas of obvious contamination. If contamination is found, the extent of contamination must be determined in a horizontal and vertical direction. Contaminated soil must be removed until a 6-inch horizontal and vertical stratum of soil in the contaminated area meets the decontamination criteria specified below, as determined by 10 representative soil samples within the contamination zone.

Soil will be considered decontaminated when analysis of soil pH and 6 CCR 1007-3 §261, Appendix VIII results indicate that background levels have been achieved. Test methods and procedures will be those specified

in the Waste Analysis Plan. Sampling methods, procedures, recordkeeping protocol and the soil sampling equipment will be those specified above. Contaminated soils will be transferred to Secure Disposal Cell 7 or to a permitted hazardous waste disposal facility.

III.A.4.e. Final Closure:

Following decontamination and testing, if required, of the Container Building Area, the excavation will be backfilled and final cover will be placed over the backfill.

- III.A.5. For purposes of this closure plan, the estimated amount of solids generated during closure that may require disposal is 8,973 yds<sup>3</sup>. This is based on the assumption that 25% of the Treatment Building containment system will require disposal. If at any time during the active life of the facility a leak is detected in the Leak Detection System of the Treatment Building, the Closure Plan and Closure Cost Estimate must be modified to include the entire containment system. The Department must be notified within 15 days of the determination and the Modification Request must be submitted within 30 days of the determination.

### III.B. EQUIPMENT AND STRUCTURES

- III.B.1. Potentially contaminated equipment and structures will be either decontaminated, disposed of in Secure Disposal Cell 7, or transferred to an interim status or permitted facility for disposal. This Closure Plan assumes decontamination procedures will be used.
- III.B.2. Potentially contaminated equipment and structures will be decontaminated by hydroblasting with an appropriate industrial strength detergent solution. The hydroblasting will be done in either the on-site or off-site Truck Wash areas, where practical, or in-situ when necessary. The wash water in the Truck Wash areas will drain to the sump before being transferred for on-site treatment or off-site for disposal. The wash water generated from in-situ cleaning will be collected by a pump or vacuum truck, or similar piece of equipment before being treated or shipped off-site. All contaminated facility equipment, structures and protective clothing that will not be decontaminated will be disposed of in Secure Disposal Cell 7 or shipped to a permitted or interim status hazardous waste disposal facility.

III.B.3. The volume of wastewater generated during the decontamination of the various equipment and structures at the Facility includes wash water from the decontamination of the associated concrete systems and concrete pads. A summary of these volumes are provided in the Closure Cost Estimate.

III.B.4. It is estimated that the decontamination activities will generate 250,000 gallons of wastewater with an amount of sediment equal to 5 percent of the wastewater created by mass, and it is estimated that approximately 12,500 gallons (62 yd<sup>3</sup>) of sediment will have to be disposed of in Secure Disposal Cell 7 after decontamination.

III.B.5. The decontamination criteria and specific procedures for the Container Management Building, tanks, sumps, Treatment Building, and heavy equipment are: equipment, tanks, and structures will be considered decontaminated upon the removal of all visible residuals and when a final rinsate volume of 300 gallons or less produces analytical results that indicate that 6 CCR 1007-3 §261, Appendix VIII constituent concentrations are no greater than maximum contaminant levels for drinking water and the pH is between 6 and 9. Test methods will be those specified in the Waste Analysis Plan. Rinsate that does not meet the above specifications will be collected for treatment on-site or disposal at an interim status or permitted waste disposal facility.

#### III.B.6. Container Management Building

Equipment in the Container Management Building (including the drum shredder and drum conveying system) will be disassembled and decontaminated in either the On-site or Off-site Truck Wash areas. Representative rinsate samples will be collected at the drain of the Truck Wash area used.

The Container Management Building floor, berms, and any remaining structures will be decontaminated in place. Representative samples will be collected at the Container Management Building sumps.

#### III.B.7. Tanks

The Contaminated Water Storage Tanks, and the Off-Site Truck Wash recycling system surge tanks will be emptied during closure. The contents will be treated on-site or transferred to a permitted facility. The empty tanks, foundations,

structural supports, piping and containment systems will be decontaminated. Representative samples will be collected from each tank's containment area sump.

### III.B.8. Collection Sumps

The Maintenance Building underground sump collection tank, the Operations Building/Sampling Station underground sump collection tank, and the in-floor sump of the Off-Site Truck Wash will be emptied during closure. The contents will be treated on-site or transferred to an appropriately permitted facility.

If leaks have not been detected in the leak detection system throughout the life of the tank, the tank and all associated piping will be decontaminated and closed in place.

If leaks have been detected in the leak detection system during the life of the tank, the double-walled fiberglass tank piping, and any other associated structures will be removed. A soil sampling program will be implemented in the excavation pit created by removal of the tank and associated materials.

The soil sampling program will include a minimum of 10 samples taken at a depth of 0 to 6 inches and additional samples will be taken in areas of obvious contamination. (These samples will be collected as follows: 2 samples will be taken from the floor of each excavation pit, 1 sample will be taken from the wall of each excavation pit and 4 samples will be taken from the pipeline excavations).

If contamination is found, the extent of contamination will be determined in a horizontal and vertical direction. Contaminated solids will be removed until a 6-inch horizontal and vertical stratum of soil in the excavation pit no longer contains hazardous constituents as determined by 10 representative soil samples within the contamination zone.

Soil will be considered decontaminated when analysis of soil pH and 6 CCR 1007-3 §261, Appendix VIII results indicate values within the mean plus two standard deviations background soil sampling values for inorganics and values below the practical quantification limits for organics, have been achieved. Test methods and procedures will be those specified in the Waste Analysis Plan. Sampling methods, procedures, recordkeeping protocol and the soil sampling equipment will be those specified herein for the closure of surface impoundments.

Contaminated soils will be disposed of in Secure Disposal Cell 7 or at an interim status or permitted hazardous waste disposal facility. All equipment and

associated piping removed from the collection sump area will be decontaminated in either the On-site or Off-site Truck Wash.

Note: This Closure Plan assumes the sumps will require decontamination and in-place closure.

### III.B.9. Treatment Building

Prior to dismantling (removal of walls and roof) the Treatment Building, the walls and roof, process equipment, and treatment mixing basins will be decontaminated. The building will be considered decontaminated upon the removal of all visible residues and when 2 representative rinse water samples (from two different locations along the face) collected from each face of the building meet the decontamination criteria specified in this Closure Plan.

### III.B.10. Heavy Equipment

All equipment and heavy machinery remaining at final closure will be decontaminated in either the On-site or Off-site Truck Wash.

## III.C. CONTAMINATED RAINWATER COLLECTED DURING CLOSURE

The following volume estimate applies to the open cell operating during the closure period:

$450,000 \text{ ft}^2 \times 130 \text{ days} \times 365 \text{ day/year} \times 8.2 \text{ in} \times 1 \text{ ft}/12 \text{ in} \times 7.48 \text{ gal/ft}^3 = 819,213$  gallons.

All contaminated rainwater collected during the closure period will be transferred to the Contaminated Water Storage Tanks or temporary storage containers before being treated by the Facility's wastewater treatment systems or transferred off-site.

## III.D. SUMMARY OF TOTAL VOLUME OF SOLID WASTE AND WASTEWATER REQUIRING TREATMENT AND/OR DISPOSAL DURING CLOSURE

### 1. Solid Waste Volume to be Disposed of in Secure Disposal Cell 7

|                                    |                       |
|------------------------------------|-----------------------|
| On-site Inventory (treated volume) | 5,629 yd <sup>3</sup> |
|------------------------------------|-----------------------|

|    |  |                          |
|----|--|--------------------------|
|    | Container Building Liner Systems                       | 8,973 yd <sup>3</sup>    |
|    | Decontamination Activities Sediment                    | <u>62 yd<sup>3</sup></u> |
|    | Total Volume   | 14,664 yd <sup>3</sup>   |
| 2. | Wastewater Volume to be Treated and Discharged On-site |                          |
|    | On-site Inventory                                      | 528,800 gal              |
|    | Contaminated Rainwater                                 | 819,213 gal              |
|    | Decontamination Activities Wastewater                  | <u>250,000 gal</u>       |
|    | Total Volume   | 1,598,013gal             |
| 3. | Waste Volume to be Shipped Off-site                    |                          |
|    | Oil/Solvent Materials                                  | 11,000 gal               |

#### IV. BACKFILL, COVER, AND VEGETATION

##### IV.A. BACKFILL REQUIREMENTS

###### IV.A.1. Total Area to be Backfilled:

|                                       |                   |
|---------------------------------------|-------------------|
| Treatment Building, approximately     | 2.1 acres         |
| Secure Disposal Cell 7, approximately | <u>10.3 acres</u> |
| Total: approximately                  | 12.4 acres        |

###### IV.A.2. Total Volume to be Backfilled:

|   |                          |
|---|--------------------------|
| Treatment Building                                      | 8,973 yd <sup>3</sup>    |
| Secure Disposal Cell 7<br>(8973- 8937 yd <sup>3</sup> ) | <u>37 yd<sup>3</sup></u> |
| Total   | 9,010 yd <sup>3</sup>    |

###### IV.A.3. Backfill Characteristics:

###### IV.A.3.a. Types of Materials

Soils with varying amounts of silt and clay occur on-site in the very shallow subsurface. These soils typically exhibit permeabilities between  $10^{-4}$  and  $10^{-5}$  cm/sec. An abundance of this

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type of soil will be stockpiled from Secure Disposal Cell excavations at the time of closure. This material, along with stockpiled weathered shale from the Secure Disposal Cell excavations, will be the predominant backfill materials.

IV.A.3.b. Total Amount of Backfill Material Required

IV.A.3.b.i) Treatment Building

The volume requirement for backfilling the excavation remaining after closure of the Containment Building lining system is approximately 8,973 yd<sup>3</sup>. It is anticipated that approximately 10,319 yd<sup>3</sup> of backfill will be needed, assuming a 15 percent compaction factor.

IV.A.3.b.ii) Secure Disposal Cell 7

The estimated volume requirement for backfilling Secure Disposal Cell 7 after disposal of on-site inventory and decontamination residues/soils is approximately 37 yd<sup>3</sup>. It is anticipated that 43 yd<sup>3</sup> of backfill will be needed, assuming a 15 percent compaction factor.

IV.A.3.c. Source of Materials

Based upon backfill requirements, sufficient quantities will exist in on-site stockpiles to accomplish backfilling without excavations, or off-site purchases.

IV.A.4. Earthmoving Procedures:

IV.A.4.a. It is anticipated all earthmoving activities associated with backfill placement and compaction will be performed by subcontractors.

IV.A.4.b. Equipment needed for hauling, spreading, compacting and grading.

(1) Backfill material will be removed from on-site stockpiles and transferred to points of application using loaders and haul trucks or scrapers and bulldozers.

- (2) Backfill material will be spread, graded, and compacted using bulldozers, motor graders, and compactors.

#### **IV.B. FINAL COVER**

##### IV.B.1.Total Area to be Covered - Approximately 22.9 acres

- Treatment Building area - approximately 2.1 acres
- Secure Disposal Cell 7 - approximately 10.3 acres
- Other Facility areas - approximately 10.5 acres

##### IV.B.2.Final Cover Characteristics for Treatment Building and other Facility Areas

###### IV.B.2.a. Types of material

###### IV.B.2.a.1). Clay Liner Material

At a depth between approximately 10 and 25 ft, a silty clay soil occurs within the landfill area of the Facility. This material will be utilized in the construction of the compacted clay liners that will cap the closed areas. The clays will be available from on-site stockpiles. Clay cover shall be placed and compacted according to the General Specifications for Liner and Cover Systems.

###### IV.B.2.a.2). General Fill

This material will be utilized as the 3 ft cover soil layer over the composite liners of closed Secure Disposal Cells and will be the same material as that used for general backfill. Section IV.A.3.a. describes the characteristics for general backfill. The subsoil will be obtained from on-site stockpiles remaining from Secure Disposal Cell excavations. General fill shall be placed and compacted according to the General Specifications for Liner and Cover Systems.

###### IV.B.2.a.3). Topsoil

Silty soils occur on-site in the very shallow subsurface. These soils will be used as topsoil. They typically exhibit permeabilities between  $10^{-4}$  and  $10^{-5}$  cm/sec. The topsoil will be obtained from on-site stockpiles remaining from Secure Disposal Cell excavations. Topsoil shall be placed

and compacted according to the General Specifications for Liner and Cover Systems.

IV.B.2.b. Depth of materials

IV.B.2.b.1). Treatment Building Area

Final cover for this unit will consist of a 1 ft thick layer of topsoil to promote vegetation and drainage.

IV.B.2.b.2). Other Facility Areas

Final cover may be necessary in other Facility areas (segregated stormwater ditches, gravel roadways, former stockpile areas, etc.) to promote drainage and vegetation. Final cover for these areas will consist of an 8 inch thick layer of topsoil unless suitable soils for vegetation are present.

IV.B.3. Final Cover for Secure Disposal Cells

The final cover system for all the Secure Disposal Cells is described within the Site Development Drawings and the associated Design and Construction Narrative.

IV.B.4. Total amount of cover materials required

IV.B.4.a. Clay - 57,500 yd<sup>3</sup>

Placing and compacting a 3 ft layer of clay over the 10.3 acres of Secure Disposal Cell 7 will require approximately 57,500 yd<sup>3</sup> of clay, assuming a 15 percent compaction factor.

IV.B.4.b. General Fill 57,500 yd<sup>3</sup>

Placing and compacting a 3 ft layer of General Fill over the 10.3 acres of Secure Disposal Cell 7 will require approximately 57,500 yd<sup>3</sup> of general fill, assuming a 15 percent compaction factor.

IV.B.4.c. Topsoil - 12,800 yd<sup>3</sup>

To spread an 8 inch thick layer of topsoil to support a vegetative cover over the approximate 10.3 acres of Secure Disposal Cell 7 will require approximately 5,900 yd<sup>3</sup>, assuming a compaction factor of 15 percent.

To spread a 1 ft thick layer of topsoil to provide drainage and support a vegetative cover over the 3.2 acres (total) of the Treatment Building and SSRB areas will require approximately 6,000 yd<sup>3</sup>, assuming a compaction factor of 15 percent.

To spread an 8 inch thick layer of topsoil to support a vegetative cover over the approximate 11.5 acres of the other facility areas will require approximately 14,200 yd<sup>3</sup>, assuming a compaction factor of 15 percent.

IV.B.4.d. HDPE Geomembrane Liner - 450,000 ft<sup>2</sup>

Placing an 80 mil HDPE liner over approximately 10.3 acres (Secure Disposal Cell 7) will require an estimated 450,000 ft<sup>2</sup> of material.

#### IV.B.5. Source of materials

Based upon the calculated requirements above, it is anticipated that sufficient quantities of final cover material will exist in on-site stockpiles without excavations or off-site purchases. The geomembrane will be available from off-site purchases.

#### IV.B.6. Earthmoving Procedures:

IV.B.6.a. It is anticipated all earthmoving activities associated with the application of final cover will be performed by off-site contractors.

IV.B.6.b. Equipment needed for hauling, spreading, compacting, and grading.

Final cover materials will be transported by either haul trucks or scrapers from on-site stockpiles to the points of application.

Final cover materials will be spread, compacted, and graded using bulldozers, motor graders, and compactors, if necessary.

IV.B.6.c. Source of Equipment

All equipment and operators described above will be subcontracted.

#### **IV.C. VEGETATION**

##### IV.C.1. Total Area Requiring Vegetation - approximately 23 acres:

- IV.C.1.a. Containment Building Area - 2.1 acres
- IV.C.1.b. Secure Disposal Cell 7 - 10.3 acres
- IV.C.1.c. Other Facility areas assumed to require vegetation during closure (gravel roads, former stockpile areas, etc.) - approximately 10.5 acres.

##### IV.C.2. Vegetation Characteristics

- IV.C.2.a. Name or type of vegetation:  
  
Blue gamma, Western Wheatgrass and Buffalo grass will be used at the Permittee as a final cover to prevent erosion.
- IV.C.2.b. Climatic, soil and maintenance requirements  
  
Requirements for final cover vegetation are given in the Surface Water Management Plan.

##### IV.C.3. Soil Preparation Procedures

- IV.C.3.a. Type and quantity of fertilizer required per acre  
  
A balanced fertilizer applied at a rate of 80 pounds per acre is adequate. To fertilize 23 acres, 1,840 pounds of fertilizer will be required.
- IV.C.3.b. Quantity of seed required per acre.

A satisfactory vegetative cover will be obtained by application of seed at a rate of 12 pounds per acre for 50 percent of the area, 24 pounds per acre for 25 percent of the area and 32 pounds per acre for 25 percent of the area. To vegetate 23 acres, 460 pounds of seed will be required.

IV.C.3.c. Type and quantity of mulch required per acre

A suitable mulch will be applied as straw at a rate of 100 bales per acre; approximately 1,150 bales of straw will be required to vegetate 11.5 acres (50 percent of the total area).

IV.C.3.d. Vegetation Schedule

Although final closure of certain areas will occur at different times, the entire 23 acres requiring vegetation may be done all at 1 time (towards the end of the closure period). Application of seed, fertilizer and mulch will be performed by a contractor.

**V. GROUNDWATER MONITORING**

Groundwater Monitoring during closure shall be conducted in accordance with the applicable sections of the Groundwater Monitoring Plan.

**VI. COLLECTING, REMOVING, AND TREATING LEACHATE**

**VI.A. Leachate Collection and Leak Detection Sump Systems**

The Secure Cell No. 7 leachate collection system and leak detection systems shall be inspected during closure in accordance with the Facility's Inspection Plan. Removal of liquids from these systems shall be in accordance with the Inspection Plan.

The quantities of leachate generated from the Secure Disposal Cells at the Facility are expected to be minimal. It is anticipated that the maximum amount of leachate removed

from all collection systems will be approximately 1,600 gallons semi-annually and decreasing there after.

#### **IV.B. Leachate Treatment Process**

Leachate will be treated on-site using the Facility's waste water treatment systems or shipped off-site for disposal.

#### **IV.C. Leachate Disposal**

All leachate removed from each of the Secure Disposal Cell leachate collection systems will be treated on-site or placed in drums or bulk trailers and disposed of at a facility permitted to treat and dispose of the leachate.

#### **IV.D. Equipment Maintenance**

Because the major portion of each leak detection and leachate collection system will be located below ground, the amounts and types of repairs and maintenance that can be performed on these systems are limited. Repairs to the exposed portion of the surface access standpipes, associated security devices (e.g., locking caps), and standpipe grouting will be performed as necessary throughout the closure period.

Maintenance activities during the closure period will consist of removal of sand or sediment from the standpipes or sumps and removal or mowing of vegetation in the vicinity of the surface projection of the standpipes. Any sediment or sand removed from leachate collection systems will be transferred to Secure Disposal Cell 7 or off-site for disposal.

### **VII. FENCE MAINTENANCE**

The Facility is enclosed by an 8 ft chain link fence topped with barbed wire. During the closure period, this fence will be inspected in accordance with the Facility's Inspection Plan. Any minor damage noted will be repaired by site personnel. Major damage will be repaired by a fencing contractor.

Maintenance activities will consist of:

VII.A. Removing or mowing vegetation close to the fence to provide an unobstructed view of the fence and attached warning signs; and

VII.B. Filling of channels and gullies caused by erosion or burrowing animals in the soil near the fence.

## **VIII. CLOSURE CERTIFICATION**

### **VIII.A. Individual Secure Cell Closure**

Within 60 days after completion of closure of each Secure Cell, the Permittee shall submit all information required by Part 264.115, 264.116 and 264.119.

### **VIII.B. Final Facility Closure**

Within 60 days after completion of final closure of the Facility, the Permittee shall submit all information required by Part 264.115, 264.116 and 264.119.

### **VIII.C. Partial Closure of Any Unit**

Within 60 days after completion of partial closure of any unit, the Permittee shall submit all information required by Part 264.115, 264.116 and 264.119.

## **CLOSURE COST ESTIMATE**

### **I. OVERVIEW/AMENDMENTS**

- I.A. This Closure Cost Estimate was developed to estimate the cost of the required closure activities identified in the Closure Plan and assumptions. This Closure Cost Estimate will be revised whenever a change in the approved Closure Plan changes the cost of closure.
- I.B. During the operating life of the Facility, this Closure Cost Estimate will be adjusted annually for inflation. The inflation factor will be derived from the annual Implicit Price Deflator for Gross National Product as published by the U.S. Department of Commerce in its survey of current business.
- I.C. Copies of the latest Closure Cost Estimate will be maintained at the Facility.

### **II. ASSUMPTIONS**

- II.A. The Closure Plan assumes that closure occurs at the end of the Facility's life or the consumption of the 2,528,000 yd<sup>3</sup> of currently permitted airspace. The final 12,500 yd<sup>3</sup> of the total permitted airspace will be utilized to dispose of wastes that are generated during closure. This scenario represents the base case and is the basis for the assumptions incorporated in the base case closure cost estimate.
- II.B. If at any point during the Facility's operating life there remains less than 12,500 yd<sup>3</sup> of available landfill airspace; the assumption of on-site capacity would not be valid. The facility shall notify the Department in writing within seven days of the date the available air space becomes less than 12,500 yds<sup>3</sup>. In the notification, the Permittee shall provide one of the following:
  - II.B.1. The closure cost estimate will be incremented by the amount calculated in Appendix 1. Appendix 1 contains the estimated construction cost of a downsized landfill unit to accommodate 12,500 yd<sup>3</sup> of wastes generated during closure. If the Permittee chooses the increase in closure cost option, the amount of financial assurance for closure will be increased by the requisite amount in accordance with 6 CCR-1007-3, '264.14. The amount of financial assurance shall be increased by the estimated amount to construct the 12,500 yd<sup>3</sup> cell within 30 days of the date the available air space becomes less than 12,500 yd<sup>3</sup>. This increase will be in effect until a minimum of 12,500 yd<sup>3</sup> of airspace becomes available at which time the closure cost estimate and corresponding financial assurance may be reduced to the base case closure cost; or

- 
- II.B.2. The Permittee shall obtain a contract with another hazardous waste transporter and disposal company documenting that they will transport and dispose of the wastes for the amount listed in Section IV.K. items B and C. of this Closure Cost Estimate. This contract shall be maintained in the operating record. This contract must be in place within 30 days of the date the available air space becomes less than 12,500 yd<sup>3</sup>. This contract must be in effect until a minimum of 12,500 yd<sup>3</sup> of airspace becomes available at which time the contract can be voided.
- II.B.3. The Permittee shall update the closure cost estimate and corresponding financial assurance to account for off-site transportation and disposal of 12,500 yd<sup>3</sup> of waste. When a minimum of 12,500 yd<sup>3</sup> of air space becomes available, the closure cost estimate and corresponding financial assurance may be changed to reflect on-site disposal.
- II.C. If at any time during the active life of the Facility a leak is detected in the Treatment Building Leak Detection System; this Closure Cost Estimate must be revised to include the entire Treatment Building Liner System. The Department must be notified within 15 days of the determination and the Modification Request must be submitted within 30 days.
- II.D. References given at the end of this Closure Cost Estimate are noted in parentheses.
- II.E. Secure Disposal Cell 7 Airspace
- II.E.1. Secure Disposal Cell 7 will have been constructed and waste disposal within Secure Disposal Cell 7 will have been ongoing when the closure period begins. It is anticipated that a minimum of 12,500 yd<sup>3</sup> of remaining airspace will be available for the disposal of materials generated during the closure period. The Closure Plan estimates that approximately 12,500 yd<sup>3</sup> of material will be disposed of in Secure Disposal Cell 7 during final closure.
- II.E.2. It is assumed that closure will occur once Secure Cell 7 has been constructed and is almost full. Thus, all references to disposal are to Secure Cell 7. However, should closure occur prior to this time, all references to Secure Disposal Cell 7 refer to the active secure disposal cell at the time of closure.

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## II.F. Waste Inventory Treatment and Disposal

The assumptions below apply to the disposal of the on-site waste inventory discussed in Section II of the Closure Plan.

- II.F.1. The maximum allowable waste inventory will be on-site when the closure period begins (i.e., the two treatment mixing basins, Container Storage Areas, Container Management Building, Treatment Building, tanks, etc. are filled to capacity). This waste inventory will be disposed of in accordance with the Closure Plan.
- II.F.2. The labor requirements for the treatment and disposal of the waste inventory (except for the treatment and disposal of contaminated and potentially contaminated water) will consist of 1 supervisor, 2 laborers, 4 heavy equipment operators, and 1 mechanic, all of whom will be employed for the duration of closure. All of the described positions will be filled by subcontracted personnel at the following costs including fringe benefits:
- II.F.3. The reagent used for treatment of the wastes (4,503 yd<sup>3</sup>) in the Treatment Building Treatment Process Area and Staging Area, Class III Drum Storage Area and Container Storage Areas will be portland cement with a mix design ratio of approximately 2 tons of reagent to each ton of waste to be treated. The mix design will be analytically evaluated to ensure the treated waste meets land disposal restrictions treatment standards as referenced in 6 CCR 1007-3, Part 268, Subpart D. The resulting treated waste volume will occupy a compacted volume (Secure Disposal Cell airspace) of approximately 1.6 yd<sup>3</sup> per ton of untreated waste or 7,205 yd<sup>3</sup>.
- II.F.4. The Facility's wastewater treatment systems will be operating during closure (two shifts) and will be able to treat all contaminated water on-site (528,800 gallons) when the closure period begins. Each shift will be manned by one Class A operator. The cost to treat and dispose of this water is included in the cost to treat and dispose of contaminated and potentially contaminated water collected during the closure period.
- II.F.5. A total of 12,000 gallons of solvent in tanks; 550 gallons of solvent in containers (100 containers); 12,000 gallons of oil in tanks; and 550 gallons of oil in containers (100 containers) will be at the Facility when the closure period begins.

- II.F.6. Numerous centrifugal pumps and two temporary storage containers (frak tanks) are owned by the Permittee, therefore, an equipment cost for transfer and temporary storage of contaminated water for these items are not included in this cost estimate. The labor cost to transfer contaminated water is included in the labor cost to decontaminate the Facility's equipment and structures.
- II.F.7. The 14 yd<sup>3</sup> of miscellaneous solid wastes (sediment in sumps, etc.) at the Facility when the closure period begins will be disposed of in Secure Disposal Cell 7 and will not require treatment. The labor cost to dispose of these wastes is included in the labor cost to decontaminate the Facility's equipment and structures.
- II.F.8. The waste that does require treatment will require the standard analytical tests (TCLP and fingerprint analyses) prior to disposal in Secure Disposal Cell 7. A total of 110 samples will be analyzed.
- II.F.9. The waste inventory that is disposed of in Secure Disposal Cell 7 will have a geosynthetic blanket placed over it as a daily cover to prevent wind dispersal. 10,000 ft<sup>2</sup> of the geotextile will be required.

## **II.G. Contaminated Solids Disposal**

The assumptions below apply to the removal of contaminated solids (7,205 yd<sup>3</sup>) generated during the closure period as discussed in Section III of the Closure Plan.

- II.G.1. Structures and equipment decontamination activities will generate 62 yd<sup>3</sup> of solids requiring disposal in Secure Disposal Cell 7. The cost to dispose of these solids is included in the cost to decontaminate the Facility's equipment and structures.
- II.G.2. Approximately 6,156 yd<sup>3</sup> of solids will be removed from the Treatment Building liner area and disposed of in Secure Disposal Cell 7.
- II.G.3. Contaminated solids will not require treatment prior to disposal in Secure Disposal Cell 7.
- II.G.4. Daily cover will be applied over spread and compacted contaminated solids disposed of in Secure Disposal Cell 7.

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## II.H. Contaminated Water Treatment and Disposal

The assumptions below apply to contaminated water collected during the closure period (1,598,013 gallons). This water will be generated from decontamination activities (wash and rinse water) and rainfall occurring during the closure period as described in Section III of the Closure Plan.

- II.H.1. All contaminated water generated from decontamination activities (250,000 gallons) and rainfall occurring during the closure period (819,213 gallons) will be treated on-site using the Facility's waste water treatment systems.
- II.H.2. Only the water that falls on the contaminated areas described in the Closure Plan will require treatment and disposal.
- II.H.3. All contaminated rainwater will be pumped to the Contaminated Water Storage Tanks or temporary storage containers awaiting treatment and disposal.
- II.H.4. Two Class A operators will operate the wastewater treatment systems throughout the closure period (40 hours per week each).
- II.H.5. The Facility's wastewater treatment systems will also treat all contaminated water on-site when the closure period begins (528,800 gallons).
- II.H.7. The treated water will be discharged through outfall DP-001 after every 300,000 gallons treated. One sample will be collected per discharge event and analyzed for the parameters required by the Facility's CDPS permit.
- II.H.8. The labor cost to collect and transfer contaminated water will be included in the labor cost to decontaminate the Facility's equipment and structures.

## II.I. Equipment and Structures Decontamination

The assumptions below apply to the decontamination of the Facility's equipment and structures as described in Section III of the Closure Plan.

- II.I.1. The decontamination activities will be performed using an appropriate industrial strength detergent solution followed by a water rinse and will be part of the total wastewater to be managed during the closure period.
- II.I.2. All decontamination activities will take place near sumps, where possible, to ensure that the water is collected.

- II.I.3. A high-pressure water cleaning unit and a man-lift are owned by the Permittee and therefore no equipment cost is included for these items.
- II.I.4. All auxiliary equipment will be decontaminated in or near either the Off-site or On-site Truck Washes.
- II.I.5. All solid residues generated during decontamination of the equipment and structures will be disposed of in Secure Disposal Cell 7 (62 yd<sup>3</sup>).
- II.I.6. A total of 50 samples will be analyzed during the decontamination of equipment and structures.

## II.J. Backfill of Voids

The assumptions below apply to backfilling the remaining Secure Disposal Cell 7 airspace and the holes remaining after removal of the Treatment Building as described in Section IV of the Closure Plan.

- II.J.1. The Treatment Building liner area will be backfilled to achieve proper elevations that ease vegetation maintenance requirements and prevent erosion.
- II.J.2. Secure Disposal Cell 7 may require partial backfill. The volume remaining in Secure Disposal Cell 7 after disposal of on-site inventory and decontamination residues/soils will be approximately 43 yd<sup>3</sup>.
- II.J.3. Sufficient quantities of backfill material will be available on-site to meet all backfilling requirements.
- II.J.4. The total cost to backfill the voids will be paid based on the amount of backfill placed (uncompacted volume).
- II.J.5. The volume of backfill material needed to fill the Secure Disposal Cell 7 and Treatment Building Areas will be 115 percent of the volume of each excavation (15 percent compaction factor).

## II.K. Final Cover Placement and Vegetation

The following assumptions apply to the areas requiring final cover placement and vegetation (23 acres) as described in Section IV of the Closure Plan.

II.K.1. The Treatment Building Area (2.2 acres) will receive a 1 ft thick layer of topsoil as a final cover after backfilling is completed.

II.K.2. Secure Disposal Cell No. 7 (10.3 acres) will have the following materials as a final cover:

- a 3 ft thick layer of compacted clay overlain by
- an 80-mil HDPE liner overlain by
- a geocomposite drainage layer overlain by
- a 3 ft thick layer of general fill overlain by
- an 8 inch thick topsoil layer.

II.K.3. Other areas (10.5 acres) requiring final cover placement, such as excavated gravel roads and former stockpile areas will require 8 inches of topsoil as a final cover.

II.K.4. The soils that will be used for cover material will be available on-site.

## **II.L. Groundwater Monitoring**

The assumptions below apply to groundwater monitoring during the closure period as described in Section V of the Closure Plan.

II.L.1. Seventeen groundwater-monitoring wells will contain enough water to be sampled and analyzed during the closure period. The Annual Groundwater Monitoring Report will assess the accuracy of the estimated 17-groundwater monitoring wells.

II.L.2. Two analyses for each Level 5 monitoring well will be performed during the closure period and 2 analyses for each of the remaining monitoring wells will be performed.

II.L.3. All samples collected will be shipped in sample shuttle boxes to the laboratory for analysis.

II.L.4. All monitoring well sampling and subsequent sample analysis will be performed by contractor(s).

II.M. Leachate Collection/Leak Detection/Permanent Sump Monitoring

The assumptions below apply to the collection of leachate during the closure period as described in Section VI of the Closure Plan. The cost for sampling unconstructed secure cells is not included in this Closure Cost Estimate. The Estimate will be updated to include newly constructed cells prior to waste being placed in such cells.

II.M.1. All leachate collection systems, leak detection systems and permanent sump systems will be inspected quarterly for the presence of leachate during the closure period.

II.M.2. All leachate collected will be removed and treated on-site.

II.M.3. The Secure Disposal Cells 1 through 6 leachate collection systems will collect a total of approximately 1,600 gallons of leachate during the closure period. The Secure Disposal Cell 7 leachate collection system will collect a total of 109,521 gallons of leachate during the closure period (Section III.D. of the Closure Plan).

II.M.4. The removal of leachate will be performed by sub-contracted laborers.

II.M.5. The labor cost associated with leachate removal and transfer has been included in the labor cost computed for decontamination of the Facility's equipment and structures.

II.M.6. The cost to treat the leachate found in the collection systems is included in the cost to treat contaminated and potentially contaminated water.

II.M.7. For Secure Disposal Cells 1 through 6, six samples will be collected from each of the leachate collection systems, two samples will be collected from one of the leak detection systems, and 1 sample will be collected from 1 of the permanent sumps.

II.M.8. For Secure Disposal Cell 7, three samples will be collected from the leachate collection system, 1 sample will be collected from the leak detection system, and no samples will be collected from the permanent sump.

II.N. Closure Certification

The assumptions below apply to the certification of closure by an independent Professional Engineer as described in Section X of the Closure Plan.

II.N.1. Inspections will be performed periodically by an independent Professional Engineer or his representative in accordance with the Closure Plan requirements. A representative of the Professional Engineer (a technician under the Professional Engineer's direction) will inspect the Facility 25 times during the 6 month closure period and the Professional Engineer will inspect the Facility 6 times during the 6 month closure period.

II.N.2. At a minimum, the inspections will be performed at the following times:

- Prior to the commencement of the closure period.
- Following treatment and disposal of all waste inventories.
- Following disposal of contaminated soils and decontamination of all facilities and equipment.
- Following completion of all elements of the closure procedures except certification of closure.

II.N.3. Each Facility inspection will require approximately 4 hours to complete. An additional 3 hours of travel time will be required for the Professional Engineer and/or the technician to travel to and return from the Facility.

II.N.4. The Professional Engineer will prepare a summary report for each inspection except the final inspection. Each summary report will require 1 hour of the Professional Engineer's time to prepare and 1 hour of technical/administrative time to produce in final form.

II.N.5. Following the final inspection, the Professional Engineer will prepare a combination summary report and a certification of closure in accordance with the Closure Plan.

II.N.6. The combination summary report and certification of closure will require 16 hours of the Professional Engineer's time to prepare, and 40 hours of technical/administrative time to provide in final form.

II.N.7. The round trip mileage to the site will be 140 miles.

**III. Calculations – Base Closure Cost****a) Project Manager and Assistant**

| Item                          | Amount   | Unit | Rate | Cost                 | ref. |
|-------------------------------|----------|------|------|----------------------|------|
| <b>Field Inspection Costs</b> |          |      |      |                      |      |
| Project Manager               | 1,000.00 | hr   | 95   | \$ 95,000.00         | 5    |
| Technical/Administrative      | 250.00   | hr   | 77   | \$ 19,250.00         | 5    |
| Mileage                       | 17500.00 | mi   | 0.37 | 6,475.00             | 5    |
| <b>Total Estimated Cost</b>   |          |      |      | <b>\$ 120,725.00</b> |      |

**b) Waste Inventory Treatment and Disposal Costs****On Site Treatment and Disposal (Solids and Sludges)**

| Item                        | Amount    | Unit | Rate   | Cost                 | ref. |
|-----------------------------|-----------|------|--------|----------------------|------|
| Supervisor                  | 320.00    | hr   | 43.52  | \$ 13,926.40         | 3    |
| Laborer                     | 320.00    | hr   | 26.00  | \$ 8,320.00          | 3    |
| Laborer                     | 320.00    | hr   | 26.00  | \$ 8,320.00          | 3    |
| Heavy Equipment Operator    | 320.00    | hr   | 33.65  | \$ 10,768.00         | 3    |
| Heavy Equipment Operator    | 320.00    | hr   | 33.65  | \$ 10,768.00         | 3    |
| Heavy Equipment Operator    | 320.00    | hr   | 33.65  | \$ 10,768.00         | 3    |
| Heavy Equipment Operator    | 320.00    | hr   | 33.65  | \$ 10,768.00         | 3    |
| Mechanic                    | 320.00    | hr   | 33.65  | \$ 10,768.00         | 3    |
| Pazzolans (Kiln Dust)       | 9,006.00  | ton  | 36.90  | \$ 332,321.40        | 8    |
| Fuel                        | 36.00     | day  | 100.00 | \$ 3,600.00          | 1,9  |
| Lab Analysis                | 110.00    | ea   | 172.00 | \$ 18,920.00         | 4    |
| Geosynthetic Blanket        | 10,000.00 | sf   | 0.12   | \$ 1,200.00          | 2,7  |
| <b>Total Estimated Cost</b> |           |      |        | <b>\$ 440,447.80</b> |      |

**c) Off Site Treatment and Disposal (Oils / Solvents)**

| Item                        | Amount | Unit | Rate | Cost                | ref.  |
|-----------------------------|--------|------|------|---------------------|-------|
| Bulk Oil                    | 100.00 | dm   | 125  | \$ 12,500.00        | 10,11 |
| Bulk Solvents               | 100.00 | dm   | 175  | \$ 17,500.00        | 10,11 |
| <b>Total Estimated Cost</b> |        |      |      | <b>\$ 30,000.00</b> |       |

**d) Treatment Building Liner Disposal Cost**

| <b>Item</b>                       | <b>Amount</b> | <b>Unit Rate</b> | <b>Cost</b>         | <b>ref.</b> |
|-----------------------------------|---------------|------------------|---------------------|-------------|
| Excavation, haul to Secure Cell 7 | 6,102.00 cy   | 5.75             | \$ 35,086.50        | 3           |
| <b>Total Estimated Cost</b>       |               |                  | <b>\$ 35,086.50</b> |             |

**e) On Site Treatment and Disposal (Wastewaters)**

| <b>Item</b>                       | <b>Amount</b> | <b>Unit Rate</b> | <b>Cost</b>          | <b>ref.</b> |
|-----------------------------------|---------------|------------------|----------------------|-------------|
| Class A Operator                  | 800.00        | hr 45            | \$ 36,000.00         | 5           |
| Class A Operator                  | 800.00        | hr 45            | \$ 36,000.00         | 5           |
|                                   |               |                  | \$                   |             |
| Chemicals                         | 1,598,013     | g 0.01           | 15,980.00            | 1           |
| Routine Discharge Sample Analysis | 6.00          | ea 1500.00       | \$ 9,000.00          | 4           |
| WET Chronic Toxicity analysis     | 3.00          | ea 1200          | \$ 3,600.00          | 4           |
| Labor for sample collection       | 6.00          | ea 750           | \$ 4,550.00          | 5           |
| <b>Total Estimated Cost</b>       |               |                  | <b>\$ 105,080.00</b> |             |

**f) Equipment and Structures Decontamination**

| <b>Item</b>  | <b>Amount</b> | <b>Unit Rate</b> | <b>Cost</b>          | <b>ref.</b> |
|--|---------------|------------------|----------------------|-------------|
| Supervisor   | 800.00        | hr 43.52         | \$ 34,816.00         | 3           |
| Operation of Presuure Washer, including Water, Soap, Electricity,Labor | 800.00        | hr 39.56         | \$ 31,648.00         | 3           |
| Operation of Presuure Washer, including Water, Soap, Electricity,Labor | 800.00        | hr 39.56         | \$ 31,648.00         | 3           |
| Lab Analysis   | 50.00         | ea 1500.00       | \$ 75,000.00         | 4           |
| Dismantle Treatment Building   | 300000.00     | cf 0.21          | \$ 63,000.00         | 3           |
| <b>Total Estimated Cost</b>  |               |                  | <b>\$ 236,112.00</b> |             |

**g) Backfill of Voids**

| Item                        | Amount      | Unit Rate | Cost                | ref. |
|-----------------------------|-------------|-----------|---------------------|------|
| Treatment Building          | 7,017.00 cy | 5.75      | \$ 40,347.75        | 3    |
| Secure Disposal Cell 7      | 43.00 cy    | 5.75      | \$ 247.25           | 3    |
| <b>Total Estimated Cost</b> |             |           | <b>\$ 40,595.00</b> |      |

**h) Final Cover Placement and Vegetation Costs**

| Item  | Amount     | Unit Rate       | Cost                   | ref. |
|---|------------|-----------------|------------------------|------|
| <b>Secure Cell 7</b>                                    |            |                 |                        |      |
| Mobilization and Demobilization                         |            | Lump Sum        | \$ 20,000.00           | 1,2  |
| Site Preparation  |            | Lump Sum        | \$ 40,000.00           | 1,2  |
| Clay Liner  | 57,000 cy  | 8.02            | \$ 457,140.00          | 1,2  |
| 80-mil HDPE Liner                                       | 448,600 sf | 0.42            | \$ 188,412.00          | 1,2  |
| Geocomposite  | 448,600 sf | 0.45            | \$ 201,870.00          | 1,2  |
| General Fill  | 57,300 cy  | 5.48            | \$ 314,004.00          | 1,2  |
| Top Soil and Vegetation                                 | 10.3 acre  | 1,680           | \$ 17,304.00           | 1,2  |
| <b>Total Estimated Contractor Cost</b>                  |            |                 | <b>\$ 1,238,730.00</b> |      |
| <b>Estimated CQA Cost</b>                               |            |                 | <b>\$ 309,682.50</b>   |      |
| <b>Total Estimated Final Cover Construction Cost</b>    |            |                 | <b>\$ 1,548,412.50</b> |      |
| <b>Treatment Building</b>                               |            |                 |                        |      |
| Top Soil and Vegetation                                 |            | 2.2 acre 1,680  | \$ 3,696.00            | 1,2  |
| <b>Total Estimated Contractor Cost</b>                  |            |                 | <b>\$ 3,696.00</b>     |      |
| <b>Estimated CQA Cost</b>                               |            |                 | <b>\$ 924.00</b>       |      |
| <b>Total Estimated Final Cover Construction Cost</b>    |            |                 | <b>\$ 4,620.00</b>     |      |
| <b>Other Areas Requiring Final Cover and Vegetation</b> |            |                 |                        |      |
| Top Soil and Vegetation                                 |            | 10.5 acre 1,680 | \$ 17,640.00           | 1,2  |
| <b>Total Estimated Contractor Cost</b>                  |            |                 | <b>\$ 17,640.00</b>    |      |
| <b>Estimated CQA Cost</b>                               |            |                 | <b>\$ 4,410.00</b>     |      |
| <b>Total Estimated Final Cover Construction Cost</b>    |            |                 | <b>\$ 22,050.00</b>    |      |
| <b>Total Cost for Final Cover and Vegetation</b>        |            |                 | <b>\$ 1,575,082.50</b> |      |

**i) Groundwater Monitoring**

| Item                                       | Amount |    | Unit Rate | Cost                | ref. |
|--|--------|----|-----------|---------------------|------|
| Sample Monitoring Wells                    | 17.00  | ea | 200       | \$ 3,400.00         | 5    |
| Sample Analysis                            | 17.00  | ea | 1725      | \$ 29,325.00        | 4    |
| Total Estimated Cost per event             |        |    |           | \$ 32,725.00        |      |
| <b>Total Estimated Cost for Two Events</b> |        |    |           | <b>\$ 65,450.00</b> |      |

**j) Leachate Collection / Leak Detection / Permanent Sump Monitoring Cost**

| Item                             | Amount |    | Unit Rate | Cost                | ref. |
|----------------------------------|--------|----|-----------|---------------------|------|
| <b>LCS</b>                       |        |    |           |                     |      |
| Sample Secure Disposal Cells 1-6 | 9.00   | ea | 200       | \$ 1,800.00         | 5    |
| Sample Secure Disposal Cell 7    | 4.00   | ea | 200       | \$ 800.00           | 5    |
| Sample Analysis                  | 13.00  | ea | 1725      | \$ 22,425.00        | 4    |
| <b>LDS</b>                       |        |    |           |                     |      |
| Sample Secure Disposal Cells 1-6 | 2.00   | ea | 200       | \$ 400.00           | 5    |
| Sample Secure Disposal Cell 7    | 1.00   | ea | 200       | \$ 200.00           | 5    |
| Sample Analysis                  | 3.00   | ea | 1725      | \$ 5,175.00         | 4    |
| <b>PS</b>                        |        |    |           |                     |      |
| Sample Secure Disposal Cells 1-6 | 1.00   | ea | 200       | \$ 200.00           | 5    |
| Sample Analysis                  | 1.00   | ea | 1725      | \$ 1,725.00         | 4    |
| <b>Total Estimated Cost</b>      |        |    |           | <b>\$ 32,725.00</b> |      |

**k) Closure Certification**

| Item                            | Amount   |    | Unit Rate | Cost                | ref. |
|---------------------------------|----------|----|-----------|---------------------|------|
| <b>Field Inspection Costs</b>   |          |    |           |                     |      |
| Technician                      | 200.00   | hr | 77        | \$ 15,400.00        | 5    |
| Professional Engineer           | 48.00    | hr | 145       | \$ 6,960.00         | 5    |
| Mileage                         | 4,340.00 | mi | 0.37      | \$ 1,605.80         | 5    |
| <b>Summary Report Cost</b>      |          |    |           |                     |      |
| Professional Engineer           | 32.00    | hr | 145       | \$ 4,640.00         | 5    |
| Technical/Administrative        | 32.00    | hr | 77        | \$ 2,464.00         | 5    |
| <b>Certification of Closure</b> |          |    |           |                     |      |
| Professional Engineer           | 1.00     | hr | 145       | \$ 145.00           | 5    |
| Technical/Administrative        | 1.00     | hr | 77        | \$ 77.00            | 5    |
| <b>Total Estimated Cost</b>     |          |    |           | <b>\$ 31,291.80</b> |      |

**4) Total Final Closure**

|                           |   |                       |
|---------------------------|---|-----------------------|
| A.                        | Project Manager and Assistant                     | \$120,725.00          |
| B.                        | Waste Inventory Treatment and Disposal Cost       | \$440,447.80          |
| C.                        | Off Site Treatment and Disposal (Oils / Solvents) | \$30,000.00           |
| D.                        | Contaminated Solids Disposal Cost                 | \$35,086.50           |
| E.                        | On Site Treatment and Disposal (Wastewaters)      | \$105,080.00          |
| F.                        | Equipment and Structures Decontamination Cost     | \$236,112.00          |
| G.                        | Backfill of Voids Cost                            | \$40,595.00           |
| H.                        | Final Cover Placement and Vegetation Cost         | \$1,575,082.50        |
| I.                        | Groundwater Monitoring Cost                       | \$65,450.00           |
| K.                        | Leak Detection/Permanent Sump Monitoring Cost     | \$32,725.00           |
| J.                        | Closure Certification Cost                        | \$31,291.80           |
| <b>Total Closure Cost</b> |   | <b>\$2,712,595.60</b> |

## 5) Closure Cost Estimate References

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1. Clean Harbors Deer Trail LLC Operational Experiences
2. 2004 Secure Disposal Cell Construction Bids, other Clean Harbors facilities
3. *R.S. Means Environmental Remediation Cost Data, Unit Price 2004*
4. Severn Trent Laboratories (STL), Denver, Colorado
5. Cameron-Cole LLC, Boulder, Colorado
6. Resource Technologies Group; Lakewood, Colorado
7. Poly-Flex, Inc., Grand Prairie, Texas
8. Bulk Materials, Inc., Fort Collins, Colorado
9. Hill Petroleum, Fort Morgan, Colorado
10. Clean Harbors Field Service Center, Denver, Colorado
11. Clean Harbors Environmental Services, Inc. Kimball, Nebraska