APPENDIX XV

RCRA FACILITY CLOSURE PLAN

Evoqua Water Technologies
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Parker, Arizona 85344
928-669-5758

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Revision 4

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1.0 INTRODUCTION

The Evoqua Water Technologies (EWT) facility accepts spent activated carbon in containers (drums and bulk) from various customers. The spent activated carbon is identified as both hazardous and non-hazardous waste and is managed at the facility in the container storage area, five storage tanks (T1, T2, T5, T6, and T18), and ultimately in the carbon reactivation unit (RF-2).

The Closure Plan for the EWT facility covers activities related to the eventual closure of the hazardous waste portions of the facility, including all hazardous waste management units (HWMUs) described in the facility's Part A application. The contents of the Closure Plan are based upon, and meet all the criteria set forth in 40 CFR Part 264, Subparts G and H. The goal of this plan is to achieve clean closure. In short, this means that all hazardous wastes will be removed from the RCRA regulated units, and that any releases at or from the units will be remediated so that further regulatory control under RCRA Subtitle C is not necessary to protect human health and the environment. In the event clean closure cannot be achieved, further investigation and remediation work will be performed. Closure of the inactive RF-1 unit is covered in a separate closure plan.

Activities associated with closure of the HWMUs will include treatment and/or removal of all hazardous waste inventory, decontamination of storage and treatment equipment and containment areas, evaluation of decontamination results (including sampling and analysis, as necessary) to ensure that decontamination is adequate, sampling and analysis to determine if soil contamination has occurred, and certification of closure by the facility owner and/or operator and a registered professional engineer. The Closure Plan also includes a cost estimate and financial assurance mechanism for the closure activities. A Sampling and Analysis Plan (SAP) for closure activities, detailing the collection of samples, laboratory analysis, and interpretation of analytical results is included as a separate appendix to the RCRA Part B Permit Application.

Since the closure activities will result in clean closure, the EWT Parker facility is not considered to be subject to post-closure requirements. However, post-closure requirements may become applicable if soil contamination is found and EWT is unable to adequately remediate that contamination. Further, there are no underground storage tanks or other treatment and disposal units at the facility that require the submittal of a contingent post-closure plan per 40 CFR 264.118.

There are no land disposal units at the EWT facility. In addition, no hazardous waste will be left in place. Therefore a “survey plat” and “notice in deed and certification” are not required.

1.1 SITE CONDITIONS

This section describes the existing environment at the location of the facility. Included is information on land features, geologic setting, soils, and water resources. The living resources described include wildlife, vegetation, ecosystems and adjacent agricultural resources. The available cultural, historic and archeological information for the site is also discussed.

1.1.1 CLIMATE

The climate is typical of the Sonoran Desert Region. Winters are mild with minimum temperatures above freezing. The summers are long, hot, and dry with temperatures commonly exceeding 100°F. Average total precipitation is approximately 3.82 inches per year. Precipitation is sporadic, occurring mainly in the time intervals of July -September and December -February. The evaporation rate in this area is 86 inches per year.

1.1.2 WATER

1.1.2.1 Groundwater

Groundwater in the Parker area occurs as both confined and unconfined aquifers. Most of the wells are completed in the Colorado River gravels (alluvium), where unconfined or water table conditions prevail. The Miocene(?) Fanglomerate (gravel deposits at base of mountains) and the lower part of the Bouse Formation contain confined aquifers (artesian). The (?) signifies the geological age is not certain. The city wells in Parker obtain most of their water from the Miocene(?) Fanglomerate. Sources of recharge to the groundwater supply of the area are the Colorado River, precipitation, and underflow from areas bordering the Parker Valley.

In this area, a large amount of the groundwater is lost through evapotranspiration in the Parker area. Direct recharge from precipitation is limited. Loss of water from the Colorado River provides almost 50% of the recharge to the groundwater near Parker.

The groundwater level near Parker is approximately 350 feet. The depth to water in the areas bordering the flood plain ranges from 70 to 300 feet below the land surface.

The production from wells screened in the Colorado River alluvium comes from highly permeable beds of sand and gravel. The Colorado River gravel has the highest transmissivity of the water-bearing sediments in the area. Wells which penetrate sufficient thicknesses of the gravel may produce more than 100 gpm per foot of drawdown (specific capacity).

1.1.2.2 Water Quality

The chemical quality of the groundwater in the Parker area is generally related to the source and movement of the water. The chemical quality of the groundwater is influenced by evaporation, transpiration by native vegetation, former flooding of the river, irrigation developments, and to a marked degree, by the local geology. The groundwater beneath the flood plain is relatively poor in quality, except where irrigation water has entered the aquifer. The shallow groundwater in the non-irrigated part of the valley has twice the mineral content as the Colorado River water.

An explanation for the water composition of many of the wells can be understood by assuming that the groundwater originated as infiltration from the Colorado River associated with irrigation canals, field irrigation, or the river channel. The water composition has been changed by evaporation and concentration.

The results of chemical analyses of water from wells in T.9N.R.20W, near Parker, Arizona show the change. The chloride concentrations for these wells varies between 107 and 208

mg/liter. It is assumed the dissolved minerals now in the ground water must have come from the Colorado River.

1.1.3 GEOLOGY

1.1.3.1 Regional Physiography

The area has a hot, arid climate and is characterized by roughly parallel mountain ranges separated by alluvial basins. The elevation of the basins varies between sea level and 1000 feet. The Colorado River is the major stream in the area. The Colorado River flood plain is between three and nine miles wide. It is less than one mile wide near Parker, and increases to nine miles in the Parker Valley. The flood plain is that part of the Colorado River Valley that has been covered by floods of the Colorado River, prior to construction of Hoover Dam. The elevation of the flood plain near Parker is approximately 360 feet above sea level. The mountains are rugged and rise abruptly from the Colorado River or from alluvial slopes. The highest mountain summits in the region reach an average elevation of around 3300 feet. Between the flood plain and the mountains are piedmont slopes, which are dissected by washes from the mountains and, in a few exceptions, into adjacent and topographically distinct basins. The facility is located on relatively flat terrain (slopes 0-3 percent), and is outside the floodplain.

1.1.3.2 Regional Geology

The geologic units considered important to water resources development near the site are the Miocene(?) Fanglomerate, the Bouse Formation and the alluvium of the Colorado River and its tributaries.

The rocks of the mountains are relatively impermeable, and form the boundaries of the groundwater reservoirs. Interbasin water movement is limited by the impermeable bedrock and limited to groundwater movement in surface sediments, where intermittent surface drainage exits from a basin.

The bedrock includes all rocks older than the Miccene(?) Fanglomerate, and contains sedimentary, metamorphic, and igneous rocks. These Miocene beds are gravel deposits that have eroded from the mountains and filled the basins. The thickness of these beds varies widely across the basins. The Fanglomerate is a potentially important aquifer as near Parker, where wells with a yield of 15 gallons per minute per foot of drawdown have been developed in the Fanglomerate, (Metzger, et al, 1973).

Sediments at the site, identified from geologic maps, are Qe (Eolian Deposits, Holocene) and QTr (Old Fluvial Deposits). Samples taken at the site indicated that only the eolian windblown sand and silt (Qe) are present. The eolian sand is tan to light tan and fine to medium grained, occurring as a deposit on the surface throughout the area.

1.1.3.3 Soils

The descriptions and delineations of soils for the Colorado River Indian Reservation Soil Survey do not always correlate with those of adjacent soil survey maps. The differences are related to differences in mapping intensity, extent of soils within the survey, change in knowledge about soils, and modifications in soil classification. The soil map shows that the

soil present at the site is classified as Superstition series, which is a gravelly loamy fine sand that develops on zero to three percent slopes. Samples collected at the site show the same type of material. Chemical analyses of the soil samples revealed no evidence of any existing site contamination. Vegetation supported by Superstition soils is white bursage, creosotebush, turkshead and big gulleta.

2.0 SCOPE OF CLOSURE PLAN

The scope of this Closure Plan includes the closure of the container storage area, as well as the closure of the tanks, associated ancillary equipment, and the surrounding containment area, as necessary. The plan also addresses the closure of the carbon reactivation unit (RF-2), and the surrounding containment, as necessary. Closure of the inactive RF-1 unit is addressed in a separate Closure Plan. A facility diagram is shown in Appendix III of the RCRA Part B Permit Application. Table 2-1 identifies the applicable units covered by this Closure Plan. This plan applies to partial as well as final closure.

In accordance with 40 CFR 264.112(c), this Closure Plan will be reviewed and amended, if necessary, whenever one of the following occurs:

- There is a change in operating plans or facility design that affects the Closure Plan;
- There is a change in the expected year of closure; or
- In conducting closure activities, unexpected events require a modification of the approved Closure Plan.

If EWT and/or EPA determine that the Closure Plan needs to be amended, EWT will submit a notification for, or request for, a permit modification based on the classification of the modification. An amended Closure Plan will be submitted as part of the permit modification.

TABLE 2-1. EQUIPMENT/ITEMS FOR CLOSURE

Equipment/Item	Use or Purpose	Size/Design Capacity[1]	Hazardous Waste Codes
Container Storage Area	Storage of Containerized Spent Carbon	~80' x 70'; 100,000 gallons	See Below[2]
Tank System T1[3]	Storage of Spent Carbon	8,319 gallons	See Below[2]
Tank System T2[3]	Storage of Spent Carbon	8,319 gallons	See Below[2]
Tank System T5[3]	Storage of Spent Carbon	8,319 gallons	See Below[2]
Tank System T6[3]	Storage of Spent Carbon	8,319 gallons	See Below[2]
Tank System T18[3]	Carbon Reactivation Unit Feed	6,500 gallons	See Below[2]
Tank containment area	Containment of leaks, drip, or spills from tank systems	~31.5' x 30'	See Below[2]
Carbon Reactivation Unit RF-2[4]	Carbon Reactivation	12'-10" dia x 19'-8" high; 3,049 lb/hr	See Below[2]
RF-2 Afterburner[4]	Carbon reactivation off-gas treatment	5' dia (inside refractory) x 33' high	See Below[2]
RF-2 Quench/Venturi[4]	Carbon reactivation off-gas treatment	4'-7" dia x 22' high	See Below[2]
RF-2 Packed bed scrubber[4]	Carbon reactivation off-gas treatment	6' dia x 34' high	See Below[2]
RF-2 Wet electrostatic precipitator[4]	Carbon reactivation off-gas treatment	10' dia x 27' high	See Below[2]
RF-2 induced draft fan[4]	Carbon reactivation off-gas handling	126" dia x 56" wide	See Below[2]
RF-2 stack[4]	Carbon reactivation off-gas handling	3'-8" dia x 110' high	See Below[2]
RF-2 containment area	Containment of leaks, drips, or spills from the RF-2 equipment	~180' x 55'	See Below[2]
Satellite Accumulation Areas (4 each)	Collection of Various Debris	≤ 55 gallons (metal or plastic)	See Below[2]

[1] Design capacity is calculated based on a tank height as defined by the level at which a high level alarm is initiated.

[2] See Attachment 1 for applicable hazardous waste codes.

[3] Tank system consists of the tank and ancillary piping, pumps, valves, etc.

[4] RF-2 equipment includes interconnecting piping, ducts, pumps, valves, sumps, etc.

3.0 GENERAL FACILITY INFORMATION

The following is general information pertaining to the EWT facility:

Facility Name: Evoqua Water Technologies

Address: 2523 Mutahar Street
Parker, Arizona 85344

Facility Contact: Monte McCue, Director – Plant Operations

Telephone Number: (928) 669-5758

EPA ID Number: AZD 982 441 263

4.0 CONTAINER STORAGE AREA, TANKS, ANCILLARY EQUIPMENT AND CARBON REACTIVATION UNIT

This section of the Closure Plan provides a description of the waste streams managed at the facility, the container storage area, the storage tanks and their associated ancillary equipment, and the carbon reactivation unit.

4.1 WASTE PHYSICAL PROPERTIES

The sole hazardous waste stream managed at the facility consists of spent activated carbon. The waste codes associated with this waste stream are identified in Attachment 1. This waste stream is a solid at ambient temperatures. Steam or water is normally used as the solvent for decontamination of equipment used for managing this waste stream.

4.2 EQUIPMENT EVALUATION

EWT has evaluated the management of this waste stream for development of this Closure Plan. This evaluation defined three groups of equipment for consideration: (1) the container storage area; (2) the tanks, containment areas, and ancillary equipment associated with the tanks; and (3) the RF-2 carbon reactivation unit. The evaluation process is discussed in the following sections.

4.2.1 CONTAINER STORAGE AREA SUMMARY

The Container Storage Area consists of a covered, reinforced concrete pad with perimeter curbs. The perimeter curbs on all four sides of the concrete pad are constructed of reinforced concrete. The base is maintained free of cracks or gaps and is liquid tight to contain liquid in the event of spills or leaks. For the purposes of this Closure Plan, the facility assumes the container storage area will be full to its maximum capacity (100,000 gallons, or approximately 1,818 – 55 gallon drums) at the time of closure.

4.2.2 TANKS AND ASSOCIATED ANCILLARY EQUIPMENT EVALUATION SUMMARY

The facility stores spent activated carbon in 5 tanks meeting applicable EPA standards for the storage of hazardous wastes. Tank detail sheets showing tank dimensions, shell thickness, supports, foundations, and other information for the tanks are provided in the Part B Permit Application. The tank capacities are identified in Table 2-1. For the purposes of this Closure Plan, the facility assumes that the tanks will be full to their maximum capacity at the time of closure.

The tanks at the facility are constructed of steel. The tanks are of closed top design and are integrally constructed. The ancillary equipment for each tank includes items such as piping, pumps, valves, and flow meters leading from the loading areas to the tanks, between the tanks, and from the tanks to the carbon reactivation unit. The ancillary equipment is constructed mainly of steel, and flexible hoses may be used in certain areas. Secondary containment for the tanks is provided and is constructed of reinforced concrete with perimeter dikes to prevent migration of spillage, leakage, or contaminated stormwater.

4.2.3 CARBON REACTIVATION UNIT SUMMARY

The facility reactivates the spent carbon in the carbon reactivation furnace (RF-2). The design capacity for the furnace is identified in Table 2-1. The RF-2 carbon reactivation unit is constructed of steel and is approximately 12'-10" in diameter by 19'-8" feet tall. The RF-2 carbon reactivation unit includes five internal hearths and a center shaft with rabble arms to agitate the spent carbon.

Equipment associated with the RF-2 carbon reactivation unit include:

- Afterburner
- Quench and venturi scrubber
- Packed tower scrubber with scrubber packing
- Wet electrostatic precipitator
- Induced draft fan
- Stack.

Containment for the carbon reactivation unit is provided and is constructed of reinforced concrete with perimeter dikes to prevent migration of spillage, leakage, or contaminated stormwater. The containment has regularly been inspected by EWT and is free of cracks and gaps, which will prevent migration of materials through the concrete.

5.0 CLOSURE REQUIREMENTS

EWT has prepared this Closure Plan in compliance with the 40 CFR 264 Subparts G, I, J, and X requirements. Closure shall be performed in such a manner as to:

- Minimize the need for further maintenance;
- Control, minimize, or eliminate, to the extent necessary to protect human health and the environment, the post-closure escape of hazardous wastes, hazardous leachates, contaminated runoff, or hazardous waste decomposition products to the groundwater, surface water, or the atmosphere;
- Comply with the closure requirements of 40 CFR 264 Subpart G, including, but not limited to, the requirements of 40 CFR 264.178 for containers, 40 CFR 264.197 for tanks, and 40 CFR 264 Subpart X for the carbon reactivation unit; and
- Confirm that any structures left in place on site meet the performance standards established for site closure.

The goal of this plan is to achieve clean closure. In short, this means that all hazardous wastes will be removed from the RCRA regulated units, and that any releases at or from the units will be remediated so that further regulatory control under RCRA Subtitle C is not necessary to protect human health and the environment. In the event clean closure cannot be achieved, further investigation and remediation work will be performed.

The closure of each hazardous waste management unit at the facility will be accomplished by:

- Decontaminating all contaminated equipment, containment system components and associated structures to specified closure performance standards;
- Verifying whether equipment has been decontaminated successfully based on the intended disposition;
- Dismantling and removing equipment that has either been decontaminated successfully or will be disposed;
- Decontaminating containment structures and verifying that they have been successfully decontaminated and removing any contaminated concrete;
- Determining whether soil contamination beneath the containment pads has occurred; and
- If soil contamination is found, remediating contaminated areas so that further regulatory control under RCRA Subtitle C is not necessary to protect human health and the environment.

5.1 CLEAN CLOSURE PERFORMANCE STANDARDS

Hazardous waste management units will be considered clean closed if they meet the following closure requirements:

5.1.1 PROCESS EQUIPMENT

Process equipment includes such items as tanks, piping, pumps, valves, the carbon reactivation furnace vessels, interconnecting ductwork, and air pollution control equipment. Process equipment will be considered clean closed if the decontaminated surfaces meet the Clean Debris Surface Standard (40 CFR 268.45, Table 1, Section A.1.e).

In smaller equipment items, where surfaces are not amenable to thorough visual inspection, a sample of the final decontamination rinsate from each item (or batch of small equipment items) will be collected and analyzed for a set of selected contaminants of concern (COCs). Those analytical results will be compared to the analytical results of decontamination water before it is used. If the COC concentration of the final rinsate sample is equal to or less than the COC concentration of the unused decontamination water (with 95% confidence) the equipment will be confirmed to be decontaminated.

5.1.2 CONCRETE CONTAINMENT PADS AND SUPPORT STRUCTURES

Concrete containment pads and steel structures will be considered clean closed if the decontaminated surfaces meet the Clean Debris Surface Standard (40 CFR 268.45, Table 1, Section A.1.a, b, c, d, or e).

5.1.3 SOILS

Soils will be considered clean if detectable metal constituents are at or below the mean of background sample results plus two standard deviations, and detectable organic constituents are below EPA Region 9's Preliminary Remediation Goals (PRGs) for Industrial Soil. If levels exceeding these standards at statistically significant levels are detected in soil, appropriate corrective action will be implemented.

5.2 ALTERNATIVE TO MEETING CLEAN CLOSURE PERFORMANCE STANDARDS

For some or all of the items subject to closure, EWT may choose to dismantle the item and dispose of it as hazardous waste or as hazardous debris at an appropriate TSDF. Disposal in this manner may be done if decontamination efforts are not sufficient to satisfy the clean closure performance standards described above, or may be done instead of decontamination. In either of these cases, the removal of the contaminated item constitutes clean closure, rather than decontamination and evaluation against the performance standards described above.

6.0 CLOSURE ACTIVITIES

This section describes both the general and specific closure activities for the container storage area, the storage tanks and their associated ancillary equipment, and the carbon reactivation unit.

6.1 GENERAL CLOSURE ACTIVITIES

The following sections of the Closure Plan are written from the perspective that third party contractors will perform the closure activities in conjunction with site personnel. The closure costs identified in Section 11.0 were developed based on the "worst case" scenario of only using contractors. EWT may perform the closure activities using EWT personnel (except for the Professional Engineer). In addition, the following sections are written to address the container storage area, the storage tanks and their associated ancillary equipment, and the carbon reactivation unit identified above, assuming that metallic components can be scrapped rather than being disposed. The cost estimates include the cost of dismantling each major piece of equipment identified in Table 2-1, but do not include any credit which may be realized from the sale of scrap materials.

EWT will utilize contractors to ensure that all activities are performed to minimize the need for future maintenance, maximize, to the extent necessary, the protection of human health and the environment, and eliminate post-closure escape of hazardous waste, hazardous constituents, contaminated run-off and/or hazardous waste decomposition products.

EWT will utilize facility health and safety and waste management procedures to address the following items prior to initiating closure:

(1) PPE and respiratory protection criteria;
(2) Air monitoring methods and techniques;
(3) Run-on/off controls for site activities;
(4) Site safety meeting criteria and schedule;
(5) Detailed site organization responsibilities;
(6) Impermeable barrier techniques and materials to be used to protect non-closure affected areas;
(7) Waste handling methods;
(8) Site material storage scenarios to segregate hazardous and nonhazardous materials;
(9) Fire protection mechanisms and techniques;
(10) Site specific Contingency Plan to address potential response activities;
(11) Proof of training and medical monitoring to satisfy OSHA compliance; and
(12) Certification and permits for any subcontractor services (if necessary).

In general, the closure activities will be performed during daylight hours. Also, site activities will be scheduled to allow personnel to secure the closure areas before leaving each day. A 10 hour workday is anticipated.

In the event that specific closure activities do not allow a safe or effective shutdown and activities are required to be performed at night, EWT will provide the necessary lighting and equipment to complete the work in a safe manner.

Contractors will perform all Confined Space activities pursuant to a Confined Space Entry program. Similar criteria are applicable for the Lock-Out/Tag-Out programs associated with confined space activities. The closure site boundary will be clearly delineated by barricades, signs, and other markers, as necessary, to ensure closure site security. Site security mechanisms will be installed at the end of each working day.

A site-specific Health and Safety Plan (HASP) will be developed by the contractor hired to perform the closure activities.

During the closure activities, utilities (i.e., electricity, water, steam, etc.) will be provided by EWT. The closure cost estimate includes the costs for providing these utility services.

All debris and other miscellaneous materials will be collected and stored as necessary on a daily basis. No waste, hazardous or otherwise, will be left in the units to be closed at closure completion. Site inspection will be performed to ensure that all hazardous waste and residuals are removed from the closure area to prevent any post-closure escape of hazardous waste, hazardous constituents, contaminated run-off, or hazardous waste decomposition products that could potentially affect groundwater, surface waters, or the atmosphere.

Site activities will be performed with the necessary barricades to prevent migration of hazardous waste during closure activities. This includes all site storage areas, temporary decontamination stations, etc. Potential prevention methods and equipment include:

- Silt fences;
- Straw boundary barricades; and
- Temporary decontamination stations, etc.

Spill response activities will be specified per the EWT Contingency Plan. Berm construction will consist of the use of visqueen and/or HDPE liners placed on the containment pad nearest to the equipment, anchored by weights such as sand, oil dry, or other suitable materials. Lay down areas will include only the area within containment, and direct placement into the macroencapsulation debris roll-off boxes, where used. The macroencapsulation debris roll-off boxes will be placed in the vicinity of the equipment being dismantled.

Temporary barriers, liners, etc. will be utilized during closure activities to prevent contamination of soil or groundwater. Inspections will be performed to address potential contributions from closure activities. Evidence of potential contributions will initiate immediate corrective action activities.

An independent Registered Professional Engineer will confirm that all closure activities have been performed in accordance with the approved Closure Plan. This individual will be

responsible for making site inspections, on an as needed basis, for confirmation of certification requirements. The engineer will ensure that all activities are being performed pursuant to the Closure Plan and in compliance with 40 CFR 264 Subparts G, I, J, and X.

6.2 SPECIFIC CLOSURE ACTIVITIES

This section identifies the specific closure activities for the container storage area, the storage tanks and their associated ancillary equipment, and the carbon reactivation unit.

Decontamination activities during closure will include the following:

- Tanks, piping, pumps, valves, and other small equipment will be decontaminated and either sold for reuse, recycled, or disposed as nonhazardous waste, or transported offsite to an appropriate TSDF for disposal.
- Contaminated secondary containment structures will be decontaminated, if possible, to achieve the closure performance standards if they are to be left on-site. As an option, contaminated structures, storage tanks, and associated equipment that may not be decontaminated will be demolished and/or cut up, and transported offsite as a hazardous waste to an appropriate TSDF.
- Contaminated soil identified during site closure will be removed and transported offsite to an appropriate TSDF for disposal or otherwise remediated.
- All equipment, including mobile equipment and earth moving equipment that comes in contact with hazardous waste constituents during closure, will be decontaminated using detergent and water (or water alone), before leaving the contaminated area or removal from the facility.
- Any residues generated during decontamination activities will be handled in accordance with all applicable hazardous waste requirements of 40 CFR 261, 262, 263, and 268.34.
- Rinse water and wastewater generated during decontamination activities will be treated in the on-site wastewater treatment unit and discharged to the POTW.

Depending on the type and condition of each surface to be decontaminated, one or more of the following technologies will be utilized for decontamination:

- Physically scraping the surfaces with appropriate hand tools to remove attached materials;
- Rinsing with low-pressure water or a detergent/surfactant cleaning solution to remove scaling and surface debris;
- Hydroblasting and/or pressure washing with high-pressure water to scour the surface to remove contaminants and carry them away from the surface; or
- Steam cleaning to remove contaminants that cannot be adequately removed by other means.

6.2.1 CONTAINER STORAGE AREA

When the container storage area is to be closed, the facility will first remove all containers

of hazardous waste from the area. For purposes of the closure cost estimate, it is assumed that the spent activated carbon in the container storage area will be shipped off-site for incineration at an appropriate TSDF. Alternatively, the contents of the containers will be transferred into the tank system, and the empty containers will be sent for reconditioning or disposal. If the alternative is used, the spent carbon will be subsequently treated in carbon reactivation unit RF-2.

Residuals potentially generated during transfer activities may include drips, leaks, and spills. These will be collected in containers, liners, pads, and absorbent materials, as necessary, for any drips, leaks, or spills that occur. Any residuals generated will be cleaned up immediately to maintain site integrity. All residuals will be consolidated for off-site disposal as hazardous waste.

Operators and all other personnel involved in work activities will be equipped with the proper PPE during all closure activities. Personnel will be made aware of the proper PPE as well as the proper operating techniques of all pumps, trucks, etc. necessary to perform the activity prior to implementation. PPE will be collected in designated containers for off-site disposal.

All concrete containment surfaces within the container storage area will be decontaminated to the maximum extent possible. The decontamination procedures will also apply to the sump collection systems within these containment structures. If it is determined that a containment area cannot be successfully decontaminated, then the structures may be demolished, removed, and disposed of off-site at a permitted TSDF.

The containment surfaces will initially be inspected for any cracks, gaps or other major structural defects prior to decontamination to determine potential subsurface soil sampling locations. An initial survey was conducted as part of the development of this Closure Plan, and preliminary soil sampling locations have been selected as shown on the figure included in the Sampling and Analysis Plan. Any cracks that are observed to extend through the entire thickness of the concrete slab will be sealed prior to decontamination of the unit. The containment pads then will be decontaminated by an appropriate decontamination technology. Areas with extensive staining or impacted contamination will be noted and addressed. All scarified materials removed from the concrete surfaces and wash water generated during decontamination will be isolated and contained within the containment pad using appropriate engineering controls, such as sand bags, visqueen plastic sheeting, and temporary absorbent barriers.

Upon verification that the containment area has met the closure performance standards, the area will be marked and isolated, or demolished and removed for disposal off site as a non-hazardous waste.

The following miscellaneous decontamination items will be considered during the container storage area closure activities:

- Disposable tools (i.e., brushes, etc.) will be collected in a designated area for off-site disposal as hazardous waste; and

- Non-disposable tools (i.e., wrenches, etc.) will be decontaminated using detergent and water (or water alone) prior to leaving the closure area.

6.2.2 TANKS AND ASSOCIATED ANCILLARY EQUIPMENT

Once the decision to initiate closure has been made, the lines to each of the five tanks will be locked out. For this reason, the maximum inventory of spent carbon expected to be present in each of the tanks is the amount identified in Table 2-1. For purposes of the closure cost estimate, it is assumed that the spent activated carbon in the tanks will be loaded onto trucks and shipped off-site for incineration at an appropriate TSDF. Alternatively, this material will be removed for treatment in carbon reactivation unit RF-2. The waste will be removed from the tanks and all associated ancillary equipment with existing site pumps, tanker loading equipment, and pressure washing and/or steaming, as necessary. Following the processing of all waste contained in the tanks, the lines associated with each of the tanks will be drained to the greatest extent possible and will be disconnected and blinded.

Decontamination and closure activities associated with the tanks will be limited to those surfaces that the waste stream contacted or potentially contacted. These will include the ancillary equipment previously identified, the internals of the tanks, and the containment area surrounding the tanks.

Residuals potentially generated during decontamination activities may include drips, leaks, and spills from piping and other equipment. These will be collected in containers, liners, pads, and absorbent materials, as necessary, for any drips, leaks, or spills that occur. Any residuals generated will be cleaned up immediately to maintain site integrity. All residuals will be consolidated for off-site disposal as hazardous waste.

Operators and all other personnel involved in work activities will be equipped with the proper PPE during all closure activities. Personnel will be made aware of the proper PPE as well as the proper operating techniques of all pumps, trucks, blenders, etc. necessary to perform the activity prior to implementation. PPE will be collected in designated containers for off-site disposal.

The ancillary equipment associated with the tanks will be removed. Non-metallic items will be collected and placed into roll-off boxes for macroencapsulation and disposal as hazardous debris. The piping and metallic ancillary equipment will be removed, cut into manageable pieces, and closed as follows:

- Pressure washing and/or steam cleaning will be performed, as necessary, to remove any residue;
- Collection vessels for wash waters will be provided for consolidation and subsequent treatment in the in-house wastewater treatment system prior to discharge to the POTW;
- Upon completion of the decontamination activities, the ancillary equipment will be evaluated to ensure that it has met the closure performance standards;

- For small equipment items that are not amenable to thorough visual inspection, a sample of the final rinsate will be collected and analyzed for confirmation that the performance standards have been met;
- The decontaminated ancillary equipment will be disassembled, removed, and sent as scrap metal for recycling;
- Any items not meeting the closure performance standards will either undergo further decontamination or will be disposed of at an appropriate TSDF as hazardous debris.

The following closure activities associated with the decontamination of the tanks will be performed:

- Any remaining liquid and sludge will be removed from the tanks as possible using physical (e.g., pumping, etc.) means;
- The tanks will be purged of vapor and the tank will be opened to allow access to personnel;
- Confined Space Entry procedures will be utilized;
- Lock-Out/Tag-Out procedures will be utilized;
- Contractors will enter the tanks and remove any residual sludge through physical means;
- Pressure washing and/or steam will be used to remove any remaining contamination until the tanks meet the closure performance standards. Decontamination fluids will be collected for treatment in the in-house wastewater treatment system prior to discharge to the POTW.

Upon completion of the decontamination activities, the tanks will be evaluated to ensure the tank internals meet the closure performance standards. The outside of the tanks and surrounding areas will also be inspected (and decontaminated, if necessary). Decontaminated tanks that meet the closure performance standard may be re-used at a TSDF, sold for re-use at a TSDF or other industrial application, left in place, or cut into manageable pieces and sent to a scrap metal reclaimer. The cost estimate includes the cost for dissembling, cutting and shipping the tanks for scrap. No credit has been taken for any revenue received for scrap sales.

All concrete containment surfaces associated with the tanks will be decontaminated to the maximum extent possible. The decontamination procedures will also apply to the sump collection systems within these containment structures. If it is determined that a containment area cannot be successfully decontaminated, then the structures may be demolished, removed, and disposed of off-site at a permitted TSDF.

The containment surfaces will initially be inspected for any cracks, gaps or other major structural defects prior to decontamination to determine potential subsurface soil sampling locations. An initial survey was conducted as part of the development of this Closure Plan, and preliminary soil sampling locations have been selected as shown on the figure included in the Sampling and Analysis Plan. Any cracks that are observed to extend through the entire thickness of the concrete slab will be sealed prior to decontamination of the unit. The

containment pads then will be decontaminated by an appropriate decontamination technology. Areas with extensive staining or impacted contamination will be noted and addressed. All scarified materials removed from the concrete surfaces and wash water generated during decontamination will be isolated and contained within the containment pad using appropriate engineering controls, such as sand bags, visqueen plastic sheeting, and temporary absorbent barriers.

Upon verification that the containment area has met the closure performance standards, the area will be marked and isolated, or demolished and removed for disposal off site as a non-hazardous waste.

The following miscellaneous decontamination items will be considered during the tank closure activities:

- Disposable tools (i.e., brushes, etc.) will be collected in a designated area for off-site disposal as hazardous waste; and
- Non-disposable tools (i.e., wrenches, etc.) will be decontaminated with detergent and water (or waste alone), prior to leaving the closure area.

6.2.3 CARBON REACTIVATION UNIT RF-2

Once the decision to initiate closure has been made, the lines to the carbon reactivation unit will be locked out, and will only be utilized to treat the material remaining in the containers and tanks, as identified above. The spent carbon stored in bulk and in containers will be treated by reactivation in carbon reactivation unit RF-2 and subsequently packaged for reshipment to customers. A maximum of 100,000 gallons of spent activated carbon from containers and approximately 45,000 gallons of spent activated carbon in bulk will be on site at the time of closure.

Slurry recycle water is consumed in the carbon reactivation process and it is anticipated that most of it will be consumed during the treatment of the spent activated carbon inventory during closure. The slurry water that is not consumed will be treated in the in-house wastewater treatment system prior to being discharged to the POTW. Additionally, makeup water may be required to complete the reactivation of all the spent carbon inventory. It is anticipated that a portion of the makeup water will be supplied by decontamination wash water produced during closure. Scrubber blowdown will be discharged to the local POTW consistent with the facility's discharge permit.

Upon completion of this treatment, carbon reactivation unit RF-2 will be operated at or above the minimum permitted temperatures, using auxiliary fuels only, and without processing any additional spent carbon, for a period of four hours to ensure that the unit is organically decontaminated. After this period, the unit will be shut down, cooled, locked out, and all lines to the unit will be removed as identified above. Therefore, the material remaining in the carbon reactivation unit and associated downstream equipment will be residual in nature, and only inorganic contaminants (metals) may remain. (See EPA memo regarding closure of hazardous waste incinerators in Attachment 2). The material remaining in the carbon reactivation unit will be removed with existing site pumps, tanker

loading equipment, manual techniques, and pressure washing and/or steaming, as necessary.

Decontamination and closure activities associated with the carbon reactivation unit will be limited to those surfaces that the waste stream or treatment residuals contacted or potentially contacted. These will include the internals of the carbon reactivation unit and downstream equipment, and the containment pad for the carbon reactivation unit.

Residuals potentially generated during decontamination activities may include drips, leaks, and spills. These will be collected in containers, liners, pads, and absorbent materials, as necessary, for any drips, leaks, or spills that occur. Any residuals generated will be cleaned up immediately to maintain site integrity. All residuals will be consolidated for off-site disposal as hazardous waste.

Operators and all other personnel involved in work activities will be equipped with the proper PPE during all closure activities. Personnel will be made aware of the proper PPE as well as the proper operating techniques of all pumps, trucks, blenders, etc. necessary to perform the activity prior to implementation. PPE will be collected in designated containers for off-site disposal.

The following closure activities associated with the decontamination of the carbon reactivation unit will be performed:

- Any remaining liquid and sludge will be removed from the carbon reactivation unit off gas treatment equipment using physical (e.g., pumping, etc.) means. Liquids will be treated in the in-house wastewater treatment system prior to being discharged to the POTW. Sludges will be placed into a roll-off box for macroencapsulation and disposal as hazardous debris;
- The carbon reactivation unit and downstream equipment will be purged of vapor and the carbon reactivation unit will be opened to allow access to personnel;
- Confined Space Entry procedures will be utilized;
- Lock-Out/Tag-Out procedures will be utilized;
- Contractors will enter the carbon reactivation unit and downstream equipment and remove any residual material (sludge, carbon, or slag) through physical means using hand tools;
- Scrubber packing will be physically removed and placed in a roll-off box for macroencapsulation for disposal as hazardous debris;
- Residual sludge, activated carbon, and slag should be minimal based on experience with periodic maintenance of the unit, and will be placed into roll-off boxes for macroencapsulation, or a 55-galllon drum of incinerables for off-site disposal;
- The refractory in the RF-2 furnace, afterburner, and connecting ductwork will be removed using hand tools and placed into a roll-off box for disposal as hazardous debris using macroencapsulation;
- Pressure washing and/or steam will be used to remove any remaining contamination until the carbon reactivation unit and downstream equipment meets the closure performance standards. Decontamination fluids will be

collected and treated through the in-house wastewater treatment system prior to discharge to the POTW;
- For small equipment items that are not amenable to thorough visual inspection, a sample of the final rinsate will be collected and analyzed for confirmation that the performance standards have been met.

Upon completion of the decontamination activities, the carbon reactivation unit and downstream equipment will be inspected to ensure the internals meet the closure performance standards. The outside of each equipment item and surrounding areas will also be inspected (and decontaminated, if necessary).

Once the carbon reactivation unit and downstream equipment have been determined to be cleaned, equipment will be dismantled. Metallic items will be scrapped. Fiberglass, plastic, and other non-metalic components will be disposed of as non-hazardous debris. Packed scrubber internals will be macroencapsulated and disposed of as hazardous debris.

All concrete containment surfaces associated with the carbon reactivation unit and downstream equipment will be decontaminated to the maximum extent possible. The decontamination procedures will also apply to the sump collection systems within these containment structures. If it is determined that a containment area cannot be successfully decontaminated, then the structures may be demolished, removed, and disposed of off-site at a permitted TSDF.

The containment surfaces will initially be inspected for any cracks, gaps or other major structural defects prior to decontamination to determine potential subsurface soil sampling locations. An initial survey was conducted as part of the development of this Closure Plan, and preliminary soil sampling locations have been selected as shown on the figure included in the Sampling and Analysis Plan. Any cracks that are observed to extend through the entire thickness of the concrete slab will be sealed prior to decontamination of the unit. The containment pads then will be decontaminated by an appropriate decontamination technology. Areas with extensive staining or impacted contamination will be noted and addressed. All scarified materials removed from the concrete surfaces and wash water generated during decontamination will be isolated and contained within the containment pad using appropriate engineering controls, such as sand bags, visqueen plastic sheeting, and temporary absorbent barriers.

Upon verification that the containment area has met the closure performance standards, the area will be marked and isolated, or demolished and removed for disposal off site as a non-hazardous waste.

The following miscellaneous decontamination items will be considered during the carbon reactivation unit closure activities:

- Disposable tools (i.e., brushes, etc.) will be collected in a designated area for off-site disposal as hazardous waste; and
- Non-disposable tools (i.e., wrenches, etc.) will be decontaminated with detergent and water (or water alone), prior to leaving the closure area.

6.2.4 SOIL INVESTIGATION

Following decontamination and partial dismantlement of the containment structures, storage tanks, and equipment at the site, soils beneath the HWMUs will be investigated. By drilling borings through the secondary containment pads, the soils will be sampled and analyzed to confirm that no residual contamination is present. The purpose of soil sampling and analysis is to identify areas where remediation may be necessary as a result of past practices and to meet the soil closure performance standards.

All collection and analysis of soil samples will be in accordance with the SAP, which includes provisions for using standard test methods, a state-certified laboratory for analyses, proper chain-of-custody procedures, and quality control/quality assurance samples such as field blanks, trip blanks, and duplicate samples.

Soils beneath each of the HWMUs will be sampled at a minimum of two to five points. Additional sample locations within each structure will be based on locations of cracks or stains in the secondary containment systems.

Background samples will also be collected from three separate locations according to the SAP. The locations are shown in the SAP, and have been selected outside of the facility's operational areas during a site survey conducted during 2011 in cooperation with the EPA Project Manager (Mr. Mike Zabaneh) and will represent constituent concentrations that have not been impacted by site operations. The results of these soil samples will be used in the development of metals closure performance standards for the site.

Soil samples will be collected at a series of depths starting just below the concrete slab. Shallow samples will be collected using a Geoprobe direct push method or hand-auger, while deeper borings will be drilled with a larger sonic or hollow stem auger rig.

After the samples are collected, each boring will be backfilled with grout. The collected soil samples will be transferred to the laboratory for analysis by the methods specified in the SAP.

If the analytical results of these soil samples meet the cleanup criteria specified in this Closure Plan, then the soils will be considered clean closed. If the samples do not meet the cleanup performance criteria, then additional soil sampling will be conducted in the area near where the contamination was found, in order to determine the extent of contamination, and appropriate remedial action will be taken. For purposes of the closure cost estimate, it has been assumed that soil borings to groundwater will be conducted at three locations, with additional sampling and analysis at 5 depths in each boring.

7.0 SAMPLING AND ANALYSIS

EWT has utilized the EPA Guidance Document "Draft of Guidance of Incinerator Closure" (June 29, 1990) in the preparation of this Closure Plan. A copy of this guidance is included in Attachment 2. It is suggested by USEPA to utilize the techniques discussed in this document to clean close all combustion related facilities. In this document, EPA recommends (in the section entitled "Approach to Incinerator Closure") operating the thermal equipment at or above minimum permit temperatures for a period of four hours to remove organic contaminants from the system. The guidance also suggests using a water rinse to remove residual inorganic contaminants to decontaminate equipment.

As described in detail in Section 6.0, decontaminated surfaces will be visually examined to determine if the Clean Debris Surface Standard of 40 CFR 268.45 Table 1, Section A is met. For equipment and other items that are not amenable to a thorough visual inspection, samples of the final rinse for each piece or batch of equipment/items will be obtained for comparison to the decontamination standards. Soil samples will be collected from background (non-process) locations and from several borings under the concrete containment pads. A summary list of the samples to be obtained is provided as Table 7-1. The samples will be obtained in accordance with a site specific "Sampling and Analysis Plan" (SAP) contained in a separate appendix to the RCRA Part B Permit Application. In addition, the samples will be handled and analyzed in accordance with site specific "Quality Assurance Objectives" which are addressed in the SAP. The SAP identifies items such as the appropriate sample containers, sampling techniques, sample preservation, chain-of-custody procedures, specific analytical procedures, and detailed QA/QC procedures, etc. General information for sample analysis and QA/QC is provided with this closure plan.

Each of the samples identified in Table 7-1 associated with the decontamination of equipment/items will be analyzed for a set of selected Compounds of Concern (COCs) that will be used to assess the decontamination of equipment/items. Based on a review of the waste codes received at the site (Attachment 1) and the constituents associated with those codes, EWT has selected COCs for closure purposes. Those selections include metals, halogenated volatile organics, aromatic and unsaturated volatile organics, nonhalogenated volatile organics,halogenated and nonhalogenated semivolatile organics, polyaromatic compounds, phenolic compounds, nitriles, nitrogen and phosphorous containing pesticides, and organochlorine and other organohalide pesticides. The closure COCs are listed in Attachment 3.

For the assessment of soil contamination, each soil sample identified in Table 7-1 will be analyzed for the same group of metals identified above, and will also receive a full scan volatile and semivolatile organic analysis for comparison to PRGs.

TABLE 7-1. SAMPLES FOR CLOSURE CERTIFICATION

ITEM	ESTIMATED NUMBER OF SAMPLES TO BE OBTAINED	ANALYSES
Container Storage Area		
Equipment rinsate	1 (small equipment batch)	Metals[1], Organics[2]
Soil (initial sampling)	9 (assume 3 locations, 3 depths each)	Metals[1], Organics[3]
Tanks and Ancillary Equipment		
Equipment rinsate	5 (1 small equipment batch for each tank system)	Metals[1], Organics[2]
Soil (initial sampling)	21 (assume 7 locations, 3 depths each)	Metals[1], Organics[3]
Carbon Reactivation Unit		
Equipment rinsate	3 (1 small equipment batch for each RF-2 furnace/afterburner, APCD, Fan/stack)	Metals[1]
Soil (RF-1 and RF-2 areas, initial sampling)	9 (assume 3 locations, 3 depths each)	Metals[1], Organics[3]
Un-used decontamination water	3	Metals[1], Organics[2]
Background Soil	9 (3 locations, 3 depths, each)	Metals[1]
Soil (borings to groundwater if initial sampling shows contamination)	15 (3 locations, 5 depths each)	Metals[1], Organics[3]

Sample analyses:

[1] Metals by SW-846 Method 6010 and 7470 for the target metal analytes listed in Attachment 3.

[2] Organics by SW-846 Methods 8260, 8270, and 8141 for the compounds listed in Attachment 3.

[3.] Organics: Full scan volatiles (SW-846 Method 8260) and full scan semivolatiles (SW-846 Method 8270) for comparison to PRGs for soil.

In all cases, the latest version of the analytical methods will be used.

The background concentration for the metal constituents will be the metals closure performance standard for closure certification of soils. The EPA Region 9 Preliminary Remediation Guide (PRG) concentrations for the organic constituents in Industrial Soils will serve as the organic closure performance standards for closure certification of soils.

For equipment or other items that cannot be adequately inspected or may not meet the Clean Debris Surface Standard of 40 CFR 268.45 Table 1, Section A, a sample of the final rinsate from the decontamination process associated with each piece of equipment/item will be collected, and the analytical results for the metal and organic COCs will be compared to the analysis of unused decontamination water.

Equipment/items meeting the clean closure performance standards defined in Section 5.0 of this document will be deemed to be clean and can be removed from RCRA Subtitle C regulation. For equipment/items not meeting the clean closure performance standards, the facility will perform additional decontamination (i.e., repeat the decontamination as specified for that piece of equipment/item) and re-evaluate the decontaminated equipment/item against the clean closure performance standards.

If, after a number of attempts are made to decontaminate equipment/items and the clean closure performance standards are not met, the facility will dispose of the equipment/item off-site as hazardous waste.

Rather than decontaminating equipment/items, the facility may alternatively elect to ship the piece of equipment/item offsite for treatment/disposal as a hazardous waste. This would remove the equipment/item from the site. Therefore no threat to human health or the environment would be applicable for that piece of equipment at the facility. This decision would be based on the size and geometry of the equipment/item, the cost of treatment and/or disposal, the cost of further decontamination, etc.

8.0 CLOSURE SCHEDULE

The closure activities, as necessary, are scheduled to be performed in general accordance with the following schedule:

Task	**Days**
Notification of Closure to Regulatory Agency	0 (initiating period)
A. Preparation of Closure Bid Package	7 days (calendar)
B. Submission and Contractor Review	7 days
C. Site Visit for Contractors	7 days
D. Contractor Bid Package Preparation/Submittal	14 days
E. Contractor Award/Contract/Notice to Proceed	7 days
F. Preparation and Submittal of Health & Safety Plan	30 days
G. Contractor Mobilization	14 days
H. Closure Activity Implementation	70 days
i. Container Storage Area Decontamination (20 days)	
ii. Tanks and Ancillary Equipment Decontamination (20 days)	
iii. Carbon Reactivation Unit Decontamination (20 days)	
iv. Soil Investigation (10 days)	
I. Obtain Sample Results	30 days
J. Profiling/Shipment of Materials to be Disposed Off-site as Hazardous Waste/Debris	30 days
K. Submittal of Certification of Closure	60 days
L. Force Majeure	14 days
M. Schedule Contingency	20 days
TOTAL	310 days (calendar)
TOTAL ALLOWED TIME	310 days

This schedule will be utilized for the closure of the container storage area, tanks and associated ancillary equipment, and the carbon reactivation unit. Certain activities (e.g., decontamination of the container storage area, tanks and associated ancillary equipment, and carbon reactivation unit) may be conducted concurrently. The facility will notify EPA of the intent to initiate closure as specified in Section 9.0.

9.0 CLOSURE ACTIVITY NOTIFICATION

EWT will notify the EPA in writing at least 60 days prior to the date that EWT expects to initiate closure. EWT will complete all closure activities within 310 days of initiating closure in accordance with the approved Closure Plan. An extension may be requested if EWT determines that additional time will be necessary to complete closure.

10.0 CERTIFICATION OF CLOSURE

In accordance with the requirements of 40 CFR 264.115, within sixty (60) days of completing closure, EWT will notify the EPA, by registered mail, that closure activities have been completed in compliance with the specifications of the approved Closure Plan by submission of a Certification of Closure.

The Certification of Closure will include signatures from the EWT Owner/Operator and the independent Registered Professional Engineer. EWT will retain documentation necessary to support the independent Registered Professional Engineer's certification. Support documentation will be submitted to the EPA on request.

Financial assurance documentation will be retained by EWT until the EPA has officially released EWT from the financial assurance requirements for Final Closure as required by 40 CFR 264.143(i) and EWT confirms receipt of this release. In addition, upon receipt of this release, EWT will consider the container storage area, tanks and ancillary equipment, and carbon reactivation unit closed and all permit requirements identified in the RCRA permit will cease to apply to the container storage area, tanks and associated ancillary equipment, and carbon reactivation unit.

If the facility performs partial closure of any portion of the facility, this Closure Plan will be modified to include only the remaining equipment. In addition, the closure cost estimate will be amended to include only the remaining equipment.

11.0 CLOSURE COST ESTIMATE

The cost estimate for performing the above closure activities pertaining to the container storage area, tanks and associated ancillary equipment and carbon reactivation unit is included as Attachment 4 of this Closure Plan.

Note: Analytical costs have been estimated on the following basis:
Metals (excluding Hg) $200/analysis
Mercury $45/analysis
Volatile organics $195/analysis
Semivolatile organics $370/analysis
Nitrogen and phosphorous pesticides $200/analysis

12.0 FINANCIAL ASSURANCE

The financial assurance mechanism currently in effect for closing the entire facility is included as Appendix XVIII to the RCRA Part B Permit Application.