

**ATTACHMENT 8**

**CLOSURE AND POST-CLOSURE PLAN**

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## **CLOSURE PLANS, POST-CLOSURE PLANS, AND FINANCIAL REQUIREMENTS**

### **1.0 Closure Plans [UAC R315-270-14(b)(13), R315-270-23(a)(2), R315-264-112]**

This Closure Plan identifies all steps necessary to achieve closure of the TTU at the end of its operating life, or partial closure of a specific area of the TTU that is no longer utilized. It also includes closure requirements for the temporary storage pads located in the Missile Storage Area (MSA Pads 1 and 2). Copies of the plan will be maintained by 75 CEG/CEIE, HAFB, Utah, until closure is completed, certified by the permittee, and signed by an independent qualified Utah-licensed professional engineer practicing within the scope of his/her education and training. This plan will be updated as necessary in accordance with Section II.P of the Permit. Partial closure activities conducted prior to initiation of final site closure will be documented as appendices to this plan.

### **1.1 Closure Performance Standard [UAC R315-264-111]**

RCRA closure requirements are intended to protect human health and the environment as well as to minimize the need for post-closure maintenance. These goals can be achieved through either:

- Clean closure - closure to screening or risk-based cleanup standards, accomplished by removing all hazardous wastes and hazardous waste residues from the unit, or
- Non-clean closure - closure where wastes remain in place and specific post-closure care is performed in order to monitor waste containment.

For clean closure, if any contamination in the form of hazardous wastes or constituents contained in soils or groundwater is determined to be the direct result of past operations of the TTU or is shown to be present in concentrations above cleanup goals, background concentrations, or other standards or guidance levels, further study will be done to determine the nature and extent of this contamination and what remediation requirements are needed. If warranted, an appropriate Corrective Measures Study (CMS) will be prepared and submitted to the Director of the Utah Department of Environmental Quality Division of Waste Management and Radiation Control (DWMRC) for approval in accordance with Module IV of the Permit. Upon approval, the CMS will then be implemented to remedy any identified contamination in soils and/or groundwater.

However, if data suggests clean closure is not a practicable alternative, the TTU will be closed in accordance with the closure standards for a landfill. The closure activities associated with each closure option are discussed in Section 1.5. The temporary storage pads in the MSA are operated in a manner that is unlikely to allow contamination and will be clean closed.

### **1.2 Partial Closure and Final Closure Activities [UAC R315-264-112]**

Partial closure of operational areas within the TTU may be accomplished as deemed necessary. In the case of final closure, for the purposes of determining the maximum extent of operations during the life of the facility, the area of closure will be defined as the TTU described in Attachment 1. This will not only include the current operational areas but also those areas that may have been impacted by past hazardous waste thermal treatment and/or disposal operations.

(such as areas used for burial of spent munitions). These areas are now within the TTU fence. Because closure will be performed for the entire TTU, none of it will remain open.

### **1.3 Maximum Waste Inventory [UAC R315-264-112(b)(3)]**

The maximum inventory of hazardous waste ever on-site at the TTU over the active life of the facility is 340,000 lb NEW.<sup>1</sup> This is the maximum quantity of propellant allowed under AF explosive safety rules to be treated at the TTU in a single event by OB. The maximum quantity of high explosives allowed to be treated at the TTU at one time by OD is 149,900 lb NEW. This is also the upper explosive safety limit prescribed by AF explosive safety rules. No hazardous waste treatment processes, other than OB/OD thermal treatment, have ever taken place at the TTU.

### **1.4 Schedule for Closure [UAC R315-264-112(b)(6)]**

The extent of requirements to fully or partially close the TTU will not be known until closure activities reveal the nature and extent of any contamination in soils and groundwater. However, ongoing soil and ground water sampling will be conducted as discussed in Attachment 9 of this permit.

#### **1.4.1 Time Allowed for Closure [UAC R315-264-112(b)(2) and 113(a) and (b)]**

An estimated closure schedule that includes the time needed to complete all required closure activities for final closure is provided in Table 1. Should final or partial closure activities determine a CMS is required, the procedures and schedule specified in Module IV of the Permit will be followed. The CMS schedule will include all activities necessary to complete final or partial closure, including post-closure monitoring. Final or partial closure will be supervised and certified by an independent qualified Utah-licensed professional engineer practicing within the scope of his/her education and training.

#### **1.4.2 Extensions for Closure Time [UAC R315-264-113(a) and (b)]**

If for any reason closure cannot be completed within the specified time frame outlined in the closure schedule, a request or petition for an extension of the closure time will be submitted to the Director. This petition will identify the need for the extension, the status of the facility, and the actions required to prevent threats to human health or the environment during the extension period. The written request will include a copy of the amended closure plan.

### **1.5 Closure Procedures [UAC R315-264-112 and 114]**

Clean closure of the TTU or areas within the TTU is preferred, but unrecoverable past releases of hazardous waste may make clean closure unachievable. To determine the nature and extent of these past releases, certain actions must be taken. These are described in subsequent sections. Upon completion of all closure activities, the TTU or partial areas thereof will be deemed closed under RCRA requirements.

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<sup>1</sup>Munitions are reported in units of pounds NEW. The NEW is the weight of the reactive filler material.

### **1.5.1 Geophysical Survey**

The locations of all areas within the TTU used to treat and/or bury munitions are not precisely identified or mapped. To date, no investigations have been performed to delineate their possible locations, dimensions, or orientations. To assist in identifying and determining the areal boundaries of TTU OB/OD treatment and burial sites, and to protect soil and groundwater sampling teams from encountering any UXO, a geophysical survey will be included as part of closure activities. The geophysical survey may be conducted using a variety of potential technologies, including aerial or ground-based techniques, and may be conducted by either HAFB EOD or contractor personnel. The geophysical survey procedures will be presented in the final closure plan developed in accordance with Section II.P of the Permit. A geophysical survey is not required for partial closure activities that do not involve subsurface clearance or corrective action. These areas would remain subject to further investigation upon final closure of the TTU.

The survey will be designed to discover munitions debris, consisting of metal fragments and inert munitions casings lying on the surface, partially buried, buried close to the surface, deeply buried by itself, or contained in old burial pits. After locating and excavating them, if required, each item will be inspected by EOD or contractor personnel in accordance with TO 11A-1-60, "Inspection of Reusable Munitions Containers and Scrap Material Generated from Items Exposed to, or Containing Explosives." Items determined to be inert will be certified, collected, and transported to the Oasis Resource, Recovery, and Recycling (R3) yard for further disposition. Any UXO or munitions fragments suspected of still containing reactive components will either be treated in situ or at one of the TTU sites, depending on its type, size, and condition. If the UXO or munitions fragments constitute an imminent threat to human health and the environment, and if it is necessary to treat outside the permitted TTU, such activities will be considered emergency treatment, and an emergency treatment permit will be requested from the Director of the Utah Division of Waste Management and Radiation Control. All inspection, certification, and treatment activities will be conducted only by qualified EOD or contractor personnel.

Once the TTU is cleared of hazardous scrap metal and UXO, soil and groundwater samples can be safely collected for analysis. If a decision is made by the EOD team that an area cannot be safely cleared of UXO, the location of the contaminated soil will be duly noted for future reference. This will result in a non-clean closure of the TTU.

### **1.5.2 Soil and Groundwater Sampling**

Baseline soil and groundwater sampling will be conducted as part of this permit (Attachment 9, Attachment 15). This sampling will establish the extent of surface and subsurface soil and groundwater contamination due to past operations. Closure activities must include similar soil and groundwater sampling. The results of the closure sampling will be used to establish cleanup requirements.

- Site-specific sampling locations, quantities, sample collection and analytical methods, and QA/QC issues will be addressed and presented in the final closure plan or any partial closure plan developed in accordance with Section II.P of the Permit. Surface

sampling for characterization of potential contamination at the temporary storage pads in the MSA will be included in the plan.

#### **1.5.2.1 Sampling Equipment Decontamination Procedures**

All field sampling equipment will be precleaned prior to arrival on-site and decontaminated in accordance with standard procedures. A decontamination area will be established and maintained on-site for all decontamination activities. The site will be selected by the sampling team based on the location's ability to isolate the decontamination area and assist in preventing cross-contamination of sampling equipment.

#### **1.5.2.2 IDW Management**

All wastes generated from field sampling and decontamination activities will be treated as contaminated media until data are available to determine their actual characteristics. This material will be drummed and stored at the TTU pending the outcome of sampling analysis. Specifics such as date, time, equipment being decontaminated, and the associated sample identification number for the equipment being decontaminated will be recorded in a field logbook. Liquids will be drummed separately from solids, and the drums will be properly labeled. It is anticipated that investigative-derived waste (IDW) will consist of decontamination fluids and rinsates, contaminated PPE, and soil cuttings.

Segregation, minimization, handling, and labeling of IDW will be performed. Solid IDW will be placed in DOT 17H drums or other DOT approved container. All groundwater, decontamination fluids, and rinsates will be placed in DOT 17E drums or other DOT approved container. Each drum will be clearly labeled and dated the day it is filled using indelible ink and have the following source identification:

- Date;
- Material contained;
- Location;
- Number of drums from location; and
- Possible contaminant

Contaminated media will be managed in accordance with the current Utah and federal hazardous waste rules. For instance, if concentrations of samples collected from decontamination/rinsate fluids exceed the Universal Treatment Standards (UTS) of UAC R315-268-40 or the maximum contaminant levels (MCLs), whichever is lower, the drummed waste will be considered a hazardous waste and will be managed accordingly. All soils with hazardous constituent concentrations exceeding the UTS or the soil screening levels (SSLs) (i.e., cleanup goals), whichever is lower, are considered hazardous waste and similarly managed. Wastes determined to be hazardous will be picked up by a contractor for transport to a permitted disposal facility.

If the results indicate none of the UTS or SSL/MCL concentrations have been exceeded, wastewater and/or soils are not considered hazardous waste and will be managed in accordance with DWMRC-approved BMPs. Such BMPs will be submitted by 75 CEG/CEIE prior to initiating any disposal activities at the TTU involving potentially contaminated media.

All sanitary trash and uncontaminated PPE will be discarded in accordance with applicable solid waste regulations.

### **1.5.2.3 Health and Safety Procedures**

Personnel performing sampling will use appropriate PPE deemed necessary to accomplish sampling tasks. The PPE to be used will be specified in the closure Health and Safety Plan. Sampling personnel will be properly trained in hazardous waste sampling procedures and will have appropriate medical monitoring and certification. Sampling personnel will also be briefed by the EOD RSO on the hazards of sampling in a potential explosively-contaminated environment. It should be noted that subsurface UXO can only be reliably detected down to approximately 15 ft, depending on other metallic contamination, soil type, etc. Although no subsurface soil sampling is anticipated below that depth, should additional groundwater sampling and monitoring wells be required, down-hole fluxgate gradiometer checks will be taken at regular intervals to ensure no UXO are encountered by groundwater well drilling crews. If instruments indicate the presence of UXO, the sampling site will be relocated to a nearby, UXO-free location and appropriate annotations made in the sampling logbook.

### **1.5.3 Determining Cleanup Goals**

The analytical results of all soil and groundwater samples taken from the TTU during closure sampling will be compared to background concentrations. Those compounds exceeding background levels will be identified as potential contaminants of concern to be investigated as possible candidates for remediation/removal. For each contaminant of concern, a review of existing standards and guidelines (in terms of soil and groundwater concentrations) will be completed. These screening criteria, which are very conservative by nature, may be used to define the clean closure requirements for the site.

In lieu of the screening criteria, risk-based cleanup levels may be developed in accordance with UAC R315-101. This decision will be driven by the availability of screening criteria for each contaminant of concern, as well as future land use and expected institutional controls. The risk-based criteria will most likely justify a reduction in the extent of remediation/removal actions needed for the site but will still allow the site to achieve clean closure. The Director must concur with the cleanup levels and remediation strategy HAFB selects for the TTU.

If site investigation results indicate clean closure is not practicable, a non-clean closure option will be considered. Under this option, the wastes will remain in place and strict post-closure monitoring activities (e.g., groundwater monitoring) will be completed to ensure the wastes are not migrating from the site and do not, therefore, pose a risk to human health or the environment.

### **1.5.4 Site Cleanup**

#### **1.5.4.1 Inventory Removal [UAC R315-264-112(b)(3)]**

The TTU hazardous waste inventory may consist of (1) ash residue left over from OB/OD treatment activities; (2) untreated UXO; and (3) soil cuttings, decontamination fluid, and other IDW. Ash will be drummed and managed in accordance with Section 1.5.4.3. UXO and contaminated scrap will be treated as described in Section 1.5.1. IDW will be managed in accordance with Section 1.5.2.2.

#### **1.5.4.2 Disposal or Decontamination of Equipment and Structures [UAC R315-264-112 and 114]**

**Note: The burn pan described below was decommissioned and partially closed in accordance with this plan on May 2, 2018.**

To the extent possible, decontamination and disposal will be performed on existing man-made structures at the TTU. These include the burn pan, burn pan cover, and burn pan supporting structure. Additionally, once the final drums of contaminated fluids and soil cuttings are removed from the TTU hazardous waste accumulation facility, this will also be decontaminated and removed. Decontamination activities will be done in such a way as to allow for reuse or recycling of those components suitable for that purpose (e.g., metal structures that could be certified clean).

All components of the burn pan will be visually inspected, and any visible waste and debris will be physically removed. The burn pan concrete pads and support columns will be scraped and brushed of all loose waste and debris. Upon removal of all loose waste and debris, the burn pan and its cover will be pressure-washed to remove any remaining residue. A bermed decontamination pad constructed of 30 mil plastic and large enough to contain the burn pan and lid will be used to contain all wash water. The decontamination pad will be positioned adjacent to the burn pan.

Following decontamination, rinsate samples and concrete chips will be collected from the burn pan and analyzed for Toxic Characteristic Leaching Procedure metals and explosive compounds to verify their cleanliness. If rinsate or concrete chip analysis indicates additional decontamination is necessary, the decontamination process and accompanying analysis will be repeated until each component is verified as clean. Once the treatment structures are certified clean, they will be either transported to the Oasis R3 yard to be stored until contracted for disposal/recycling or disposed of at the UTTR-North sanitary landfill. All waste generated from the decontamination process will be containerized in drums for characterization and disposal/recycling.

Soils adjacent to each pad will be characterized as part of the subsurface investigation of the TTU. To provide continued protection against unauthorized visitors to the TTU, the fence and gates will remain in place and be routinely maintained as required (see Table 2).

#### **1.5.4.3 Closure of Containers [UAC R315-264-178, R315-264-110 through 120, and R315-270-14(b)(13)]**

All ash and contaminated debris identified as treatment residue, solid IDW, and decontamination fluids and rinsates will be placed in DOT 17E and 17H drums or other DOT approved container, as previously described. Should sampling analysis determine these to be contaminated, each container will be closed and transported to a hazardous waste disposal facility. Remaining containers will be decontaminated and removed from the facility.



#### **1.5.4.4 Remediation**

In the event contamination is detected after HAFB and DWMRC agree to pursue clean closure, activities necessary to remediate the site to predetermined cleanup levels will be conducted. These activities will be documented in the CMS as discussed in Section 1.1.

#### **2.0 Closure Certification and Required Notices [UAC R315-264-115 and 116]**

Within 60 days of the completion of closure for the TTU and the MSA temporary storage pads, 75 CEG/CEIE will submit in writing (by registered mail) a closure certification to the Director. The certification will verify that the hazardous waste treatment facility was closed in accordance with the specifications outlined in the approved closure plan, including the completion of all required corrective action measures. The certification will be signed by an authorized official of the HAFB 75<sup>th</sup> Air Base Wing and an independent qualified Utah-licensed Professional Engineer practicing within the scope of his/her education and training. Documentation supporting the Professional Engineer's certification will be furnished to the Director upon request.

No later than the submission of closure certification, 75 CEG/CEIE will also submit to the local zoning authority, or the authority with jurisdiction over local land use, and the Director, a survey plat indicating the location and dimensions of the facility with respect to permanently surveyed benchmarks. The survey plat will be prepared and certified by a professional land surveyor licensed in Utah. The survey plat will contain a note, prominently displayed, which states the 75 CEG/CEIE is obligated to restrict disturbance of the hazardous waste disposal unit in accordance with UAC R315-264-110 through 120.

#### **3.0 Closure Cost Estimate [UAC R315-264-142]**

The TTU is a federal government facility, owned and operated by the HAFB 75<sup>th</sup> Air Base Wing for the AF and the DOD. As such, it is exempt from the requirements for closure cost estimates under UAC R315-264-140(c).

#### **4.0 Financial Assurance Mechanism for Closure [UAC R315-264-143]**

The TTU is a federal government facility, owned and operated by the HAFB 75<sup>th</sup> Air Base Wing for the AF and the DOD. As such, it is exempt from the requirements for financial assurance for closure under UAC R315-264-140(c).

#### **5.0 Post-Closure Plan [UAC R315-270-14, R315-270-23(a), R315-264-118, and R315-264-603]**

This plan identifies all necessary activities to be implemented following closure of the TTU. Post-closure care will include all planned monitoring and maintenance activities, as required, along with their respective frequencies. The post-closure plan will be based on the general requirements of R315-264-118 and the post-closure care requirements of R315-264-603. Should it be impracticable to remove all contaminated soils or UXO during closure, the treatment units will be monitored in accordance with the groundwater monitoring plan. This plan will be updated as necessary in accordance with Section II.P of the Permit.

### **5.1 Post-Closure Use of Property**

The post-closure use of property following final closure will not be allowed if such use results in a disturbance of the area. This may endanger personnel entering the area or may result in disturbance or damage to the facility's monitoring and/or remediation systems (i.e., groundwater wells) that exist at the TTU. 75 CEG/CEU will maintain the fences and gates while 75 CEG/CEIE will maintain monitoring devices. Table 2 describes the TTU inspection and maintenance plan. Post closure use of the MSA temporary storage pads will not be restricted if the area is successfully clean closed.

### **5.2 Post-Closure Care [UAC R315-270-23(a)(3) and R315-264-603]**

The post-closure care period for the TTU will begin after the completion of closure of the waste management units, including all required corrective measures, and will continue for a period of time that is dependent on whether the facility can be clean closed. This determination cannot be made until closure activities are completed.

### **5.3 Post-Closure Security [UAC R315-264-117(b)]**

The TTU is not intended for public access, but is located in an area that may be used for grazing domestic livestock. In addition, the TTU is within the UTTR-North and immediately west of the Helicopter Air-to-Ground (HAG) Range. These are used as munitions testing and training ranges, respectively. Therefore, security requirements will be implemented following closure. Because of the remoteness of the facility, security can be ensured using the existing three or four-strand wire fence and the existing locked gates.

### **5.4 Post-Closure Contact [UAC R315-264-118(b)(3)]**

Post-closure contact should be with 75 CEG/CEIE, HAFB, until the post-closure care period is completed, certified by the permittee, and signed by an independent qualified Utah-licensed Professional Engineer practicing within the scope of his/her education and training.

### **5.5 Monitoring Plan [UAC R315-264-118(b)(1)]**

Groundwater monitoring will be conducted at the TTU during the post-closure care period (and during the closure period as well) to determine whether any remaining contamination could originate from the TTU (e.g., hazardous wastes or hazardous constituents from any contaminated soils that might remain in place following closure) and impact groundwater quality. Post-closure monitoring will be the same as that described in the SAP (Attachment 15).

### **5.6 Maintenance and Inspection Requirements [UAC R315-264-118(b)]**

Specific items to be inspected during the post-closure care period, as well as their respective schedules and corrective action responses, are outlined in Table 2. The TTU will be re-seeded; however, a final cover of the TTU is not proposed as part of closure activities.

All inspections will be recorded in an inspection log kept by 75 CEG. The inspection log will include the following:

- the date and time of the inspection,

- the name of the inspector,
- a notation of observations made regarding:
  - condition of security devices (fencing, gates, locks, legibility of signs)
  - drainage control (areas indicative of degradation, blockage, settlement, etc.)
  - detection/monitoring equipment (damaged well casings, protective posts, eroded well pads)
  - disturbance of surveyed benchmarks
- the date and nature of any repairs or remedial measures taken to correct the problem.

If an inspection reveals deterioration or breakage of equipment and/or structures, remedial action will be implemented to prevent or mitigate any harm to human health and the environment. When such a hazard is recognized as being an imminent threat, remedial action will be taken immediately.

#### **5.7 Amendment of Post-Closure Plan [UAC R315-264-118(d)]**

An amended post-closure plan will be submitted for review and approval by the Director if (1) changes in the operating plans or facility design affect the approved post-closure plan, or (2) events occur during the active life of the facility, including partial or final closure, that affect the approved post-closure plan. The Director reserves the right to request modification to the plan under the conditions described in Utah Admin Code R315-264-118(d)(4).

The post-closure plan will be amended at least 60 days prior to a proposed change in facility design or operation or no later than 60 days after an unexpected event has occurred that affects the post-closure plan.

#### **5.8 Post-Closure Notices [UAC R315-264-116 and 119]**

If any wastes (determined to be hazardous) remain in place following the completion of closure activities, a record of their type, location, and quantity will be submitted to the authority with jurisdiction over local land use, and to Director no later than 60 days following closure.

Additionally, an Environmental Covenant, as provided for in Utah Code § 57-25-101, *et seq.*, covering the facility property will be recorded within 60 days of final certification of closure of the first hazardous waste disposal unit and within 60 days of the last hazardous waste disposal unit. The contents of the environmental covenant will include all information required by Utah Code § 57-25-104(1) and, where applicable, information required by Utah Code § 57-25-104(2).

A survey plat and record of the type, location, and quantity of hazardous wastes disposed of within each disposal unit at the OB/OD facility will be filed with the authority with jurisdiction over local land use and with the Director. The plat will state 75 CEG's obligation to restrict disturbance of the hazardous waste disposal unit area in accordance with applicable Subpart G regulations.

A certification signed by an authorized official of 75 CEG signifying the deed notation was recorded, including a copy of the document in which the notation was placed, will be submitted to the Director.

**5.9 Certification of Completion of Post-Closure Care [UAC R315-264-120]**

A certification that the post-closure care period for the hazardous waste treatment facility was performed in accordance with the specifications in the approved post-closure plan will be submitted by registered mail to the Director no later than 60 days following completion of the established post-closure care period. The certification will be signed by an authorized official of 75 CEG and an independent qualified Utah-licensed professional engineer practicing within the scope of his/her education and training. Documentation supporting the Professional Engineer's certification will be furnished to the Director upon request.

**5.10 Financial Requirements for Post-Closure [UAC R315-264-144 and 145]**

UTTR-North facilities are owned and operated by the federal government and, as such, are exempt from the financial requirements of post-closure care under Utah Admin. Code R315-264-140(c). These include R315-264-144, "Cost Estimate for Post-Closure Care," and R315-264-145, "Financial Assurance for Post-Closure Care."

**TABLE 1**  
Estimated Closure Schedule

<b>Task</b>	<b>Closure Activity</b>	<b>Start Date</b>	<b>Completion Date</b>
1	Mobilize to the field	First day (D-1)	D-3
2	Conduct geophysical survey and remove UXO/scrap	D-3	D-13
3	Sample soil and groundwater	D-14	D-17
4	Decontaminate and dispose of TTU structures	D-17	D-20
5	Demobilize	D-21	D-22
6	Review and validate data	D-23	D-48
7	Write closure report	D-23	D-100
8	Monitor post-closure compliance	D-107	To be determined

**TABLE 2**  
Inspection and Maintenance Plan for TTU

<b>Area/Equipment</b>	<b>Specific Items</b>	<b>Potential Problems</b>	<b>Corrective Action</b>	<b>Inspection-Frequency</b>
Security devices	Facility fence	Broken	Repair immediately, if damaged	Quarterly
	Access gate	Locking mechanism jammed	Repair/replace	Quarterly
	Signs	Illegible	Replace	Quarterly
Detection/monitoring equipment	Monitoring wells	Unlocked well caps, damaged casings, protective posts or well pads	Secure well caps; if damage precludes the use of the well, seal damaged well, and install a replacement well	Quarterly
Benchmarks	N/A	Damage	Replace, if damaged	Quarterly
Soil	Re-seeded vegetation	Erosion	Re-seed; implement soil retention measures	Quarterly

**Appendix A**

**Site 3 Partial Closure Activities: Miscellaneous Munition Burn Pan**

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Table 4. UTTR Emergency Contacts

Figure 1. Aerial Image of Site 3 Burn Pan

Figure 2. Burn pan showing weather cover and gantry (February 2017)

## 1.0 EXECUTIVE SUMMARY

**Note: The burn pan described below was decommissioned and partially closed in accordance with this plan on May 2, 2018.**

The burn pan at the Utah Test and Training Range (UTTR) Thermal Treatment Unit (TTU) was built in 1992. From 1994 to 1997, it was used to treat 48,033 pounds (5,714 pounds NEW) of small arms and other explosive wastes. Burn pan usage was discontinued in 1997 because alternative treatment options for these small explosive wastes were developed, but has continued to be included as a permitted “inactive” operational site (Site 3) in the UTTR Hazardous Waste Operating Permit (UTTR Permit) (UT0570090001). The burn pan weather cover is damaged and in disrepair due to continued detonation activities at the TTU and the purpose of the unit was questioned during a recent Strategic Arms Reduction Treaty (START) inspection. Because there is no anticipated future use for the burn pan, the US Air Force is proposing to partially close the site.

Proposed partial closure activities are governed by the UTTR Permit. Partial Closure will include removal and recycling of the site gantry, dismantling and recycling of the burn pan weather cover, and decontamination and recycling of the steel burn pan and lid. Characterization and restoration of the area surrounding the burn pan will be conducted via ongoing biennial sampling and final closure activities.

## 2.0 BACKGROUND

The TTU is located in the eastern part of the UTTR-North, adjacent to the western shore of the Great Salt Lake in Box Elder County (see UTTR Permit Attachment 1, Figure 1). It is centered on latitude 41° 07' 45.45" North, longitude 112° 07' 41.38" West, as depicted on the Strongs Knob, Utah, U.S. Geological Survey (USGS) Map. The TTU is operated for the Ogden Air Logistics Complex (OO-ALC), Hill Air Force Base (AFB), Utah, by the 75 Civil Engineer Group, 775 Civil Engineering Squadron, Explosive Ordnance Disposal (EOD) Flight, on behalf of the U.S. Air Force (USAF) and the U.S. Department of Defense (DoD). The UTTR is assigned U.S. Environmental Protection Agency (USEPA) ID No. UT0570090001.

The TTU occupies a 2-square mile area in a gently southwestward-sloping valley. The TTU topography and geology, its proximity to Box Elder County Road 02230, the types of operations conducted, and the quantities of munitions treated were all taken into consideration in determining the size and shape of the TTU. The TTU is outlined on the aerial photograph shown in UTTR Permit Attachment 1, Figure 2.

The TTU contains four sites used for treating waste munitions by open burning (OB) or open detonation (OD) (See UTTR Permit Attachment 1, Figure 2). Sites 1 and 4 are the rocket motor and bulk propellant OB pads. Site 2 consists of three smaller OB/OD pads for treating rocket motors as well as other waste munition items and a large pad used for detonation of large missile motors. Site 3 is the munitions burn pan where cartridge-actuated device (CAD) and propellant-actuated device (PAD) items, flares, and small arms ammunition are treated by OB.



Site 3, the miscellaneous munitions burn pan, is located in the eastern portion of the TTU at 41° 07' 55.72" North latitude, 112° 53' 25.55" West longitude. It is located approximately 150 ft southeast of the burn pit it replaced. This pan was constructed in 1992, but not put into operation until 1994. It is approximately 7 ft wide and 20 ft long and is constructed of steel plate and concrete. The pan is used to treat by OB, CAD/PAD items, flares, and small arms ammunition. An aerial view and a photograph of the pan are included in Figures 1 and 2. The engineering drawings of the pan are included in the UTTR Permit Attachment 1, Figure 4. The pan is completely surrounded by a concrete containment structure or box and has a movable track-mounted weather cover intended to keep out precipitation and wildlife when not in use. A large steel lid for the pan and a site gantry to assist with offloading items to be treated are also present at the site.



**Figure 1. Aerial Image of Site 3 Burn Pan**



**Figure 2. Burn pan showing weather cover and gantry (February 2017).**

## **2.1 Permit Requirements Describing Operation of the Burn Pan**

The following requirements from Module III of the UTTR Permit discuss how the burn pan was operated (These requirements will be removed from Module III upon execution of the partial closure activities described in this Appendix):

### **III.D.3. Open Burning in the Miscellaneous Munitions Burn Pan (Site 3)**

III.D.3.a. The Permittee shall operate and maintain the burn pan in accordance with the design plans and specifications in Attachment 1.

III.D.3.b. The Permittee shall operate and maintain the munitions burn pan in accordance with the following conditions:

III.D.3.b.i. Open burning shall be conducted only during daylight hours, sunrise to sunset.

III.D.3.b.ii. The Permittee shall operate and maintain a lid on the burn pan, during years of burn pan operation, to keep out precipitation, vegetation and wildlife.

III.D.3.b.iii. The Permittee shall manage accumulated precipitation in accordance with the WAP in Attachment 3.

III.D.3.b.iv. The Permittee shall treat only waste identified in Condition III.B.1 and small arms ammunition greater than or equal to .50 caliber.

III.D.3.c. The Permittee shall operate and maintain the burn pan in order to minimize exposure to air emissions in accordance with the following conditions:

III.D.3.c.i. The area surrounding the burn pan shall be inspected for untreated explosives, propellant material, or other kick out material after each burn. Non-energetic residue will be collected, characterized and accumulated for disposal or recycling. Energetic residue that is safe to handle will be stored at the TTU for up to 90 days and treated at the next OB operation. Energetic residue that is not safe to handle will be retreated within 24 hours at the TTU.

III.D.3.c.ii. Prior to use of the burn pan, all combustible material, within 50 ft. of the pan, shall be removed.

III.D.3.d. The integrity of the munitions burn pan and the concrete secondary containment shall be evaluated by March 1 of each year the pan is in operation. A report of the evaluation, signed by an independent qualified Utah-licensed professional engineer practicing within the scope of his/her education and training, shall be submitted to the Director by March 31 of each year. Any deficiencies identified in the report shall be corrected before the burn pan is used.

III.D.3.e. The Permittee shall use combustible material and fuel oil as an initiator of the burn in accordance with the following conditions:

III.D.3.e.i. The combustible material shall consist of wooden ammunition crates and/or pallets, non-explosive contaminated scrap wood and cardboard boxes used to pack and ship the items to be treated.

III.D.3.e.ii. The fuel shall be less than 50 gallons of No. 2 diesel fuel.

III.E.1.c. The burn pan shall remain closed until the ash is removed.

### **III.G.2. Soil Monitoring Adjacent to Site 3 Burn Pan**

III.G.2.a. The Permittee shall sample the soil adjacent to the burn pan at Site 3 annually, for every year the pan is in operation, according to an approved sampling and analysis plan (SAP).

## **2.2 Summary of Partial Burn Pan Closure Activities**

To partially close the Site 3 Miscellaneous Munitions Burn Pan, the following steps will be undertaken:

- Removal and recycling of the site gantry.
- Dismantling and recycling of the burn pan weather cover.
- Removal, decontamination, and recycling of the steel burn pan and lid

### 3.0 HISTORIC BURN PAN USAGE

Operational logs of the TTU were reviewed and indicate that the burn pan was used 26 times from March 1994 through October 1997 to treat a total of 48,033 pounds of waste (5,714 pounds net explosive weight). Table 1 summarizes the treatment events. Operational logs and manifests for each treatment event are available in the TTU operating log.

**Table 1. Historic Treatment Events at the Site 3 Burn Pan**

LOG #	Date	Gross Weight	NEW <sup>1</sup>	Notes
2	16-Mar-94	6228	322	Initiators, Linear Charges, Misc. Items
7	17-May-94	517	243	Black Powder, Propellant
9	27-May-94	4791	146	20mm, Misc. Items
15	27-Jun-94	5257	135	Gas pressure gen., Misc. Items
26	9-Aug-94	1088	167	Explosive kits, Flares
4	28-Mar-95	855	22	Det cord, Cartridges, Misc. Items
10	25-Apr-95	932	251	Cartridges, Fuzes
14	3-May-95	268	6	Fuzes, Misc. Items
17	9-May-95	1362	183	Cartridges, Misc. Items
25	13-Jun-95	732	37	Cartridges, Fuzes, Misc. Items
27	20-Jun-95	3864	4	Fuzes
31	18-Jul-95	1234	255	Cartridges, Fuzes
32	24-Jul-95	744	63	Cartridges, Fuzes, Misc. Items
1	6-Mar-96	1085	79	Cartridges, Shape Charges, Fuzes
10	16-Apr-96	573	171	Cartridges, Igniters, Misc. Items
13	30-Apr-96	3187	682	Flares, Cartridges, Misc. Items
20	14-May-96	1066	1066	Flares
30	25-Jun-96	458	9	Cartridges, Fuzes, Misc. Items
36	30-Jun-96	73	9	Fuzes, Rocket Motor
50	4-Sep-96	574	140	Fuzes, Cartridges
68	14-Nov-96	876	61	Igniters, Cartridges, Fuzes
3	20-Feb-97	4081	688	Cartridges, Igniters, Flares
20	21-May-97	1761	90	Cartridges, Charges
33	16-Jul-97	1598	262	Propellant, Cartridges
37	25-Jul-97	4089	394	Flares
66	30-Oct-97	740	229	Cartridges, Fuzes
<b>TOTAL</b> :	<b>26 Operations</b>	<b>48033</b>	<b>5714</b>	

<sup>1</sup>Net Explosive Weight

#### 4.0 HISTORIC SAMPLING DATA

Sampling of the burn pan area was conducted in 1989 and 1991 before the current burn pan structure was installed. This sampling was described in the 1997 RCRA Part B Permit Application for the TTU (US Air Force, 1997). In 1989, “five samples were collected in a preliminary study of the munitions burn pit adjacent to what is now Site 3...Four of the five samples were taken from the top 2 in. of soil in the bottom of the pit. The fifth sample was taken to represent background conditions approximately 150 to 200 yards east of Site 3.” The results indicated elevated levels of Total Petroleum Hydrocarbons ranging from 210 to 47,000 mg/kg (the single background sample level was 20 mg/kg). Detections of some polycyclic aromatic hydrocarbons including acenaphthene, fluorene, 2-methylnaphthalene, naphthalene, phenanthrene, and pyrene were also observed as were bis (2-ethylhexyl) phthalate and dibenzofuran. Metals including arsenic, cadmium, chromium, and lead were also detected, of which only lead exceeded twice the background sample concentration with an average of 225 mg/kg (lead in the background sample was 16.1 mg/kg).

In 1991, six soil samples were taken in the Site 3 area. Results of the sample analysis indicated elevated levels of aluminum, cadmium, copper, lead, and zinc and detections of the explosives HMX, 2,4-DNT, and nitroguanidine. The highest lead concentration of 48,000 mg/kg was found in the sample from the “west wall of Site 3.” The average “background” concentration of lead was 29.8 mg/kg during this sampling event.

In 2010, the area containing the burn pan was sampled as part of the annual surface soil sampling event at the TTU. This sampling is meant to characterize the surface contamination of large areas within the TTU to show contaminant distribution from open burn and open detonation events. The sampling is conducted by taking a composites sample comprised of 100 increments within a 100 x 100 meter grid cell. The samples are homogenized, ground, subsampled, and analyzed to give a single average value for the cell. Sample results for the grid cell containing the burn pan area showed an elevated lead concentration along with detections of HMX and 2,4-DNT. At 44 mg/kg, the lead concentration is the maximum of any grid cell sampled between 2005 and 2015. The average grid cell lead concentration at the TTU over this time period is 10.6 mg/kg.

Overall, the historic sampling data from the burn pan indicate that prior to the construction of the current burn pan, there were higher levels of metals, primarily lead, and indications of combustion residues including total petroleum hydrocarbons and some polycyclic aromatic hydrocarbons associated with the treatment operation. Detection of some explosive residues (HMX, 2,4-DNT, and nitroguanidine) typical of other areas of the TTU have also been found. Since the construction of the current burn pan in 1992, only the 2010 sampling event evaluated the area and found an elevated lead level. It is not known if highly contaminated soils were removed from the TTU during the 1992 burn pan construction. It is likely that they were excavated to allow for construction of the concrete containment box and left on site. Because of potential contamination indicated by past sampling events, extensive disturbance or regrading of the area surrounding the burn pan containment box will not be conducted during the partial closure activities described in this appendix.

## **5.0 BURN PAN CLOSURE PLAN REVIEW**

Closure requirements for the TTU are found in Section II.P and Attachment 8 of the UTTR Permit. Section II.P.4 requires that “The Permittee shall review the closure plan contained in Attachment 8 before commencing partial or final closure...If the closure plan requires modification, the plan shall be modified pursuant to Utah Admin. Code R315-124-5.” Closure requirements found in Attachment 8 are summarized and reviewed below. Sections titles and section references are those found in Attachment 8. As a result of this review, modified language to the closure plan and this appendix to Attachment 8 will be submitted to the Director.

**Closure Plans (Section 1.0).** This section describes the intent of the closure plan. It does not address the potential of partial closure in advance of final TTU closure.

**Closure Performance Standard (Section 1.1).** This section discusses clean closure versus non-clean closure. Only partial closure involving removal of equipment from Site 3 will be conducted at this time. Activities that may result in final clean closure or non-clean closure will be conducted during future closure of the TTU.

**Partial Closure and Final Closure Activities (Section 1.2).** This section specifically states that “Partial closure of the TTU is not planned.” This would have to be modified to allow for the planned partial closure of the Site 3 burn pan area.

**Maximum Waste Inventory (Section 1.3).** This section discussed the maximum allowable limits for waste treatment at the TTU. It is not affected by the proposed partial closure activities at Site 3.

**Schedule for Closure (Sections 1.4, 1.4.1, and 1.4.2).** This section discusses the schedule and time allowed for closure. It needs to be modified to allow for partial closure activities.

**Closure Procedures (Section 1.5).** This section discusses planned closure procedures. Applicable procedures for the partial Site 3 burn pan closure activities will be utilized.

**Geophysical Survey (Section 1.5.1).** This section discusses the need for a geophysical survey to identify areas of the TTU where buried wastes may be present. Since no subsurface work will be conducted as part of the partial closure activities at the Site 3 area, it will not be completely closed at this time and will remain part of the active TTU area. Therefore, a geophysical survey will not be conducted at this time.

**Soil and Groundwater Sampling (Section 1.5.2).** This section requires that closure activities involve sampling to establish cleanup requirements in accordance with section II.P of the permit. Because the burn pan is a man-made structure, the intent of the partial closure activity is to remove all steel components and leave only the concrete containment box in place. Sampling will focus on characterization of decontamination fluids prior to disposal. No sampling or remediation of the area outside of the concrete box will take place at this time.



**Sampling Equipment Decontamination Procedures (Section 1.5.2.1).** This section requires that “Site-specific sampling locations, quantities, sample collection and analytical methods, and QA/QC issues will be addressed and presented in the final closure plan.” It also requires that “All field sampling equipment will be pre-cleaned prior to arrival on-site and decontaminated in accordance with standard procedures. A decontamination area will be established and maintained on-site for all decontamination activities. The site will be selected by the sampling team based on the location’s ability to isolate the decontamination area and assist in preventing cross-contamination of sampling equipment.” These procedures will be followed during partial closure activities at Site 3.

**IDW Management (Section 1.5.2.2).** This section requires that “All wastes generated from field sampling and decontamination activities will be treated as contaminated media until data are available to determine their actual characteristics. This material will be drummed and stored at the TTU pending the outcome of sampling analysis.” Labeling and packaging requirements are also discussed. All investigation derived wastes will be managed in accordance with the requirements of this section. While this section specifies the use of 55 gallon drums for collection of IDW, it is not anticipated that this volume of container will be required for the partial closure activities. Appropriate container sizes will be utilized.

**Health and Safety Procedures (Section 1.5.2.3).** This section requires that “Personnel performing sampling will use appropriate Personal Protective Equipment (PPE) deemed necessary to accomplish sampling tasks. The PPE to be used will be specified in the closure Health and Safety Plan. Sampling personnel will be properly trained in hazardous waste sampling procedures and will have appropriate medical monitoring and certification. Sampling personnel will also be briefed by the EOD RSO on the hazards of sampling in a potential explosively-contaminated environment.” No soil sampling will be conducted as part of this partial closure. PPE for those involved in decontamination and IDW sampling is addressed in the Health and Safety Section below.

**Determining Cleanup Goals (Section 1.5.3).** This section focuses on background sampling and determining appropriate screening criteria or risk-based cleanup levels required for clean closure. Because only the burn pan and associated structures are to be removed, no soil background sampling is planned.

**Inventory Removal (Section 1.5.4.1).** This section describes the types of waste that may be removed from the site during closure activities. During partial closure activities for Site 3, ash residue left in the burn pan and decontamination fluids will be the primary wastes produced.

**Disposal or Decontamination of Equipment and Structures (Section 1.5.4.2).** This section of the permit is most applicable to the partial closure of the burn pan. The applicable portion of the section is as follows:

To the extent possible, decontamination and disposal will be performed on existing man-made structures at the TTU. These include the burn pan, burn pan cover, and burn pan supporting structure...Decontamination activities will be done in such a way as to allow for reuse or recycling of those components suitable for that purpose (e.g., metal structures that could be certified clean).

All components of the burn pan will be visually inspected, and any visible waste and debris will be physically removed. The burn pan concrete pads and support columns will be scraped and brushed of all loose waste and debris. Upon removal of all loose waste and debris, the burn pan and its cover will be pressure-washed to remove any remaining residue. A bermed decontamination pad constructed of 30 mil plastic and large enough to contain the burn pan and lid will be used to contain all wash water. The decontamination pad will be positioned adjacent to the burn pan.

Following decontamination, rinsate samples and concrete chips will be collected from the burn pan and analyzed for Toxic Characteristic Leaching Procedure metals and explosive compounds to verify their cleanliness. If rinsate of concrete chip analysis indicates additional decontamination is necessary, the decontamination process and accompanying analysis will be repeated until each component is verified as clean. Once the treatment structures are certified clean, they will be either transported to the Oasis R3 yard to be stored until contracted for disposal/recycling or disposed of at the UTTR-North sanitary landfill. All waste generated from the decontamination process will be containerized in drums for characterization and disposal/recycling.

The applicable decontamination procedures described above will be followed during partial closure of the Site 3 burn pan. The burn pan gantry and weather cover will be recycled without prior decontamination as they were not exposed to munitions during treatment operations. No concrete sampling or removal will be performed as part of the partial closure activities. The only wastes generated will be from decontamination of the burn pan. No reactive wastes should be present in the burn pan, only residues from prior treatment operations. Non-metal residues that do not meet the definition of "scrap metal" will be removed prior to recycling. Visual verification that no non-metal residues are present (i.e., the components are "clean") will be accomplished. All metal components will then be sent for recycling in accordance with the scrap metal exclusions found in R315-261-4(a)(13) and R315-261-6(a)(3)(ii) No disposal in the UTTR-North sanitary landfill is anticipated. Samples of decontamination water will be evaluated for proper disposal.

**Closure of Containers (Section 1.5.4.3).** This section states that "All ash and contaminated debris identified as treatment residue, solid IDW, and decontamination fluids and rinsates will be placed in DOT 17E and 17H drums, as previously described. Should sampling analysis determine these to be contaminated, each container will be closed and transported to a hazardous waste disposal facility. Remaining containers will be decontaminated and removed from the



facility.” Any residues, including IDW, generated during partial closure will be properly managed as described.

**Remediation (Section 1.5.4.4).** This section states that “In the event contamination is detected after HAFB and DWMRC agree to pursue clean closure, activities necessary to remediate the site to predetermined cleanup levels will be conducted. These activities will be documented in the Corrective Action Plan (CAP) as discussed in Section 1.1.” No remediation efforts are anticipated during the partial closure activities.

**Closure Certification and Required Notices (Section 2.0).** This permit section states that:

Within 60 days of the completion of closure for the TTU and the MSA temporary storage pads, 75 CEG/CEIE will submit in writing (by certified mail) a closure certification to the Director. The certification will verify that the hazardous waste treatment facility was closed in accordance with the specifications outlined in the closure plan, including the completion of all required corrective action measures. The certification will be signed by an authorized official of the Hill AFB 75<sup>th</sup> Air Base Wing and an independent qualified Utah-licensed professional engineer practicing within the scope of his/her education and training. Documentation supporting the professional engineer’s certification will be furnished to the Director upon request.

No later than the submission of closure certification, 75 CEG/CEIE will also submit to the Director a survey plat indicating the location and dimensions of the facility with respect to permanently surveyed benchmarks. The plat will be prepared and certified by a professional land surveyor licensed in Utah.

In accordance with this requirement, the Air Force will submit a closure certification for the partial closure activities at the burn pan area within 60 days of completion. Modified sections of the UTTR Hazardous Waste Operating Permit will also be submitted with the closure certification to describe the current state of the burn pan operational area. No survey work will be conducted during the partial closure activities, so a survey plat will not be submitted.

As a result of the above review, a permit modification will be submitted to the Director in advance of any partial closure activities to update Attachment 8 to allow for partial closure of specific TTU areas in advance of final TTU closure.

**Closure Cost Estimate (Section 3.0).** This section states that “The TTU is a federal government facility, owned and operated by the Hill AFB 75th Air Base Wing for the AF and the DoD. As such, it is exempt from the requirements for closure cost estimates.” This statement is still accurate and applicable to the Site 3 partial closure activities.

**Financial Assurance Mechanism for Closure (Section 4.0).** This section states that “In accordance with 40 CFR 264.143, “Financial Assurance for Closure,” federal facilities are

exempt from the requirements for financial assurance.” This statement is still accurate and applicable to the Site 3 partial closure activities.

**Post-Closure Plan (Section 5.0).** This section discusses the need for a post-closure plan that specifies post-closure monitoring and maintenance activities. Because the partial closure activities of Site 3 will not result in final closure of any part of the TTU, a post-closure plan is not applicable at this time. The Site 3 area will continue to be monitored and maintained in accordance with the active Hazardous Waste Operating Permit, as are other non-treatment areas within the TTU boundary.

## **6.0 BURN PAN CLOSURE PROCESS**

In accordance with the requirements of the UTTR Hazardous Waste Operating Permit outlined above, the following procedures will be followed to complete partial closure of the Site 3 burn pan. The area outside the containment structure will continue to be considered as potentially contaminated like other areas within the TTU and will be subject to further evaluation and restoration upon final site closure. Future biennial soil sampling events at the TTU may be used to further characterize this area.

Details of Phase I closure activities are as follows:

### **1-Removal and recycling of the site gantry**

The gantry located to the south east of the burn pan will be removed with a crane, dismantled or cut into manageable pieces, and placed in a roll-off container for recycling. No decontamination or special procedures are necessary prior to recycling as the gantry was not directly exposed to waste during treatment events.

### **2-Dismantling and recycling of the burn pan weather cover**

The weather cover and supporting rails will be removed by crane, dismantled, and placed in a roll-off container for recycling. No decontamination or special procedures are necessary prior to recycling as the weather cover was not directly exposed to waste during treatment events.

### **3- Removal and decontamination of the steel burn pan and lid prior to recycling**

In order to safely enter the containment box without the threat of snake or spider exposure, vegetation and debris will be removed from above prior to entering. This will be accomplished using hand implements or power equipment as deemed necessary. Vegetation will be discarded on-site. Any debris that appears to be from treatment operations (e.g., ash etc.) will be containerized and managed as potential hazardous waste. Debris that is clearly not treatment residue will be managed as non-hazardous waste.

The steel burn pan and supporting structure will be disconnected from the concrete containment box by cutting the mounting bolts with a torch and then removed using a crane. As described in the UTTR Hazardous Waste Operating Permit, “All components of the burn pan will be visually inspected, and any visible waste and debris will be physically removed. The burn pan concrete pads and support columns will be scraped and brushed of all loose waste and debris. Upon removal of all loose waste and debris, the burn pan and its cover will be pressure-washed to remove any remaining residue. A bermed decontamination pad constructed of 30 mil plastic and

large enough to contain the burn pan and lid will be used to contain all wash water. The decontamination pad will be positioned adjacent to the burn pan.”

Both the burn pan structure and lid will be washed with a pressure-washer to remove any potential contamination. It is anticipated that less than 15 gallons of water will be needed to decontaminate each piece of equipment. Rinsate for each wash will be collected in containers and rinsate samples will be analyzed by the Hill AFB chemistry lab and disposed of properly. The plastic used on the decontamination pad is not anticipated to be contaminated. It will be rinsed clean after the final use and disposed as solid waste.

After decontamination, the burn pan, supporting structure and lid will be sent for recycling. These items may be staged in the R3 (Oasis recycling) lot until transportation to the recycler is available. It may be necessary to cut these items into smaller pieces to facilitate transportation which can be accomplished in the R3 lot.

#### **4-Certification and notification**

In accordance with permit requirements, the Air Force will submit a certification for the partial closure of the Site 3 Burn Pan area within 60 days of the burn pan closure. Modified sections of the UTTR Hazardous Waste Operating Permit will also be submitted with the closure certification to describe the current state of the burn pan operational area.

#### **7.0 SAMPLING**

Sampling of decontamination rinsate will be conducted by Hill AFB hazardous waste program contractors. The decontamination rinsate will be sampled and analyzed as described in Tables 2 and 3. Applicable Hill AFB standard operating procedures for equipment decontamination, field decontamination, location and sample identification, and sample handling and shipping will be followed. These documents are found in the Hill AFB Basewide Quality Assurance Project Plan (Hill AFB, 2013).

**Table 2. Samples and Analytical Methods**

Sample Type	Number of Samples	Analytical Methods	Purpose/Notes
Decontamination Rinsate	1	TCLP Metals (SW-846 1311) Explosives (SW-846 8330) Perchlorate (SW-6850/6860)	<ul style="list-style-type: none"> <li>Characterize rinsate and debris from burn pan, lid, and containment structure for proper disposal</li> <li>Rinsate will be decanted and analyzed for explosive residues and perchlorate but these constituents will not be used for waste characterization since they are unregulated and would have to be present at high enough concentrations to be reactive to make the waste hazardous. Remaining solid debris will be assumed to be potentially reactive and will be stored and treated as reactive hazardous wastes at the TTU.</li> </ul>

**Table 3. Containers, Preservatives, and Holding Times**

Analytical Method	Matrix	Container*	Preservative	Holding Time
Explosives, 8330	water	1 L amber with Teflon lined cap	4° C, dark	7 days from sample collection to extraction, 40 days from extraction to analysis
Metals-ICP (Al, As, Ba, Be, Cd, Cr, Fe, Pb, Ni, Se, Ag, V, Zn) 6010C/6020A/1311	water	1-liter polyethylene with Teflon line cap	HNO <sub>3</sub> , 4° C, dark	180 days from sample collection to extraction, 28 days from sample collection to analysis for mercury
Perchlorate, 6850/6860	water	100 ml polyethylene with Teflon line cap	4° C, dark	28 days from sample collection to analysis

\*Container volumes may vary depending on laboratory preference

## 7.1 Health and Safety

Health and Safety of all personnel involved in the burn pan removal and closure is of primary importance. An initial safety briefing will be held by the UTTR Unit Environmental Coordinator prior to commencing work at the site. CE Operations will brief personnel daily as work assignments are given out. Visitors will be briefed prior to site access. Emergency contact information, site hazards, and personal protective equipment are discussed below:

Emergency Contacts

**In the event of an emergency at the TTU, call Oasis Security:**

**Call sign “Phoenix”, Phone: 801-777-1552**

**Table 4. UTTR Emergency Contacts**

<b>Contact</b>	<b>Phone Number or Radio Call Sign</b>
<b>Hill Range Control</b>	Radio call sign: “Hill Range Control” Phone: 801-777-9386
<b>Oasis Security</b>	Radio call sign: “Phoenix” Phone: 801-777-1552
<b>Hill AFB Emergency Communications Center (HAFB ECC)*</b>	Radio call sign: “Hill Fire Dispatch” Phone: 801-777-3021/3022/3023
<b>UTTR EOD</b>	Radio call sign: Depends on current RSO assignment Phone: 801-777-5501
<b>UEC</b>	Radio call sign: “UEC” Phone: 801-777-1550

\*Note: All emergency notifications will be made through the HAFB ECC

Hazards

Primary hazardous that may be encountered during the burn pan closure and a discussion of mitigating factors are as follows:

**Exposure-**Work will be conducted during fall/winter months at the UTTR. Personnel will need to wear appropriate winter clothing and stay hydrated. Work will not be conducted during inclement weather conditions.

**Chemical-**Low levels of explosive residues are known to be present in site soils. Wastes associated with the burn pan may contain excessive levels of heavy metals, primarily lead. Since site soil will not be significantly disturbed, exposure to soil is not anticipated to pose a significant risk. Any residual ash material present in the burn pan will be removed during burn pan decontamination. Appropriate respiratory protection will be used when dealing directly with dry wastes from the burn pan.

**Unexploded Ordnance-**The TTU is part of a past and current active military range. Operational areas are cleared by explosive ordnance disposal (EOD) personnel after each operation and the entire TTU area is swept on an annual basis. Occurrence of unexploded ordnance may occur. Should UXO/MEC items be observed, they will be left in place and flagged for further assessment and disposal by EOD.

**Biological Hazards-**Potential biological hazards include snakes, spiders, scorpions and larger animals such as badgers and coyotes. General awareness/avoidance and personal protective equipment are the primary measures to avoid these hazards. Areas where animals may reside (e.g., under the burn pan) will be carefully inspected prior to commencing work in the area.

**Trip/Fall Hazardous-**The potential for physical hazards including trip/fall hazards is significant. Topography at the site is varied and the burn pan and open concrete containment structure pose a significant fall risk. All personnel will be briefed on these hazards and only personnel involved in burn pan removal or sampling activities will be allowed near the open burn pan and containment structures.

**Heavy Equipment-**The use of heavy equipment including cranes and loaders at the site will pose risks for personnel on the ground. All site personnel will remain in view of equipment operators at all times. Personnel assisting with rigging will be clear of any items being moved prior to lifting. A spotter on the ground will direct all crane operations to ensure site safety.

**Power Equipment and Tools-** Power equipment including grinders, drills, power washers, and other hand tools will be utilized during the burn pan removal and decontamination process. All manufacturer safety guidelines will be followed and recommended personal protective equipment (see below) will be employed. Although explosive residues are anticipated at the site, no explosive hazards are expected due to the low residue concentrations, therefore no additional explosive safety requirements (e.g., non-sparking or intrinsically safe tools) will be required.

#### Personal Protective Equipment

All personnel on the site will be required to wear standard Level D PPE, including long pants, safety-toed boots, hard hats, leather gloves, and eye protection. Personnel performing decontamination or sampling activities where respirable aerosols or dust may be present will employ Level C PPE including full-face or half-mask NIOSH approved air purifying respirators with eye protection and chemical resistant gloves and coveralls. Personnel involved in sampling or direct management of decontamination residues and rinsate will wear Level C PPE as described above with eye protection (respirators are not required).

## **8.0 SCHEDULE**

Partial burn pan closure, the burn pan removal and recycling is planned to take place in fall of 2017.

## **9.0 REFERENCES**

US Air Force, 1997. Final Draft, Resource Conservation and Recovery Act Part B Permit Application for the Open Burning/Open Detonation at the Utah Test and Training Range-North Thermal Treatment Unit. Radian International, LLC, Oak Ridge, TN. August 1997.

Hill AFB, 2013. Basewide Quality Assurance Project Plan. 26 February, 2013.