

ATTACHMENT 1

POST CLOSURE MONITORING, INSPECTION AND MAINTENANCE PLAN FOR SOLID WASTE MANAGEMENT UNITS (SWMUs)

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Post Closure Monitoring, Inspection and Maintenance Plan
For Solid Waste Management Units (SWMUs)

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Attachment 1
Monitoring, Inspection and Maintenance Plan
For Solid Waste Management Units (SWMUs)

1. Industrial Waste Lagoon (SWMU 02)

The monitoring, maintenance, and inspection requirements of this section apply to the Industrial Waste Lagoon (IWL) and associated ditches that remain on the Tooele Army Depot. A risk assessment has been completed on the ditch sections located on property that was exceded and transferred to the Redevelopment Agency of Tooele City in 1998. The results of this assessment identified no unacceptable risk therefore no further action is required at the exceded and transferred ditch sections.

A. Monitoring Plan

(1) Security

(a) Post closure use of or on the Industrial Waste Lagoon and associated ditches shall not disturb the integrity of the final cover, liner, or any other component of the containment system without the approval of the Director.

(b) The Permittee shall protect against illegal trespassing on the IWL or associated ditches that remain on TEAD property. The entire TEAD property, which contains the IWL, shall be surrounded by barbed wire perimeter fences. Security on the Depot confines shall be maintained by 24-hour surveillance, and by patrolling armed security personnel. In addition, access to the Depot shall be restricted and gained only through guarded gates.

(c) The IWL shall remain fenced and access gates shall be locked for the duration of the post closure period. Access to the IWL shall be strictly enforced with access only being granted for inspection and maintenance of the cap, and other investigative activities that are approved by the Director.

(2) Groundwater Monitoring

(a) The primary objectives of the ground water monitoring program shall be:

1. To monitor the groundwater contaminant concentration at various locations in the plume, and allow for tracking of the reduction in the size of the plume.

2. To monitor the effectiveness of the implemented corrective measures in relationship to reducing contaminant concentrations within the footprint of the plume.

3. To monitor aquifer characteristics and collect data required to confirm containment of the plume through on-going modeling efforts.

(b) Table 2 provides a list of monitoring wells available for use under the groundwater monitoring program specified in Module V of this permit. Maps showing the location of each available monitoring well are provided as Figure 3. Groundwater investigations are ongoing at TEAD and periodically new monitoring wells are constructed. The selection of groundwater monitoring wells during semi-annual sampling events shall not be limited by the wells listed in Table 2 or Figure 3.

B. Inspection Plan

The IWL shall be inspected periodically as defined in Table 3 during the post-closure period to observe and document changes as they occur to the cover. Proper observation and documentation through inspection reports shall enable rapid repair or routine maintenance of the IWL cover should either be necessary. Inspection frequencies, procedures and documentation are applicable to the security fence, erosion damage, vegetative cover condition, and run-on/run-off control structures. Inspection schedules for the IWL and associated wastewater collection ditches are shown in Table 3. Information necessary for documentation of these inspections is listed in Table 5. An inspection form is presented in Figure 1.

(1) Routine Inspections

Visual inspections are the most efficient and cost effective method of examining the integrity of the IWL cover. Visual inspections shall be made on foot by Tooele Army Depot or contract personnel. Inspections shall document any breaches in the fence, wildlife, and unusual odors.

(2) Erosion Damage

In the semi-arid environment in which TEAD is located, erosion will occur only after intense precipitation events. TEAD or contract personnel shall inspect the surface of the IWL cover on foot for evidence of erosion or ponded water as specified in Table 3 or within 24 hours of a storm event with precipitation amounts greater than ¼ inch in one hour. If erosion damage greater than three inches in depth has occurred, or if vegetative cover has been destroyed due to erosion, corrective action shall be initiated within 72 hours.

(3) Ponded Water

The inspection program shall monitor the presence of ponded water on the surface of the IWL cover. The purpose of the sloping cover is to promote drainage of excess water and the highly compacted foundation material should maintain the three to five percent slope for drainage. However, the presence of ponded water would indicate a localized

(4) Subsurface Inspection

In the unlikely event that a large unexplained settlement problem, or vegetative die-off occurs, it may become necessary to examine the subsurface conditions beneath the distressed areas. The drilling of soil borings and collection of continuous, undisturbed soil samples shall be

conducted to investigate the problem only after other methods of subsurface inspection, such as geophysical techniques, have failed. Non-destructive geophysical techniques may reveal the location of the problem if there is sufficient contrast in the soil layers within the cap. The excavation of test pits shall not be conducted due to the complex layering of the soil cap, the presence of geo-fabrics and the impermeable synthetic membrane. If the exploratory boring penetrates the synthetic membrane, then it shall be excavated and patched according to the industry standards. Backfill for exploratory soil borings above and below the geo-fabric shall be of a low permeability, swelling clay material. The exploratory borings shall be backfilled from their total depth to the ground surface. Any means of investigation that shall breach the synthetic membrane shall be approved by the Director.

(5) Vegetative Cover Condition

During each of the inspections, observations shall include the extent of bare areas susceptible to erosion and the presence of stressed vegetation. In addition, the Permittee or contract personnel shall note the presence of animal burrows. If repairs are made to the vegetative cover, monthly inspections shall be instituted until the vegetation has been re-established.

(6) Run-on/Run-off Control Structures

Run-on shall be intercepted by ditches around the perimeter of the IWL. Observations shall include the presence of debris, vegetation, or soil. If debris, vegetation or soil are present in Run-on control ditches that would prevent proper drainage from the area, corrective action to clear the ditches shall be initiated within 72 hours.

(7) Cover Drainage System

The cover drainage system shall be inspected as specified in Table 3. Observations shall include the presence of debris in the discharge pipes or waterlogged soil condition which may indicate that the drains are not functioning. If debris is found in discharge pipes that would impede flow, corrective action shall be initiated within 72 hours to clear the pipes. However, it is possible that the drains may never receive any infiltration because annual potential evaporation exceeds rainfall at TEAD.

C. Maintenance Plan

This section describes a program of routine maintenance designed to maintain IWL cover during post-closure care. Maintenance plans are presented for the security fences, erosion damage, settlement, vegetative cover, and run-on/run-off control structures.

(1) Security Fence Maintenance

Repairs to the security fence around the IWL shall include patching holes in the chain-link fabric, reattaching the fabric to the posts, replacing chain-link fabric or replacing posts.

Maintenance activities shall be initiated within 72 hours, if deterioration of the fencing system is identified during any inspection event.

(2) Erosion Damage

The most common problem on portions of the cover system is the development of large or small gullies. The cover system is especially susceptible to gullying when it has no vegetation. However, even after vegetation has been firmly established, gullying may continue to threaten the integrity of the cover. Areas most susceptible to gully formation on the IWL cover are those steeper slopes around the perimeter of the cap. In the event that a gullying problem (as defined by linear erosional features greater than 3 inches in depth and greater than 5 feet in length) does develop, repair procedures shall consist of regrading and filling using stockpiled soil followed by re-establishment of vegetation. Corrective action shall be initiated within 72 hours upon identification of gullying during any conducted inspection.

(3) Sideslope Stability

Another potential problem is that of sideslope stability. The cover sideslopes range up to 10 percent inclination, and there is a potential for slippage of material laterally down the slope. This process may be initiated by a high degree of saturation as may occur during spring melt cycles. Repairing sideslope stability shall entail a partial reconstruction of the sideslopes with subsurface drains. Corrective action to address material slippage laterally down slopes shall be initiated within 72 hours upon discovery during any inspection event. Design specifications for the reconstruction activities to be conducted shall be submitted to the Director for review and approval within seven working days prior to execution of reconstruction activities.

(4) Vegetative Maintenance

Since vegetation has been established on the cover system, a certain amount of maintenance is necessary. In the event that invading plants species become established on the cover system, the selective use of herbicides shall be used to control these plants. Under certain circumstances, if an infestation of large insects threatens a stand of vegetation, the use of insecticides may become necessary. The application of herbicides or pesticides on the cover system shall be approved by the Director prior to the initiation of any corrective action.

(5) Soil Maintenance

Chronically weak vegetation may signal a need for revitalization of the vegetative soil layer. Soil characteristics which may be of concern are texture, water-holding capacity and drainage properties, nutrient content and accumulation of toxic salts. In the event of vegetative die-off or stress, the cover soils shall be amended with appropriate nutrients to revitalize cover vegetation. A plan for the application of such nutrients shall be submitted for approval to the Director.

(6) Run-on/Run-off Control Structures

Run-on/Run-off control ditches shall be kept clean of debris and vegetation. If debris or vegetation is found in these structures during inspections that may result in inadequate drainage of the capped lagoon, action shall be initiated within 72 hours to clear the drainage structures.

2. TNT Washout Ponds (SWMU 10)

The corrective measures for SWMU 10 include composting of contaminated soil, groundwater monitoring, and land use controls. This Inspection and Maintenance Plan is required in order to ensure that the corrective measures remain in effect over the long term. Groundwater monitoring is being performed as part of the installation wide groundwater monitoring program.

A. Monitoring Plan

(1) Security

(a) The Permittee shall protect against illegal trespassing on the former TNT Washout Ponds. The entire TEAD property, which contains the TNT Washout Ponds, shall be surrounded by barbed wire perimeter fences. Security on the Depot confines shall be maintained by 24-hour surveillance, and by patrolling armed security personnel. In addition, access to the Depot shall be restricted and gained only through guarded gates.

(2) Groundwater Monitoring

(a) The primary objective of the groundwater monitoring program shall be:

1. To monitor groundwater contaminant concentrations at various location in the plume, and allow for tracking of the reduction in the size of the plume.

2. To monitor the effectiveness of the implemented corrective measures in relationship to reducing contaminant concentrations within the footprint of the plume.

3. To monitor aquifer characteristics and collect data required to confirm containment of the plume through on-going monitoring and evaluation efforts.

(b) Table 2 provides a list of monitoring wells available for use under the groundwater monitoring program specified in Module V of this permit. Maps showing the location of each available monitoring well are provided as Figure 3. Groundwater investigations are ongoing at TEAD and periodically new monitoring wells are constructed. The selection of groundwater monitoring wells during semi-annual sampling events shall not be limited by the wells listed in Table 3 or Figure 3.

B. Inspection Plan

(1) Land Use Control Inspections

The Permittee shall conduct, at a minimum, annual land use control inspections at SWMU 10, as a component of the corrective measures implemented at the site include “Residential Land Use Restrictions”. As part of this inspection, the Permittee shall:

(a) Verify that land use restrictions preventing any residential building construction are documented in the installations Environmental Management System (EMS) for SWMU 10 located on TEAD. Any differences between the stated land use restrictions, and those identified in Table 1 will be stated in the monitoring report.

(b) The Permittee shall perform a site visit and visually inspect the site, observing and noting any changed and abnormalities including soil erosion, soil color, habitat, vegetation, building construction, and digging. Any findings shall be recorded in the monitoring report.

(d) The Permittee shall photograph SWMU 10 during the site visit and visually inspection to document the physical conditions at the site. Photographs will be labeled with the location of the photograph, direction facing, date photographed, and a description of any relevant features in the photograph. Copies of the photographs shall be included in the monitoring report.

(2) Inspection Report

The inspection report shall be due annually on October 15th of each year. The report shall include at a minimum the following:

(a) Brief Summary

(b) Verification of restrictions in the deed or Installation EMS

(c) Site Inspection Report

(d) Photographs Documenting Site Conditions.

3. Sanitary Landfill-Pesticide Disposal Area (SWMU 12/15)

The corrective measures for SWMU 12/15 include soil and vegetative cover improvements, groundwater monitoring, and land use controls. This Inspection and Maintenance Plan is required in order to ensure that the corrective measures remain in effect over the long term. Groundwater monitoring is being performed as part of the installation wide groundwater monitoring program.

A. Monitoring Plan

(1) Security

(a) Post closure use of or on the former Sanitary Landfill/Pesticide Disposal Area shall not disturb the integrity of the final soil or vegetative cover, or any other component of the corrective measures without the approval of the Director.

(b) The Permittee shall protect against illegal trespassing on the Sanitary Landfill/Pesticide Disposal Area. The entire TEAD property, which contains the Sanitary Landfill/Pesticide Disposal Area, shall be surrounded by barbed wire perimeter fences. Security on the Depot confines shall be maintained by 24-hour surveillance, and by patrolling armed security personnel. In addition, access to the Depot shall be restricted and gained only through guarded gates.

(c) The Sanitary Landfill/Pesticide Disposal Area shall remain fenced and access gates shall be locked for the duration of the post closure period. Access to the Sanitary Landfill/Pesticide Disposal Area shall be strictly enforced with access only being granted for inspection and maintenance of the cap, maintenance and inspection of installation utility systems located on the site and other investigative activities that are approved by the Director.

(2) Groundwater Monitoring

(a) The primary objectives of the ground water monitoring program shall be:

1. To monitor the groundwater contaminant concentration at various locations in the plume, and allow for tracking of the reduction in the size of the plume.

2. To monitor the effectiveness of the implemented corrective measures in relationship to reducing contaminant concentrations within the footprint of the plume.

3. To monitor aquifer characteristics and collect data required to confirm containment of the plume through on-going modeling efforts.

(b) Table 2 provides a list of monitoring wells available for use under the groundwater monitoring program specified in Module V. Maps showing the location of each available monitoring well are provided as Figure 3. Groundwater investigations are ongoing at TEAD and periodically new monitoring wells are constructed. The selection of groundwater monitoring wells during semi-annual sampling events shall not be limited by the wells listed in Table 2 or Figure 3.

B. Inspection Plan

SWMU 12/15 shall be inspected periodically to identify and document changes in the cover and the perimeter fence as they occur. Proper observation and documentation through inspection reports will enable rapid repair of the cover or fence, should it be necessary. Inspection frequencies, procedures, and documentation are provided for the perimeter fence, erosion damage, ponded water, and vegetative cover condition. Inspection schedules are shown

in Table 6. Information necessary for documentation of the inspections is listed in Table 7. An inspection form is provided and Figure 2.

(1) Perimeter Fence

The perimeter fence will be inspected semi-annually. Breaches in the fence, broken strands, or other damage will be documented on the inspection form and the approximate location will be marked on a site map. Fence repairs will be performed within 30 days after discovery of the requirement.

(2) Erosion Damage

In the semi-arid environment in which TEAD is located, erosion will occur only after intense precipitation events. TEAD or contract personnel will inspect the surface of the landfill cover on foot for evidence of erosion at mid-wet season and after wet season or within 24 hours of a storm event with precipitation greater than ¼ inch in one hour. Corrective actions will be implemented within 30 days of observations of exposed debris, loss of vegetative cover due to erosion, or other erosion damage greater than 3 inches in depth.

(3) Ponded Water

TEAD or contract personnel will inspect the surface of the landfill cover on foot for evidence of ponded water at mid-wet season and after wet season or within 24 hours of a storm event with precipitation greater than ¼ inch in one hour. Infiltration through the soil cover and the buried debris may be accelerated due to increased volume of water in the ponded areas. Ponded areas of diameter greater than six feet will be documented on the inspection forms. Corrective action will be taken as appropriate to the specific depression within 30 days of discovery of ponding.

(4) Vegetative Cover

TEAD or contract personnel will inspect the surface of the landfill cover on foot for evidence of damage to the vegetative cover semi-annually or within 24 hours of a storm event with precipitation greater than ¼ inch in one hour. Any areas showing evidence of dead, damaged, or stressed vegetation will be identified on the inspection forms, including location, size, and nature of damage. Re-planting will be performed as appropriate. The schedule for re-seeding may depend on season. Other erosion control measures may be necessary if re-planting is delayed. Monthly inspections will be made at re-planted areas until the vegetation is re-established.

(5) Unusual Conditions

In addition to documenting fence condition, erosion, ponding, and vegetation, observations of any unusual conditions will be similarly documented. “Unusual conditions” include any conditions that may adversely affect the corrective measures that are not specifically addressed in this plan.

C. Maintenance Plan

This section describes a program of corrective maintenance designed to maintain the soil cover and perimeter fence at the landfill. Plans are presented for maintenance of the perimeter fence, eroded and ponded areas, settlement of soil cover, and vegetative cover.

(1) Perimeter Fence Maintenance

Repairs to the fence may include replacing broken/missing strands of barbed wire, missing/damaged signage, tightening loose strands of barbed wire, replacing posts, replacing locks. Repair activities will be initiated within 30 days after observations of deficiency are made.

(2) Erosion Damage

On areas of minor slope, gulying is the most likely form of potential erosion damage. Corrective action will be initiated within 30 days after discovery of gulying. Re-covering and re-vegetation will be performed. Erosion control matting may also be used. At areas of significant slope, slumping may occur if the ground becomes saturated. Upon discovery of slumped areas, an engineering design for corrective action will be prepared and implemented. Corrective action will commence after review and approval of the design by a geotechnical engineer. The Director will be notified of all repairs required.

(3) Ponding

Subsidence in the landfill may result in observations of ponding. Additional soil will be brought in to fill the ponded areas within 30 days after discovery.

(4) Vegetation

Since vegetation, for the purpose of erosion control, is a required component of the landfill cover, a certain amount of maintenance is necessary. Since the landfill cover has no engineered barrier layers to protect, maintenance will not include control of “undesirable species”. Maintenance is focused on ensuring vegetation remains viable to serve the purpose of erosion control. The need for maintenance will most likely be the result of erosion damage, or operation of equipment (drill rigs, etc.). If damage occurs, re-seeding will be the likely corrective action. In the event that die-off of vegetation is observed, investigation into the cause of the die-off will be performed before determining the corrective action. Soil amendments may be necessary before re-seeding the area. The Director will be notified of any revegetation activities.

4. Ammunition Equipment Directorate (AED) Deactivation Furnace Site (SWMU 20)

A. Monitoring Plan

(1) Security

(a) Post closure use of or on the AED Deactivation Furnace Site shall not disturb the integrity of the asphalt cover, or any other component of the containment system without the approval of the Director.

(b) The Permittee shall protect against illegal trespassing on the AED Deactivation Furnace Site. The entire TEAD property, which contains the SWMU 20, shall be surrounded by barbed wire perimeter fences. Security on the Depot confines shall be maintained by 24-hour surveillance, and by patrolling armed security personnel. In addition, access to the Depot shall be restricted and gained only through guarded gates.

(c) SWMU 20 shall remain fenced and access gates shall be locked during non-operational periods of the deactivation furnace. Access to the furnace site shall be strictly enforced with access only being granted for operations and maintenance of the furnace system, inspection and maintenance of the asphalt cover, and other investigative activities that are approved by the Director.

B. Inspection Plan

The human health risk assessment determined that cancer risks and non-cancer hazard levels are acceptable for the current and anticipated future land use. However, the risk assessment for hypothetical adult and child residents indicates the site may pose an unacceptable risk, therefore, management measures have been implemented to meet the requirements of Utah Admin. Code R315-101-6. Management measures implemented consist of land use controls prohibiting residential use or development of the site, and construction of an asphalt cover to prevent migration of lead contaminated soil.

(1) Land Use Inspections

The Permittee shall conduct annual land use inspections of the site. As part of this inspection, the Permittee shall verify that land use controls prohibiting residential use of the site are maintained as part of the Permittee's Environmental Management System. Any differences between the stated land use restrictions, and those identified in Environmental Management System will be documented in the monitoring report.

(2) Asphalt Cover/Site Inspections

(a) The Permittee shall perform a site visit and visually inspect the site, observing and noting any changed and abnormalities including soil erosion, soil color, habitat, vegetation, building construction, and digging. Any findings shall be recorded in the inspection report.

(b) The Permittee shall inspect the condition of the constructed asphalt cover to ensure its integrity, and its capability to prevent the migration of lead-contaminated soil. Any findings shall be recorded in the inspection report.

(c) The Permittee shall photograph the site during the site visit and visually inspect to document the physical conditions at the site. Photographs will be labeled with the location of the photograph, direction facing, date photographed, and a description of any relevant features in the photograph. Copies of the photographs shall be included in the inspection report.

(3) Inspection Report

The inspection report shall be due annually on October 15th of each year. The report shall include at a minimum the following:

- (a) Brief Summary
- (b) Verification of restrictions in the deed or Installation EMS
- (c) Site Inspection Report
- (d) Photographs Documenting Site Conditions.

C. Maintenance Plan

(1) Asphalt Cover

The most common problem on portions of the cover system is the development of cracks, and degradation of the cover system associated with heavy equipment traffic on the site. Heavy equipment traffic on the site is unavoidable, as the site remains an active demilitarization facility.

(a) In the event that cover damage is identified (as defined by cracks greater than 3/4 inch wide and greater than 5 feet in length that penetrate completely through the cover, or surface damage greater than 3 inches in depth), repair procedures shall consist of patching, filling, or replacement of asphalt as required to ensure the integrity of the cover system. Corrective action shall be initiated within 72 hours upon identification of cover during any conducted inspection.

(b) SWMU 20 remains an active demilitarization facility. As such, periodic maintenance and modification of the facility are required. In the event of breaching of the asphalt cover, repair of such damage will be completed in accordance with Condition 4.C.(1)(a) as part of the maintenance or modification activities.

5. Ammunition (Ammo) Deactivation Furnace Site (SWMU 21)

A. Monitoring Plan

(1) Security

(a) Post closure use of or on the Ammunition (Ammo) Deactivation Furnace Site shall not disturb the integrity of the asphalt cover, or any other component of the containment system without the approval of the Director.

(b) The Permittee shall protect against illegal trespassing on the Ammo Deactivation Furnace Site. The entire TEAD property, which contains the SWMU 21, shall be surrounded by barbed wire perimeter fences. Security on the Depot confines shall be maintained by 24-hour surveillance, and by patrolling armed security personnel. In addition, access to the Depot shall be restricted and gained only through guarded gates.

(c) SWMU 21 shall remain fenced and access gates shall be locked during non-operational periods of the deactivation furnace. Access to the furnace site shall be strictly enforced with access only being granted for operations and maintenance of the furnace system, inspection and maintenance of the asphalt cover, and other investigative activities that are approved by the Director.

B. Inspection Plan

The human health risk assessment determined that cancer risks and non-cancer hazard levels are acceptable for the current and anticipated future land use. However, the risk assessment for hypothetical adult and child residents indicates the site may pose an unacceptable risk; therefore, management measures have been implemented to meet the requirements of Utah Admin. Code R315-101-6. Management measures implemented consist of land use controls prohibiting residential use or development of the site, and construction of an asphalt cover to prevent migration of lead contaminated soil.

(1) Land Use Inspections

The Permittee shall conduct annual land use inspections of the site. As part of this inspection, the Permittee shall verify that land use controls prohibiting residential use of the site are maintained as part of the Permittee's Environmental Management System. Any differences between the stated land use restrictions, and those identified in Environmental Management System will be documented in the monitoring report.

(2) Asphalt Cover/Site Inspections

(a) The Permittee shall perform a site visit and visually inspect the site, observing and noting any changed and abnormalities including soil erosion, soil color, habitat, vegetation, building construction, and digging. Any findings shall be recorded in the inspection report.

(b) The Permittee shall inspect the condition of the constructed asphalt cover to ensure its integrity, and its capability to prevent the migration of lead-contaminated soil. Any findings shall be recorded in the inspection report.

(c) The Permittee shall photograph the site during the site visit and visually inspect to document the physical conditions at the site. Photographs will be labeled with the location of the photograph, direction facing, date photographed, and a description of any relevant features in the photograph. Copies of the photographs shall be included in the inspection report.

(3) Inspection Report

The inspection report shall be due annually on October 15th of each year. The report shall include at a minimum the following:

- (a) Brief Summary
- (b) Verification of restrictions in the deed or Installation EMS
- (c) Site Inspection Report
- (d) Photographs Documenting Site Conditions.

C. Maintenance Plan

(1) Asphalt Cover

The most common problem on portions of the cover system is the development of cracks, and degradation of the cover system associated with heavy equipment traffic on the site. Heavy equipment traffic on the site is unavoidable, as the site remains an active demilitarization facility.

(a) In the event that cover damage is identified (as defined by cracks greater than 3/4 inch wide and greater than 5 feet in length that penetrate completely through the cover, or surface damage greater than 3 inches in depth), repair procedures shall consist of patching, filling, or replacement of asphalt as required to ensure the integrity of the cover system. Corrective action shall be initiated within 72 hours upon identification of cover during any conducted inspection.

(b) SWMU 21 remains an active demilitarization facility. As such, periodic maintenance and modification of the facility are required. In the event of breaching of the asphalt cover, repair of such damage will be completed in accordance with 4.C.(1)(a) as part of the maintenance or modification activities.

6. Bomb Washout Facility – Building 539 (SWMU 42)

The monitoring, maintenance, and inspection requirements of this section apply to the Bomb Washout Facility-Building 539 located on the Tooele Army Depot.

A. Monitoring Plan

(1) Security

(a) Post closure use of or on the Bomb Washout Facility shall not disturb the integrity of the final cover, liner, or any other component of the containment system without the approval of the Director.

(b) The Permittee shall protect against illegal trespassing on the Bomb Washout Facility that remains on TEAD property. The entire TEAD property, which contains SWMU 42, shall be surrounded by barbed wire perimeter fences. Security on the Depot confines shall be maintained by 24-hour surveillance, and by patrolling armed security personnel. In addition, access to the Depot shall be restricted and gained only through guarded gates.

(c) The Bomb Washout Facility Pond shall remain fenced and access gates shall be locked for the duration of the post closure period. Access to the Bomb Washout Facility Pond shall be strictly enforced with access only being granted for inspection and maintenance of the cap, and other investigative activities that are approved by the Director.

B. Inspection Plan

The human health risk assessment determined that cancer risks and non-cancer hazard levels were unacceptable for the current and anticipated future land use, as well as hypothetical future adult and child residents, therefore, management measures have been implemented to meet the requirements of Utah Admin. Code R315-101-6. Management measures implemented consist of land use controls prohibiting residential use or development of the site, and construction of a soil cover, and installation of a perimeter fence.

(1) Land Use Inspections

The Permittee shall conduct, annual land use inspections of the site. As part of this inspection, the Permittee shall verify that land use controls prohibiting residential use of the site are maintained as part of the Permittee's Environmental Management System. Any differences between the stated land use restrictions, and those identified in Environmental Management System will be documented in the monitoring report.

(2) Soil Cover Cover/Site Inspections

(a) The Permittee shall perform a site visit and visually inspect the site, observing and noting any changed and abnormalities including soil erosion, soil color, habitat, vegetation, building construction, and digging. Any findings shall be recorded in the inspection report.

(b) The Permittee shall inspect the condition of the constructed soil cover to ensure its integrity, and its capability to prevent the migration of lead contaminated soil. Any findings shall be recorded in the inspection report.

(c) The Permittee shall photograph the site during the site visit and visually inspection to document the physical conditions at the site. Photographs will be labeled with the location of the photograph, direction facing, date photographed, and a description of any relevant features in the photograph. Copies of the photographs shall be included in the inspection report.

(3) Inspection Report

The inspection report shall be due annually on October 15th of each year. The report shall include at a minimum the following:

- (a) Brief Summary
- (b) Verification of restrictions in the Environmental Management System
- (c) Site Inspection Report
- (d) Photographs Documenting Site Conditions.

C. Maintenance Plan

This section describes a program of routine maintenance designed to maintain the Bomb Washout Pond during post-closure care. Maintenance plans are presented for the security fences, erosion damage and vegetative cover.

(1) Security Fence Maintenance

Repairs to the security fence around the IWL shall include patching holes in the chain-link fabric, reattaching the fabric to the posts, replacing chain-link fabric or replacing posts. Maintenance activities shall be initiated within 24 hours, if deterioration of the fencing system is identified during any inspection event.

(2) Erosion Damage

The most common problem on portions of the cover system is the development of large or small gullies. The cover system is especially susceptible to gullying when it has no vegetation. However, even after vegetation has been firmly established, gullying may continue to threaten the integrity of the cover. Areas most susceptible to gully formation on the cover are those steeper slopes around the perimeter of the cap. In the event that a gullying problem (as defined by linear erosional features greater than 3 inches in depth and greater than 5 feet in length) does develop, repair procedures shall consist of regrading and filling using soil followed by re-establishment of vegetation. Corrective action shall be initiated within 72 hours upon identification of gullying during any conducted inspection.

(3) Vegetative Maintenance

Since vegetation has been established on the cover system, a certain amount of maintenance is necessary. In the event that invading plants species become established on the cover system, the selective use of herbicides shall be used to control these plants. Under certain circumstances, if an infestation of large insects threatens a stand of vegetation, the use of insecticides may become necessary. The application of herbicides or pesticides on the cover system shall be approved by the Director prior to the initiation of any corrective action.

(4) Soil Maintenance

Chronically weak vegetation may signal a need for revitalization of the vegetative soil layer. Soil characteristics which may be of concern are texture, water-holding capacity and drainage properties, nutrient content and accumulation of toxic salts. In the event of vegetative die-off or stress, the cover soils shall be amended with appropriate nutrients to revitalize cover vegetation. A plan for the application of such nutrients shall be submitted for approval to the Director.

7. Land Use Controls

The inspection, monitoring, and maintenance requirements of this plan apply to Solid Waste Management Units (SWMUs) located on the Tooele Army Depot (TEAD), as well as portions of the installation transferred in 1998 under the authority of the Base Realignment and Closure (BRAC) Act. These requirements apply to all SWMUs where administrative Institutional Controls (ICs), as well as monitoring requirements were applied to the site as part of the corrective measures implemented. ICs and monitoring requirements applied at each SWMU are fully described in the Corrective Measures Study Reports listed in Attachment 4, Section B. and Site Management Plans listed in Attachment 4, Section G. The following table provides a summary of ICs applicable to each site.

Table 1 – SWMU Institutional Controls

SWMU #	SWMU Description	Residential Land Use Controls	Deed Restrictions	Excavation Restrictions
1b	Propellant Burn Pad	√		√
1c	Trash Burn Pits	√		√
3	X-Ray Lagoon	√		√
4	Sandblast Areas – Buildings 600, 615 and 617		√	√
10	TNT Washout Ponds	√		√
11	Laundry Effluent Ponds	√		√
12	Pesticide Disposal Area	√		√
15	Sanitary Landfill	√		√
19	AED Demilitarization Test Facility	√		√
20	AED Deactivation Furnace Site	√		√
21	Ammo Deactivation Furnace	√		√
25	Battery Shop – Building 1252	√		√
26	DRMO Storage Yard		√	√
29	Drum Storage Yard		√	√

34	Pesticide Handling and Storage – Building 518	√		√
37	Contaminated Waste Processor	√		√
42	Bomb Washout Facility – Building 539	√		√
45	Storm Water Holding Pond	√		√
46	Used Oil Dumpsters – Building 611		√	√
48	Old Dispensary	√		√
49	Storm/Industrial Waste Water System		√	√
50	Compressor Condensate Drains – Building 613 and 619		√	√
51	Chromic Acid/Alodine Drying Beds		√	√
52b	Disposal Trenches		√	√
54	Sandblast Areas – Buildings 611 and 617		√	√
56	Gravel Pit Disposal Area		√	√

A. Monitoring Plan

(1) Security

(a) Post closure use of or on the SWMUs identified in this section shall be used solely for industrial/commercial use, and not for residential purposes. Residential uses include, but are not limited to housing, day-care facilities, and schools. Industrial/commercial uses include, but are not limited to administrative/office space, manufacturing, and warehousing.

(b) The Permittee shall protect against illegal trespassing on the SWMUs identified in this section that remain on TEAD property. The entire TEAD property shall be surrounded by abarbed wire perimeter fencing. Security on the Depot confines shall be maintained by 24-hour surveillance, and by patrolling armed security personnel. In addition, access to the Depot shall be restricted and gained only through guarded gates.

B. Inspection Plan

(1) Land Use/Deed Restriction Inspections

The Permittee shall conduct, annual land use inspections on all sites identified in this section having “Residential Land Use Restrictions” or “Residential Deed Restrictions”. As part of this inspection, the Permittee shall:

(a) Verify that deed restrictions preventing any residential building construction are part of the deed for SWMUs identified in Table 1 that are located on portions of the installation transferred in 1998 under the BRAC action. Any differences between the stated land use restrictions, and those identified in Table 1 will be stated in the monitoring report.

(b) Verify that land use restrictions preventing any residential building construction are documented in the installations Environmental Management System (EMS) for SWMUs identified in Table 1 that are located on TEAD. Any differences between the stated land use restrictions, and those identified in Table 1 will be stated in the monitoring report.

(c) The Permittee shall perform a site visit and visually inspect the site, observing and noting any changed and abnormalities including soil erosion, soil color, habitat, vegetation, building construction, and digging. Any findings shall be recorded in the monitoring report.

(d) The Permittee shall photograph each SWMU during the site visit and visually inspection to document the physical conditions at the site. Photographs will be labeled with the location of the photograph, direction facing, date photographed, and a description of any relevant features in the photograph. Copies of the photographs shall be included in the monitoring report.

(2) Inspection Report

The monitoring report shall be due annually on October 15th of each year. The report shall include at a minimum the following:

- (a) Brief Summary
- (b) Verification of restrictions in the deed or Installation EMS
- (c) Site Inspection Report
- (d) Photographs Documenting Site Conditions.

Table 2 – Groundwater Monitoring System

Monitoring/Piezometer Well ⁽¹⁾ Designation	Measuring Point Elevation (Ft, MSL)	Screen Interval (Ft – Ft)	
A-01	4907.1	413	- 423
A-02	4759.68	272	- 282
A-02A	4758	278	- 298
A-03	4704.81	222	- 232
A-04	4720.04	236	- 246
A-05	4690.38	214	- 224
A-06	4666.2	277	- 287
A-07	4670.02	276	- 286
A-07A	4671	302	- 322
A-08	4681.53	287	- 297
B-01	4680.26	288	- 298
B-02	4815.65	335	- 345
B-03	4721.11	268	- 270
B-04	4645.88	170	- 180
B-05	4692.02	420	- 430
B-06	4587.63	285	- 295
B-07	4607.5	280	- 290
B-08	4605.34	222	- 232
B-09	4654.97	370	- 380
B-10	4681.41	284	- 294
B-11	4589.22	274	- 284
B-12	4569.29	256	- 266
B-13	4566.87	444	- 454
B-14	4537.9	210	- 220
B-15	4533.09	286	- 296
B-16	4534.79	285	- 295
B-17	4494.59	440	- 450
B-18	4504.11	210	- 220
B-19	4484.65	256	- 266
B-20	4644.71	396	- 406
B-21	4682.13	244	- 254
B-22	4694.62	364	- 374
B-23	4623.22	269	- 279
B-24	4681.85	378	- 388
B-25	4478.71	560	- 570
B-26	4779.53	314	- 324
B-27	4706.19	256	- 266
B-28	4608.33	380	- 390

Monitoring/Piezometer Well ⁽¹⁾ Designation	Measuring Point Elevation (Ft, MSL)	Screen Interval (Ft – Ft)
B-29	4542.07	468 - 478
B-30	4535.69	225 - 235
B-31	4514.28	422 - 432
B-32	4502.61	225 - 235
B-33	4480.32	377 - 387
B-34	4477.72	224 - 234
B-35	4469.45	212 - 222
B-36	4623.9	229 - 239
B-37	4444.91	192 - 202
B-38	4445.21	480 - 490
B-39	4460	300 - 310
B-40	4461.6	174 - 184
B-41	4478.22	176 - 186
B-42	4423.29	190 - 200
B-43	4423.9	484 - 494
B-44	4434.73	163 - 173
B-45	4434.89	488 - 498
B-46	4418.08	208 - 218
B-47	4414.44	198 - 208
B-48	4414.32	472 - 482
B-49	4434.95	260 - 270
B-50	4463.07	240 - 250
B-51	4462.56	260 - 270
B-52	4479.04	260 - 270
B-53	4495.74	254 - 264
B-54	4788.64	353 - 362
B-55	4684.2	648 - 658
B-56	4666.27	656 - 666
B-57	4599.8	505 - 515
B-58	4586.47	422 - 432
B-59	4533.75	690 - 700
B-60	4509.75	268 - 278
B-61	4518.34	448 - 458
B-62	4521.89	270 - 280
C-01	4471.15	280 - 290
C-02	4445.09	262 - 272
C-03	4428.1	258 - 268
C-04	4413.07	235 - 245
C-05	4441.91	242 - 252
C-06	4474.87	274 - 284
C-07	4513.9	304 - 314

Monitoring/Piezometer Well ⁽¹⁾ Designation	Measuring Point Elevation (Ft, MSL)	Screen Interval (Ft – Ft)
C-08	4532.04	335 - 345
C-09	4658.11	348 - 368
C-10	4683.18	264 - 284
C-11	4618.31	280 - 300
C-12	4742.49	300 - 320
C-13	4716.47	288 - 308
C-14	4701.96	268 - 288
C-15	4791.45	329 - 349
C-16	4818.3	340 - 360
C-17	4820.69	343 - 363
C-18	4761.12	318 - 338
C-19	4817.63	353 - 363
C-20	4809.84	360 - 380
C-21	4827.53	358 - 378
C-22	4825.3	366 - 386
C-23	4849.19	370 - 390
C-24	4819.73	362 - 388
C-25	4682.02	353 - 373
C-26	4824.74	358 - 378
C-27	4871.49	409 - 429
C-30	4749.84	281 - 296
C-31	4814.41	440 - 450
C-32	4857.73	384 - 404
C-33	4822.63	353 - 373
C-34	4802.49	339 - 359
C-35	4784.64	310 - 330
C-36	4779.36	270 - 285
C-37	4784.19	427 - 447
C-38	4741.61	390 - 510
C-39	4820.78	440 - 460
C-40	4745.61	264 - 294
C-41	4804.70	356 - 376
C-42F	4785.10	340 - 360
C-43F	4754.87	319 - 339
C-44	4722.81	280 - 300
C-45	4689.99	249 - 269
C-46	4689.57	319 - 349
C-47F	4824.53	349 - 379
C-48F	4823.67	349 - 379
C-49	4710.02	260 - 280
C-50F	4796.10	330 - 360

Monitoring/Piezometer Well ⁽¹⁾ Designation	Measuring Point Elevation (Ft, MSL)	Screen Interval (Ft – Ft)
C-51F	4792.05	313 - 343
C-52	4818.46	427 - 457
C-53F	4786.11	307 - 337
C-56	4754.92	277 - 302
C-57	4763.8	285 - 310
C-58	4760.53	280 - 305
C-59	4740.95	261 - 286
C-60	4772.07	291.5 - 316.5
C-61	4771.74	294 - 319
C-62	4775.92	293 - 318
C-63	4767	289 - 314
C-64	4773.92	294 - 319
C-65	4777.58	298 - 323
C-66	4776.16	297 - 322
C-67	4785.55	307 - 332
C-68	4756.14	276 - 301
D-1	4636.86	265 - 285
D-2	4726.34	355 - 375
D-3	4546.08	205 - 225
D-4	4635.35	275 - 295
D-5	4556.67	195 - 215
D-6	4648.47	280 - 300
D-7	4556.54	195 - 215
D-8	4500.06	155 - 175
D-9	4449.62	128 - 148
D-10	4477.52	186 - 206
D-12	4800.56	345 - 365
D-13	4717.40	362 - 382
D-14	4592.80	255 - 275
D-15	4494.12	180 - 200
D-16	4580.11	232 - 251
D-17	4476.25	129 - 149
D-18	4476.07	155 - 205
D-19	4497.75	148 - 168
D-20	4398.57	68.5 - 88.5
M-01	4372.40	135 - 155
M-02	4429.28	225 - 245
M-03	4424.74	225 - 245
M-04	4590.95	245 - 265
M-05	4520.42	236 - 256
MW-01	5033.40	718 - 788

N-03A	4724.63	298	-	337
N-03H	4714.30	223	-	263
N-08B	4474.69	182	-	280
N-111-88	4783.20	317	-	337
N-112-88	4799.32	310	-	330
Monitoring/Piezometer Well ⁽¹⁾ Designation	Measuring Point Elevation (Ft, MSL)	Screen Interval (Ft – Ft)		
N-114-88	4795.81	315	-	334
N-115-88	4749.92	276	-	295
N-116-88	4754.21	265	-	285
N-117-88	4702.48	220	-	235
N-118-88	4722.16	240	-	260
N-119-88	4749.37	266	-	275
N-120-88	4777.66	300	-	320
N-127-88	4702.26	222	-	242
N-128-88	4701.92	235	-	254
N-129-88	4702.41	223	-	243
N-130-88	4704.12	225	-	244
N-131-90	4690.68	214	-	234
N-133-90	4714.76	246	-	266
N-132-90	4690.54	220	-	240
N-134-90	4655.84	184	-	204
N-135-90	4705.48	227	-	247
N-136-90	4713.02	233	-	253
N-142-93	4727.40	355	-	375
N-143-93	4796.30	325	-	345
N-144-93	4770.50	291	-	311
N-145-93	4688.20	295	-	315
N-146-97	4726.28	251	-	271
N-147-97	4719.29	244	-	264
N-148-97	4700.24	225	-	245
N-150-97	4745.54	269	-	289
P-01D	4679.86	485	-	495
P-01S	4680.2	200	-	210
P-04D	4693.61	356	-	366
P-04S	4693.73	220	-	230
P-05D	4748	305	-	315
P-05S	4748.25	264	-	274
P-06D	4814.14	440	-	450
P-06S	4812.96	358	-	368
P-07D	4720.99	414	-	424
P-07S	4720.95	290	-	300
P-08D	4687.3	358	-	368

P-08S	4687.42	72	-	82
P-09D	4679.35	414	-	424
P-09S	4679.47	289	-	299
P-10D	4680.85	322	-	332
P-10S	4681.26	222	-	232
Monitoring/Piezometer Well ⁽¹⁾ Designation	Measuring Point Elevation (Ft, MSL)	Screen Interval (Ft – Ft)		
P-11D	4587.7	358	-	368
P-11S	4587.64	234	-	244
P-12D	4603.8	230	-	240
P-12S	4603.91	230	-	240
P-13D	4598.77	580	-	590
P-13S	4598.74	280	-	290
P-14D	4643.75	348	-	358
P-14S	4644.01	262	-	272
P-15D	4539.24	498	-	508
P-15S	4539.03	224	-	234
P-16D	4558.59	626	-	636
P-16S	4558.59	264	-	274
P-17D	4537.47	556	-	566
P-17S	4537.61	218	-	228
P-18D	4672.37	376	-	386
P-18S	4672.33	300	-	310
P-19D	4504.88	544	-	554
P-19S	4504.63	213	-	223
P-20D	4493.15	590	-	600
P-20S	4492.94	180	-	190
P-21D	4552.18	460	-	470
P-21S	4552.2	238	-	248
P-22D	4551.92	370	-	380
P-22S	4552.02	370	-	380
P-23D	4551.96	460	-	470
P-23S	4551.96	320	-	330
P-24D	4550.44	460	-	470
P-24S	4550.49	233	-	243
P-25D	4640.86	460	-	470
P-25S	4640.82	214	-	223
P-26D	4585.8	457	-	467
P-26S	4585.03	300	-	310
P-27D	4600.07	665	-	675
P-27S	4600.09	230	-	235
P-28D	4454.45	480	-	490
P-28S	4454.26	170	-	180

P-29	4655.48	232	-	242
P-30	4600.59	230	-	235
P-31	4600.59	225	-	235
P-32	4445.91	255	-	265
P-33	4429.2	250	-	260
Monitoring/Piezometer Well ⁽¹⁾ Designation	Measuring Point Elevation (Ft, MSL)	Screen Interval (Ft – Ft)		
P-34	4431.53	245	-	255
P-35	4417.97	239	-	249
P-36	4490.08	295	-	305
P-37	4430.65	250	-	260
P-38	4441.14	265	-	275
P-39	4446.79	257	-	267
P-3D	4644.99	444	-	454
P-3S	4644.97	190	-	200
P-40	4605.36	276	-	296
P-41	4605.21	466	-	486
P-42	4579.86	280	-	300
P-43	4580.07	550	-	570
P-44	4619.07	480	-	500
T-1	4677.77	235	-	265
T-2	4690.4	234	-	264
T-3	4683.3	239	-	269
T-4	4620.24	165	-	195
T-5	4612.14	300	-	330
T-6	4597.92	241	-	271
T-7	4793.97	306	-	337

- (1) Wells designated as P are piezometer wells. All others are monitoring wells.
- (2) Wells with a F designation (x-xxF) have flush surface completions.
- (3) Wells with a D designation (x-xxD) are deep paired wells.
- (4) Wells with a S designation (x-xxS) are shallow paired wells.

Table 3 – Post Closure Inspections (Industrial Waste Lagoon and Associated Ditches)

Inspection Item	Inspection Method	Inspection Frequency*
Security Fence	Routine Patrol	Semi-annual
Presence of Wildlife	Routine Patrol	Semi-annual
Unusual Odors	Routine Patrol	Semi-annual
Erosion Damage	Close-up	Semi-annual
Ponded Water	Close-up	Semi-annual
Vegetative Cover	Close-up	Semi-annual
Animal Burrows	Close-up	Semi-annual
Run-on/Run-off Control Structures	Close-up	Semi-annual
Cover Drainage System	Close-up	Semi-annual

Table 4 – Inspection Period

Yearly Quarter	Inspection Period**
2	April 1 - June 30
4	October 1 - December 31

Note: *Following a rain fall event greater than 2” an inspection will be conducted as soon as possible. Likewise, in the event of an abnormal snow met event an inspection will be conducted as soon as possible.

**Coincides with groundwater monitoring events.

Table 5 – IWL Inspection Information

Inspection Item	Required Information
Security Fence	Presence of breaches, damage, corrosion
Presence of Wildlife	Number, types, location and activities
Unusual Odors	Description, location, wind direction, strength or odor
Erosion Damage	Extent, location, depth of gullies
Ponded Water	Size, depth, location, time since last precipitation event
Vegetative Cover	Condition, extent and location of bare soil and stressed vegetation
Animal Burrows	Locations, number, animal types
Run-on/Run-off Control Structures	Presence of debris, vegetation and soil
Cover Drainage System	Discharge, presence of waterlogged soil

Table 6 – Post Closure Inspections (Sanitary Landfill/Pesticide Disposal Area)

Inspection Item	Inspection Frequency
Perimeter Fence	Semi-annual
Unusual Conditions	Semi-annual
Erosion Damage	Semi-annual/24 hour post-precipitation
Ponded Water	Semi-annual/24 hour post-precipitation
Vegetative Cover	Semi-annual/24 hour post-precipitation

Table 7 – Sanitary Landfill/Pesticide Disposal Area Inspection Information

Inspection Item	Required Information
Perimeter Fence	Barbed wire missing/broken/loose, damaged/missing signage, damaged posts, locks, location
Unusual Conditions	Description, location
Exposed Debris	Description, location, extent
Erosion Damage	Extent, location, depth of gully/slump
Ponded Water	Size, depth, location, time since last rain
Vegetative Cover	Nature of problem, extent, location

Figure 1 – IWL and Wastewater Ditch Inspection Form

Inspector: _____ Inspection Date: _____

Reviewed By: _____ Date: _____

INSPECTION TYPE (Check One)

Semi-annual (Item 1-3) _____ Quarterly (Item 1-3 and 9) _____ Semi-annual (Item 1-9)

Item No.	Inspection Item	√	IWL		Wastewater Ditches	
			Deficiency	Action Taken	Deficiency	Action Taken
1	Security Fence					
2	Presence of Wildlife					
3	Unusual Odors					
4	Erosion Damage					
5	Ponded Water					
6	Vegetative Cover					
7	Animal Burrows					
8	Run-on/Run-off Control					
9	Cover Drainage System					

Description of Daily Weather Conditions Prior to Inspection: _____

Figure 2 – Sanitary Landfill/Pesticide Disposal Area Inspection Form

Inspector: _____

Inspection Date: _____

Reviewed By: _____

Date: _____

INSPECTION TYPE (Check One)

Semi-annual (Items 1,3,5) ___ Mid-Wet Season (Items 2-3) ___ Post-Wet Season (Items 2-3) ___ Post-Wet Season (Items 2-3) ___

Item No.	Inspection Item	√	Deficiency	Action Taken
1	Security Fence			
2	Erosion Damage			
3	Ponded Water			
4	Vegetative Cover			
5	Other Observations			

Description of Daily Weather Conditions Prior to Inspection: _____

Figure 3 – Monitoring Well Location Maps

(see Quadrant Maps)