MODULE V
CORRECTIVE ACTION PROGRAM (CAP)
FOR SOLID WASTE MANAGEMENT UNITS

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MODULE V
CORRECTIVE ACTION PROGRAM
FOR SOLID WASTE MANAGEMENT UNITS

V.A. SOLID WASTE MANAGEMENT UNITS (SWMUs)

V.A.1. The Permittee shall conduct a Corrective Action Program (CAP) for the SWMUs in Table 1A in accordance with this module.

V.A.2. The Director may append additional SWMUs to those listed in Table 1A in accordance with Utah Admin. Code R315-270-42, based on additional information received by the Permittee, the Director or any other knowledgeable source.

V.B. STANDARD CONDITIONS

V.B.1. Failure to submit the information required by this module or falsification of any submitted information is grounds for termination of this Permit in accordance with Utah Admin. Code R315-270-43.

V.B.2. The Permittee shall sign and certify all plans, reports, notifications, and other submissions to the Director, in accordance with Condition I.AA.

V.B.3. The Permittee shall submit two paper copies and one electronic copy of each plan, report, notification or other submissions, required by this module to the Director by mail or hand delivery to the address specified in Condition I.DD.

V.B.4. All plans and schedules required by this module shall, upon written approval from the Director, be incorporated by reference into this Permit. Any noncompliance with such approved plans and schedules shall be deemed noncompliance with this Permit.

V.B.5. The Permittee can only receive extensions of the specified compliance schedule due dates for the submittals required by this module in accordance with Condition V.I., and upon written approval from the Director.

V.B.6. All raw data, such as laboratory reports, drilling logs, bench-scale or pilot-scale data and other supporting information gathered or generated during activities undertaken pursuant to this module shall be maintained at the Facility during the effective term of this Permit. The Permittee shall provide copies of reports, logs, etc., to the Director upon request.

V.B.7 The Permittee shall provide seven days' advance notice of field activities associated with approved work plans. This notice may be provided by telephone, but shall be followed with a written notice within 72 hours.

V.C. RCRA FACILITY INVESTIGATION

V.C.1. The Permittee shall conduct a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) to determine the nature and extent of releases of hazardous wastes or hazardous constituent(s) to the environment, originating from any location at the Facility including a Solid Waste Management Unit (SWMU)to gather data to support the Corrective Measures Study (CMS). The Permittee shall conduct the RFI in accordance with Appendix A.

V.C.2. The Permittee shall prepare and submit the RFI Report as described in Appendix A for each SWMU.

V.C.4. Reserved

V.C.5. Reserved

V.C.6. The Permittee shall identify a need, if applicable, and recommend an alternate RFI schedule for the additional investigation of any SWMUs' potential or imminent threat to human health or the environment.

V.C.7. The RFI compliance schedules shall be modified in accordance with Condition V.I.

V.D. INTERIM MEASURES

V.D.1. If, during the course of any activity initiated in compliance with this module, the Director or the Permittee determines that a release or potential release of hazardous waste or hazardous constituents from a SWMU poses a threat to human health and the environment, the Permittee shall perform specific interim measures.

V.D.2 If any release or potential release of hazardous waste or hazardous waste constituents poses an immediate danger to the human health or the environment, the Permittee shall inform the Director immediately.

V.D.3. The Director shall notify the Permittee in writing of the requirement to perform any interim measures.in accordance with Condition V.D.4. If interim measures are required, the Permittee shall develop and submit an Interim Measures Plan to the Director for approval.

V.D.4. Within 30 days of receiving the written notification requiring the Interim Measures Plan as specified in Condition V.D.3, the Permittee shall provide the Interim Measures Plan to the Director for approval. At a minimum, the Interim Measures Plan shall include the requirements found in Condition V.E.4 and Condition V.E.5 as well as the following:

V.D.4.i Time required developing and implementing a final remedy;

V.D.4.ii Actual and potential exposure of human and environmental receptors;

V.D.4.iii Actual and potential contamination of drinking water supplies and sensitive ecosystems;

V.D.4.iv The potential for further degradation of the medium without interim measures;

V.D.4.v Presence of containerized or uncontainerized hazardous waste that may pose a threat of release;

V.D.4.vi. Presence and concentration of hazardous waste including hazardous constituent(s) in soils that have the potential to migrate to groundwater or surface water;

V.D.4.vii Weather conditions that may affect the current levels of contamination;

V.D.4.viii Risks of fire, explosion or accident;

V.D.4.ix. Other situations that may pose threats to human health and the environment; and

V.D.4.x Reasons related to funding.

V.D.5 The Director may require a 30-day public comment period prior to implementation of the interim measures or before approval of the interim measures report.

V.D.6 The Permittee shall provide the interim measures report as specified in the approved interim measures work plan. This report shall address the requirements of Utah Admin. Code R315-101 and post closure requirements in Module VI as required.

V.E. NOTIFICATION REQUIREMENTS FOR AND ASSESSMENT OF NEWLY IDENTIFIED SOLID WASTE MANAGEMENT UNITS

V.E.1. The Permittee shall notify the Director in writing within 30 days of discovery of any newly identified sites which the Permittee believes may meet the definition of a Hazardous Waste Management Unit (HWMU) or SWMU. Upon notification, a visit to the site will be scheduled. During the site visit, the Permittee shall present available information about the site as needed to justify a decision about how to manage the site. These decisions include: 1) a determination that the site is not an HWMU or SWMU; 2) a determination that the site will be addressed through the process outlined in Condition V.D for interim measures (if managed under Condition V.D, the site does not need to be added to Table 1A); 3) a determination that a newly identified SWMU needs to be added to Table 1A and that the Permittee must include the new SWMU in the RFI program as described in Appendix A.

V.E.2. If information is presented during the decision making process described in Condition V.E.1 to indicate that hazardous wastes were or may have been placed in a newly identified SWMU after November 19, 1980, the Director may consider the unit as a HWMU and require the Permittee to close the unit under the requirements of Utah Admin. Code R315-265 and Utah Admin. Code R315-101 of the Rules.

V.E.3. A decision as described in ConditionV.E.1 and ConditionV.E.2 shall be made within 30 days of the site visit. Thirty days after making a decision and choosing a site management process as described in Condition V.E.1, the Permittee shall submit a schedule for submittal of an interim measures plan or RFI Workplan.

V.E.4. The RFI Workplan, closure plan or interim measures plan shall include the following: a description of past and present operations and dates of operation; a description of site waste streams; all existing site environmental monitoring data; a sample and analysis plan; a quality assurance and quality control plan; plans for collection of human health and ecological risk assessment data and other data and information as needed to fulfill the requirements of Utah Admin. Code R315-101. The plan shall also include a schedule for plan implementation and a date for submittal of a draft final report of results.

V.E.5. The Permittee shall submit draft final and final RFI reports, closure reports or interim measures reports describing all results obtained from the implementation of the approved plans. The reports shall also include a risk assessment and address non-degradation of natural resources as described in Utah Admin. Code R315-101. The CMS Workplan may be submitted as part of the final RFI or as a separate document for approval by the Director.

V.E.6. Based on the results and conclusions proposed by the Permittee in the final RFI Report, closure report or interim measures report, the Director may approve the site for no further action (NFA) as defined in Condition V.F, require further investigations or require a CMS as described in Condition V.G. For SWMUs meeting the residential or industrial land use requirements of Utah Admin. Code R315-101, the Director will require a public comment period before approval of the RFI report. For SWMUs needing corrective action, a public comment period may be required.

V.F. DETERMINATION OF NO FURTHER ACTION

V.F.1. The Permittee may petition the Director for a determination of No Further Action (NFA) as described in Utah Admin. Code R315-101 for a HWMU or SWMU in accordance with Utah Admin. Code R315-264-100. NFA means the unit qualifies for residential land use and is no longer regulated under this Permit.

V.F.2. At a minimum, the NFA proposal for HWMUs and SWMUs shall contain information based on the RFI or other relevant information that demonstrates there are no releases of hazardous waste or hazardous waste constituents from the HWMUs or SWMUs at the Facility that pose a threat to human health or the environment in accordance with Utah Admin. Code R315-101.

V.F.3. A determination of NFA, in accordance with Condition V.F.1., shall not preclude the Director from requiring further investigations, studies or remediation at a later date, if new information or subsequent analysis indicates a release or potential of a release from a HWMU or SWMU at the Facility that is likely to pose a threat to human health or the environment. In such a case, the Director shall notify the Permittee in writing and provide specific requirements and schedules.

V.G. CORRECTIVE MEASURES STUDY AND IMPLEMENTATION

V.G.1. Based on the results of the RFI and for SWMUs requiring corrective action as described in Utah Admin. Code R315-101, the Permittee shall identify, screen and develop the alternative or alternatives for removal, containment, treatment and/or other remediation of the contamination. This information shall be included in the CMS Workplan; this workplan shall be submitted separately or with the Phase II RFI Report. The Permittee shall prepare the CMS Workplan as described in Appendix B.

V.G.2. Upon the Director's approval of the RFI Report and the CMS Workplan, the Permittee shall prepare and submit a CMS report for approval as specified in Table 3. This CMS report shall include a recommendation for corrective action based on the information in the CMS Workplan. A public comment period may be required prior to approval of the CMS Report.

V.G.3. Upon the Director's approval of the CMS report, the Permittee shall submit the Corrective Measures Implementation (CMI) plan for approval. The CMI plan shall be prepared in accordance with Appendix B.

V.G.4. The Permittee shall implement the approved CMI plan as specified in Table 3 or other approved schedules.

V.G.5. The Permittee shall submit a CMI Report within 180 days of completion of the CMI Workplan. This report shall be certified by a Utah registered professional engineer.

V.H. REPORTING REQUIREMENTS

V.H.1. The Permittee shall submit to the Director signed quarterly progress reports or meeting minutes describing activities (i.e., Interim Measures, RFI, CMS) conducted pursuant to this module.

V.H.2. These reports may be in the form of minutes from regular project management meetings or if no project management meetings are held during the quarter, the reports shall contain the following:

V.H.2.i. A description of the work completed;

V.H.2.ii. Summaries of all problems or potential problems encountered during the reporting period and actions taken or to be taken to rectify problems; and

V.H.2.iii. Projected work for the next reporting period.

V.H.3. In accordance with Condition V.F.3, the Director may require the Permittee to conduct new or more extensive assessments, investigations or studies as needed, based on information provided in these minutes, progress reports.

V.I. MODIFICATION OF THE CORRECTIVE ACTION SCHEDULE OF COMPLIANCE

V.I.1. Modifications of the following compliance dates in this module shall be submitted to the Director for approval:

V.I.1.i. The compliance date(s) for submittal of the RFI Final Reports in accordance with Table 2.

V.I.1.ii. The compliance date(s) for submittal of the CMS Report in accordance with Table 3.

V.I.1.iii. The compliance date(s) for submittal of the final Corrective Measures Implementation Program Plan in accordance with Table 3.

V.I.1.iv. Once established in accordance with Condition V.G.5., the compliance date(s) for submittal of the corrective measures final (100% completion) design and construction plans in accordance with Table 3.

V.I.1.v. Compliance dates for implementing the approved plans or reports; and

V.I.1.vi. Compliance dates for quarterly submittal of progress reports.

V.I.2. In accordance with Utah Admin. Code R315-270-41, the compliance schedules shall be modified if the Director determines that good cause exists for which the Permittee had no control and for which there is no reasonable available remedy.

V.I.2.i. Failure to obtain adequate funds or appropriations to conduct the Corrective Measures Implementation Program Plan in accordance with Condition V.G.3 shall be considered good cause for modification of the compliance schedule(s) as provided in Condition V.I.2 subject to the following conditions:

V.I.2.i.a. The Permittee shall use its best effort to secure all funds that may be required for implementation of the CMI plan.

V.I.2.i.b. If necessary, the Permittee shall seek by the most expeditious means possible, appropriations from the U.S. Congress. In accordance with Sections 1-4 and 1-5 of Executive Order 12088 as implemented by the Office of Management and Budget Circular A-106, as amended. Section 1-5 of Executive Order 12088 states, “The head of each executive agency shall ensure that sufficient funds for compliance with applicable pollution control standards are requested in the Agency budget.”

V.I.2.i.c. Immediately upon failure to obtain adequate funding, the Permittee shall submit to the Director, by certified mail, express mail or hand delivery, a written request and justification for modification of the compliance schedule. The written justification shall demonstrate that good cause exists, in accordance with Condition V.I.2.i. The Permittee shall also provide an alternate schedule of compliance for conducting the Corrective Measures Implementation for the subsequent fiscal year.

V.I.2.i.d. Upon evaluation, if the Director determines that good cause exists in accordance with Condition V.I.2.i, the Director shall modify the compliance schedule.

V.I.2.i.f. For any approved modification, the compliance schedule shall be modified to provide relief from the original compliance schedule time frames only for the subsequent fiscal year. All successive compliance dates after the end of such fiscal year shall be modified to reflect the original time frames specified prior to the modification request under Condition V.I.2.i.

V.I.2.ii. Failure to obtain adequate funds or appropriations from Congress shall not, in any way, release the Permittee from its obligation to comply with Condition V.G.3. or any other requirement of this permit or applicable rules.

V.I.2.iii. If adequate funds for corrective measures are not available, the Director may pursue any actions deemed necessary to protect human health and the environment, not excluding judicial recourse or termination of this permit.

V.I.3. The Permittee may submit a request for modifications of the interim compliance dates that do not affect the final compliance dates to the Director for approval.

FIGURE 1

LOCATION OF SOLID WASTE MANAGEMENT UNITS (SWMUS) TOOELE ARMY DEPOT-SOUTH AREA, TOOELE, UTAH

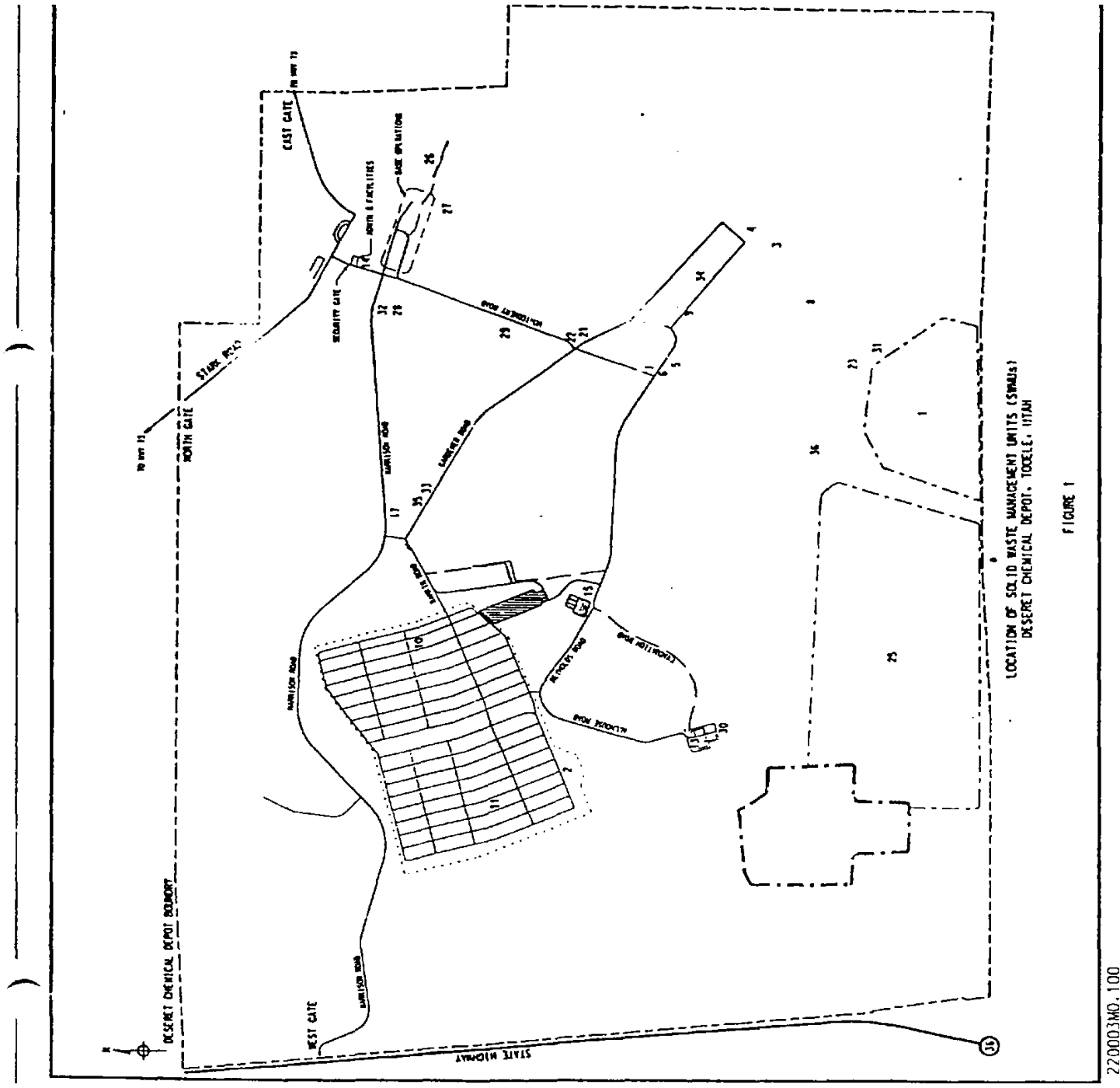

TABLE 1A
SOLID WASTE MANAGEMENT UNITS (SWMU[a])

SWMU NUMBER	SWMU DESCRIPTION
1	Demilitarization area/Disposal pits
25	Demilitarization area/Disposal pits
40	Toxic Area 1 Burial Site (former AOC 5)

[a]The SWMU numbering (Nos. 1-38) corresponds to that used in Ground-water Consultation No. 38-26-1364-86, September 5, 1986, conducted by the U.S. Army Environmental Hygiene Agency and the RCRA Facility Assessment, December 1987, prepared for the U.S. Environmental Protection Agency (USEPA).

TABLE 1B
AREAS OF CONCERN (AOCs[a])

AOC Number[b]	AOC Description
3	Ladder Dip Tank
6	Toxic Area 2
8	Classification Yard
9	Open Storage Pad 1
23	Building 4553 Bomb Renovation Building Evaporation Pond
27	Classification Yard Access Road Burial
28	Hillside Debris Area

[a] AOCs will undergo a Phase I RFI in accordance with Module V Appendix A permit condition 1.A.1.
[b]AOC numbers are based on the Site of Potential Concern notation identified in the “Final Report for Identification of Sites of Potential Concern (SPC),” TEAD-S, November 2013. AOC 28 was newly identified in 2019.

Table 2	
RCRA FACILITY INVESTIGATION COMPLIANCE SCHEDULE FOR SOLID WASTE MANAGEMENT UNITS (SWMUS) AND AREAS OF CONCERN (AOC)	
RFI Activity	**Due Date**
Submit Final Phase I RFI Workplans and Reports to the Director for approval.	The Phase I RFI for the SWMUs listed in Table 1A is complete and has been approved. Minor data gaps are filled by submittal of variances and amendments to the approved workplan. The variances and amendments must be approved by the Director and documented in the Phase I RFI report.
Submit Final RFI-Phase II Workplans and Implement the Workplans to the Director for approval.	Minor data gaps are filled by submittal of variances and amendments to the approved workplan. The variances and amendments must be approved by the Director.
Submit Draft Final Phase II RFI Reports and CMS Workplans for each site or group of sites (grouping of sites is determined by the Permittee) to the Director for approval.	The Permittee shall annually provide an updated schedule. This schedule shall be submitted annually by September 30.
Submit Progress Reports to the Director.	Quarterly (every 90 calendar days).
Submit a Schedule for submittal of a Site-Wide Ecological Assessment for Director approval.	Within 90 days upon completion of Phase II RFIs.

TABLE 3 CORRECTIVE MEASURES STUDY (CMS) AND IMPLEMENTATION COMPLIANCE SCHEDULE FOR SOLID WASTE MANAGEMENT UNITS (SWMUS) AND AREAS OF CONCERN (AOC)	
CMS SUBMISSION/CMI SUBMISSION	**Due Date**
Submit CMS Workplans	CMS Workplans shall be incorporated into Phase II RFI Reports or submitted separately
Submit Draft Final CMS Report	As specified in the approved schedule to be included in Final CMS Workplans
Submit Final CMS Report	As specified in the Draft Final CMS Report
Submit Draft Final CMI Plan	As specified in the approved Final CMS Report
Submit Final CMI Plan	As specified in the Draft Final CMI Plan
Implement CMI Plan	As specified in the Final CMI Plan
Submit Draft Final CMI Report	Within 180 days of completion of the CMI Plan
Submit Final CMI Report	As specified in the Draft Final CMI Report
Conduct approved Post-Closure Activities and Implement any approved post-closure plans	As specified in the Final CMI Plan and Condition V.H.

MODULE V - APPENDIX A
RCRA FACILITY INVESTIGATION

1. OBJECTIVES AND PURPOSE

The objective of the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) is to determine if releases of hazardous waste or hazardous waste constituents at any Solid Waste Management Unit (SWMU) or Area of Concern (AOC) pose an unacceptable risk to human health, ecological receptors or natural resources. The RFI has two main parts, Phase I and Phase II. The purpose of Phase I is to determine if a release has occurred. The purpose of Phase II is to define the nature and extent of any release and collect sufficient data to conduct risk assessments. Phase II also includes an evaluation of all data collected in Phases I and II and preparation of a Phase II Report. The evaluation of RFI data shall be conducted as defined in approved RFI Workplans, Utah Admin. Code R315-101 and approved documents describing groundwater management, applicable USEPA guidance and memorandums or other correspondence from the Director describing requirements for corrective action and long-term monitoring for landfills. The final RFI report may act as a final decision document for each site (e.g., no further action (NFA), remediation, etc.) The final decision document is presented to the public for comment.

1.A. Phase I RFI

The Permittee has met all the requirements of the Phase I RFI for all SWMUs listed in Table 1A. A Phase I RFI shall be conducted for AOCs listed in Table 1B.

1.A.1. Phase I RFI Reports for Newly Identified SWMUs and AOCs

Upon completing the Phase I investigation for newly identified SWMUs or AOCs, the Permittee shall prepare and submit for approval by the Director a Phase I RFI Report. This report shall be consistent in scope with the approved Phase I RFI Reports. This report shall recommend no further action, additional investigation as part of the Phase II RFI, immediate action under an interim measures plan as outlined in Condition V.D., or other action as deemed necessary by the Permittee. The Phase I Report shall be incorporated into the permit in accordance with Utah Admin. Code R315-270-41.

For AOCs where the results of the Phase I RFI indicate that additional investigation is required as part of the Phase II RFI, the AOCs shall be added to the Module V Table 1A and given a SWMU designation.

1.B. Phase II RFI Workplans

For SWMUs requiring Phase II RFI Workplans, the Phase II RFI Workplans shall be consistent in scope with the previously approved Phase II RFI Workplans.

1.B.1. Phase II RFI Workplan for Newly Identified SWMUs

Based on the results of the Phase I RFI Report for newly identified SWMUs, the Permittee shall prepare and submit a Phase II RFI Workplan. This workplan shall be consistent in scope with Phase II RFI Workplans approved for SWMUs listed in Condition1.B.

1.C. Phase II RFI Report

The Permittee shall prepare and submit to the Director for approval a Phase II RFI Report for SWMUs listed in Module V, Table 1 with an analysis and summary of all Phase I and Phase II RFI results. The objective of the evaluation and report is to ensure that the investigations for each SWMU are sufficient to describe the nature and extent of contamination, potential threats to human health and the environment, to prepare a risk assessment, address non-degradation of natural resources and a Corrective Measures Study (CMS) Workplan.

1.C.1. Phase II RFI Workplan and Report Requirements

The Phase II RFI Workplan and Report shall, at a minimum, address and include the following:

1.C.1.a. The sample analytical results, geophysical results, lithology logs, well logs, data quality assurance and quality control information, maps, survey data and other information as need to describe the nature and extent of contamination;

1.C.1.b. The information needed to identify sources of contamination, to estimate and describe the mass of contamination contained in sources or in contamination release in air or in groundwater plumes and to describe the use, value and vulnerability of groundwater as described in Appendix B.

1.C.1.c. The information needed to describe chemical specific contaminant migration;

1.C.1.d. The information needed to identify pathways of exposure to humans and ecological receptors and complete risk assessments as required by Utah Admin. CodeR315-101 and the "Risk Assumptions Document**"**);

1.C.1.e. The information needed to evaluate the geological pathways of contaminant migration in air, bedrock, soil, surface water or groundwater as required by Utah Admin. Code R315-101-3 and the "Risk Assumptions Document";

1.C.1.f. The information describing background levels of contamination or other protection standards for air, bedrock, groundwater, soil and surface water as described in Section 2 below;

1.C.1.g. A CMS Workplan as described in Appendix B;

1.C.1.h. The analytical or other information needed to independently reproduce conclusions and sample data as presented in text, spreadsheets, maps or other formats;

1.C.1.i. Plans for long-term inspection, monitoring and site management after corrective actions have been implemented or sites have been designated as needing no further action under an industrial risk scenario in accordance with Module VI and the Post Closure Plan Attachments.

1.C.1.j. Other information as required by the Director.

1.C.2. PROTECTION STANDARDS

The levels of contamination as identified in the RFI Reports or other reports shall not be allowed to increase beyond the existing contamination levels determined through appropriate monitoring or the use of other data accepted by the Director, in accordance with Utah Admin. Code R315-101-3. The Permittee shall propose site-specific protection standards as outlined in Condition 1.C.2A and Condition 1.C.2.B.

1.C.2.A. Air, Groundwater, Surface Water and Soil Standards

The Permittee shall propose protection standards for air, groundwater, soil and surface water for approval by the Director. These standards shall include, but are not limited to: statistically derived background concentrations for naturally occurring elements and compounds, human health and ecological risk-based standards as set by Utah Admin. Code R315-101, the USEPA or other credible organizations acceptable to the Director, technology based limits such as maximum concentration limits (MCL) listed in Utah Admin. Code R315 and other standards as applicable. These standards

shall be proposed in the Phase I and Phase II RFI Reports and CMS Workplans or other reports and plans as applicable.

1.C.2.B. Chemical Agent Standards for Soil

The Permittee shall assess concentration levels for agents GA, GB, GD, GF, H, HD, HT, L and VX in soil. The "agent free concentration level" shall be defined as the agent concentration in the soils and waste not to exceed the detection limit for determining agent concentrations in soil and waste (i.e., solvent extraction methods). The detection limits for determining agent concentrations in soil and waste is technology driven and shall be evaluated by the Permittee or the Director by laboratory audits or other methods as needed.

The Director may also approve an alternate limit. For any proposed alternate limit, the Permittee shall include a justification based upon the criteria specified in Utah Admin. Code R315-101.

1.C.3. Other Relevant Protection Standards

The Permittee shall document all relevant and applicable standards for the protection of human health and the environment including, but not limited to National Ambient Air Quality Standards and state or federal approved water quality standards.

1.C.3.A COMMUNITY RELATIONS PLAN

In addition to the public comment requirements as described in Module V the Permittee has implemented this plan and informed the public by organizing a Restoration Advisory Board (RAB) and holding regular RAB meetings. The Permittee shall maintain the RAB and hold regular RAB meetings until such time that the RAB decides that a RAB is no longer necessary.

1.C.4. SITE-WIDE ECOLOGICAL ASSESSMENT

The Permittee shall complete a site-wide ecological assessment as required by Utah Admin. Code R315-101. The purpose of this assessment shall be to determine if residues from waste management activities at all HWMUs, and SWMUs, combined in their entirety, are a threat to ecological receptors. The assessment shall address all presently permitted or formally permitted sites under corrective action (SWMUs), HWMUs and any units closed under post-closure. This assessment shall be conducted in accordance with applicable USEPA guidance as approved by the Director and as described in Module V. The assessment shall address each of the plant communities located at TEAD-S, wildlife receptors for each trophic level and any threatened and endangered species, and may include species-specific toxicity testing.

MODULE V - APPENDIX B
CORRECTIVE MEASURES STUDY AND CORRECTIVE MEASURES IMPLEMENTATION

1. OBJECTIVES

The objectives of the Corrective Measures Study (CMS) and Corrective Measures Implementation (CMI) are to evaluate corrective action alternatives and design and implement the chosen alternative as needed for protection of human health and the environment. The CMS and CMI shall be completed for each SWMU that does not meet the risk based no further action (NFA) or industrial closure criteria outlined in Appendix A, Module V, Utah Admin. Code R315-101 and as recommended in approved Phase II RCRA Facility Investigation (RFI) Reports and CMS Workplans. The corrective action design and implementation information shall be included in the CMI plan.

1.A. Establish Corrective Action Objectives (CAO)

The CMS Workplan shall establish SWMU specific CAOs. These objectives shall be based on public health and environmental criteria, information gathered during the RFI, EPA and State of Utah guidance, and the requirements of any applicable State and Federal statutes. Any corrective actions concerning groundwater releases must provide human health and environmental protections consistent with those required under Utah Admin. Code R315-101 and other requirements or groundwater management plans approved by the Director. The Permittee shall also consider the use, value and vulnerability of groundwater in establishing CAOs and preparing groundwater management plans.

2. DEVELOPMENT OF CORRECTIVE ACTION ALTERNATIVES

Based on the results of the RFI, the Permittee shall identify, screen and develop the alternatives for removal, containment, treatment or other corrective action of the contamination based on the CAOs. This information shall be included in the CMS Workplan. This information shall also be developed and reported as required by Condition 2.A., Condition 2.B. and Condition 2.C.

2.A. Description of Remedial Actions

The CMS Workplan shall include a statement of the purpose for the response. The statement of purpose shall identify the actual or potential exposure pathways that should be addressed by corrective measures. The RFI Reports and CMS Workplan shall also include information regarding previous response activities, interim measures and voluntary cleanup activities.

2.B. Screening of Corrective Measure Technologies

The Permittee shall review the results of the RFI to identify technologies which are appropriate for the facility. The Permittee shall screen technologies and identify those having severe limitations, those that present safety hazards for a given set of waste and site-specific conditions or that do not meet the requirements of this Permit or the Utah Admin. Code. The screening may eliminate technologies based on these criteria. Site, waste and technology characteristics which are used to screen inapplicable technologies are described in more detail in 2.B.1. through 2.B.3.

2.B.1. Site Characteristics and History

Site data shall be reviewed to identify conditions that may limit or promote the use of certain technologies. Technologies whose use is clearly precluded by site characteristics or safety hazards shall be eliminated from further consideration. If information that is classified by the U.S. Government will impact the CMS, and the Director has not reviewed or will not have access to this information, the existence of the classified information shall be identified in the CMS Workplan. The Permittee shall provide for the Director to review or be made aware of the essential elements of this information.

2.B.2. Waste Characteristics

Identification of waste characteristics that limit the effectiveness or feasibility of technologies is an important part of the screening process. Technologies clearly limited by these waste characteristics shall be eliminated from consideration. Waste characteristics particularly affect the feasibility of in-situ methods, direct treatment methods and land disposal (on/off-site). For SWMUs where chemical warfare agent or chemical warfare agent residues are present, the Permittee shall identify chemical warfare agent safety, surety or other Army requirements that may impact use of certain technologies.

2.B.3. Technology Limitations

During the screening process, the level of technology development, performance record and inherent construction, operation and maintenance problems shall be identified for each technology considered. Technologies that are unreliable, perform poorly or are not fully demonstrated shall be eliminated in the screening process. Technologies evaluated by the Interstate Technology Regulatory Council (ITRC) (see http://www.itrcweb.org/) may be favored for use with minimum requirements for site specific testing and prove-out.

2.C. Identification of Corrective Measure Alternatives

The Permittee shall develop the corrective measure alternatives based on the CAOs and shall report these alternatives in CMS Workplans. The Permittee shall rely on engineering practice to determine which technologies appear most suitable for each SWMU. Technologies can be combined to form the overall corrective action alternative or alternatives. The alternative developed shall represent a workable number of option(s) that appear to address all site problems and corrective action objectives. The Permittee shall document in the workplan the reasons for excluding technologies.

3. EVALUATION OF THE CORRECTIVE MEASURE ALTERNATIVES

The Permittee shall describe each corrective measure alternative that passes the screening as described in Section 2 and evaluate each corrective measure alternative and its components. The evaluation shall be based on technical, environmental, human health and institutional concerns. The Permittee shall also develop cost estimates for each corrective measure.

3.A. Technical/Environmental/Human Health/Institutional

The Permittee shall evaluate each alternative using the criteria outlined below.

3.A.1. Technical

The Permittee shall evaluate each corrective measure alternative based on performance, reliability, efficacy of implementation and safety.

3.A.1.a. The Permittee shall evaluate performance based on the effectiveness and useful life of the corrective measure:

3.A.1.a.i Effectiveness shall be evaluated in terms of the ability to perform intended functions, including but not limited to containment, diversion, removal, destruction or treatment. The effectiveness of each corrective measure shall be determined either through design specifications or by performance evaluation. The evaluation shall also consider the effectiveness of combinations of technologies.

3.A.1.a.ii Useful life is defined as the length of time the level of effectiveness can be maintained. Each corrective measure shall be evaluated in terms of the projected service lives of its component technologies. Resource availability in the future life of the technology, as well as appropriateness of the technologies, must be considered in estimating the useful life of the project.

3.A.1.b. The Permittee shall provide information on the reliability of each corrective measure including its operation and maintenance requirements and its demonstrated reliability. Demonstrated reliability measures the risk and effect of failure. The Permittee shall evaluate whether the technologies have been used effectively under analogous conditions, whether the combination of technologies have been used together effectively, whether failure of any one technology has an immediate impact on receptors and whether the corrective measure has the flexibility to deal with uncontrollable changes at the site.

3.A.1.c. The Permittee shall describe the implementation of each corrective measure including the relative ease of installation (constructability) and the time required to achieve a given level of response. The Permittee shall estimate the time that will be required to implement a corrective measure and the time it takes to actually see beneficial results. Beneficial results are defined as the reduction of contaminants to some acceptable, pre-established level.

3.A.1.d. The Permittee shall evaluate each corrective measure alternative with regard to safety. This evaluation shall include threats to the safety of nearby communities and environments as well as those to workers during implementation. Factors to consider include but are not limited to fire, explosion and exposure to hazardous substances.

3.A.2. Environmental

The Permittee shall perform an environmental assessment for each alternative. The environmental assessment for each alternative shall include an evaluation of any adverse effects on environmentally sensitive areas and an analysis of measures to mitigate adverse effects.

3.A.3. Human Health

The Permittee shall assess each alternative in terms of the extent to which it mitigates short and long-term potential exposure to any residual contamination and protects human health both during and after implementing the corrective measures. The assessment shall describe the types and levels of contaminants on-site, potential exposure routes and potentially affected populations. Each alternative shall be evaluated to determine the level of exposure to contaminants and the reduction over time. For management of mitigation measures, the relative reduction of impact shall be determined by comparing residual levels of each alternative with existing criteria, standards and guidelines acceptable to the Director.

3.A.4. Institutional

The Permittee shall assess the effects of federal, state and local environmental and public health standards, regulations, guidance, advisories, ordinances and community relations on the design, operation and timing of each alternative.

3.B. Cost Estimate

The Permittee shall develop an estimate of the cost of each corrective measure alternative and for each phase or segment of the alternative. The cost estimate shall include capital and operation and maintenance costs.

4. RECOMMENDATION OF A CORRECTIVE MEASURE AND PREPARATION OF THE CMS REPORT

The Permittee shall justify and recommend a corrective measure alternative in the CMS Report. The Permittee shall submit summary tables of the corrective measure alternative recommendations. Tradeoffs among health risks, environmental effects and other pertinent factors shall be highlighted. The Director shall approve the corrective measure alternative or alternatives to be implemented. The following criteria shall be used to select the final corrective measure or measures.

4.A. Technical

4.A.1. Performance - corrective measures which are most effective at performing their intended functions and maintaining performance over extended periods of time;

4.A.2. Reliability - corrective measures which do not require frequent or complex operation and maintenance activities and that have proven effective under waste and facility conditions similar to those anticipated;

4.A.3. Implementability - corrective measures which can be constructed and operated to reduce levels of contamination to attain or exceed applicable standards in the shortest period of time; and

4.A.4. Safety - corrective measures which pose the least threat to the safety of nearby residents and environments as well as workers during implementation.

4.B. Human Health

The corrective measures shall comply with existing federal and state criteria, standards and guidelines for the protection of human health. Corrective measures which provide the minimum level of exposure to contaminants and the maximum reduction in exposure with time are preferred.

4.C. Environmental

The corrective measures posing the least adverse impact (or greatest improvement) over the shortest period of time on the environment will be favored. The corrective measures shall be assessed as to the degree to which they employ treatment that reduces toxicity, mobility or volume of hazardous wastes and/or hazardous constituents.

4.D. Other Pertinent Factors

The Permittee shall justify the recommended alternative by describing other pertinent factors, such as cost. In addition, all other factors being equal, in-situ technology alternatives shall be favored.

5. CORRECTIVE MEASURES IMPLEMENTATION PROGRAM AND PREPARATION OF CMI WORKPLANS

The purpose of the Corrective Measure Implementation (CMI) Program is to design, construct, operate, maintain and monitor the performance of the corrective measures selected to protect human health and the environment as described below. This information shall be included in the CMI Workplans.

5.A. Corrective Measure(s) Design

The Permittee shall prepare final construction plans and specifications to implement the corrective measure(s) at the facility as defined in the CMS. The construction plans and specifications shall include, but not be limited to:

5.A.1. Design plans and specifications;

5.A.1.a. Design strategy and basis for implementation;

5.A.1.b. Currently accepted environmental control measures, construction practices and techniques and the constructability of the design. The Director has approved use of a performance rather than technology-based standard for landfill covers. This performance standard is one millimeter or less water

infiltration per year though any current or proposed landfill cover. All landfill cover designs shall meet this standard or provide justification if the design or current site conditions exceed this standard.

5.A.1.c. Assumptions, detailed drawings including, but not limited to, process flow diagrams, general arrangement and any applicable piping and instrumentation diagrams), equipment and specifications and material and energy balances; and

5.A.1.d. A discussion of the possible sources of error and potential operation and maintenance problems.

5.A.2. Short-term and long-term operations, inspection, maintenance and monitoring plans as needed;

5.A.2.a. Normal and alternate operation and maintenance practices including, but not limited to tasks for operation, tasks for maintenance, prescribed treatment or operation conditions and schedule identifying frequency;

5.A.2.b. Routine monitoring and laboratory testing including, but not limited to, description of monitoring tasks, required laboratory tests and their interpretation, required Quality Assurance/Quality Control and a schedule of monitoring frequency;

5.A.2.c. Equipment description (including equipment identification, installation of monitoring components, maintenance procedures and replacement schedule) and records and reporting including, but not limited to, daily operating logs, laboratory records, records for operating costs, reporting emergencies, personnel and maintenance records and required reports to be stored at the facility;

5.A.2.d. Alternate operating and maintenance procedures to prevent undue hazard due to system failure and analysis of vulnerability and additional resource requirements should a failure occur; and

5.A.2.e. Safety plan during routine operation and safety tasks in the event of systems failure.

5.A.3. Cost estimate.

5.A.4. Project schedule identifying timing for initiation and completion of all critical path tasks, dates for completion of the project and major milestones.

5.A.5. Construction quality assurance objectives (including but not limited to the responsibility and authority, personnel qualifications, inspection activities, sampling requirements and documentation).

5.A.6. Health and safety plan.

5.A.7. Design phases may include a preliminary design, additional studies, pre-final design and final design as specified in approved plans or reports:

5.A.7.a. Preliminary Design. The preliminary design is a 30% design. The technical design requirements of the project shall be adequate to determine if the final design will provide an operable and usable corrective measure. Supporting data and documentation shall be provided with the design documents defining the functional aspects of the program. The Permittee shall include calculations reflecting the same percentage of completion as the designs they support. If the approved alternative is a standard industry practice or considered a presumptive remedy (see http://www.epa.gov/superfund/policy/remedy/presump/pol.htm) and can be easily implemented, the Director may not require a preliminary design for review and approval.

5.A.7.b. Additional studies to supplement the available technical CMI data may be required. Upon written notification from the Director, the Permittee shall provide sufficient sampling, testing and analysis to optimize the required treatment and/or disposal operations and systems. A final report of the testing shall include all data taken during the testing and a summary of the results of the studies.

5.A.7.c. Prefinal Design. The prefinal design is a 95% design. The pre-final design submittal shall include the Design Plans and Specifications, the Operations and Maintenance Plan, the Project Schedule, the Quality Assurance Plan, specifications for the Health and Safety Plan and the Construction Quality Assurance Plan as described in Condition 5.B. Depending on the site and alternative proposed, the Director may not require a pre-final design for review and approval.

5.A.7.d. Final design. The final design is a 100% design. The final design submittal shall include the Final Design Plans and Specifications, the Final Operation, the Maintenance and Monitoring Plan, the Final Quality Assurance Plan, the Construction Quality Assurance Plan as described in Condition 5.B, the Final Project Schedule, and Final Health and Safety Plan specifications. The final design and pre-final or preliminary design may be the same submittal.

5.B. Corrective Measure(s) Construction

Following Director approval of the final design, the Permittee shall implement a construction quality assurance program to ensure, with a reasonable degree of certainty, that a completed corrective measure meets or exceeds all design criteria, plans and specifications. The construction quality assurance plan is a facility-specific document that shall be submitted to the Director as part of the design for approval and prior to the start of construction. At a minimum, the construction quality assurance plan shall include the elements identified in Condition 5.B.1 and Condition 5.B.2. Upon the Director's approval of the construction quality assurance plan, the Permittee shall construct and implement the corrective measures in accordance with the approved design, schedule and the construction quality assurance plan. The Permittee shall also implement the elements of the approved operation required for long-term maintenance and any conditions required to enter into post-closure.

5.B.1. The responsibility and authority of all organizations and the qualifications of all personnel shall be described in the construction quality assurance plan.

5.B.2. The observations and tests that will be used to monitor the construction and/or installation of the components of the corrective measure(s) shall be summarized in the construction quality assurance plan. The plan shall include the scope and frequency of each type of inspection. Inspections shall verify compliance with all environmental requirements and include, but not be limited to, air quality and emissions monitoring records and waste disposal records. The inspections shall also ensure compliance with all health and safety procedures.

5.B.2.a. A preconstruction inspection and meeting shall be held to discuss methods for documenting and reporting inspection data, reviewing the distribution and storage of documents and reports, reviewing work area safety, discussing appropriate modifications to the construction quality assurance plan and conducting a site visit.

5.B.2.b. Upon preliminary project completion, the Permittee shall conduct a pre-final inspection consisting of a walk-through inspection of the entire site. The inspection is to determine whether the project is complete and consistent with the corrective measures approved by the Director. The Permittee shall operationally test the treatment equipment. The Permittee shall demonstrate and document that the equipment has performed to meet the purpose and intent of the specifications. Retesting shall be completed where deficiencies are revealed. If necessary, a pre-final inspection report shall outline the outstanding construction items, actions required to resolve items, completion date(s) for these items, and the date of the final inspection.

5.B.2.c. Upon completion of all outstanding construction items, the Permittee shall notify the Director for the purposes of conducting a final inspection. A final inspection by the Director or his representatives will focus on confirming compliance with the design specifications and corrective measures objectives.

5.C. Sampling Requirements

The sampling activities, sample size, sample locations, frequency of testing, acceptance and rejection criteria and plans for correcting problems shall be presented in the Corrective Measures Design.

5. D. Documentation

Reporting requirements for construction quality assurance activities shall be described in detail in the Corrective Measures Design and CMI Plan. This shall include but not be limited to such items as daily summary reports, inspection data sheets, problem identification and corrective measure reports and design acceptance reports.

6. LONG-TERM INSPECTION, MAINTENANCE AND MONITORING

The Permittee shall address long-term inspection, monitoring and maintenance in the CMI Workplan and as described in Module V. The CMI plan shall propose addition of long-term monitoring plans to a post-closure permit or other plan as needed in accordance with Module VI. The Permittee shall implement the inspection, maintenance and monitoring requirements contained in the CMI Plan upon implementing the corrective measure.

7. REPORTS

7.A. Corrective Measures Study (CMS) Workplan and CMS Reports

The Permittee shall prepare CMS Workplan and CMS reports in accordance with the schedule specified in Table 3.

7.B. Progress Reports

The progress reports shall contain the following information:

7.B.1. A description and estimate of the percentage of the CMS completed;

7.B.2. Summaries of all findings;

7.B.3. Summaries of all changes made in the CMS during the reporting period;

7.B.4. Summaries of all problems or potential problems encountered during the reporting period;

7.B.5. Actions being taken to rectify problems;

7.B.6. Projected work for the next reporting period; and

7.B.7. Copies of daily reports, inspection reports, laboratory and monitoring data shall be held at the facility until the CMI is completed.

7.C. Corrective Measure Implementation (CMI) Reports

At the completion of construction, the Permittee shall submit a CMI Report to the Director for approval. The report shall establish that the project was implemented and/or built according to the specifications and that the corrective measure is performing adequately. The report shall include, but not be limited to, the following elements:

7.C.1 Certification by an independent professional engineer registered in the state of Utah of the design and construction;

7.C.2 Explanation of any modifications to the plans and why these modifications were necessary;

7.C.3 Listing of the performance or other criteria established for judging the functioning of the corrective measure and also justifying any modification to these criteria;

7.C.4 Results of facility monitoring, indicating that the corrective measure meets or exceeds the performance criteria; and

7.C.5 This report shall include all of the daily inspection summary reports, inspection summary reports, inspection data sheets, problem identification and corrective measure reports, block evaluation reports, photographic reporting data sheets, design engineers' acceptance reports, deviations from design and material specifications and as-built drawings.